Structured Inventory of Studies

PREPARATORY ECONOMIC ANALYSIS OF THE VALUE-ADDING PROCESSES WITHIN INTEGRATED SUPPLY CHAINS IN FOOD AND AGRICULTURE

(DG JRC/IPTS)

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1. Introduction

An extensive literature research on existing studies and applied methodologies on the economic analysis of the value-adding processes within integrated supply chains in food and agriculture, hereby focusing on food quality assurance and certification schemes, has resulted in a wide variety of different studies and methodologies.

The objective of this second deliverable is to further structure and analyse more deeply these retrieved studies. To this end, each study is reviewed according to a pre-specified standardised format, which summarises the relevant information to enable in-depth comparison. Each summary includes:

- Title, authors, contact details, and link to the study,
- Abstract
- Classification according to the analytical table (see deliverable 3)
- Background and context of the study,
- Goals and objectives of the study,
- Quality assurance or certification scheme addressed in the study,
- Scope and coverage of the study,
- Dataset(s) used in the study,
- Methodology, or methodologies used in the study,
- Conclusions and recommendations of the study,
- Strengths and weaknesses of the methodology used (with respect to its capacity to achieve the goals and objectives of the study).

Following an extensive search, a total of 128 studies have been retained. In making our choice of papers to analyse, we have concentrated on scientifically validated papers, in particular those that are published in refereed journals and in conference proceedings where some selectivity has been exercised. There exists a large number of papers in the “grey literature” (conference presentations, papers posted on researchers’ websites etc), the scientific value of which is quite variable and often debatable. In our judgement, it is unlikely that, among this grey literature, significant papers could be found using valid methodological approaches that are quite different from what we have already found in the more “up-market” literature. On the contrary, papers in the grey literature that have not succeeded in being published in a journal are usually, from the methodological point of view, weaker or less rigorous variants of papers we have inventoried and cited. There is, of course, the possibility that in the very recent grey area a more original paper can be found, that has not yet had time to find its way into a journal. Therefore, we have – within the limits of time and resources available – also scanned this literature quite carefully, and some papers in this category have been included.
The 128 papers retained have been classified as either ‘methodological’ papers (82) or ‘background’ papers (46), according to whether or not they contain material of an analytical (theoretical or empirical) nature. The following section of this report contains reviews of the 82 methodological papers in the format presented above.

The breakdown of the 82 methodological papers according to provenance is shown in Table 1.

Table 1: Provenance of the methodological studies inventoried

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<th>Australia</th>
<th>Belgium</th>
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<th>Denmark</th>
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Table 1 shows the provenance of the methodological studies inventoried in this report. In most cases, the country in which the authors are based is the same as the country on which the study focuses. Where co-authors are of different nationalities, the provenance is shown as the country on which the study focuses.

In order to get a clearer overview of the existing literature on the economic impacts of food quality assurance and certification schemes, the methodological studies presented in this inventory have been classified according to the quality characteristic or product attribute that is targeted by the scheme. This enables us to get a first impression of the frequency distribution of the number of studies according to the kind of characteristic targeted by the scheme (e.g., regional origins, biotech/non-biotech) and to identify gaps in the literature, or gaps in our literature review. Our rationale behind using this approach is that, from an economic analysis perspective it does not make a difference what specific quality or safety aspect is addressed in the scheme, as they all concern product differentiation and the creation of a niche market. Using this approach, the studies we have found so far in the literature can be grouped into ten categories, according to the characteristic(s) by which the market is segmented:

- Articles on internal chain standards (22) [9],
- Articles on region-of-origin labelling and EU certificates of origin (12) [8],
- Articles on country-of-origin labelling (6) [1],
- Articles on specific quality assurance schemes (11) [2],
- Articles on biotech/non-biotech labelling (6) [2],
- Articles on food safety assurance schemes and food safety standards (5) [7],
- Articles on ECO-labelling (3) [1],
- Articles on environmental, organic, animal welfare and sustainable standards (7) [5],
- Articles on national and store brands (4) [2],
- Articles on nutritional labelling (5) [0],
• Articles on food labelling in general (1) [9].

In the above list, the number in round brackets represents the number of methodological papers in this category, whereas the number in square brackets shows the number of background papers appearing in this category. The two lists of studies (methodological and background papers), grouped into these 10 categories, are attached as Annexes to this deliverable. The same lists of studies presented alphabetically by first author name can be found as Annexes to deliverable 1.
2. Inventory of methodological papers

| Title: No such thing as a free safe lunch: the cost of food safety regulation in the meat industry |
| Authors: John M. Antle |
| Publication date: May 2000 |
| Journal: American Journal of Agricultural Economics 82 |
| Publisher: American Agricultural Economics Association |
| Number of pages: 310-322 |
| Availability, URL: |
| Contact details authors: jantle@montana.edu |

Abstract
This study develops theoretical and econometric cost function models for the meat industry to test the hypothesis of safety exogeneity, i.e. that product safety does not affect productive efficiency. Using plant-level data from the Census of Manufactures, this hypothesis is rejected. Estimates of the impacts of food safety regulation on variable cost of production in the beef, pork, and poultry industries show that the efficiency costs of food safety regulations could plausibly exceed benefits estimated by the U.S. Department of Agriculture. Costs of regulation per pound of meat are found to be size neutral for all but the smallest plants.

Position in the analytical framework

Question: Do QA and certification schemes improve profitability?
Stakeholders: Processors

Background and context of the study
Periodic discoveries of fresh or frozen fish, meat and poultry contaminated with pathogens such as E. coli and Salmonella have led the Food and Drug Administration of the Department of Health and Human Services, and the Food Safety Inspection Service of the US Department of Agriculture, to mandate new quality-control regulations and product testing for the seafood, meat and poultry industries. These new regulations are designed to modernize the inspection system that has been recognized as ineffective in preventing microbial contamination of fresh and processed meat and poultry products. The principal elements of the new meat and poultry regulations are the mandatory use of the Hazard Analysis Critical Control Points (HACCP) approach to quality control, and the use of tests for pathogens such as E. coli and salmonella. HACCP involves identifying hazards and establishing methods to control those hazards.

Many regulatory impact assessments (RIA) have been conducted in order to estimate the potential benefits and cost of the new regulations. However, theoretical literature on the possible impacts of food safety regulation on the cost of production has remained scarce.

Goals and Objectives of the study
The first goal of this paper is to develop a theoretical model and a corresponding econometric cost function appropriate for the meat industry to test the hypothesis of safety exogeneity. Upon rejection of this hypothesis, the second part of this paper uses these cost functions to estimate the impacts of food safety regulations on variable cost of production in the beef, pork, and poultry industries. Finally, the benefits and costs of the recent HACCP and pathogen reduction regulations will be assessed.

Quality assurance or certification scheme addressed in the study
The theoretical model presented in this paper could be used for analysing changes in variable production costs due to any regulation that is aimed at increasing the level of safety. The empirical section however, explicitly focuses on the HACCP regulations.

Scope and coverage of the study
In this study, both a theoretical as well as an empirical analysis are presented.

Dataset(s) used in the study
In the empirical analysis of this study, Census of Manufactures plant-level data for 1987 and 1992 are used. The data were stratified into samples for beef, pork and poultry slaughters and processors, and into groups of large and small plants.

Methodology, or methodologies used
The theoretical model presented in this study is a model of a competitive industry with product differentiation. Demand is assumed to be a function of the price, safety, other quality attributes and other variables. Supply is assumed to be a function of the price, safety, other quality attributes,
factor prices and capital stock. Using these two equations, safety is assumed to be endogenous and expressed as a function of the other quality attributes, price, other demand variables, factor prices and capital stock. Solving this equation for the market equilibrium price results in planned levels of safety and quality. The plant then chooses its output level to maximise its returns, taking the price, safety and quality levels as given. The cost function of the plant is thus assumed to be a function of its output, safety and quality level, factor cost and capital stock.

The report continues with the estimation of the restricted quality-adjusted translog variable cost functions for beef, pork and poultry plants in the US. The non-safety quality is represented by the ratio of management to production labour and the proportion of processed product in total output. Other variables included in the cost function are animal inputs, production labour inputs, and safety. This safety is assumed to be endogenous too, and therefore, the variable cost function is simultaneously estimated with the safety function, using SUR. The safety function is estimated as a function of per capita income, the ratio of management to production labour and the proportion of processed product in total output.

Then the hypothesis of safety exogeneity is tested. The results of the test reject this hypothesis and confirm the hypothesis of the theoretical model that safety is endogenously determined.

Finally, the change in variable costs of small and large beef, pork and poultry plants due to HACCP is estimated. This change in variable costs is estimated using the current level of variable costs, the cost-safety elasticity that resulted from the SUR estimation, the current level of safety (in percentage) and the level of effectiveness of the regulation. The regulation is assumed to be 20% effective, as demonstrated by Knutson et al.

Conclusions and recommendations of the study
According to the theoretical model presented in this paper, safety is endogenously determined by among others the quality level of the plant and total consumer demand. Additionally, the theoretical model results in an expression of the variable cost function, which is among others a function of the level of safety.

Based on these results, the variable cost functions and the safety functions are empirically estimated for beef, pork and poultry. The results clearly reject the hypothesis of safety exogeneity and thus correspond to the theoretical model. The estimation results allow for calculating the elasticities of variable costs with respect to safety. Using these elasticities, the current level of safety and costs, and the level of effectiveness of the regulation, the authors were able to estimate the change in variable production costs for small and large beef, pork and poultry plants.

Strengths and weaknesses of the methodology used

**Strengths**
- The impact of safety rules on both operating costs and productivity of the firms is evaluated. These costs are generally ignored in studies that used accounting data or survey.
- Also deals with the adjustment within the firm when adopting a new regulation. It recognises that the choice of quality is endogenous. Therefore, when the firm is facing a new regulation, it will adapt its production systems. It also allows for the fact that a stricter food safety regulation could imply a decrease in productivity
- Uses real data.
- Theoretical consistency means that tests can be derived.

**Weaknesses**
- Requires firm level data which are difficult to access (in France, it is necessary to have a ‘habilitation’ with INSEE in order to obtain this kind of data).
- According to the authors, some caveats should be mentioned. First, the analysis is static and does not account for the possibility that firms may be able to fully adapt their technologies in response to regulations and thus mitigate the impacts of the regulations on the cost of production.
- There could be differences between small and large firms due to economies of scale enjoyed by multi-plant firms that are not measured in this study.
- The industry costs estimated in this study are the sum of the plant-level costs, and do not account for the market equilibrium effects of costs increases on producers.
The purpose of this study is to check the presence of reciprocal synergies between typical and traditional products and local development. The area in question is the province of Parma, where the presence and intensification of relations between the primary and secondary sector were, in the first fifty years of the century, the deciding factors of the economic development (Basini and Forestieri, 1989; Giacomini and Mora, 1996). To analyse this case we used the method of the chain-analyses, to study Parmigiano Reggiano Cheese (PR), and the idea of agro-industrial districts to examine Parma Raw Ham case.

Position in the analytical framework

Question: What is the impact of QA and certification schemes on market structure?

Stakeholders: Primary producers

Background and context of the study

After a long period of crisis (1930-1945), Parma, which had come out of the war conflict less damaged than other cities and with a production system specialised in agro-food, lived more intensely than other provinces the period of fast development of the Italian economy which is named “economic miracle”. Since the first years of the post-war the local economic growth had been faster than the national and regional one, to the point that during these years the income per person was higher than the national one by 20.5 % and by 15.6% compared to the regional datum. Development was favoured especially by the rapid growth of the secondary and the services sector. However, the real development of this area took place during the last years of the Sixties, when the country was taking the road of the great economic growth, and it was stirred at first by the big business, then by a characterisation at local level (North-East and Centre area) and with sectorial peculiarities; from the traditional manufacturing industry (textile-clothing, shoe-manufacturing, food industry) to sectors characterised by mechanical specialisation. Nowadays, Parma places itself among the first Italian cities for its living standard and its income per head. The composition of its production reveals, moreover, the ascent of the services sector, which covers today 60% of the value of the local production of goods and services. Moreover, the composition of the workers points out a generalised expansion of the tertiary sector in the economy of Parma.

With respect to the Parma agri-business, two typical products can be distinguished: Parmigiano Reggiano (PR) Cheese and Parma Raw Ham. Today the production of Parmigiano Reggiano (PR) represents 15% of Italian cheese market and more than 30% of DCO (Designation of Controlled Origin) and labelled cheeses, which represent about 75% of all cheese manufacturing in Italy; 75% of the milk used in the production of PR originates in Emilia Romagna (from now on indicated as ER), the second most important region in dairy production after Lombardia. Since 1963, the production of typical raw ham has passed from 50.000 raw hams to almost 7.8 millions in 1996; in particular the development of the production took place after 1970, when the designation of origin “Prosciutto di Parma” was approved. Today Parma raw ham covers 45.5% of the national raw ham market.

The evolution of the organising, technical and global aspects, in other words, of the product production system has changed, especially during the last century and, as a result, today the organisation and the relations with the territory of the two most important and typical products are undoubtedly typical.

Goals and Objectives of the study

The purpose of this study is to check the presence of reciprocal synergies between typical and traditional products and local development.

Quality assurance or certification scheme addressed in the study

This study focuses on two typical products coming from the province of Parma: Parmigiano Reggiano Cheese and Parma Raw Ham. These two products both are protected by DCO
**Scope and coverage of the study**
In order to achieve the objective as defined above, this study will focus on two typical products coming from the province of Parma: Parmigiano Reggiano Cheese and Parma Raw Ham.

**Dataset(s) used in the study**

**Methodology, or methodologies used**
To analyse the presence of reciprocal synergies between local development and the two commodities in question, two methods have been used. To study the case of Parmigiano Reggiano (PR) Cheese, the method of chain-analysis is used, whereas the idea of agro-industrial districts is used to examine the Parma Raw Ham case.

Using the chain-analysis, all the stages in the production chain of PR cheese are identified, from the raw material sector (farms) to the final distributor. At each level, changes in the number of actors (e.g. farms, cheese diaries, seasoners, output levels and distributors), their distribution, concentration, sizes etc. are analysed.

For the case of the Parma Raw Ham, the idea of Marshallian Industrial District has been applied to the agro-industrial system for analysing and interpreting the relationships among agriculture, industry and the socio-economic environment over the course of time. The ‘survival’ of the district is in detail explained by several concepts; spatial concentration of factories, demographic trend, creation of other activities, external economies of scale, community markets and innovation.

**Conclusions and recommendations of the study**
Conclusions are missing in this study. However, the chain-analysis clearly describes the development of/within the production chain of PR cheese. In addition, the idea of agro-industrial districts is able to explain the regional development using several concepts.

**Strengths and weaknesses of the methodology used**
- Deals with ‘local development’ and impact on market structure of a DCO.
- Provides a list of indicators to characterize the impact of DCO
- Due to the absence of reference to a ‘standard’ chain (that is not a DCO one), it is not possible to identify what is the impact of the DCO (are the changes observed due to DCO or due to other factors).

Utility for our study: mainly a list of indicators and an example of the interactions that play a role in the chain.
Title: Quality signalling through certification. Theory and an application to agricultural seed markets.
Authors: Emmanuelle Auriol and Steven G.M.Schilizzi
Publication date: January 27, 2003
Journal: Agricultural and Resource Economics, Faculty of Agriculture, University of Western Australia, Crawley, Australia
Publisher:
Number of pages:
Contact details authors: eauriol@cict.fr, Steven.Schilizzi@uwa.edu.au

Abstract
We examine the problem of signalling the quality of goods and services when quality is never observable to consumers. The solution to this problem is certification, which acts to transform unobservable credence attributes into observable search attributes. We study the impact of certification systems on market structure and performance. It turns out that the costs of certification, sunk in order to achieve credibility, play a key role in producing an oligopolistic market.

We next show that since it involves increasing return to scale, certification is better achieved by an independent body which can either be a private firm or a public agency. We examine the two ways in which quality provision through certification may be financed (i.e. public and private), and identify the conditions under which each is most efficient. Finally we examine the relevance of the model by studying the role of certification in quality seed provision for agriculture. Overall, model predictions are compatible with the conclusions of this empirical study.

Position in the analytical framework

**Question:** What is the optimal mix of publicly and privately funded labelling or certification?
What is the impact of QA and certification schemes on market structure?

**Stakeholders:** Aggregate supply chain

Background and context of the study
In increased awareness and concern for health and the environment, coupled with rising living standards, have brought quality attributes of industrial products into the limelight. Increasingly, in the wealthier and more industrialized countries, consumers and public authorities are giving weight to quality attributes such as nutritional content, safety, functionality and environmental impact. Many people are hence prepared to pay a premium for goods that improve health standards, preserve the environment, or are produced in an ethical way. In the process, problems arise linked to the possibility for consumer deception and, more generally, to the efficient signalling of quality attributes of goods and services. One practical solution to this problem is the process known as certification.

However, a major concern with certification is consumer confidence which depends on the credibility of the certification process and stamp. A second concern which is directly linked to the first one is that to signal quality without uncertainty or with little certainty, certification is costly and may indeed be very costly in some cases.

Goals and Objectives of the study
The aim of this paper is to examine the impact of certification costs on market structure and performance, by both a theoretical and an empirical investigation. The final goal of the paper is to examine where on the public-private and on the monopoly-competitive spectra optimal certification is to be identified and achieved.

Quality assurance or certification scheme addressed in the study
The theoretical analysis of this paper focuses on quality certification schemes in general. The empirical section however, is focussed on the certification of seed. In this case, the certification guarantees a minimum quality and a maximum sensitivity to specific agronomic conditions.

Scope and coverage of the study
The theoretical part of this study presents a model for analysing the problem of quality provision when the quality is costly to produce (high certification costs) and unobservable by the consumer. This framework is further exploited in order to study the optimal certification policy both under private and public control. In the empirical section, the theoretical model is illustrated using the certification of agricultural seed. Three hypotheses are tested: (1) under laissez-faire there is a high correlation between a nation’s wealth and the degree to which farmers use certified seed, (2) under a publicly funded program the level of certification is much higher than what would have occurred.
under laissez-faire. (Such a publicly funded program occurs when the funds used to finance it come at low cost), (3) seed certification is an important factor in achieving high agricultural productivity.

**Dataset(s) used in the study**

For the empirical illustration of the theoretical model, data on non-certified and certified seed usages in 40 countries was found and compiled from the FAO database. Auxiliary data included GDP per head, arable land area, agricultural output, and agricultural production factors: labour, tractors, fertilizers, and irrigation (all available in the FAO Production Yearbook series and the FAO Fertilizer Yearbook series). The dates used were 1985, 1990 and 1995. To minimize problems of climatic variability, three-year moving averages were used (1984-86, 89-91, 94-96). Three levels of aggregation were considered for agricultural production: cereals only, all crops, and aggregate agricultural produce. We considered tractors and fertilizer use per arable hectare, and percentage of farmland irrigated. Labour was recorded as the active population in agriculture per hectare of arable land. Data was recorded only for those countries for which certification data was available.

**Methodology, or methodologies used**

In the theoretical analysis, three situations are distinguished (1) quality is observable, (2) quality is not observable and (3) quality is not observable but certification is used. For the first two situations, the equilibrium levels of prices, quantities and surplus are defined. In general, consumer surplus is expressed as a function of the price, quality and the level of wealth. Producer costs are expressed as a function of the quantity and quality. For the third situation, two different options are analysed, (a) private self-certification, and (b) optimal certification policy, where either the certification is funded by the state or by fees paid by the taxpayers. Again, the equilibrium levels are formulated.

Three hypotheses are tested in the empirical section of the paper. The first two hypotheses are tested using simple statistics to examine the empirical relationship between GDP per capita and certification ratios. In addition, simple regression has been performed of the certification ratio on GDP per capita. For testing the third situation, linear regression methods have been used where the level of cereal yields is regressed upon the certification ratio, the usage of fertilizers, number of tractors per hectares, size of active population, and percentage of arable land irrigated.

**Conclusions and recommendations of the study**

This paper has studied the problem of quality certification when quality is a credence attribute and certification is perfect. The theoretical model shows that the costlier the certification process, the fewer will be the firms able to afford certification. In this sense certification cost is a major factor in deciding market structure, with high costs leading to a monopoly for certification, and ultimately to no certification at all. In this case the market for quality collapses. The certification equilibrium is also influenced by the wealth level of the population. For a rich population, a certification equilibrium might prevail, whereas with a poor one it might not. In addition, the theoretical model has shown that certification through an independent certification body always dominates self-certification. Whether it should be funded by a fee on the certified product or by public funds, depends on the shadow cost of public funding. In developing countries where there are external organizations eager to fund the certification program, the shadow cost of funding is close to 0 (at least in theory). These countries should rely on public funding. On the other hand, in rich countries the shadow cost of public funding is high because the tax burden is already very high. It is better to rely on a fee to finance the certification process.

These ideas were confronted with the issue of agricultural seed certification. Although the available data was limited in both quantity and quality, the relationship between levels of average income and levels of certification is verified for countries with market-based certification (that is, provided through the private sector). In countries with government provision, GDP per head, as expected, is not a good predictor of certification levels, especially where international aid is relied on. Finally a difficulty appeared regarding the efficiency of government-funded seed certification. One would have expected that these (often voluntary) certification programs would have had some positive (though lagged) impact on agricultural productivity. Instead, the data revealed a negative impact. We were not able to explain away what appears as an anomaly, and it is not obvious whether the data is at stake. For government-based certification schemes, it is likely that there is more at stake than what is accounted for in our model.

**Strengths and weaknesses of the methodology used**

**Strengths**

Interesting theoretical model to generate some policy-relevant results, in the form of testable hypotheses.
Weaknesses  The empirical part contains some weak econometrics. The purpose of this section is simply to provide evidence in support of the theoretical results, on a cross-section basis. However, the estimated equations undoubtedly suffer from omitted-variable bias, and the technique used does not accommodate country heterogeneity.

Title: Influence of product perception and quality label valuation on consumer decision. The case of beef in Italy and Spain.
Authors: Ramo Barrena, Mercedes Sánchez and Franco Rosa.
Publication date: 2005
Journal: Paper prepared for presentation at the XIth International Congress of the EAAE, Copenhagen, Denmark, August 24-27, 2005
Publisher:
Number of pages:
Contact details authors: ramo.barrena@unavarra.es, mersan@unavarra.es, rosa@uniud.it

Background and context of the study
The influence of the relation between food and health has increased for the consumers in developed countries. This situation has generated opportunities and advantages for different activity sectors, but in other sectors this has generated important problems which are difficult to recuperate or to resolve. Examples of these negative scenes can be found in sectors with food scares. The beef sector for example has experienced many problems with respect to the recuperation of consumers’ confidence.

Goals and Objectives of the study
The objective of this paper is to examine the effects of consumer perception of intrinsic and extrinsic product attributes and consumers’ label valuation on product confidence and consumption reduction.

Quality assurance or certification scheme addressed in the study
The case study presented in this study focuses on Spanish and Italian beef consumption. No particular certification or quality assurance scheme is addressed in study. However, the results might be interesting for analysing the impacts of food scares or quality labelling policies on consumer confidence and consumption.

Scope and coverage of the study
In order to achieve the objective as mentioned above, the case study will focus on beef consumption in Friuli-Venezia-Giulia in Italy and Navarra in Spain.

Dataset(s) used in the study
The data used in this study is obtained from a survey conducted in 2003 in two European countries, Italy and Spain. Friuli-Venezia-Giulia in Italy and Navarra in Spain were the two regions selected because of their relative importance with respect to beef production and consumption, and their similarities regarding their habits and economic structure. The 250 respondents from Spain and 125 from Italy were asked about their fresh meat consumption patterns, beef attributes perceptions, beef quality label aspects evaluation, their socio-demographic characteristics and lifestyles.

Methodology, or methodologies used
The methodological approach used in this paper is based on structural equation modelling (SEM) (also called covariance structure analysis or latent variable analysis). Structural equation modelling is a multivariate technique that examines a series of dependence relationships simultaneously and it is particularly useful when one dependent variable can be an independent variable in following relationships. SEM has the ability to incorporate latent (unobservable) variables into the analysis, which is approximated by observable variables. In this study, two latent variables were selected for having an impact on beef confidence and consumption reduction: the perception of the beef attributes and the valuation of the quality label. The beef attributes perception latent was formed by two factors; intrinsic and extrinsic attributes. The quality label valuation was also assumed to depend on two factors: guarantee quality label aspects and external guarantee label aspects. Each of these four latent factors were approximated by three observable variables.

In the analysis, two types of multi-group analyses are presented. The first multi-group analysis will focus on factor analysis and will include four different models: 1) Measurement Weights Model
(the weights are constrained to be equal across groups, 2) Structural Covariances Model (the weight and covariances are constrained to be equal across groups), 3) Measurement Residuals Model (the parameters are constrained to be equal across groups) and 4) the unconstrained model. The second multi-group analysis will not only focus on factor analysis but on the complete model and will include two different models: 1) Structural Weight Model (structural weight-regression weight is constant across groups) and 2) Structural Residual Model (structural residual variance is constant across groups).

Conclusions and recommendations of the study
Applying the different (6) models as mentioned above, allowed the researchers to find 1) the impact of extrinsic and intrinsic attributes on product perception, 2) the impact of guarantee quality label aspects and external guarantee label aspects on label valuation, 3) the impact of product perception on label valuation, 4) the impact of label valuation on label consumption, 5) the impact of label consumption on beef confidence and 6) the relationship between beef confidence and reduction in beef consumption. As the estimations were separately performed for Italy and Spain, the results allow for a comparison of Spanish and Italian consumers.

Strengths and weaknesses of the methodology used
**Strengths:** - The methodology used allows a cross-cultural comparison; ability of the model to incorporate unobservable variables into the analysis, which is approximated by observable variables.
**Weaknesses:** - Model based upon respondents answers and not upon observed behaviour; complexity of the model.
### Title: Premium private labels, supply contracts, market segmentation and spot prices

**Authors:** Pascale Bazoche, Eric Giraud-Héraud and Louis-Georges Soler.

**Publication date:** 2005

**Journal:** Journal of agricultural and Food Industrial Organisation

**Publisher:**

**Number of pages:** 29

**Availability, URL:** http://www.bepress.com/jafio/vol3/iss1/art7

**Contact details authors:** bazoche@ivry.inra.fr; giraud@poly.polytechnique.fr; soler@ivry.inra.fr

### Abstract

In recent years, European retailers have modified the market segmentation in the meat and the fresh produce sectors by implementing new private labels which aim to guarantee higher quality and food safety. As a result, retailers impose more demanding production requirements and rely on contractual relationships with upstream producers. Meat and vegetables shelf spaces are now composed of generic products supplied from competitive spot markets, and premium private labels based on long term supply contracts. In this paper we propose a model of vertical relationships between producers and retailers in order to analyze the consequences of such strategies. In particular, we analyze the interest of producers to commit to these new private labels, their effects on spot market prices, and the resulting market segmentation between the spot market and supply contracts.

### Position in the analytical framework

**Question:** Who benefits from QA schemes?

**Stakeholders:** Producers, retailers, consumers

### Background and context of the study

From a commercial point of view, these initiatives have resulted in increased segmentation of products offerings on store shelves. In order to meet the wide range of expectations of consumers, especially those seeking products of a higher quality, retailers now offer – next to standard products – differentiated products to which they commit themselves not only in terms of stricter controls but also as regards taste, origin and environmental features. These differentiated products are generally sold under the store’s brand and are promoted as “premium private labels” (PPL) which are positioned at a higher quality level than unbranded products.

From a supply point of view, these initiatives have resulted in the creation of a new type of relationship with suppliers. Consequently, direct relationships with group of producers are often established on the basis of the application of specific production requirements which enable distributors to become much more involved than before in the suppliers’ production processes. Even though distributors may have recourse to wholesale markets for the supply of standard products, the majority of PPL products are based on long-term contractual supply relationships between retailers and producers.

### Goals and Objectives of the study

The goal of the paper is to analyze these new private labels which aim to segment the market of fresh produce and meat and increase the quality level in sectors in which producers are atomistic and not able to implement strong national brands. We propose a model of a vertical relationship between producers and retailers in order to answer the following questions: is it in the interest of producers to commit to these new procedures? Do premium private labels (PPL) have an effect on spot market prices? How are these prices influenced by the quality choice of PPL? How does the retailer segment the market between to spot purchases and supply contracts? In order to answer these questions, it is necessary to determine the optimal allocation of the market between the standard products and the premium private labels in relation with the price formation in the intermediary markets, and the quality level of the PPL and its effect on the strategic games within the vertical structure.

### Quality assurance or certification scheme addressed in the study

The paper is motivated by some observations regarding the beef market in France. The model is a stylised generic one, which the authors consider applies well to the beef and fruit sectors.

### Scope and coverage of the study

Generic.

### Dataset(s) used in the study

This is a theoretical model with no empirical application, so no data are used.
Methodology, or methodologies used
A theoretical model, depicting a vertical chain comprising producers, retailers and final consumers is constructed. Producers are linked to retailers either via fixed longer-term contracts or via a spot market. Within this set-up, key relationships with and without PPLs are derived, and the model is simulated with some stylised parameters.

Conclusions and recommendations of the study
The model shows that, for the beef and fruit sectors, the creation of PPLs benefits the upstream producers. Spot market prices are influenced by the PPL quality. This effect is positive for producers but the retailer, by implementing PPL, is able to influence other retailers’ profit, even if each retailer is a local monopoly. - In such a context, an increase in contractual supply can be correlated either positively or negatively with the spot market price. The model never predicts a lower spot market price with vertical contracts than without contracts. But it shows that the spot market price can decrease or increase according to the variation of PPL quality and the volume of contracts. - Optimal private label quality is not the same for the consumers, the retailers and the producers. Consumers prefer lower PPL quality level than the producers and the retailers. It can be inferred that, under certain conditions, the producers could accept a decrease in their profit in order to encourage the retailer to increase PPL quality. Such an agreement would result in a PPL quality choice that could be more negative for the consumers.

Strengths and weaknesses of the methodology used
Strengths: The paper addresses some pertinent questions that are very difficult to tease out without this formal approach.
Weaknesses: Simplified framework and lack of empirical work mean that the results remain non-specific. Moreover, it would be difficult to test the predictions of this model because of the difficulty of obtaining data, although the paper does stress that the results are in line with a number of casually observed real world outcomes.
Title: The effect of certification costs on the success of a PDO/PGI
Authors: G. Belletti, T. Burgassi, A. Marescotti, and S. Scaramuzzi
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Abstract
The paper aims at categorising and qualifying costs and benefits of using Protected Designations of Origins or Protected Geographical Indications through a case – study analysis. The paper shows how the amount and the distribution of the direct certification costs among the actors of the chain also depend on product certification bodies and their relationships with the actors, especially Consortia. But direct certification costs emerge as an important but not as the main element in the firms’ decision whether to use or not a PDO-PGI. The paper draws a cost-benefit balance useful to evaluate the opportunity of valorization of an agrifood product through a PDO-PGI.

Position in the analytical framework

**Question:** Do QA and certification schemes improve profitability?

What are the effects of PDO/PGI certification?

**Stakeholders:** Primary producers, processors, retailers

Background and context of the study
In recent times consumers are paying a growing attention to the quality of agro-food products, due to both the greater concern about food safety related aspects, and the need of re-discovering the true values of agriculture and rurality. Agro-food typical products are an important example of these tendencies, as their specific qualities are strictly tied to the territory they come from, including both natural specificities (i.e. animal breed, climate), and human ones (i.e. the knowledge and skills of local producers). The success of the market of typical products is due to their suitability in responding to consumers needs in terms of genuinity, reply to food massification and rediscovery of old cultural traditions; this success has pointed out the usefulness of agro-food products territorial origin highlighted in the label to become a strategic tool for differentiation in the agro-food sector. Reg. EEC 2081/92 supported consumers’ needs, and provided a strategic tool through the creation of the Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI), two quality signs aiming at pointing out the link between the quality characteristics of an agro-food product and its territorial origin. At the same time PDOs and PGIs are also considered as an important protection and promotion tool for producers in order to increase their added value and market power, and may represent a means to enhance rural economy and rural development, remunerate locked-in resources, obtain spill-over effects on the local economy and activate or reinforce rural development.

However, notwithstanding the growing attention and interest on these important “official” tools, up to now there is no much evidence on costs and benefits deriving to supply chain firms from the use of these quality schemes and more in general on the effects of their application on rural economy and development.

Goals and Objectives of the study
Within the described general framework, this paper aims at identifying, categorising and qualifying costs and benefits faced by firms when joining a PDO or PGI certification scheme. Furthermore, the aim is to draw a first cost-benefit balance, which identifies the factors the actors of supply chains have to evaluate in order to join a PDO/PGI scheme.

Quality assurance or certification scheme addressed in the study
The certification schemes addressed in this study are the PDO and PGI certification schemes, which aim at protecting EU geographical indications and designations of origin for agricultural products and foodstuffs.
**Scope and coverage of the study**

The analysis presented in this paper deals with three significant case studies of PDO/PGI products in Tuscany, Italy. The case study analysis starts with the evaluation of direct certification costs (costs born by the actors of the PDO/PGI supply chain for product certification body services), then focusing on how these costs are shared among the actors of the chain. Finally, a costs-benefit balance is drawn.

**Dataset(s) used in the study**

The data used in this paper have been drawn from the rate books of product certification bodies, and from direct surveys to firms involved in the supply chain, to product certification bodies and to representative producers associations and consortia.

**Methodology, or methodologies used**

The analysis presented in this paper deals with three significant case studies of PDO/PGI products in Tuscany, Italy: the Olio Toscano PGI oil, the Vitellone Bianco dell’ Appennino – Chianina PGI beef and the Pecorino Toscano PDO cheese.

With respect to the Olio Toscano PGI, both the direct certification costs and the Consortium costs are presented for the three stages in the value chain; the agricultural phase, milling phase and bottling phase, using data from the Consortium. The costs for the farmers and the millers are fixed amounts per capita, whereas the costs for the bottles are depending on the lots (kg). The bottlers seem to bear the main part of the PGI certification costs, which include all the analysis, control and bureaucratic costs. Between 2002 and 2003, the Consortium decided to cut down the fees for small bottlers. The discount introduced was inversely related to the amount of production. This eased the burden of the certification costs to the small producers, which in this way can join the PGI supply chain.

With respect to the Vitellone Bianco dell’ Appennino Centrale – Chianina PGI beef, both the PDI certification and Consortium costs are presented for the breeders, sectioners and the marketers, using direct survey data. The PGI certification costs (of controlling the animals alive and marking the carcasses) are only paid by the breeders and sectioners. The costs of the Consortium are distributed amongst all three phases.

Regarding the Pecorino Toscano PDO, both the PDO certification costs and Consortium costs are presented for the milk producers, milk collectors, dairy producers and the seasoners, using direct survey data.

Finally, for each of the three products, a balance of the importance of indirect costs and benefits is made up. The indirect costs include investment costs for structural adjustment, costs of raw materials of higher quality, costs of re-organization of production process and bureaucratic and psychological costs. The benefits include the benefits of increased sales, the benefits of receiving a higher price, access to new commercial channels, and EU incentives.

**Conclusions and recommendations of the study**

The overview of the PDO/PGI certification costs and Consortium costs for the three products addressed in this analysis indicates to what extent the costs are distributed, both vertically as well as horizontally. Vertical distribution involves the distribution of the costs among the different phases in the supply chain. This vertical distribution takes place through the difference between variable and fixed costs for each of the different phases. Horizontal distribution involves the distribution of the costs among different agents in the same phase, e.g. between small and large farmers.

The cost-benefit balance drawn in this analysis could be useful to evaluate the opportunity of valorisation of an agro-food product through a PDO/PGI. However, it only indicates the importance of the different types of costs and benefits; no indication is given of their levels.

**Strengths and weaknesses of the methodology used**

Strengths from the analysis of certification cost and how they are shared among agents. It is a careful case study that uses actual data and provides accurate information on what are the costs of certification and Consortium (the body that represents the firms involved in the QA) and who pays them. It is based on survey and analysis of the rules that are used in each specific case.

Weaknesses:
- Results cannot be generalized as they are specific to the 3 case studies.
- Benefit of PDO/PGI is not quantified.
ISO 14001 is a standard that sets out guiding principles for environmental management systems. The objective of ISO 14001 is to define the underlying principles of an EMS (environmental management system) that is recognized worldwide. Implementation of an EMS, and ISO certification, remains at the discretion of individual companies. Companies can choose whether to implement an EMS, whether to meet ISO 14001 standards, and whether to attain ISO 14001 certification. From the point of view of both shareholders and management, an EMS certified to ISO 14001 standards can have many benefits. However, companies may encounter problems during the implementation of such a system. This study examined the benefits perceived, and problems experienced, by Canadian businesses that have undergone ISO 14001 certification. The study, which sampled a large group of Canadian companies, produced results tending to suggest that ISO 14001 certification is mainly precipitated by factors relating to corporate image, and that the problems encountered during the certification process are mainly centred on employee training and involvement by staff and management. While the survey does underscore the very real benefits of certification, the results also clearly indicate that there are significant barriers to successful ISO 14001 certification in North America.
Scope and coverage of the study
In this study, the results are presented of a survey that was developed and administered to a large sample of Canadian business whose EMSs were certified to ISO 14001 standards.

Dataset(s) used in the study
This research is based on the results of a survey sent to a large sample of companies. The sample used for the study consisted of Canadian companies that had obtained certification to ISO 14001 standards and were registered in the WORLDPREFERRED.COM Inc. database as of February 2002. In total, 546 Canadian companies were sent a questionnaire, of which 131 were completed and returned. After deleting the unusable one, the final sample consisted of 129 questionnaires.

In the questionnaires, the respondents were offered a list of possible motivational factors behind ISO 14001 certification, possible benefits accrued from certification and problems encountered with certification. They were asked to rank them according to importance from 1 to 7.

Methodology, or methodologies used
Based on the results of the questionnaires, a descriptive analysis is performed on the importance of factors that motivated the companies to certify to ISO 14001. The results are separately analysed for companies that already had an EMS and companies that did not yet have an EMS. Subsequently, descriptive analysis is performed on the ranking of the benefits and problems connected with the certification, where the results of companies with prior EMSs are compared with companies without them.

Conclusions and recommendations of the study
The analysis of the importance of several motivational factors for certifying to ISO 14001 indicate what factors played an important role in companies’ decision to adopt ISO 14001 certification. The main motivations appeared to be; enhancement of corporate image, improvement of EMS already in place, enhancement of environmental performance, competitive advantage, meeting client demands and access to world markets, costs savings and protection from lawsuits.

The results of the ranking of the benefits and problems connected with the certification allow for an easy assessment of the relative importance of each benefit or potential problem as accrued from or encountered with ISO 14001 certification. The main problems encountered appeared to be; the need for staff training, lack of employee and management involvement, delays and documentation requirements, and implementation costs. The main benefits appear to be enhancement of corporate image and improvement of environmental performance.

Strengths and weaknesses of the methodology used
Strengths: detailed information
Weaknesses: does not offer any explanation. The research identifies the types of cost and benefit that were expected and actually encountered in adopting HACCP. Expected benefits are equated to “motivation”. The quantification comes in regarding the number of firms expecting or reporting certain kinds of benefits and costs, and/or how important they considered them to be. But there is no quantification of the costs and benefits themselves.
This paper derives the distribution of willingness to pay for a PDO-labelled food product, French Camembert cheese, using scanner data on purchases of Camembert brands in the French national market. Mixed multinomial logit models, where the parameter associated with each observed product attribute is allowed to vary randomly across consumers, are estimated using simulation techniques. The distribution of willingness to pay is expressed as a function of consumer income or age. Our results do not suggest that consumers value the quality signal provided by the PDO label. Indeed, at the same price, only a small portion of consumers would prefer to buy a similar Camembert brand with a PDO label than without it. Moreover, brand appears to be a more relevant information in the consumer's valuation of the available products.

Position in the analytical framework
Question: What is consumers' willingness to pay for quality?
What are the effects of PDO/PGI certification?
Stakeholders: Consumers

Background and context of the study
MMNL models can be viewed as an alternative to the hedonic price models. Indeed, first, MMNL models provide a flexible specification for representing the distribution of preferences in the population and the choices of each consumer. These models generalise standard multinomial logit models by allowing the parameter associated with each observed variable or attribute (e.g. its coefficient) to vary randomly across consumers. The moments of the distribution of consumer-specific parameters can then be estimated. Moreover, in contrast to multinomial logit models, MMNL models do not exhibit the independence from irrelevant alternatives property. In fact, as shown by McFadden and Train (2000), any random-utility models can be approximated to any desired degree of accuracy with a MMNL model through appropriate choice of explanatory variables and distributions for the random parameters. Second, the values of the estimated moments of the distribution of consumer-specific parameters provide quantitative information about consumers' preferences. When price coefficients are assumed to be fixed, the distribution of the willingness to pay for any attribute, which is defined as the ratio of the attribute coefficient to the price coefficient, can easily be derived from the distribution of the attribute coefficient.

Goals and Objectives of the study
The objective of this study is to identify the variation of consumers' willingness to pay for a Protected Designation of Origin (PDO) label.

Quality assurance or certification scheme addressed in the study
The certification scheme addressed in this study is the EU Protected Designation of Origin (PDO) scheme on French Camembert cheese, which indicates that the product is from Normandy.

Scope and coverage of the study
In order to assess consumer response to PDO labels, this study focuses on consumers' purchases of French Camembert in the national French market. The consumer response is assessed by means of an estimation of the consumers' willingness-to-pay for PDO labelled Camembert cheese.

Dataset(s) used in the study
This study analyses an optical scanner panel dataset on purchases of Camembert in the national French market, collected by Secodip. As well as demographic information, this dataset contains information on all purchases of Camembert by 4,627 French households over the year 1998 (nearly 60,000 observations). For each purchase made by a given household, they know the
brand chosen, its actual price, if the product is PDO labelled or not, and the name of the supermarket. It should be noted that this dataset shares the following feature of revealed-preference datasets: it does not report the choice set faced by a consumer for a given purchase occasion. The choice set a consumer faced during a purchase occasion that took place in a given supermarket chain is approximated with the set of all the brands that were sold during the same week in this supermarket chain in the same period. The prices of the non-chosen brands are recovered by averaging the prices of these brands over all the purchases in the same supermarket chain in the same period. Initially, the sample consisted of purchases in 25 supermarket chains, which implied a large number of brands. Therefore, in order to reduce the number of brands, the study focuses on a sub sample of consumers making their purchases in one of the leading French supermarket chains.

Methodology, or methodologies used

In order to identify the variation of consumers’ willingness to pay for the Protected Designation of Origin (PDO)-labelled French Camembert cheese, a mixed multinomial logit model (MMNL) is used as a framework. The starting point of the model is that the consumer’s choice for a particular brand is a function of observed attributes of the brands. Using a MMNL model, the parameters associated with each observed product attribute is allowed to vary randomly across consumers. The MMNL is estimated using simulation techniques.

However, before estimating the MMNL model, two other models are tried. First a usual multinomial logit model is estimated, where the utility derived from consuming a particular brand is a function of its price and a PDO dummy. As it is a usual multinomial logit model, the parameters of these variables are assumed to be fixed. In the second model, a brand-specific intercept is added to the model, in order to account for the fact that the brand of the product might play an important role in the decision process too. Then the MMNL model is estimated. The MMNL equals the second model, while allowing the PDO dummy’s parameter to vary across consumers. By doing so, the fact that some consumers like to by PDO products and other don’t is allowed for. The price parameter is assumed to remain fixed. The consumers’ willingness-to-pay is calculated by dividing the PDO parameter by the price parameter. A likelihood ratio test rejected the first and second model in favour of the third MMNL model.

In order to see to what extend the variation in the estimated willingness to pay can be captured through the inclusion of consumer characteristics, the MMNL is extended by allowing a demographic variable (income or age) to interact with the price. By doing so, the distribution of the willingness-to-pay for a PDO camembert varies with income and age.

Conclusions and recommendations of the study

The mixed multinomial logit model allowed the researchers to recover the distribution of the willingness to pay for a labelled product and to decompose this distribution into components depending on consumer’s income or age. This application generated two major results: (1) with respect to the extent to which the brand is relevant information that affects the consumer’s valuation of the available products and performs well in explaining choices and (2) with respect to the impact of the PDO label on the consumers’ behaviour.

According to the researchers, this paper could be extended. For example it could be interesting to make use of a nested logit model for estimating consumers’ choice in several steps. First the decision whether to buy or not the Camembert. Secondly, if Camembert is not chosen, the choice of the alternative brand. And finally, the quantity bought under the condition that an alternative brand was chosen.

Strengths and weaknesses of the methodology used

A strength of the methodology used in this study, a MMNL model, could be the characteristic of providing a flexible specification for representing the distribution of preferences in the population and the choices of each consumer. These models generalise standard multinomial logit and hedonic price models by allowing the parameter associated with each observed variable or attribute to vary randomly across consumers. Furthermore, the model is estimated on real consumer behavior which gives it a strong external validity. Globally, the model used is more realistic than hedonic price models.

- Weaknesses: - Approximation of the choice set faced by a consumer for a given purchase occasion; reduction of the data set to only one French supermarket chain; approximation of non-chosen brands prices
Background and context of the study
Concerns about the negative effects of US meat and livestock imports on domestic livestock prices have increased the interest in country-of-origin labelling (COOL) legislation. Proponents of the legislation argue: (a) consumers have the right to know and choose the source of their meat products, (b) COOL would enhance food safety and quality, and (c) COOL would increase the demand for domestically produced products and improve domestic livestock prices. Opponents argue that implementation of COOL would be prohibitively expensive because of product blending, the number of ownership exchanges occurring in commodity livestock and meat markets, and the complexity of the meat supply chain. The resulting debates have been both heated and expansive.

Historically in the beef and pork industries, increases in marketing and processing costs have been distributed across market levels. In the absence of a demand increase, consumers would only pay the entire costs of COOL if consumer demand for beef and pork products is completely inelastic. If consumer demands are not completely inelastic and demand increases are not large enough to maintain or increase equilibrium quantities, the incidence of COOL costs (the effects of increased marketing costs of market level prices) depends primarily on relative demand and supply elasticities at each level of the marketing chain.

Goals and Objectives of the study
The objective of this research is to estimate short-run and long-run changes in equilibrium prices and quantities of meat and livestock in the beef, pork and poultry sectors which would result from the implementation of COOL. In addition, the authors intend to estimate the changes in producer surplus at each level of the marketing chain and consumer surplus at the retail level to determine the welfare effects of COOL on consumers and livestock and meat producers.

Quality assurance or certification scheme addressed in the study
The certification scheme addressed in this study is US country-of-origin labelling (COOL) legislation. Currently, this certification scheme is mandatory for most products, except for poultry products.

Scope and coverage of the study
In this study, the impacts of COOL are analysed by focussing on the changes in equilibrium prices, quantities and the surplus of the actors in question. The equilibrium displacement model developed in this study considers a meat industry which consists of three sectors: beef, pork and poultry, each consisting of several actors. The model is adjusted to the US meat industry in that the costs associated with the certification scheme are only represented in the beef and pork industry. This corresponds to the actual US situation where poultry products are exempted for labelling. However, this equilibrium model could be adjusted to any industry or country.

Dataset(s) used in the study
In order to analyse the impact of COOL on equilibrium prices and quantities, an equilibrium displacement model is constructed and simulated using Monte Carlo simulation. Most of the demand and supply elasticities used, were obtained from several literature sources (Brester, 1996; Marsh, 1992, Wohlgemant, 1993; Lemieux and Wohlgemant, 1989; Brown, 1997; Hahn, 1996). In order to estimate the remaining elasticities, annual data from 1970-2000 was used (regression results are available from the authors upon request). The exogenous percentage changes in COOL costs are obtained from Sparks Companies, Inc. (2003).

Methodology, or methodologies used
The starting assumption of this study is that COOL imposes additional marketing costs on suppliers at each market level. Conceptually, these costs shift the supply functions upward and to the left in each affected sector. As a result, this change causes a reduction in derived demand at the prior level in the marketing chain. It is assumed that the impacts and distribution of added
marketing costs on prices and quantities at each market level are determined by the size of the cost impact and relative supply and demand elasticities at each level.

In order to calculate the relative changes in equilibrium prices and quantities, an equilibrium displacement model (EDM) is used. This model is based upon a structural model of supply and demand relationships in the beef, pork and poultry industries. The beef marketing chain is modelled using four distinct sectors; retail, wholesale, slaughter and farm. The pork and poultry marketing chains are more integrated so fewer sectors are considered. Supplies and derived demands are related to each other by own prices, other prices and quantity levels. The implementation of COOL is represented by a costs variable in the beef and pork supply functions. Within each meat sector, the model incorporates variable input proportions among livestock, meat and marketing service inputs by allowing production quantities to vary across market levels. This permits input substitution in response to changing output and input prices. In addition, interactions among the meat sectors are considered by modelling consumer substitution among meat products.

All the supply and demand functions are transformed into logs. The model is simulated using Monte Carlo simulation, in order to approximate relative changes from the initial equilibrium in the endogenous quantities and prices for any given exogenous percentage change in COOL costs and/or consumer demand.

Finally, assuming linear supply and demand functions, the elasticity estimates and the resulted relative changes in equilibrium prices and quantities are used to calculate the relative changes in surplus levels at each level of the marketing chain.

Conclusions and recommendations of the study
The equilibrium displacement model simulated in this study is able to explain the percentage changes in equilibrium prices and quantities at the different stages within the beef, pork and poultry marketing chains, as a result of COOL cost increases and changes in consumer demand, while allowing for input substitution and consumer substitution among meat products.

The percentage changes in prices and quantities have been used in order to calculate the surplus of each actor in the supply chain of each meat product.

Strengths and weaknesses of the methodology used
Strengths
1. The functional form does not have to be specified. Thus, the model can be used whatever the demand and the supply functions are.
2. Relatively easy to parameterise (e.g. elasticities assumed or culled from the literature)
3. Stylised form that is easy for policy makers to understand.
4. Relatively easy to consider multiple stages in the supply chain as well as to consider multiple markets, that is to deal with the substitution among markets.
5. Possibility of evaluating the impact of QA on non participant producers.

Weaknesses
1. Only marginal changes can be handled accurately, unless the underlying functions are Cobb Douglas functions.
2. Difficult to deal with the creation of a new market resulting from the adoption of the QA or certification scheme. This difficulty arises when the QA changes the number of goods that are available on the markets.
3. The method compares one equilibrium (‘with’) to another (‘without’), with no idea of how long it takes to reach a new equilibrium. That is, it is completely static.
4. Because of strength 2 and weakness 2, there is a danger that when EDMs are constructed, they assemble elasticities from various sources obtained in different structures and for different “reaction times” so that the parameter set is not internally consistent, and in fact represents some kind of unrealistic hybrid. It is often difficult for readers and users of such models to form an idea of whether such models are realistic. Ideally, one would evaluate their performance against data on real-world changes, or at least perform some sensitivity analysis – but often this is not done

Specific Strengths of this paper: Substitution between products; Distributional effects among the chain; Estimation of the minimum increase in demand to have >0 impact for agriculture; Sensitivity analysis
Specific Weaknesses of this paper: Large number of parameters to estimate; Ignores the creation of two segments for each product (domestic production vs imported).
Abstract
This paper analyses how a group of Dutch milk consumers would react if milk labelled as produced by rBST-treated cows became available alongside milk from untreated cows, or if rBST were authorised but without any labelling to differentiate rBST milk from that of untreated cows. Results show that for potential buyers of rBST milk, the two types of milk are substitute products. However, rBST milk is an inferior good, and it needs a price advantage to gain any market share. Fears about the safety of rBST milk are far more important than concerns about animal welfare in determining consumers’ preferences between the two types of milk.

Position in the analytical framework
Question: How effective are quality labels in influencing consumer perceptions/behaviour?
Stakeholder: Consumers

Background and context of the study
Bovine somatotropin (BST) is a protein produced by the pituitary gland of cattle. It regulates growth in calves and milk production in cows. Artificial BST (rBST) can be reproduced on a commercial scale using recombinant DNA technology. When the cow’s own supply of BST is supplemented by rBST, milk yields increase with less than proportionate feed increases.

In the US, rBST was released for commercial use in February 1994. In the EU however, rBST falls under the legal definition of a medicinal product and requires a licence for marketing. In 1990, the EU Council of Agricultural Ministers placed a moratorium on the commercial use of rBST. In December 1994, the moratorium was renewed until December 1999. In October 1999, the EU ban was extended for an indefinite period on animal health grounds.

As well as animal health and welfare, the issues surrounding rBST use can be summarised under four other headings too: food safety, effects on farm structure, overproduction and other ethical considerations involving animal rights and non-interference with nature.

Goals and Objectives of the study
The objective of this study is to examine two questions. First, how might Dutch consumers react if milk labelled as produced by rBST-treated cows becomes available alongside milk from untreated cows? Second, how might consumers react if rBST is authorised but without any labelling scheme to allow them to distinguish between the milk of treated and untreated cows?

Quality assurance or certification scheme addressed in the study
This study focuses on labelling (or non-labelling) of rBST milk.

Scope and coverage of the study
This paper presents some empirical evidence relevant to the two questions presented above.

Dataset(s) used in the study
The data analysed in this study comes from a survey carried out in October 1997 among 99 respondents. First, they were asked to rank four attributes of milk (healthiness, taste, price, and the way it is produced). Secondly, after having received information about rBST, questions were asked about safety, cow welfare, labelling and so on. In addition, a relative price experiment was conducted.

Methodology, or methodologies used
Using the data from the survey, a binary choice model is estimated. The probability that a respondent is unwilling to buy rBST milk is estimated as a function of some socio-demographic variables, and the respondents’ attitude towards the milk attributes healthiness, taste, price and the way it is produced.

In order to analyse the sensitivity of demand for the different types of milk to prices and income,
Demand functions were estimated econometrically using the data from the relative price experiment. Two different models were estimated. First, an ad hoc approach involved estimating a loglinear regression of demand for non-rBST milk as a function of its own price, the price of rBST milk and income, for both the potential-buyers’ and non-buyers’ group of rBST milk. These equations are estimated using Weighted Least Squares. Second, assuming two-stage budgeting on the part of the consumer, a loglinear model of total milk demand was used for the upper stage, and an AID model for the two types of milk at the lower stage. The former equation is estimated using Weighted Least Squares, whereas the latter is estimated as a censored Tobit model.

Then, respondents’ reactions are analysed in the case where rBST use is authorized, but there is no labelling scheme to enable consumers to distinguish between milk produced by rBST-supplemented cows and milk produced without rBST. First, the intention to maintain consumption unchanged, the intention to reduce consumption and the intention to stop completely was tried to be explained by using an ordered choice model. However, the boundary between maintaining consumption and reducing consumption to some extend was not clearly market in the data. Therefore, the intention to stop completely against the intention to continue consuming milk is predicted using a binary choice model. The probability of stopping consumption is modelled as a function of some socio-demographic variables, the respondents’ opinion about the importance of healthiness of milk, and their views on rBST with respect to its ‘non-natural’, ‘unsafe’, and ‘animal unfriendly’ character.

Finally, a censored regression model was used in order to explain the size of the consumption reduction.

**Conclusions and recommendations of the study**

The results of the empirical analyses presented in this study indicate what factors motivate the respondents’ decisions not to purchase rBST milk and how they would react if rBST were authorised but without labelling. In addition, the two different models estimated in order to analyse the sensitivity of demand for the different types of milk (the ad hoc approach and the AID model) allowed the calculation of elasticities for both types of milk (rBST and non-rBST).

**Strengths and weaknesses of the methodology used**

**Strengths**

The methodology is suitable for analysing the data collected. In particular, the AID sub-model allows the substitution between rBST-treated milk and untreated milk to be assessed in a conventional demand system, so that implications for quantities consumed can be derived.. This goes beyond what most other methodologies (including RU-based models) usually deliver.

**Weaknesses (of the specific paper)**

Small sample size. Weaknesses in survey design.
Abstract
This paper analyses a representative sample of 356 Dutch egg consumers in order to measure the extent to which ethical principles concerning the welfare of hens in different rearing systems are translated into egg purchasing intentions, and the extent to which declared intentions are expressed in actual behaviour. Whilst concern expressed about hen welfare helps to explain behaviour, other factors including economic constraints, consumer attitudes and above all product and labelling knowledge also play an important role. Stated willingness-to-pay for eggs produced according to higher welfare standards is a poor predictor of actual choice.

Position in the analytical framework

Question: 1. What is consumers' willingness to pay for quality?
2. How effective are quality labels in influencing consumer perceptions/behaviour?

Stakeholders: Consumers

Background and context of the study
Individuals in society can express their concerns and preferences in various ways. First, electoral voting enables them to cast their vote for the policy package offered by the political party of their choice. Second, individuals may join pressure groups and take part in campaigns that focus on single issues. Third, as consumers, individuals can express their concerns through their purchasing behaviour.

So, one may distinguish between ethically motivated consumer behaviour in general, and using consumption choices to signal an ethical position. A prerequisite for the second type of behaviour is that there should exist alternative versions of the same good, where the main difference is the absence from one of the versions of the characteristics that consumers find unacceptable, and where the different versions are clearly labelled.

Since 1990, a system of voluntary labelling has been in operation in the Netherlands of eggs produced under each of the systems (the battery cage, perchery, deep litter, semi-intensive and free-range system). In addition, for some of the five systems, Dutch consumers have been offered choices related to the type of feed the hen has received, use of artificial colouring and other differences relating to the quality of the eggs as a consumer product rather than to the welfare of the laying hen. There are also a few other types of labelled non-battery table eggs available, in particular organic eggs and ecological eggs.

Although figures show that Dutch consumers are quite animal friendly and have a high level of awareness and ethical concern about hen welfare, the number of households buying more hen-friendly eggs has remained moderate. This discrepancy between survey respondents' attitudes and actual behaviour gave rise to this research.

Goals and Objectives of the study
The objective of this study is to measure the extent to which ethical principles concerning the welfare of hens in different rearing systems are translated into egg purchasing intentions, and the extent to which declared intentions are expressed in actual behaviour. This study also seeks to identify other factors that modify or stimulate the translation of ethical principles into intentions, and intentions into actions.

Quality assurance or certification scheme addressed in the study
This study is focussed on eggs produced using different production systems.

Scope and coverage of the study
This paper reports the results of an empirical study conducted on hen welfare and egg consumption in the Netherlands.

Dataset(s) used in the study
The data used in this study are obtained from a survey. The survey responses were collected by
personal interviews from 375 respondents in 15 towns and cities in the Netherlands. The survey recorded respondents' knowledge and concern about the welfare of laying hens, together with details of their egg purchasing behaviour and other personal characteristics. The questionnaire included multiple choice questions, open-ended questions and questions where respondents had to rank their attitudes or preferences. After having deleted the non-usable interviews, the final sample consisted of 356 respondents.

In order to measure consumer concern for hen welfare, the consumers were asked to rank the importance he/she attached to hen welfare on a 5-point scale. Actual consumer behaviour was measured by asking the consumers which types of eggs they were aware of and how often they purchased these different types of eggs. Consumer ethical intentions were measured by asking them for their willingness to pay for hen welfare.

Methodology, or methodologies used
The responses of the survey are analysed in a two-stage framework that attempts to measure, in the first stage, the extent to which ethical principles (importance of welfare of laying hens) are translated into purchasing intentions (stated willingness to pay), and secondly, the extent to which declared intentions are expressed in actual buying behaviour.

Using the data obtained by the survey, first an ordered choice model is used to identify the factors determining the probability that a respondent will express a particular degree of concern for hen welfare. The consumers’ indicated importance of hen welfare is estimated as a function of their gender, age, education level, egg consumption, presence of children, living in rural area, score on hen welfare knowledge, member of an animal welfare organisation, vegetarian in the household, importance attached to several egg attributes.

Then, to analyse responses concerning how much respondents would be willing to pay for hen welfare, a censored regression (Tobit) model is used. The willingness to pay (latent) variable is regressed upon the level of importance attached to hen welfare, some economic constraints variables, knowledge/awareness variables and other characteristics.

To analyse the link between intention and action, the researchers focus on battery and non-battery eggs. Consumers’ reported egg-purchasing behaviour is analysed using a binary choice model where the options are whether to buy battery eggs or non-battery eggs. Here it is assumed that reported choices are not a biased indicator of actual behaviour. Explanatory variables were dummy variables indicating their willingness to pay, variables indicating the level of concerns, economic constraints variables, consumers’ attitudes towards eggs, knowledge/awareness variables and other characteristics.

Conclusions and recommendations of the study
The three models estimated in this study indicate the extent to which there is a link between consumer concern for hen welfare, their intention (willingness to pay) and their actual buying behaviour. The results of the ordered choice model allows for an analysis of the factors determining the probability that a respondent will express a particular degree of concern for hen welfare. The results of the censored regression (Tobit) model give an indication of whether and how much, a respondent is willing to pay for hen welfare, and give an indication of the factors influencing this willingness to pay. The final binary choice model shows which variables play an important role in the consumers’ choice of whether to buy battery or non-battery eggs.

Strengths and weaknesses of the methodology used
Strengths Inclusion of information showing respondents’ knowledge level of the issue. Comparison between stated and revealed preferences.
Weaknesses (specific to this paper) WTP data collected using open-ended questions, therefore potential biases in survey responses.
### Abstract
This paper reports a study of UK consumer attitudes to Genetically Modified Organisms (GMOs) in food and the extent to which they translate into willingness to pay to avoid these products. The results indicate the relative importance of different aspects of the food system in forming food preferences, and that GM food is only one of a number of concerns, albeit a significant one. Attitudes towards organic food are found to be a useful indicator of attitudes towards GM technology, as the preference structure which underlies the former also appears to inform the latter. Significant differences are found between attitudes to GM food in which plants are modified by the introduction of genes from other plants and those in which they are modified by the introduction of genes from animals and plants.

### Position in the analytical framework
**Question:**
(a) What is consumers’ willingness to pay for quality?  
(b) What are consumers’ preferences towards alternative labelling strategies?
**Stakeholder:** Consumer

### Background and context of the study
Consumer concern about pesticide contamination of food, pollution, food scares and health concerns are having a major impact on consumer purchasing behaviour. The use of Genetically Modified Organisms (GMOs) in food products appears to be the cause of particular anxiety and mistrust among consumers, especially those in the UK and other parts of Europe. This paper reports the results of an analysis of attitudes of a sample of UK consumers to GMOs in food. The research method adopted for this purpose, choice modelling, has the significant advantage of allowing the issue of primary interest (here GMOs) to be presented along with a number of other potential consumer concerns, so allowing an exploration of the trade-offs which are made in real decision-making.

### Goals and Objectives of the study
To identify consumers’ WTP to avoid consumption of GM food, alongside WTP for other food attributes such as freshness (food miles), on farm chemical use and price.

### Quality assurance or certification scheme addressed in the study
GM-free food, locally produced food, chemical-free food, health risk.

### Scope and coverage of the study
The design of the choice experiment covers a number of credence attributes so that consumers were not necessarily aware that the main focus of the research was GM, and so that other kinds of consumer concerns can be evaluated alongside concern about GMs in a consistent multi-attribute framework. The study covers consumers in just one area of the UK.

### Dataset(s) used in the study
A survey was administered in the summer of 2000, in Manchester UK. A ‘drop-off and collect’ approach was undertaken, with approximately 2000 surveys delivered to randomly selected streets, and then collected again approximately three days later. The person who did the household’s food shopping was asked to complete the questionnaire. Some respondents elected to return their surveys by post. A total of 228 complete surveys were obtained over a six week period. It was not a stratified sample and hence it can not claimed to be wholly representative of the population. A higher non-response rate may have occurred amongst low income households.

### Methodology, or methodologies used
Data was collected using a choice experiment. The respondents’ choices (1626 choice sets) were analysed using a conditional logit model. The sample was segmented into three groups, according to the respondents’ attitudes to organically produced food. This segmentation was taken to be representative of general consumer attitudes towards the ‘naturalness’ of food. Parameter
estimates were allowed to vary between the different groups. Partworths (i.e. monetary estimates of WTPs) were estimated for the various food attributes, and compared between attributes for the different consumer segments.

<table>
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<tr>
<th>Conclusions and recommendations of the study</th>
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<td>The results indicate the relative strengths of different aspects of the food system in forming preferences: that GM food is only one element within a number of concerns, albeit an important one. Moreover, attitudes differ significantly between GM technology in which plants are modified by the introduction of genes from other plants and that in which they are modified by the introduction of genes from animals and plants. The results also indicate that attitudes towards organic food may be taken as a useful indicator of attitudes towards GM technology: the value sets which underlie the former appear to inform the latter also.</td>
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<th>Strengths and weaknesses of the methodology used</th>
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<td><strong>Strengths</strong></td>
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<td>This paper represents the first attempt in the literature to identify WTP to avoid consumption of GM food and illustrates the fact that choice modelling brings with it a number of advantages in this area of study. One of the most significant of these advantages is the possibility of embedding the issue of interest within a broader context and hence exploring the trade-offs. In this case the specific concern regarding GMOs has been located and examined within the broader framework of consumer attitudes to the organisation of the food production system.</td>
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| **Weaknesses** |
| A later paper (Rigby et al, European Review of agricultural Economics 32(2), 2005) reanalysed these data using a mixed logit model, in which consumer segments are identified based on the data and not imposed according to a priori ideas. This late approach led to richer and more reliable conclusions. |
### Abstract
Reports a survey of the largest-ever national survey of the international quality management system, ISO 9000 (BS EN ISO 9000), which has been installed in 95,000 companies internationally. Specifically, reports the marketing considerations which motivate companies to seek certification and the marketing benefits which accrue from certification. Mail surveys were carried out on 4,250 certificated organizations; 1,220 (28.7 per cent) responded. Marketing considerations were secondary in seeking registration, and outcomes related to profitability and process improvement were more highly valued than marketing benefits.

### Position in the analytical framework
**Question:** What motivates producers to register to a QA and certification scheme? What are the types of benefits and costs are accrued from QA and certifications schemes?
**Stakeholders:** Processors and retailers

### Background and context of the study
ISO 9000 is a series of international standards which sets out requirements and recommendations for the design and assessment of management systems. ISO 9000 is grounded on the “conformance to specification” definition of quality. The standards specify how management operations shall be conducted. ISO 9000’s purpose is to ensure that suppliers design, create and deliver products and services which meet predetermined standards; in other words, its goal is to prevent non-conformity.

Companies which seek registration to the standard must review and document their management procedures, prepare a quality manual and have their processes periodically assessed by an approved external body.

### Goals and Objectives of the study
The objective of this study is to examine the marketing considerations which motivate companies to seek ISO 9000 certification and the marketing benefits which accrue from certification.

### Quality assurance or certification scheme addressed in the study
The certification scheme addressed in this study is the ISO 9000 certification in UK business.

### Scope and coverage of the study
This paper reports the findings from the largest-ever national, omni-sectoral survey into the motivations and impacts of ISO 90000 on UK business.

### Dataset(s) used in the study
The dataset used in this study is gathered through a national omni-sectoral survey. Questionnaires were mailed to 4,250 organizations certificated to ISO 9000, under a Manchester Business School covering letter, together with a pre-paid return envelope. The sample was selected at random from the 1995 quality assurance register of the Department of Trade and Industry. A total of 1,220 questionnaires (28.7 per cent) was returned. This is the largest-ever national, omni-sectoral ISO 9000 survey. Respondents were asked to rate the importance of ten motivations for pursuing ISO 9000 certification, on a five-point Likert-type scale ranging. In addition, the respondents were exposed to 23 benefits and asked if they had experienced any of them and if so, the value placed on that benefit.
Finally, the degree to which certificated companies’ expectations were met, satisfaction achieved, and their willingness to recommend ISO 9000 to others was measured on seven-point Likert-type scales.

**Methodology, or methodologies used**

First, a thorough literature review was conducted. This generated a large number of statements concerning motivations, benefits and costs anticipated, and benefits and costs experienced. These were used to construct the questionnaire.

Based on the results of the survey with respect to the marketing motivations, factor analysis, using the principle component method, is performed. From this analysis, two motivations appear to be the most important ones: improving operations and improving marketing performance.

Factor analysis, using the principle component method, is conducted again on the survey results regarding the benefits of certification, in order to ascertain if there were any underlying benefit dimensions.

Finally, multiple regression was used to establish whether there was any association between satisfaction and benefits experienced after certification. The goodness of fit was analysed using the R square and the F-statistics.

**Conclusions and recommendations of the study**

The results of the factor analyses used in this study indicate the motivations of UK businesses to seek ISO 9000 certification and the benefits experienced after certification. The multiple regression analysis shows the extent to which businesses’ satisfaction and benefits are related to each other.

**Strengths and weaknesses of the methodology used**

**Strengths**: Factor analysis is a well-known statistical method to combine survey responses in a smaller number of principal components. It seems to have been carried out in a straightforward manner. The same applies to the use of regression analysis.

**Weaknesses**: Factor analysis does not provide an explanation of factors. In the regression analysis data on both satisfaction with and (perceived) benefits obtained from certification are obtained from the same survey data, provided by the same respondents – so the strong correlation does not come as a surprise.
Abstract

Some rural development strategies are based on the assumption that quality labels may act as levers for inducing economic growth and population migration. To investigate the validity of this assumption, we use a new economic geography model. A differentiated agricultural good is assumed to be produced by farmers who co-operate in order to set a monopoly price and control the number of producers. We find that there is a trade-off between the number of differentiated farmers and their individual income. Besides, the positive effect of agricultural differentiation on rural industrialization, due to increased demand for industrial goods, is offset by an opposite effect produced by urban wage rise. Higher transport costs foster the positive induced effects but limit the size of the differentiated agricultural sector.

Position in the analytical framework

Question: Do QA and certification schemes improve profitability?
What are the effects of PDO/PGI certification?
What is the impact of QA and certification schemes on market structure?

Stakeholder: Primary producers and other non-agricultural sectors

Background and context of the study

Rural development strategies are often based on the production of differentiated agricultural goods that may be sought after by consumers, because of their typicality, health quality, or environmental innocuousness. These goods are generally closely associated to the area where they are produced, so that they represent an immobile comparative advantage that can be used as a lever for developing economic activity in remote and/or underprivileged regions. Producing specific products can be more profitable than generic agricultural goods for two reasons. First, differentiation in itself generates a monopoly power that may be exploited through appropriate organization. Second, these products may have specific characteristics that are desired by consumers, who will have a higher tendency to buy them, provided that appropriate communication is done.

Note that quality is not necessarily objective, it can be linked, for instance, to a specific image the region of origin may have. Moreover, these products need not be agricultural or physical goods. Their main characteristic is to be linked to the region. Such strategies have long been undertaken, in particular in France with cheeses and wines. This process has been generalized in the European Union, through official quality labels that are linked to the area of production, namely Protected Designations of Origin (PDO) and Protected Geographical Indications (PGI).

Goals and Objectives of the study

The objective of this paper is twofold. First, it aims at clarifying the conditions under which agricultural differentiation (quality good production) is profitable for farmers. Second, it investigates whether increased demand for manufactured products in the rural region, generated by specific good production, may induce rural industrialization.

Quality assurance or certification scheme addressed in the study

The analytical framework presented in this paper is focused on agricultural differentiation due to the use of origin labelled products.

Scope and coverage of the study

In order to achieve the study’s objective, this paper will present a theoretical framework only. Except for some comparative statics, no empirical analysis is performed.

Dataset(s) used in the study

In this study, the results of the theoretical framework are analysed using comparative statics only. Therefore, no specific dataset has been used.

Methodology, or methodologies used

A microeconomic model of economic geography is used to investigate the conditions under
which a differentiation strategy based on quality labels may lead to economic growth in a rural region. As it is a general equilibrium model, it allows for analysing indirect effects between sectors.

Consumer demand is divided into three equations; one for the industrial good, one for the generic agricultural good and one for the specific agricultural good. They are each functions of consumer’s income, expenditure shares, their prices and some substitution elasticities.

The generic agricultural producer is assumed to be independent and to only use labour as agricultural input. The specific producer is assumed to need specific intermediate industrial inputs and to collude and behave as a monopolist. An institution is used here to manage production and trade of the specific good in such a way that total profit is maximised. Assuming industrial prices and income as being exogenous, the equations of price, income and quantities in the specific agricultural sector are derived. The price is a function of the price of the generic good, the index of propensity to consume the differentiated good, the price of the industrial goods, the productivity and the elasticity of substitution.

The economy is assumed to be made up of two regions: urban and rural. The number of workers and farmers in respectively the urban and rural region is assumed to be exogenous. The income of the industrial workers is amongst others expressed as a function of the number of workers employed in each sector and the wages within the two agricultural sectors. From this equation it appears that agricultural differentiation has a positive impact on industrial wages, due to a higher demand for industrial goods.

Some comparative statics have been performed using the equations of specific farmers’ and industrial wages. The impact of an increasing in 1) agricultural product differentiation, 2) industrial product differentiation, 3) transport costs for manufactured goods, and 4) preference for quality labelled products, on specific farmers’ and industrial wages is analysed.

Then the necessary condition for rural industrialisation (urban workers migrate to the rural region and earn the original urban wage) is defined. According to this condition, rural industrialization will occur when urban and rural final demand and rural intermediate demand are higher than the minimal quantity a firm must send to have a nonnegative profit.

Finally, the demand for the specific agricultural product and the necessary condition for rural industrialisation are analysed allowing for transport costs for both the generic and specific agricultural product.

**Conclusions and recommendations of the study**

The theoretical framework presented in this study is able to assess the impact of agricultural product differentiation, industrial product differentiation, transport costs and preferences for quality labelled products on specific farmers’ and industrial wages and rural industrialisation. A very surprising finding of this study is that the necessary condition of rural industrialisation is the same as the one that would have been obtained if agricultural differentiation had not occurred. This implies that agricultural differentiation does not alter in either way the possibility of rural industrialisation. Moreover, it shows that one should not take for granted that an income rise in the rural region automatically implies positive induced effects in other sectors. However, these results might drastically change when relaxing the assumption that rural industrialisation implies a migration of industrial workers to the rural region. If farmers could be hired as industrial workers in the rural region, the results would have been different.

**Strengths and weaknesses of the methodology used**

This kind of stylised theoretical model can generate results at a ‘general’ level that may be difficult to obtain with a more micro-oriented empirical approach. However, the degree of simplification of reality in this kind of model, and the large number of assumptions required to generate an analytical outcome, mean that the results are highly dependent on those assumptions and empirical testing of those assumptions is not often not an easy matter. Moreover, in this kind of study, assumptions are not made to be tested, but are simply assumed.
Abstract
Since 1987, when the International Organization for Standardization accepted a series of quality norms – the ISO 9000 standards – large companies and small and medium-sized enterprises (SMEs) have been obliged to open their doors to something new: the culture of quality, a message which is very often associated with the initials of this well-known standard. In Spain there are around 6,000 companies with this certificate, but they have not always obtained the same results. In this article we expose the results of an empirical research developed in 288 Spanish companies, to determine what the benefits are of the implementation of this standard. With a cluster analysis we found the existence of different typologies of companies. We found that nearly 65 per cent of the companies that have been certified in Spain have obtained very high levels of internal and external benefits.

Position in the analytical framework
Question: What type of benefits and costs are accrued from QA and certification schemes?
Stakeholders: Processors and retailers

Background and context of the study
In the literature one can find considerable research related to motivations of companies throughout the world to be certified following ISO 9000, with almost the same conclusions as the results obtained. But, when one analyses the benefits that this standard has brought, one finds a smaller number of investigations, where the results are much more confused and unequal. For example, while some of them indicate especially the improvement in the organisation, others emphasise only the marketing contributions. The high dispersion of the existing results relating to the benefits of the implementation of the ISO 9000 standard gave rise to this research.

Goals and Objectives of the study
The objective of this study is to examine what the companies really obtained with the certification, and to analyse if it is possible to define different typologies of companies that characterise the performance obtained.

Quality assurance or certification scheme addressed in the study
The quality assurance scheme addressed in this study is the ISO 9000 standard.

Scope and coverage of the study
This study presents the results of both a descriptive and a cluster analysis. In order to perform these analyses, a survey was conducted in Catalonia (Spain).

Dataset(s) used in the study
In order to achieve the objective of the study, a survey has been conducted. For this survey all the companies certified in Catalonia since 1998 were selected, giving 900 companies in all sectors of activity. This sample was chosen because it was one of the communities with a higher number of certified companies and with a larger diversification of activities. Eventually, 288 valid responses were received. The respondents were first asked about some general characteristics, such as number of workers, type of economic sector, which certifying organization contracted to and whether they had used the services of external consultants. Then they were asked about the benefits accrued from registration.

Methodology, or methodologies used
In order to analyse the benefits accrued from ISO 9000 registration, this study distinguishes between internal and external benefits. The empirical analysis starts with a descriptive analysis of the internal and external benefits. First, the respondents were asked to rank different internal benefits. From this, improvement in the definition of the responsibilities and obligations of the
workers, increase in the company quality confidence, better involvement in work and improvement in guidelines thus reducing improvisations resulted to be the most important internal benefits accrued. The same question was asked with respect to the external benefits. The response of the clients’ requirements, and minimising customer audits were the most important external benefits.

The empirical analysis continues with a cluster analysis, in order to analyse the relationship between the characteristics of the companies and the types of benefits accrued. First, the sample is divided into two groups: companies with high internal benefits and companies with moderate internal benefits. Then, the characteristics of both groups have been compared. The same analysis has been performed, dividing the entire sample into a group of companies with high external benefits and a group of companies with moderate external benefits.

Conclusions and recommendations of the study
The results of the descriptive analysis performed (based on survey data of 288 Spanish companies) indicate which types of internal and external benefit have accrued from ISO 9000 registration. Using the results of the cluster allows the researchers to give a description of the different typologies of companies.

Strengths and weaknesses of the methodology used
Strengths Brings new information on the table about an under-researched area.
Weaknesses The analysis is basically qualitative. Although a statistical method (cluster analysis) is used, its purpose is to group firms according to the answers they gave to qualitative questions. Thus, this kind of study cannot quantify exactly what the costs and benefits arising from ISO 9000 are, measured in money terms, because the relevant data was not collected. This would have been difficult to do (a) because of commercial secrecy (b) because firms could find it difficult to say exactly what the monetary costs and benefits are unless a full analytical study has been made!
Certification de la qualité par une AOC: un modèle d’analyse.

Claire Chambolle et Eric Giraud Héraud

2002

Cahier nr. 2002-01, INRA-LORIA, Laboratoire d’Organisation Industrielle Agro-Alimentaire


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International competition on the wine market is characterized by a disparity of strategies used by the producers and wine-producing regions. We provide a theoretical analysis of the producer’s arbitration between both main brand strategies : a private brand name and a brand within a public certification like the French "Appellation d’Origine Contrôlée" (AOC). We show that the last one could be profitable compared to the private brand name strategy. However, such a system can lead to underinvestment in quality which can injure consumer's surplus.

What are the welfare benefits from QA and certification schemes? How are they distributed? What are the effects of PDO/PGI certification? What is the optimal mix of publicly and privately funded labelling or certification?

Consumers, aggregate supply chain

The exceptional success of the EU in the international wine market is for a large part due to the French public certification system of “Appellations d’Origine Contrôlée (AOC). This system is based upon a reference to a restricted area and very binding rules, especially for the producers. Therefore, the choice for the specific regions, the limited yield per hectare (in order to assure the highest quality) and the strict control of the production process are factors that obstruct the producers from producing and commercializing large quantities. The objective of these certification schemes is to assure unique high-quality products, which are sold at higher prices because of the strategy of product differentiation and the creation of niche markets.

However, the ‘new’ wine exporting countries, such as the US, Australia and Chile, are characterized by another system of wine production and commercialisation. Here, the wine production is more industrialized and based upon private brand names. The promotion expenditures are mainly associated with these private labels and the efficiency of the enterprises is mainly based upon there capacity to obtain economies of scale.

Although the quality of the AOC wines is higher than the quality of the wines sold under a private brand, the consumers are not automatically better off in the case of the AOC system. Their utility depends upon a ratio of quality and price. Therefore, the consumer might prefer a lower quality which is sold at a more feasible price.

The objective of this paper is to provide a theoretical framework of the producer’s arbitration between both main brand strategies: a private brand name or a brand name with a public certification like the French AOC. The intention is to examine under which conditions a producer would prefer to benefit from a particular collective reputation which at the same time reduces his flexibility.

In addition, the impact of each brand strategy on consumer surplus will be analyzed.

This study focuses on the French public certification system of “Appellations d’Origine Contrôlée (AOC) which is applied to specific wines. This system of AOC is compared with the strategy of private brand names.

This paper provides only a theoretical analysis of the producer’s arbitration between both main brand strategies and the impact of the strategies on consumer surplus.
### Dataset(s) used in the study

As this study only provides a theoretical analysis, no specific datasets are used.

### Methodology, or methodologies used

The theoretical analysis is based upon a standard model of vertical product differentiation. The model starts from the point were producers are given a choice of either using a producer brand or an AOC. The latter one is associated with a limited production level, but with a higher quality and reputation level. In order to generate the same quality level, the producer with the producer brand, who is not restricted by production limits, has to considerably increase his investments, which implies higher fixed costs. From this the producer profit equations (for both private and public producers) are defined as functions of the quality, price, investment costs and production level.

The model is used to compare two situations. In the first one, the producer chooses a producer brand strategy (he is thus in monopoly position). From this he chooses the optimal quantity and the optimal quality of the good. In the second one, the producer chooses a public certification. The level of production is exogenous but the producer chooses the optimal quality.

With respect to the consumers; their demand is assumed to be an increasing function of the quality and decreasing with the price. In addition, a taste parameter is added to the demand equation which expresses the consumer’s preference for a particular quality level. Inversing the demand equation, results in the price equation, which is a function of total supply, the quality and the taste parameter. From this expression, the consumer surplus expression is derived as a function of total supply and quality.

The general methodology is an Industrial Organisation based model of product differentiation.

### Conclusions and recommendations of the study

The theoretical analysis of the producer profit and consumer surplus in both the case of private labelling and public AOC certification has resulted in two main observations. First, the results show that the AOC system might result in underinvestment by the producers. Secondly, the AOC certification system might be adopted by the producers, while damaging the interests of the consumers.

### Strengths and weaknesses of the methodology used

The analytical model presented in this study is new in that it presents both the producer profits and consumer surplus in case of private labelling and in case of public AOC certification.

However, the model ignores the variable costs that would result from quality improvement. In addition, the resulted segmentation and competition of the market are not accounted for in this model (the producer chooses exclusively either a producer brand strategy or a public certification strategy).

Mainly a background paper that provides an important mechanism rather than a paper that could be applied to an empirical analysis of a specific QAS.
### Background and context of the study

The 2002 Farm Bill (PL 107-171) contains a Country of Origin Labelling (COOL) provision that requires retailers to label the country of origin of the covered commodity from September 30, 2004. The covered commodities in this provision include whole muscle and ground product of beef, lamb, and pork, seafood (wild and farm-raised fish and shell fish), fresh and frozen fruits and vegetables, and peanuts. Although the implementation of this provision is expected to affect U.S. agriculture and food industries as well as trade relations with neighboring countries significantly, there is still a great deal of uncertainty regarding the COOL effect. Proponents of COOL claim that the new provision would increase the demand for U.S. beef by promoting beef born, raised, and processed in the United States. However, some producer groups such as National Cattlemen's Beef Association (NCBA) and National Pork Producers Council (NPPC) do not support the mandatory COOL expecting the cost would outweigh the benefit. Packers and retailers are also concerned about the increased labor and infrastructure cost due to the COOL requirements.

### Goals and Objectives of the study

The objective of this paper is to provide an economic analysis of the COOL effects in the US meat industry.

### Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is the US Country-of-Origin Labelling (COOL) provision that requires retailers to label the country of origin of the covered commodity from September 30, 2004.

### Scope and coverage of the study

The economic analysis of the COOL effects in the US meat industry presented in this paper covers several issues. First, a description is given of the estimated COOL costs for every stage in the beef supply chain. Then a summary is given of the existing literature on the consumers’ willingness-to-pay for COOL labelled products. The main part of the study involves the construction of an equilibrium displacement model to assess the impact of COOL on each stage of the beef supply chain, with respect to equilibrium prices and quantities.

Although the constructed model has been simulated, no simulation results are presented in this paper.

### Dataset(s) used in the study

Although the equilibrium displacement model constructed in this study has been simulated by the researchers, no information is given about the data sources with respect to the elasticities, price and quantity levels.

### Methodology, or methodologies used

In order to assess the impact of COOL on each stage of the beef supply chain an equilibrium displacement model is developed. This model is based upon three sectors; the U.S. beef, pork and chicken industries with four production stages (retail, processing, feedlot, and backgroundering) for the beef industry, three production stages (retail, processing, and farm) for the pork industry, and two production stages (retail and farm) for the poultry industry. For each level in each sector, two supply and demand functions are constructed, one for the domestic version and one for the foreign version of the product. As well as allowing for substitution between domestic and foreign products, the model allows for substitution between alternative meat products in retail demand and farm-supply level.

A 'simplified' model is presented in the paper. It considers two stages (farm level and retail level) and assumes that chicken is only produced in the US. There is thus 5 different products which
implies a model with 25 endogenous variables that characterize the equilibrium. By totally differentiating each of the 25 equations and solving it, one gets the displacement model that provides how the equilibrium prices and quantities are modified in response to exogenous changes such that the cost of implementing the COOL.

The model, with 25 endogenous variables (prices and quantities), is simulated with various estimates of the COOL costs and willingness-to-pay from consumers, assuming that COOL will raise producer costs and consumer's willingness to pay for the domestic beef and pork products. However, the results and discussion of the simulation are not presented in this paper.

The model is called an equilibrium displacement model. It is a model that is used to perform static comparative

The model, with 25 endogenous variables (prices and quantities), is simulated with various estimates of the COOL costs and willingness-to-pay from consumers, assuming that COOL will raise producer costs and consumer's willingness to pay for the domestic beef and pork products. However, the results and discussion of the simulation are not presented in this paper.

<table>
<thead>
<tr>
<th>Conclusions and recommendations of the study</th>
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<tr>
<td>Although the constructed equilibrium displacement model has been simulated by the researchers, no results or discussion are presented in the paper.</td>
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<tr>
<th>Strengths and weaknesses of the methodology used</th>
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<td>An advantage of using an equilibrium displacement model could be the fact that it allows for an assessment of the impacts on each stage and sector of a particular industry. In addition, it allows for substitution effects in both demand and supply sides of the market. Potentially it is an interesting tool to assess the impact of changes in demand or costs on the different agents in a chain.</td>
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<td>Because it is a ‘displacement’ model, it can only be used to analyse marginal changes of exogenous variables (such as the cost of implementing the legislation) on the equilibrium. For example, it seems that it is difficult to use such a model to infer the impact of introducing the country of origin labelling as it will create two distinct markets and thus will not affect marginally the pre-existing equilibrium.</td>
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<td>Another weakness or limit is the difficulty to get all the parameters of the model if one want to take into account the different agents in the chain and their relative market power. At least for the EU, there exists only very few studies that provide estimates of oligopoly of oligopsony power.</td>
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Abstract
The ISO 9000 series of quality management systems standards, introduced in 1986, has been adopted at over 560,000 locations worldwide. Anecdotal evidence suggests that firms can achieve internal benefits such as quality or productivity improvements, or that certification can help firms maintain or increase their market share, or both. Others argue that the standard is too generic to cause performance improvement, but can be seen as a signal of good management. In this paper, we track financial performance from 1987 to 1997 of all publicly traded ISO 9000 certified manufacturing firms in the US with SIC codes 2000-3999, and test whether ISO 9000 certification leads to productivity improvements, market benefits, and improved financial performance. We employ event study methods, matching each certified firm to a control group of one or more non-certified firms in the same industry with similar pre-certification size and/or return on assets. We find that firms' decision to seek their first ISO 9000 certification was indeed followed by significant abnormal improvements in financial performance, though the exact timing and magnitude of this effect depend on the specification of the control group. Three years after certification, the certified firms do display strongly significant abnormal performance under all control group specifications. The degree to which the precise results vary across control group specifications indicates that event studies should always include extensive sensitivity analysis, for instance matching by size and performance separately and jointly, using both single firms and portfolios as controls.
market value of the outstanding financial claims on the firm to the current replacement cost of the firm's assets,
- ISO 9000 certification leads to lower COGS/SALES ratios, which stands for the cost of goods sold divided by sales,
- ISO 9000 certification leads to higher relative sales growth and to increased asset turnover (SALES/ASSETS).

The empirical analysis is only focussed on US manufacturing firms.

**Dataset(s) used in the study**

This study is based on two large datasets. First the World Preferred database is used. This database contains data on ISO 9000 certifications in the US through 1997, a total of 21,482 certifications in all SIC codes at that time. This database listed the name and address of the certified site, the parent company, primary and secondary SIC code, and date of certification. In this study, only the data on a firm's first certification has been used from this database. Secondly, Compustat Annual Industrial File data for 1987-1997 has been used. The data distracted from this database contained amongst others data on the firms' total assets, sales, ROA, ROS, Tobin's Q and the costs of the goods sold. Merging the two databases was a major challenge, as no unique company identifier was listed in both.

In addition, the authors focused on manufacturing firms, i.e. all firms with SIC codes 2000-3999. Furthermore, they separated SIC code 357 (computer equipment) from the other sectors within SIC code 35 (industrial and commercial machinery, which includes engines and turbines, farm and garden machinery and equipment, etc.) as it is far more high-tech in nature and sufficiently large to treat separately. Of the 7238 firms listed in Compustat with SIC codes 2000-3999, 1103 firms received at least one ISO 9000 certification during 1990-1997. 310 observations with insufficient financial information were deleted. After trimming the data, the final sample consisted of 554 certified firms for which control firms existed under all matching criteria.

**Methodology, or methodologies used**

In this study, event-study methods have been used. The event period specified for this event study is the year in which the ISO 9000 certification was received and the year immediately preceding the certification. The three years following the event period are used to test for abnormal performance.

The hypotheses are tested by examining whether certified firms experience abnormal performance in terms of ROA, ROS, Tobin's Q, COGS/SALES, SALES, and SALES/ASSETS respectively for the event period and each of the three years following the event period. Abnormal performance is defined as the difference between the expected performance of a firm and the performance of the control group. In order to specify a firm's predicted performance in the absence of the event, the certified firms' post-event performance is compared with a control group of one or more firms with similar pre-event performance to the certified firms, but which did not experience the event. Several types of control groups have been created based on similarity with respect to the industry, ROS and size.

After having calculated the abnormal performance, the significance of the absolute performance is tested using parametric t-tests, the Wilcoxon signed-rank test and the sign test.

Finally, in order to test for the possibility that the sample firms were already increasing their ROA relative to the control firms, even before deciding to seek ISO 9000 certification, the post-certification abnormal performance has been calculated as well, for the two years prior to the event period.

**Conclusions and recommendations of the study**

Using event-study methods, the results indicate that after deciding to seek their first ISO 9000 certification, US manufacturing firms experience significant abnormal improvements in financial performance, with respect to ROA, ROS, Tobin's Q, COGS/SALES, SALES, and SALES/ASSETS. The results show that the precise timing and magnitude of the effects vary across different control group specifications, but the longer-term effects are strongly significant in all cases. The degree to which the control group specification affects the short-term results indicates the importance of including extensive sensitivity analyses in any event study, e.g., using several combinations of industry, size and pre-event performance as matching criteria, and using both individual firms and portfolios as control groups. By using control firms with similar pre-event size and performance,
and by performing extensive sensitivity analyses, the researchers can largely rule out the alternative hypothesis that ISO 9000 has no causal effect on performance but is simply adopted by firms that are better managed.

Strengths and weaknesses of the methodology used

**Strengths**

- The study deals with a large number of firms, which makes the statistical analysis robust.
- Statistical analysis of profit due to QA (ISO in this case) based on real firm-level data.
- As the impact of QA on profit is measured as the difference of profitability of each ISO firm with a non ISO firm that has similar characteristics, the choice of this control firm is crucial. alternative choices of the control firm are made, which is a way of testing the robustness of the results.
- The methodology allows firms that are in very different industries to be combined in one study. This was required because ISO is a QA that can be applied to every industrial firm.

**Weaknesses**

- The choice of the control firm which is “matched” with each ISO firm requires a huge work and the choice could be somewhat arbitrary or difficult.
- The study requires to access to data on individual firms.
- It is implicitly assumed that any difference in the profitability between the certified firm and the control firm is due to certification. This is a strong restriction on a more general model that would explain difference in the evolution of firms performances by characteristics of the firm, the certification would be only one among many characteristics. In the worst case, other factors promoting a change in profitability over time also predispose towards certification, then the study suffers from potential selection bias. It may be difficult to control for these “other factors” with the matching procedure.
Title: Nutrition knowledge and consumer use of nutritional food labels  
Authors: Andreas C. Drichoutsis, Panagiotis Lazaridis and Rodolfo M. Nayga, Jr.  
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Abstract  
Factors affecting nutritional food label use in Greece are examined using primary data collected from personal interviews with consumers shopping at supermarkets in Athens. The econometric approach treats nutrition knowledge, where appropriate, as an endogenous variable when estimating the models for general label use, degree of general label use and use of information on nutrient content. The results suggest that nutrition knowledge has a strong effect on general label use, degree of use, and on use of nutrient content concerning fat, ingredients and vitamins/minerals, thus confirming the hypothesised link between consumers’ nutrition knowledge and behaviour. Socio-demographic effects are also evident in all models.

Position in the analytical framework  
Question: How effective are quality labels in influencing consumer perceptions/behaviour?  
Stakeholders: Consumers

Background and context of the study  
Recent studies have found a correlation between the huge increase in several chronic diseases, and dietary and lifestyle factors. More specifically, nutritional factors and inactive lifestyles are implicated in 30-40 per cent of cancer cases and at least one-third of premature deaths from cardiovascular diseases in Europe. They are also blamed for pan-European obesity, the overweight epidemic and for osteoporosis and its consequences.

In an effort to make nutritional information available to consumers, the European Union (EU) has provided a complex legal framework about food labelling. The goal of this legislative framework is to provide consistent and usable labels that can help consumers make healthy food choices. In the USA, Teisl et al. (2001) found that food labelling can significantly affect consumer behaviour. Although they did not find that providing health-related information always leads consumers to switch their consumption to ‘healthy’ products, Kim et al. (2000, 2001) found positive effects of nutritional label use on the quality of consumers’ diets. In any case, consumers will generally make better food choices only if they understand and use the food labels. It is, therefore, important to know the factors affecting consumers’ use of nutritional food labels. By identifying these factors, it is possible to outline the profile of the consumers who use or do not use nutritional food labels and nutrient content information, which is a prerequisite to designing food labelling regulations, improving public health, and enhancing the profitability of the food industry.

Goals and Objectives of the study  
The aim of this study is to explore the factors that determine nutritional label use and nutrient content use with special emphasis on nutrition knowledge as in this study, the use of nutritional labels or nutrient content is considered an act of information search.

Quality assurance or certification scheme addressed in the study  
The labelling schemes addressed in this study are nutritional labels.

Scope and coverage of the study  
In order to achieve the objective, econometric estimation methods are used in this study for determining the determinants of nutritional label use and nutrient content use.

Dataset(s) used in the study  
A sample of 330 was obtained from conducting a survey during September 2003 at supermarkets of various sizes throughout the city of Athens. Consumers were asked about individual characteristics (age, gender, education), situational, behavioural and attitudinal factors.
(working status, income, special diet status, smoking status, household size, shopper, meal planner, time spent on grocery shopping, health related attitudinal variables), nutrition knowledge and their perceived importance of price, taste, ease of preparation, nutrition, brand. Label use was measured in two ways; a binary variable reflecting whether or not the respondent uses nutritional food labels and an ordinal variable reflecting the extent to which he makes use of the nutritional food labels.

**Methodology, or methodologies used**

An empirical model of nine equations is estimated. 1) the level of nutrition knowledge is estimated using OLS as a function of the consumer’s individual characteristics, situational, attitudinal and behavioural factors, and the degree of sources of nutritional information. 2) binary label use is estimated as a function of the consumer’s individual characteristics, situational, attitudinal and behavioural factors, product class perceived importance and the level of nutrition knowledge using a binary logit model. 3) ordinal label use is estimated using the same variables as in 2) but using an ordered logit model. 4) – 9) the nutrient use of 6 different nutrients is regressed upon the consumer’s individual characteristics, situational, attitudinal and behavioural factors, product class perceived importance and the level of nutrition knowledge using a binary logit model.

**Conclusions and recommendations of the study**

In this study, the factors affecting general food label use and nutrient content use in Greece were empirically investigated. In addition, the role nutrition knowledge has in label use behaviour was explored. The results suggest that nutrition knowledge has a strong effect on label use and on nutrient content use, confirming the hypothesis that there is a strong link between knowledge and behaviour of consumers. Socio-demographic effects are also evident in all equations. The success of this study is in finding a link between nutrition knowledge and label use. Additionally, the results provide the profiles of consumers that are more likely to use nutritional food labels.

However, some limitations of the study should be mentioned. Because of the localised nature of the study, an important caveat relates to the generality of the results. Further research is needed using a larger and more heterogeneous sample so that the robustness of these finding can be assessed. This study should be considered as only a pilot study as there are many areas in which the research can be directed.

**Strengths and weaknesses of the methodology used**

Efficient methodology for analysing data collected.

**Weaknesses**

Lack of rich underlying behavioural model, means that the information collected (standard demographic details) possibly misses interesting determinants of behaviour that would have yielded more useful results. Because of the localised nature of the study, an important caveat relates to the generality of the results. Further research is needed using a larger and more heterogeneous sample so that the robustness of these finding can be assessed.
Background and context of the study
As a result of recent food scares, European consumers have lost trust in meat products and increasingly demand more food safety and traceability. In general, producers face rising marginal costs when providing additional units of food quality and food safety. Given perfect markets, an optimal level of food safety is attained when marginal costs to producers equal marginal benefits to consumers. However, attempts to establish quality assurance programmes in the German meat sector supported by the CMA (Central Marketing Organisation of German Agricultural Industries) have rarely been successful, indicating at least partial market failure. It can be argued that this failure is caused by the fact that small-scale suppliers are not capable of efficiently signalling experience/credence attributes. Food safety would thus be considered a public good with no explicit market price, justifying government intervention. Several European governments support public monitoring, quality management initiatives and chain building by means of third-party certification. The Q&S system currently being established in Germany is an example of the latter.

Goals and Objectives of the study
The objective of this study is to investigate consumers’ willingness-to-pay (WTP) for the quality assurance scheme recently introduced in the German meat sector; the ‘quality and safety’ (Q&S) scheme.

Quality assurance or certification scheme addressed in the study
This study focuses on the Q&S scheme currently being introduced in Germany. In the Q&S scheme, meat can be traced through each production stage by all participants in the supply chain and by the consumer.

Scope and coverage of the study
As well as explaining the theoretical background and conducting an empirical analysis of the consumers’ WTP, this paper gives an overview of the literature on food safety evaluation and discusses the pros and cons of different valuation approaches. The choice experiment conducted is focused on 125g packaged liver sausages.

Dataset(s) used in the study
The data used in this study is collected in pedestrian areas and shopping centres using personal computer-assisted interviews. In this way, interviewers came across respondents who were in a shopping mood so that the survey could at least partly mirror the point-of-scale context. People were addressed according to a simple random rule and only those whose households at least occasionally consume packaged liver sausages were requested to participate in the interview. From February to March 2002, 321 interviews were conducted in four cities in the northern part of Germany.

Methodology, or methodologies used
The methodology used in this study for measuring consumers’ willingness to pay is a choice experiment, which is based on random utility theory. According to this theory, the overall utility of choice $i$ for individual $e$ is a function of a random utility component and a systematic/measurable utility component. The latter one is a function of attributes that pertain to choice options,
characteristics that pertain to individuals and interactions between attributes and individual characteristics. Than, based upon a given choice set, the choice probabilities are specified. The WTP is interpreted as the Compensating Variation (CVAR) and calculated as the marginal utility of the Q&S label divided by the negative marginal disutility of price.

The choice experiment conducted aimed at estimating implicit prices for a Q&S label place on 125g packaged liver sausages. After having made statements about their general meat consumption, and an interview on the respondents' personal characteristics, the respondents were asked for three choices from a set of six liver sausages, of which two were Q&S labelled (one on a premium brand, the other on a medium-priced brand). To design the choice set, the 'mix and match' approach described by Chrzan and Orme (2000). In total, 762 choice sets were provided for analysis.

Then the linear utility functions for each brand are estimated in the form of a conditional logit model. The respondents' choices for each brand were estimated as a function of its price, the Q&S label, the preferred place of purchase, the respondents' price orientation, brand loyalty, preference for animal friendly produced goods, and occupational status. Gender, age and income were excluded as they proved statistically irrelevant on the basis of an LR test. Then, as explained above, the WTP is calculated by taking the ratio of the label coefficient to the coefficient on the price variable. However, as the sample size was relatively small, confidence intervals of WTP were estimated applying the bootstrap method.

Conclusions and recommendations of the study

The results of the choice experiment and econometric estimation conducted in this research show the extend to which a consumer’s brand choice is determined by its price, a Q&S label, the preferred place of purchase, price orientation, brand loyalty, preference for animal friendly goods, and occupational status. From the estimation results, the WTP for the Q&S label can be calculated.

Strengths and weaknesses of the methodology used

A strength of experimental auctions is that they can be implemented so as to respect incentive compatibility. Moreover, they allow a real budget constraint to be imposed upon respondents. However, an important restriction is that participants do not expect to be offered an unsafe product in a university laboratory and so potential real market risks cannot adequately be replicated in the research setting. Another disadvantage of experimental auctions is that these studies focus on one food attribute. As a result, respondents’ attention is strongly directed to this product feature which might lead to an overrepresentation of this attribute. In order to overcome this problem, the researcher of this article decided to make use of choice experiments.

Main weaknesses are that multi-attribute choice tasks might place a cognitive burden upon interviewees and that Q&S label had to be introduced to respondents in the course of the interview, ignoring the fact that real consumers are generally far less informed about the meaning of certificates.
Abstract
In order to ensure and to improve quality in the agro-food sector quality systems have to undergo a permanent change: simple end-of-the-pipe monitoring is therefore being replaced with management oriented concepts. Farmers are also increasingly requested to implement quality systems. This paper gives an overview of quality regimes in the agro-food sector and compares three systems in the domains of pork production, potato growing and the cultivation of hop. 315 Bavarian farmers were interviewed in order to identify factors which may influence the acceptance of quality systems. Differences between the three quality regimes were moderate with respect to the overall acceptance. Hop growers judged their system to improve production efficiency while the others did not to this extent. Apart from age, sociodemographic factors do not have any significant impact on farmers’ satisfaction with the quality systems. Key factors are gains in image, in sales and in production efficiency.

Position in the analytical framework
Question: What motivates producers to accept QA schemes?
Stakeholders: Primary producers

Background and context of the study
Increasingly, farmers are required to implement quality systems. A variety of quality-assurance systems for use at the primary-production level have therefore been developed over the last few years. They differ widely, however, with respect to their requirement levels, regional scope of application, degree of integration into the supply chain or their sponsorship. The supposition that certified farmers’ reasons for participating in the various systems and their assessment of the latter are not necessarily identical was the reason for this study. Apart from measuring differences in assessments of individual quality systems, the aim of the study was also to ascertain non-system-specific factors influencing the acceptance of quality systems.

Goals and Objectives of the study
The objective of this study is to evaluate three quality systems implemented in Bavaria at the agro-food production level, in order to identify the factors that promote acceptance of the system by farmers.

Quality assurance or certification scheme addressed in the study
The products covered are potatoes, pork and hops. Each product is regulated by a different QA scheme, with some variation in coverage and characteristics. Under the KVA (“Kontrollierter Vertragsanbau”) scheme, producers’ unions of potato growers and customers are contractually integrated into the quality system. The aim is reciprocal guarantees regarding quantities and prices, taking quality-assurance aspects into account. The Q&S system (pork) is a vertically adjusted quality-assurance system covering all production, processing and distribution levels. The purpose of this system is thorough quality and information assurance along the supply chain. The hops growers’ system is a quality management system (EN ISO 9001:2000) which based on ISO certification, but less demanding. Participating farmers have to undergo matrix certification organised by the hop growers’ association, ‘Hopfenring Hallertau’. The aim is to improve international competitiveness, exploit managerial advantages and increase the reputation of hops production.

Scope and coverage of the study
The investigation covers 315 producers of (one of) these products in Bavaria, Germany.
Dataset(s) used in the study
The data were obtained by a questionnaire that was administered by telephone interview (agricultural managers) using a random selection from address lists. Open questions regarding the strengths and weaknesses of individual systems were intended to highlight inter-system differences. Other questions were intended to identify factors influencing acceptance of quality regimes in agriculture across all systems. It can be assumed, for example, that less implementation-related effort or improved sales potential in the value-added chain will result in increased acceptance. However, it is also conceivable that differences in assessment might arise because participants vary from system to system in their personal characteristics and farm structure. As far as the design of the questionnaire is concerned, this meant that farm-related and personal questions had to be included as well as questions on the quality system. So-called 'fact questions' on farm-related and personal data were also collected.

Methodology, or methodologies used
Survey results were analysed descriptively, and using an ordered logit model in which the ordinal variable was the producer's degree of acceptance of the scheme, ordered from 1 to 7. This enabled the identification of 5 “success factors” (two relating to expectations, three relating to outcomes actually experienced) that helped explain the way producers evaluated their scheme.

Conclusions and recommendations of the study
The strengths of the systems are clearly system-specific ones. With the KVA potato and QS pork quality assurance systems, external and market-oriented parameters such as safeguarding of sales, transparency and consumer confidence are acknowledged system strengths, whereas with DIN ISO hops, internal, farm-related systematic documentation is of importance. The systems also show weaknesses. The QS pork and ISO hops participants criticized the additional time needed for documentation without commensurate financial reward. Both systems were partly classified as too theoretical. The results of this study also show that quality management systems are not generally rejected by farmers because of higher costs or organizational effort. Efficiency improvements, gains in image and sales may compensate for costs associated with the introduction of quality systems. As such, higher demands may even motivate farmers to continue participating in quality systems.

Strengths and weaknesses of the methodology used
**Strengths**
Provides useful information for those designing new QA schemes, or wishing to improve existing ones.

**Weaknesses**
The study is descriptive of a particular sample in a given context. Generalisations from this sample, in this location, and these schemes, should only be made with extreme caution.
Two of the three systems were relatively young and the farmer-interviewees have not all had the same amount of experience with them. Because of this, it was considered to be difficult for farmers to judge whether the safeguarding of sales potential is a key element of the system, for instance, if they had not already experienced concrete success in this respect themselves. An adjustment was made to the questionnaire to accommodate this, but the problem remains to some extent.
Abstract
An economic analysis of new meat and poultry inspection rules evaluates the benefits and costs of reducing microbial pathogens and preventing foodborne illness. The new rules require federally-inspected processors and slaughterhouses to adopt Hazard Analysis and Critical Control Points (HACCP) systems to identify potential sources of pathogen contamination and establish procedures to prevent contamination. The benefits of reducing pathogens, which include lower medical costs of illness, lower productivity losses, and fewer premature deaths, range from $1.9 billion to $171.8 billion over 20 years, depending upon the level of pathogen control. These benefits will likely exceed the costs of HACCP, which are estimated at between $1.1 and $1.3 billion over 20 years. Small meat and poultry processing firms may bear higher costs under the new regulations than do large firms. Non-regulatory alternatives to improving food safety, such as education, labelling, market-based incentives for pathogen reduction, and irradiation, may contribute to the goal of making foods safer, but are not a substitute for regulation. Additional research is necessary to address the fundamental uncertainties involved in estimating the economic consequences of meat and poultry regulatory policies.

Position in the analytical framework
Question: 1. What are the welfare benefits from QA and certification schemes?
   2. Do QA and certification schemes improve profitability?
   3. What are the types of benefits and costs of QA and certifications schemes?

Stakeholders: Consumers, processors

Background and context of the study
American agriculture excels at producing an abundant supply of safe, nutritious food for the Nation and the world. Despite the productivity and quality of the Nation's food system, concerns remain about the safety and quality of the food we eat and the water we drink. In recent years, some well-publicized incidents, such as the contamination of hamburgers with the E. coli O157:H7 bacterium and residues of the pesticide Alar on apples, have led to increased public concern about the possibility of foodborne illness and exposure to potentially hazardous chemicals in the food supply. According to the U.S. Department of Agriculture's (USDA) 1991 Diet and Health Knowledge Survey, 49 percent of primary meal preparers cited bacteria or parasites in food as the food safety issue of greatest concern. An additional 26 percent cited pesticide residues in food as their greatest safety concern. In response, the USDA has begun several broad-based efforts to make further improvements in the safety and quality of the Nation's food supply. New meat and poultry inspection rules have been introduced. USDA is now requiring all federally-inspected meat and poultry processing plants to implement a new inspection system called Hazard Analysis and Critical Control Points (HACCP). This system strives to reduce human exposure to meat- and poultry-borne pathogens by requiring processing plants to scrutinize the critical control points in the production process-points where food safety hazards can be prevented, reduced to an acceptable level, or eliminated.

Goals and Objectives of the study
The objective of this study is to evaluate the benefits and costs of the HACCP program which is aimed at reducing microbial pathogens and preventing foodborne illness.

Quality assurance or certification scheme addressed in the study
The certification scheme addressed in this study is the HACCP program. This program strives to reduce human exposure to meat- and poultry-borne pathogens by requiring processing plants to scrutinize the critical control points in the production process-points where food safety hazards can
Scope and coverage of the study
This paper starts with a detailed description of the historical background on US meat and poultry inspection. The main part of this paper involves an economic assessment of the benefits and costs of the HACCP regulations on consumers and meat and poultry processors.

Dataset(s) used in the study
Several data sets have been used for this study. In order to estimate the benefits, effectiveness estimates were obtained from FSIS, the discount rate was recommended by the Office of Management and Budget, and the estimates of the costs-of-illness (COI) were based on Landefeld and Seskin’s (1982) human capita/WTP hybrid approach.

The longitudinal research database data at the US Bureau of the Census was used for estimating the costs per sector for very small, small and large plants. In order to estimate the total costs, the estimates of FSIS and IFSE were used.

Methodology, or methodologies used
Both the initial costs and benefits are estimated as well as the costs and benefits over 20 years. The benefits of HACCP were estimated using four key assumptions regarding the following questions:
1. How effective is HACCP in reducing pathogen levels (this study focuses on 6 pathogens)?
2. By how much do lower pathogen levels reduce foodborne illness?
3. What is the discount rate?
4. What method is used to value premature deaths?

With respect to Q1, the original FSIS assumption of 90% effectiveness is used. Regarding Q2, it is assumed that HACCP will reduce illnesses and deaths in proportion to the reduction in pathogen levels. The discount rate is assumed to be 7%. With respect to the fourth question, the value of premature deaths is estimated using the Cost-of-Illness (COI) approach. In this approach, the COI are estimated as the sum of medical costs and productivity losses from foodborne and meat/poultry diseases. Although the initial benefit estimation was based on these assumptions, several alternative scenarios were considered with different effectiveness rates, discount rates, and different valuation methods for premature deaths.

Then the estimates of the costs are presented. The total costs are presented, as well as the costs for different size slaughter plants in each meat sector. Both the estimates from FSIS as well as the estimates from IFSE (Institute for Food Science and Engineering at Texas A&M University) are presented. The following types of cost are distinguished: Sanitation Standard Operating procedures, time/temperature requirements, antimicrobial treatments, microbial testing, compliance with salmonella standards, compliance with generic E. coli standards, HACCP plan development, annual plan reassessment, recordkeeping, initial training, recurring training, additional overtime.

Conclusions and recommendations of the study
This study presented the results of a costs and benefits analysis of the HACCP in the meat and poultry industry. For most assumptions about the effectiveness of HACCP in reducing foodborne pathogens (six pathogens were taken into account), the new inspection system will likely reduce medical costs and productivity losses from foodborne disease, and these benefits of pathogen reduction will outweigh the costs of HACCP. In addition, the report highlights some distributional considerations: Certain segments of the population (the elderly, the very young, pregnant women, people with HIV/AIDS or cancer) may benefit more from improved food safety, while the costs of implementing HACCP can be proportionally greater for some small processing plants.

Strengths and weaknesses of the methodology used

Strengths
• As the cost evaluation is based on the estimates of the costs of each operation, this allows an ex ante evaluation of costs
• Cost estimates are based on the time each operation requires and on the materials that are needed for each operation. Thus, evaluation of costs can be parameterized as functions of the market prices of the different components.

Weaknesses
• Calculations are based on assumptions rather than on actual costs
• Calculations are based on an average ratio and thus ignore any variations in costs that could actually exist.
Because it is based on the evaluation of the costs of the different additional operations, it is implicitly assumed that there will be no interactions within the firm. It is assumed that this new activity will not change anything in the way the firm organises production. All the changes that these new operations will induce on pre-existing operations in the firm are thus ignored. Costs are based on standards that are defined in 'out of the plant' conditions. It is possible that these standards under-estimate the real time it will take.
Title: Tracing the costs and benefits of improvements in food safety
Authors: Elise H. Golan, Stephen J. Vogel, Paul D. Frenzen, and Katherine L. Ralston
Publication date: 2000
Publisher:
Number of pages:
Contact details authors: egolan@ers.usda.gov, Stephen.J.Vogel@usda.gov, Paul.D.Frenzen@usda.gov, kralston@ers.usda.gov

Abstract
The level and distribution of the costs and benefits of the Hazard Analysis and Critical Control Point (HACCP) regulatory program for meat and poultry change dramatically once economy wide effects are included in the analysis. Using a Social Accounting Matrix Model, we find that reduced premature deaths had a strong positive effect on household income, with economy wide benefits almost double initial benefits. Contrary to expectations, reduced medical expenses resulted in a decrease in household income, while HACCP costs resulted in an increase. Net economy wide benefits were slightly larger than initial net benefits, with poor households receiving a proportionally smaller share of the increased benefits than non-poor because of their weak ties to the economy. Our SAM analysis provides policymakers useful information about who ultimately benefits from reduced foodborne illnesses and who ultimately pays the costs of food safety regulation. This analysis also sheds light on a number of issues central to cost-benefit analysis involving health, highlighting the danger of equating changes in income with changes in well-being.

Position in the analytical framework

Question: What are the welfare benefits from QA and certification?
Stakeholders: Input suppliers, primary producers, processors, retailers, consumers, other sectors

Background and context of the study
In 1997, the Federal Government introduced a new food safety regulation for meat and poultry slaughter and processing plants. Under the Pathogen Reduction and Hazard Analysis and Critical Control Point rule (commonly known as HACCP), slaughterhouses and processors must adopt new procedures to reduce the incidence of foodborne illness transmitted by raw meat and poultry products. The costs and benefits of implementing HACCP are distributed throughout the economy. The costs of implementing HACCP are paid initially by the meat and poultry industry, while the benefits of controlling foodborne illness are distributed initially among consumers. However, the ultimate impact of these costs and benefits extends well beyond the initial payers and beneficiaries, with economic ramifications for many different segments of the economy.

Goals and Objectives of the study
The objective of this study is to examine the full economic ramifications of HACCP implementation and to answer the question as to how economic activity might be different if the HACCP system were implemented and foodborne illness were reduced.

Quality assurance or certification scheme addressed in the study
The quality assurance scheme addressed in this study is the US HACCP program.

Scope and coverage of the study
In order to achieve the objective of this study, this paper first presents an estimate of the initial impact of HACCP on medical expenses, earnings lost due to illness, accident, or premature death and the implementation costs on the different industries and household categories. Then, the SAM multiplier model is used to examine the ultimate impact of HACCP on consumers and the rest of the US economy. This study only provides a monetary measure of wellbeing, as it does not account for changes in welfare resulting from changes in health and longevity.
**Dataset(s) used in the study**

The HACCP SAM constructed in this study is based on a 1993 SAM derived from a Computable General Equilibrium (CGE) model of the United States economy developed at USDA’s Economic Research Service (ERS) (Hanson et al., forthcoming). The underlying data are the 1987 benchmark I-O accounts prepared by the U.S. Department of Commerce, Bureau of Economic Analysis (1994). Information about the distribution of the U.S. population by household type and poverty level is based on estimates from the March 1994 Current Population Survey conducted by the U.S. Department of Commerce, Bureau of the Census.

The initial benefits of the HACCP program were estimated using the mid-range benefit estimates converted to 1993 dollars reported in Crutchfield et al. (1997). These estimates are calculated with a HACCP efficacy rate of 50 percent, a discount rate of 7 percent, and the Landefeld and Seskin cost-of-illness approach. This approach provides an accounting of the reduction in dollars spent on medical expenses and the reduced earnings lost due to illness, accident, or premature death. In order to determine the initial impact of these benefits, two things are examined. First, it is determined who initially paid these costs of illness. Data on the distribution of these costs (by households and insurance categories) have been gathered from the National Health Interview Survey (NHIS). Secondly, the sector of receipt of the costs of illness had to be identified. In order to do so, the data from Buzby et al. (1996) was used and extrapolated.

Regarding the production costs of implementing the HACCP program, the mean value of the FSIS HACCP 20-year present-value cost estimates converted to 1993 dollars was used. These estimates were gathered from the study of Crutchfield et al. (1997) as well.

**Methodology, or methodologies used**

In order to achieve the objective of this study, the researchers developed a Social Accounting Matrix (SAM) multiplier model. The endogenous accounts are the production, value-added, and household expenditures as shares of total expenditures. The exogenous accounts are government, the capital account, and domestic and foreign trade.

After having presented an estimate of the initial distribution of the costs and benefits of the reduced foodborne illness using the data as described above, the researchers used the SAM to run four basic simulations to illustrate the probable economic consequences of HACCP implementation. First, they traced the economic impact of hypothetical reductions in the human capital costs of foodborne illness (benefits of HACCP). Second, they examined the economic impact of hypothetical reductions in medical expenses arising from foodborne illness (benefits of HACCP) when households paid these costs. Third, they examined the economic impact of hypothetical reductions in medical expenses when either private or public health insurers paid these costs. Fourth, they looked at the economic impact of hypothetical increases in meat and poultry plant operating expenses due to HACCP implementation (costs of HACCP). For each simulation, they investigated how the hypothetical change might affect the level and distribution of consumption, production, and income in the U.S. economy.

**Conclusions and recommendations of the study**

The SAM multiplier model extends the initial cost-benefit analysis to account for the full economic impact of HACCP on consumers and the rest of the US economy. This accounting indicates who ultimately benefits from improved health outcomes and who ultimately pays the costs of food safety regulation.

**Strengths and weaknesses of the methodology used**

The SAM analysis used in this study does no provide precise dollar estimates of the ultimate costs and benefits of HACCP. Instead, it provides information on the market mechanisms through which costs and benefits of the HACCP program affect the economy, thereby indicating the direction and magnitude of the economic flows resulting from regulation and reductions in foodborne illness. A weakness of this analysis is that it does not account for changes in welfare resulting from changes in health and longevity.
### Title: The management of perceived risk in the food supply chain: a comparative study of retailer-led beef quality assurance schemes in Germany and Italy

### Authors: Andrew Fearne, Susan Hornibrook, and Sandra Dedman

### Publication date: 2001

### Journal: International Food and Agribusiness Management Review 4

### Publisher: Elsevier Science Inc.

### Number of pages: 19-36

### Availability, URL:

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### Abstract

This paper reports the findings from two exploratory case studies of retailer-led quality assurance schemes (QAS) for beef in Germany and Italy. The focus is on the potential for QAS to reduce the risks associated with fresh beef, as perceived by consumers. Results of two consumer surveys are reported, which suggest that QAS have the potential to reduce perceived risk and increase consumer confidence in specific fresh beef products, but that considerable scope remains for improving the communication of QAS, in order that specific scheme objectives are clearly understood by consumers.

### Position in the analytical framework

**Question:**
1. How effective are quality labels in influencing consumer perceptions/behaviour?
2. What motivates producers to register to a QA or certification scheme?

**Stakeholders:**
- Consumers, processors, retailers

### Background and context of the study

Increasing consumer concerns and the consequential costs imposed on society as a result of food safety incidents have led to an increased public focus on the causes, effects and prevention of both microbiological and non-microbiological hazards. In developed countries, the issue of food safety in general, and for beef in particular, has been one of the key driving forces behind a change in the role of and relationships between the key stakeholders in the supply chain, with breeders, feeders, finishers, processors, retailers, consumers and the government all grappling with the fundamental problems associated with the management of risk in the food supply chain.

As a result, stakeholders within the beef industries of developed countries have, in recent years, been exploring a range of strategic options that both meet consumers' needs and comply with food safety legislation. One such option is quality assurance, which has been variously described as “...a strategic management function concerned with the establishment of policies, standards and systems for the maintenance of quality”, and “the assurance of quality of a product by means of a system which will manage quality into the product”. The main objective behind industry-wide assurance schemes is to reduce consumers’ product category risk associated with commodity beef, and is primarily concerned with reducing consumers’ perception of risk associated with credence attributes such as food safety and process attributes.

This paper focuses on the recent experience with retailer-led quality assurance schemes for beef in two European countries; Germany and Italy. Given the paucity of published evidence regarding the benefits of quality assurance schemes for consumers, the focus here is on the consumer perspective.

### Goals and Objectives of the study

The objective of this study is to establish the extent to which the beef quality assurance schemes in Germany and Italy meet the needs of consumers, in the sense that it has reduced the risks associated with fresh beef, as perceived by the consumers.

### Quality assurance or certification scheme addressed in the study

The case studies presented in this paper address two retailer-led quality assurance initiatives in two contrasting member states of the European Union: “Prodotti con Amore” in Italy and “Wörther Hof” in Germany.

### Scope and coverage of the study

In order to achieve the objective of this study, this paper tries to find an answer to the following questions by analysing two case studies:

Q1 What are the aims and objectives behind the adoption of retailer-led quality assurance schemes for beef?
Q2 Is the focus of these schemes on different product attributes in response to consumers' concerns with different risk dimensions?

Dataset(s) used in the study
The research was undertaken over a period of 5 months, from March 1999 to August 1999. First, desk research was undertaken to establish the key characteristics of the respective beef industries in Germany and Italy. This was followed by exploratory visits to both countries in April 1999. This primary research was conducted during July and August 1999, during which time semi-structured interviews were conducted with senior management representatives of the two retail organizations concerned: (Co-op in Italy and GROSSO-MAGNET in Germany), the abattoirs and a small number of beef producers, followed by a survey of 300 consumers in each country.

The trade interviews were used to establish the fundamental rationale for the schemes concerned and their subsequent operation and evolution in recent years. The consumer survey focuses on establishing the level of awareness of such schemes, attitudes towards quality assurance schemes for beef and the level of interest in the schemes currently available. In addition, they were asked about their beef consumption patterns, their reasons for reducing meat consumption over the past years, the type of attributes they looked for when purchasing fresh beef, and socio-demographic issues. The Italian survey was undertaken over a period of 3 days, inside a Co-op supermarket in the Laurentino area of Rome. The German survey was conducted over the same period in two GROSSO-MAGNET supermarkets in Dresden.

Methodology, or methodologies used
Comparative analysis has been performed in order to analyse:
- what motivated retailers and producers to adopt the quality assurance initiatives “Prodotti con Amore” and “Wörther Hof”,
- What specific attributes the consumers look for when purchasing fresh beef,
- Their awareness of the existence of the schemes,
- Their purchase behaviour and reasons for buying quality assured fresh beef,
- Their perception of the role of the quality assurance schemes,
- Their opinion about the importance of these roles,
for both German and Italian retailers and consumers.

Conclusions and recommendations of the study
The results of the interviews among retailers, producers and abattoirs give an indication about their main motivations of adopting quality assurance schemes. The results of the consumer surveys indicate the extent to which they value particular attributes, and allows for an analysis of their perception of the role of the quality assurance schemes and their importance attached to the several functions of a quality assurance schemes. Although both in Germany and Italy, increasing food safety was one of the main objectives of the quality assurance initiatives, and food safety was perceived as being very important according to the German consumers, in the eyes of the German consumers, the particular quality assurance scheme in question did not really function as a safety guarantee. Compared to Italy, the beef quality assurance schemes in Germany meets less the needs of consumers, in the sense that it has reduced the risks associated with fresh beef, as perceived by the consumers.

Strengths and weaknesses of the methodology used
Strengths: Case studies provide significant depth of coverage

Weaknesses: Impossible to generalise results from a small number of individual cases.
### Abstract
This research studies the organization of quality brand names —both private and geographical indicators— in agri-food. In order to do that, six of the biggest fresh meat brand names, representing 65% of high quality fresh meat, were analyzed in depth. The main conclusions drawn from this are, first, that the coexistence of several quality indicators for the same product is not redundant. They are complementary due to each one’s specialization in guaranteeing different attributes of the product. Second, the organizing method varies according to the kind of brand. Thus, the geographical indicators are based more on the market since they offer more intensive incentives, whereas the private brands are similar to a hierarchy in order to take advantage of their superiority in solving specific coordination problems (design attributes).

### Position in the analytical framework
**Question:** What is the impact of or reasons for using more than one label/standard simultaneously?
**Stakeholders:** Processors

### Background and context of the study
The movement of brand establishment has given rise to the development of two brands in the fresh meat sector in Spain. On the one hand, companies of a certain size have developed their own brands (private), guaranteeing the marketed product with their own reputation. On the other, the use of geographical indicators has spread. Protected by a “public” guarantee, these brands refer to specific geographical spheres and/or production methods related to a superior product quality. Such is the case of the Protected Denominations of Origin (PDO), the Protected Geographical Indicators (PGI), the Guaranteed Traditional Specialties (GTS) and the Guarantees of Quality. Except for the GTS, all of them refer to a certain extent, to the geographical origin of the product. The European Union recognizes those products that have some kind of geographical name at a national level as Registered Denomination products.

### Goals and Objectives of the study
The paper aims to obtain evidence relating to two hypotheses: (1) different brands (geographical indicators and private) are specialized in guaranteeing different product attributes, both being complementary in the sense that when they appear together in a product, investments in one increases the value of the other (2) specialization of brands in solving one kind of informational asymmetry about quality or another (average level or heterogeneity) affects the mechanisms of governance selected and the contract design. In particular, geographical indicators will make use of governing mechanisms similar to the market, whereas private ones will be organized more like a hierarchy.

### Quality assurance or certification scheme addressed in the study
Various types of product differentiation (private brands, geographical designations) operating in the meat sector in Spain.

### Scope and coverage of the study
Meat. Spain.

### Dataset(s) used in the study
Case studies.

### Methodology, or methodologies used
Descriptive, comparative.

### Conclusions and recommendations of the study
Geographical indicators are not redundant when a private brand is also present for the same product. On the contrary, a specialization of functions appears between the two. Geographical indicators are based more on the market since they offer more intensive incentives, whereas the private brands are similar to a hierarchy in order to take advantage of their superiority in solving specific coordination problems (design attributes).
indicators guarantee a high average level of quality whereas private ones ensure homogeneity among products and batches marketed by a specific company. On the other hand, it has been seen how the organization of geographical indicators involves the specialization of functions between the participating agents, similar to what happens in any hierarchy. Thus, there is a division between the quality control and management of geographical indicators: the control of specified quality compliance falls on the public organization that owns the geographical indicator, and the attaining that quality falls on the individual producers. This implies an efficient designation of ownership rights to avoid opportunism.

Another result is that the brand specialization in resolving any of the problems of informational asymmetry in relation to product quality, highly affects the mechanisms of governance chosen. Thus, if the problem to be resolved is an average level of high quality (geographical indicators), the organization formula chosen is more similar to the market than if the problem to be resolved is of high homogeneity (private brands) where a hierarchy is more efficient. Likewise, the type of contractual relationship between the parties involved in any type of quality sign differs substantially. More formalization and details appear in those cases where a greater homogeneity must be guaranteed, than in those cases where the main variable to be guaranteed is the presence of higher organoleptic attributes.

**Strengths and weaknesses of the methodology used**

**Strengths:** The paper asks interesting questions, and provides a thoroughly researched background for those questions.

**Weaknesses:** The hypotheses are not tested in a rigorous way; the conclusions appear to be supported for the specific context studied, but one needs caution in extrapolating them to other contexts.
**Title:** Quality labels as a marketing advantage; the case of “PDO Zagora” apples in the Greek market  
**Authors:** Christos Fotopoulos and Athanasios Krystallis  
**Publication date:** 2003  
**Journal:** European Journal of Marketing 37 (10)  
**Publisher:** MCB UP Limited  
**Number of pages:** 1350-1374  
**Availability, URL:** 
**Contact details authors:** igeke@compulink.gr, krystallis@hotmail.com  

**Abstract**  
The adoption of different quality assurance schemes, such as the Protected Denomination of Origin/Geographical Indication (PDO/PGI) by the European Union, has been a response to the growing demand for certified quality food products among consumers. Tries to offer some more insights into the effectiveness of the PDO scheme and its acceptance by the consumer. The use of conjoint analysis in exploring Greek consumers’ willingness to pay (WTP) for PDO apples from the area of Zagora, Central Greece, has been selected as one of the most appropriate approaches to that target. Opens with a brief theoretical background presentation on the concepts of food quality and labelling. Proceeds with a detailed description of the research methodology, focusing on the WTP measurement method through the use of conjoint analysis, the identification of segments based on the importance consumers attach to the PDO label and the development of their profiles. Finally, concludes with some thoughts regarding the managerial implications of the findings, the limitations of the survey and the suggested research extensions.  

**Position in the analytical framework**  
**Question:** What is consumers’ willingness to pay for quality? What are the effects of PDO/PGI certification? 
**Stakeholders:** Consumers  

**Background and context of the study**  
The use of Protected Denomination of Origin/Protected Geographical Indication (PDO/PGI) labels by food companies has become a marketing strategy very similar to branding. A PDO label may not provide a food product with a value similar to that of an old, worldwide known and heavily advertised brand name. However, it gives regional products, usually made by small producers, a competitive advantage similar to that of a brand name. The PDO label does not create only functional and emotional product values. Its social role is eminent as well, through its job creation and higher regional income potential. From this point of view, the PDO/PGI value is compared to the brand equity of a product: the value is being derived from the label of the product like benefiting from a (supposedly) strong and widely known brand name. Wright and Nancarrow (1999) refer to the creation of brand equity as the building of brand reputation or brand strength — including awareness, levels of esteem and differentiation with other competing brands — in the minds of consumers. These aspects of the PDO product are examined further in this paper.  

**Goals and Objectives of the study**  
The objective of this study is to try to offer some more insights into the effectiveness of the PDO scheme and its acceptance by the consumer.  

**Quality assurance or certification scheme addressed in the study**  
The quality assurance scheme addressed in this study is the PDO scheme.  

**Scope and coverage of the study**  
In order to gain insights into the effectiveness of PDO schemes, this study will focus on “PDO Zagora apples”. They will be compared with common (non-labelled) and commercially branded apples. The research question of this study is defined as follows: is a food product with the “PDO Zagora” label perceived as more valuable by consumers, since the PDO label guarantees quality in a more easily identifiable way? In order to answer this question, this study intends to measure the PDO label’s strength through consumers’ willingness to pay (WTP).
Dataset(s) used in the study
 Both qualitative and quantitative surveys were conducted. The qualitative survey involved three group discussions (each within another region) and was aimed at formulating hypotheses. This part of the research identified consumers’ associations to particular protected products, consumption patterns and purchase places of the particular product, links between the product and specific regions/places, the relation of region/place to consumers’ evaluation of the product, associations and value added of the PDO label, and individual characteristics.

For the quantitative survey a sample of 1014 randomly selected respondents were interviewed in a country wide survey about their socio-demographic characteristics, consumption behaviour with respect to apples in general, and their attitude and willingness to pay for the PDO label.

Methodology, or methodologies used
 The willingness to pay for PDO Zagora apples was measured using a Conjoint Analysis using SPSS 8.0. The apple attributes selected for the conjoint analysis were “price” and the “label”. Three alternatives were possible for “label”: no label, a commercial brand or the PDO Zagora label.

As well as the stated WTP, a second estimate of the WTP was obtained. It is calculated using the Ittersum et al. (1999) formula where the monetary value of the label is calculated by multiplying the monetary value of an increase of utility due to price reduction by the increase of utility due to the existence of a PDO label. Dividing this monetary value of the label by the price of the common product leads to the increase in money consumers are willing to pay for the existence of the PDO label.

Additionally, k-mean cluster analysis has been used to segment the buyers of Zagora apples by the average importance of the price and the existence of the PDO label. Then 14 variables are used in order to develop a more detailed profile of each cluster. Nine variables concerned the view of the buyers towards the PDO label, three concerning the consumption of Zagora apples and substitutes and two demographic variables (age and income).

Conclusions and recommendations of the study
 The results of the conjoint analysis indicate how much consumers are willing to pay for the existence of the PDO label over a non-labelled and commercially labelled product. The cluster analysis enables the researchers to segment the market of Zagora buyers and to analyse the extent to which price and label are important to each segment. Moreover, this analysis allows for a detailed analysis of the profiles of each cluster.

Strengths and weaknesses of the methodology used
 A weakness of using the conjoint analysis for measuring the willingness to pay is that it is based upon the stated willingness to pay as indicated by the participants. However, participants in market research studies tend to overestimate their willingness to pay. A major reason for this phenomenon is the tendency of research participants to pay less attention to cost considerations than do real costumers who are faced with multiple potential expenditures competing for their limited resources. As a result, market research typically underestimates consumer price sensitivity, overestimates willingness to pay and overestimates demand.

Main advantage of the conjoint method is that utilities are estimated for each individual consumer allowing a cluster analysis which permits the description of specific consumer profiles, ie.market segmentation.
**Title:** Inserting GM products into the food chain: the market and welfare effects of different labelling and regulatory regimes.

**Authors:** Murray Fulton and Konstantinos Giannakas

**Publication date:** February 2004

**Journal:** American Journal of Agricultural Economics 86(1)

**Publisher:** American Agricultural Economics Association

**Number of pages:** 42-60

**Availability, URL:**

**Contact details authors:** murray.fulton@usask.ca, kgiannakas@unl.edu

### Position in the analytical framework

**Question:** What are the welfare benefits from QA and certification schemes? How are they distributed?

**Stakeholders:** Input suppliers, consumers, whole supply chain

### Background and context of the study

Perhaps the most important feature of agriculture over the past 100 plus years has been the introduction and adoption of new technologies. These new technologies have typically created cost savings or productivity increases that shifted out one or more supply curves in the marketing chain. The system-wide analysis of these supply shifts has generally shown that agricultural technology has increased the welfare of consumers and producers.

The introduction of genetically modified (GM) products requires modifications to the traditional analysis of technological change to account for the market power of the private innovating firms that made the investments in GM technology and to address the demand response to the introduction of this technology. The generation of costs savings or productivity increases as a result of privately funded research and development (R&D) alters the degree to which the supply curves shift outwards, since the innovating firms capture some of the benefits depending on the power they possess. As well, since the introduction of the so-called first-generation GM products has been met with consumer resistance, the impact of this technology on demand must be examined.

### Goals and Objectives of the study

The purpose of this article is to examine the system-wide effects of the introduction of genetically modified (GM) products with and without labelling and to compare these two regimes to a third regime where GM products are not present either because they have not yet been developed or because they have been banned.

### Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is GM certification scheme. However, as this study solely involves a theoretical analysis, the analytical framework developed is applicable to a wide range of situation.

### Scope and coverage of the study

In order to achieve the objective as described above, the authors will examine for each regime the decisions and welfare of consumers, producers and life science companies. The article explicitly incorporates the consumer response to the introduction of GM technology and considers different market structures of the life science sector.

This article will only focus on the development of an analytical framework, instead of performing empirical analysis.

### Dataset(s) used in the study

In this study, a theoretical framework is constructed which is exploited using numerical simulations only. No empirical analysis is performed. Therefore, no specific dataset has been used.

### Methodology, or methodologies used

The paper starts with defining the equations of consumer demand and producer supply of both the GM product and the conventional product in the case when products are labelled. These equations are constructed as well for the situation where GM products are not available and for the...
situation where they are available but not labelled. The market outcomes (the equilibrium retail, farm and seed prices) for the three regimes are found by simultaneously solving the relevant demand and supply equations. This results in the expressions of consumer welfare, producer welfare and life science profits for each regime. Comparative static analysis using numerical simulations has been performed in order to examine the impact of changes in the exogenous variables (the consumer aversion to GM products, GM technology costs effectiveness, the market power of the life science companies and the costs of Identity preservation) in each of the three regimes.

**Conclusions and recommendations of the study**

The theoretical model constructed in this paper is able to explain the impact of the introduction and labelling of GM products on retail, seed, and farm prices, consumer welfare, producer welfare and life science companies profits, while allowing for different levels of consumer aversion to GM, different levels of technology costs effectiveness, different degrees of market power of the life science industry and different levels of identity preservation costs. The most striking result of the numerical simulations is how seldom the three groups (consumers, producers and life science companies) agree regarding their preferences for the different regimes.

**Strengths and weaknesses of the methodology used**

A possible strength of the analytical framework presented in this study is the fact that it is applicable to a wide range of situations. The most obvious application is to other credence goods where consumers exhibit some resistance to either the production process or (invisible) product characteristics – a good example would be BST milk. With some modification, however, the model can also be applied to products where consumers exhibit a preference-rather than an aversion-for the production process or (invisible) product characteristics. Organic food and food produced under strict food safety regulations are cases that come to mind.

**Strengths of IO based models**

1. They focus on an issue that is well defined and provides the key economic mechanisms that are involved.
2. They lead to analytical solutions – a strength for a theoretical model.
3. Mechanisms involved that lead to the results can be explained. Parameters that have a key influence on the results can be determined.
4. Consistency of the model can be easily checked. Assumptions of the model are explicit, which allows for precise evaluation of the validity and realism of the model.
5. Easy to analyse the impact of the creation of new markets resulting from the adoption of a QA.
6. Possibility of dealing with non participant producers and evaluating the impact of a QA on them.

**Weaknesses of IO based models**

1. Difficult to develop. Advanced skills are required.
2. Results provided are mainly qualitative rather than quantitative.
3. Difficult to calibrate, as they frequently use simplifying assumptions that do not change qualitative results but could change quantitative ones. They also rely on parameters that are sometimes difficult to quantify.
**Title:** Market segmentation and willingness to pay for organic products in Spain  
**Authors:** J.M. Gil, A. Gracia and M. Sánchez  
**Publication date:** 2000  
**Journal:** International Food and Agribusiness Management Review 3  
**Publisher:** Elsevier Science Inc.  
**Number of pages:** 207-226  
**Availability, URL:**  
**Contact details authors:** agracia@aragob.es

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<th>Abstract</th>
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<td>In recent years, consumer concerns on environmental and health issues related to food products have increased and, as a result, the demand for organically grown production has grown. Higher costs of production and retailer margins generate a gap between real prices and those that consumers are willing to pay for organic food. In this article, consumer willingness to pay for organic food in two Spanish regions is analysed. Markets in both regions are segmented considering consumers lifestyles. Results indicate that consumers concerned about healthy diet and environmental degradation are the most likely to buy organic food, and are willing to pay a high premium. Organic attributes are easily identified in perishable products as the premium consumers would pay for organic meat, fruits, and vegetables is higher.</td>
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<th>Position in the analytical framework</th>
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| **Question:** What is consumers' willingness to pay for quality?  
**Stakeholders:** Consumers |

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<th>Background and context of the study</th>
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| Production and consumption of organic products in most developed countries has considerably grown in recent years. Organic farming refers to a farming system which uses organic manure, and avoids or largely excludes the use of synthetic fertilizers, pesticides, and chemicals. On the demand side, consumers have positive attitudes towards organic products, since they perceive them as healthier than conventional alternatives.  
In the case of Spain, although the production of organic food products has considerably increased during the past decade, demand is still very low, as only 0.5% of food expenditure is allocated to such products. The main obstacle with organic production seems to be the difficulty in selling organic products in retail food markets. Although consumers search for more diverse, higher quality, and healthier food products, organic products face problems related to consumer product acceptability, new product, high price, and deficiencies in distribution channels. |

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<th>Goals and Objectives of the study</th>
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<td>The objective of this study is to estimate the willingness of different consumer segments in Spain to pay for organic products.</td>
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<th>Quality assurance or certification scheme addressed in the study</th>
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<td>This study addresses consumers’ attitudes towards organic foods. No specific certification scheme is focussed on.</td>
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<th>Scope and coverage of the study</th>
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<td>In this study, a wide range of food products is considered: (1) vegetables, (2) potatoes, (3) cereals, (4) fruits, (5) eggs, (6) chicken, and (7) red meat. Additionally, two regions are examined: Madrid and Navarra.</td>
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<th>Dataset(s) used in the study</th>
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<td>The data used come from a survey conducted in July through August 1997 in two Spanish regions: Navarra and Madrid. Samples in both regions were selected using a stratified random sample of food buyers on the basis of age and district of residence. Four hundred respondents were randomly selected and personally interviewed at home in each region. Respondents were the main purchasers of food products within the household. Only respondents with at least some knowledge of organic products were considered.</td>
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Consumers were asked about their socioeconomic characteristics and their attitudes towards organic food products and environmental issues. Among socioeconomic characteristics, age, gender, education level, family size, and income were judged to be the most relevant. Lifestyles, as well as attitudes towards environmental issues on one hand, and towards organic food products on the other, were measured by three tested scales. Respondents were asked to evaluate, assigning a value from 1 to 7, their agreement with different statements. These three scales have been reduced by a principal components analysis to extract the main dimensions on each aspect. From this, four lifestyles were distinguished; natural food consumption, health care, life equilibrium and Mediterranean diet. Two attitudes towards environmental issues were found; environmental concerns, environmental conservation. With respect to consumers’ attitudes towards organic food, three components were found; negative aspects, quality and healthy aspects and external appearance.

In order to calculate the willingness to pay for organic products, the respondents were asked a dichotomous choice question and a maximum WTP question.

**Methodology, or methodologies used**

First, consumers were segmented according to their lifestyles. Then, the market segments were characterized by looking at both consumers’ socioeconomic characteristics and their attitudes towards organic food products and environmental issues. Using principle component analysis, four types of lifestyles, three types of attitudes towards organic foods and two environmental attitudes were distinguished. The K-means cluster analysis technique was used to identify market segments in relation to organic food products, using lifestyle variables as segmentation variables.

The willingness to pay for organic products is measured using a direct valuation method: contingent valuation (CV), using the results of the dichotomous choice question and a maximum WTP question. The WTP was calculated as the probability of paying amount $A$, estimated as a linear function of the four premiums offered in the questionnaire.

The covariance analysis method was used to examine if WTP differences existed across market segments.

**Conclusions and recommendations of the study**

The principle component analysis and the K-means cluster technique allow the researchers to segment the market according to different lifestyles, attitudes and behaviour.

The contingent valuation method used to calculate the WTP indicates the maximum premiums consumers within each of the segments would be willing to pay for organic foods.

In both the market segmentation and the WTP analysis, the very broad sample allowed the researchers to compare the results between regions (Madrid and Navarra) and between different products.

**Strengths and weaknesses of the methodology used**

A weakness of using the contingent valuation method for measuring the WTP is the fact that the responses to the WTP question might be biased. The answers giving by the respondents might not reflect their real behaviour or attitudes. The respondents might indicate on purpose a higher WTP in order to satisfy the interviewer. Moreover, their responses might not take account of the consumer’s budget.
Abstract
At the end of the 1990s European retailers had significantly contributed to restructuring fresh agricultural product food chains (meat, fruit and vegetables), and had turned away from spot markets in order to create their own supply chains, based on private technical requirements and verification systems usually managed from within the firm. However, over the last few years a second type of system has appeared, as the range of standards adopted by retailers has been broadened to include generic standards common to several retailers. A telling example of this new approach is provided by the EUREPGAP protocol. In this paper we propose a theoretical analysis of this new procedure and its possible impacts.

Position in the analytical framework

Question: Do QA and certification schemes improve profitability?
Stakeholders: Retailers and processors

Background and context of the study
The food safety crises in the 1990s prompted the public authorities to adapt domestic and international regulations related to food safety and protection of consumer health. At the same time private operators were seeking to meet customer expectations in terms of food safety by implementing private standards. As shown by numerous studies, European retailers have strongly pursued this approach to enhancing the safety of food chains. The regulation of product safety by retailers was implemented in two main ways. The first way is based on decreasing use of spot markets, more involvement of retailers in their suppliers’ processes, and the establishment of relatively formalized contractual relationships aimed at fostering stable relations with producer groups. The resulting vertical alliances between producers, manufacturers and retailers have proven to be an important mechanism in the regulation of agricultural product food chains, with a view to ensuring food safety and quality characteristics. In recent years a second type of system has appeared, as the range of standards adopted by retailers has been broadened to include generic standards common to several retailers. A good example of this new approach is the EUREPGAP protocol, developed by a network of European retailers in order to ensure production and supply best practices for fresh agricultural products. This standard functions as a norm for the certification and selection of suppliers, and imposes requirements mainly related to safety risks (pesticides, contamination…).

Goals and Objectives of the study
The aim of this article is to contribute to the study of interactions within the framework of the public/private regulation of product safety and quality, which emerged in order to react to the uncertainties and food safety crises having occurred over the last two decades.

Quality assurance or certification scheme addressed in the study
This study is focussed on the introduction of the EUREPGAP procedure, which was developed by a network of European retailers in order to ensure production and supply best practices for fresh agricultural products. This standard functions as a norm for the certification and selection of suppliers, and imposes requirements mainly related to safety risks (pesticides, contamination…).

Scope and coverage of the study
In order to achieve the objective of the study, this paper presents a theoretical model which allows for the analysis of the EUREPGAP procedure and its impacts.

Dataset(s) used in the study
As no empirical analysis is conducted in this study, no specific data has been used.
Methodology, or methodologies used

In this paper, a theoretical analysis is proposed of the EUREPGAP procedure and its impacts. It considers a vertical relationship between \( J \) upstream producers and \( R \) downstream retailers. Each producer sells a quantity \( q \) and is price taker on two intermediary markets: (1) A generic spot market which supplies some retailers at the intermediary price \( w_0 \), and (2) A safer spot market which supplies other retailers at price \( w_1 \). Each retailer sells a quantity on the final market, and buys the quantity he needs either on the generic or the safer spot market. The final product is considered as a homogeneous product by the consumers who have the same willingness-to-pay the product coming from the generic or safer spot market. In order to be able to sell on the safer spot market, the producers must reach a certain level of equipment imposed by the retailers who buy on the safer spot market. A safety risk probability is linked to each individual producer, and depends on their equipment level. At the retailer level, a safety crisis leads to a decrease of the final demand, but also to penalty costs in application of the due diligence principle. This penalty is supposed to depend on the safety risk probability of the producers and a coefficient. From this, the equation of the retailer profit without a safer spot market is defined as a function of the market price, safety risk probability, consumer demand, intermediate price and a coefficient.

In the benchmark situation, only one spot market exists and the probability of food safety crisis is \( \frac{1}{2} \). Calculating the Cournot-Nash equilibrium between the retailers, the supply on the final market according to the spot market price paid to the upstream producers is determined. Then, as all the producers sell the same quantity \( q \) on the spot market, the equilibrium spot price is obtained by equalizing supply and demand on this intermediary market. Given this equilibrium, the expression of the retailer’s profit is defined.

Then the model is extended with the introduction of the EUREPGAP protocol, in order to assess the extension of the safer chain by the downstream retailers and the upstream producers who have to adapt their equipments. The introduction of the safer chain is assumed to result in the following game: Step 1: the retailers decide simultaneously to pay or not the fixed cost \( C \) to enter the safer spot market defined by the safety standard. Step 2: the upstream producers decide simultaneously to enter the safer market and, if necessary adapt their equipments. Step 3: the producers offer the quantity \( q \) on the market they have chosen and the retailers decide simultaneously the quantity to be supplied on the final market. From this, the Nash equilibrium in quantity between the retailers is obtained. Then, given the equipment level of the producers and the new non-safety risk, the supply-demand equilibrium on the intermediary markets (spot and EUREPGAP) is determined. Based on this equilibrium, the expression of the spot market prices and profit equations of the retailers on the spot market and on the EUREPGAP market are defined. Retailers’ profits depend on the number of producers and retailers involved in the safer spot market.

Conclusions and recommendations of the study

Using the theoretical model developed in this paper, several conclusions are drawn with respect to the impact of the introduction of EUREPGAP on the sanitary risk level, number of producers entering the safer market, number of retailers participating, level of minimum producer equipment, and finally on the impact on retailer profits (of both general spot market and safer spot market retailers) and producer profits (of both involved and non-involved producers).

Strengths and weaknesses of the methodology used

Strengths of IO based models

- They focus on an issue that is well defined and provides the key economic mechanisms that are involved. In this case, it is the strategy of retailers that is analysed and the consequences for the food safety.
- They lead to analytical solutions – a strength for a theoretical model.
- Mechanisms involved that lead to the results can be explained. Parameters that have a key influence on the results can be determined
- Consistency of the model can be easily checked. Assumptions of the model are explicit, which allows for precise evaluation of the validity and realism of the model.

Weaknesses of IO based models

- Difficult to develop. Advanced skills are required.
- Results provided are mainly qualitative rather than quantitative.
- Difficult to calibrate, as they frequently use simplifying assumptions that do not change qualitative results but could change quantitative ones. They also rely on parameters that are sometimes difficult to quantify.
Abstract

Results of surveys sent to plant managers of eleven firms representing 25 percent of the U.S. broiler volume were used to estimate HACCP implementation costs for poultry kill plants and to perform welfare analysis. First-year welfare losses were $70 million for the broiler industry. There were also substantial consumer losses.

Position in the analytical framework

Question: What are the welfare benefits from QA and certification schemes?

Stakeholders: Processors and consumers

Background and context of the study

On July 25, 1996 the US Department of Agriculture published the proposed Final Rule for Pathogen Reduction: Hazard Analysis and Critical Control Point (HACCP) Systems. HACCP represents a new approach to food safety in the meat industry because it focuses on prevention of microbial hazards, rather than ex post inspection for contamination. While the philosophy that food safety is a shared responsibility between consumers and producers is widely accepted, the issue of who bears costs and risks is still controversial. Federal legislation does not require an efficient allocation of resources among the various aspects of food safety and health policy. Health and safety regulations are only coincidentally efficient in the sense that an additional dollar spent on each program yields the same risk reduction.

USDA FSIS carried out an economic impact assessment of the regulation that showed that expected benefits would greatly exceed expected costs. In spite of the demonstrated benefits, the assessment was met with controversy. Main reasons for controversy were the difficulty in estimating ex ante costs and the uncertainty associated with forecasting the regulation’s ultimate impact on foodborne illnesses.

Goals and Objectives of the study

The objective of this study is to examine how the incidence of costs from new regulatory action affects the poultry industry.

Quality assurance or certification scheme addressed in the study

This study focuses on the HACCP safety regulation.

Scope and coverage of the study

In order to achieve the objective mentioned above, this study will focus on an estimation of the real HACCP implementation costs and analyse the changes in consumer and producer surplus.

Dataset(s) used in the study

Estimates of HACCP costs for poultry slaughter industry in this study are based on surveys of plant managers from the 11 firms participating in the HACCP Roundtable, an academic, governmental, and industry group that meets monthly to discuss issues related to HACCP implementation and monitoring. A survey of 56 broiler slaughter plants was conducted to assess costs associated with the first year of HACCP implementation. Surveys were sent to the respective plant managers for completion and were returned to the University of Arkansas for analysis. Of the 56 surveys sent, 35 were returned in usable form. Total slaughter capacity for these 35 plants represented over 25 per cent of the total U.S. broiler slaughter in 1998, 2.05 billion of the 8 billion total. The survey focused on additional 1998 capital and capital monitoring costs as well as operational costs incurred since HACCP implementation. Operational costs included water costs, maintenance and monitoring costs, personnel costs and additional training costs related to HACCP monitoring and record keeping. In order to estimate the equilibrium displacement model, estimates of supply and demand elasticities utilized by Unnevehr et al., Wohlgemant and Sullivan et al, will be used in this paper.
Methodology, or methodologies used

In order to quantify producer and consumer surplus resulting from the HACCP implementation, an equilibrium displacement model (EDM) will be employed. In this model, the market equilibrium is characterized by functions that are linear in supply and demand elasticities. Demand is assumed to be a function of own and cross prices and supply is expressed as a function of own price and the estimated HACCP costs. The model accounts for three products (broilers, beef and pork) and three actors in each sector (producer, wholesaler and consumer). Proportional changes in quantities and prices of pork, beef and chicken are endogenous to the model, whereas changes in prices received by the producer due to additional costs are exogenous shocks. Using the linear demand and supply functions and assuming market equilibrium, the equations of change in producer and consumer surplus are defined. Finally, the supply and demand elasticities, and the estimated costs of the HACCP regulation are added to the model, in order to analyse the change in producer and consumer surplus, with and without substitution possibilities for the consumer.

Conclusions and recommendations of the study

Using survey data, the authors were able to give an estimate of the real HACCP costs. These were used in order to estimate the change in consumer and producer surplus due to the introduction of the HACCP regulation. The results provided by the model analyses show how the HACCP regulation cost affects both the poultry industry and the consumer. Producer loss comparison with and without substitutability emphasises the importance of consumer behaviour on producer welfare.

Strengths and weaknesses of the methodology used

The use of an EDM framework allows for an examination of the impact of an exogenous shock on the endogenous variables of the model both in terms of the direct and indirect effects allowing for substitution effects among different products. However, a weakness of the EDM in analysing the welfare impacts due to safety regulations is that it does not allow for possible benefits derived from health improvement.

Strengths

- The functional form does not have to be specified. Thus, the model can be used whatever the demand and the supply functions are.
- Relatively easy to parameterise (e.g. elasticities assumed or culled from the literature)
- Stylised form that is easy for policy makers to understand.
- Relatively easy to consider multiple stages in the supply chain as well as to consider multiple markets, that is to deal with the substitution among markets.
- Possibility of evaluating the impact of QA on non participant producers.

Weaknesses

- Only marginal changes can be handled accurately, unless the underlying functions are Cobb Douglas functions (whose elasticities are by definition constant).
- Difficult to deal with the creation of a new market resulting from the adoption of the QA or certification scheme. This difficulty arises when the QA changes the number of goods that are available on the markets.
- The method compares one equilibrium (‘with’) to another (‘without’), with no idea of how long it takes to reach a new equilibrium. That is, it is completely static.
- Because of strength 2 and weakness 2, there is a danger that when EDMs are constructed, they assemble elasticities from various sources obtained in different structures and for different “reaction times” so that the parameter set is not internally consistent, and in fact represents some kind of unrealistic hybrid. It is often difficult for readers and users of such models to form an idea of whether such models are realistic. Ideally, one would evaluate their performance against data on real-world changes, or at least perform some sensitivity analysis – but often this is not done

Strengths of this specific study

- Substitution between meat; compares with and without substitution

Weaknesses of this specific study

- Ignores the positive effect on consumer health (HACCP is analysed); only one market for each meat (kick to derive impact on wholesale price)
Title: Evaluating consumer usage of nutritional labelling: the influence of socio-economic characteristics
Authors: Ramu Govindasamy and John Italia
Publication date: January, 1999
Journal: New Jersey Agricultural Experiment Station, Department of Agricultural, Food and Resource Economics, Cook College Rutgers The State University of New Jersey
Publisher:
Number of pages:
Availability, URL: http://aesop.rutgers.edu/~agecon/pub/label.pdf
Contact details authors: govindasamy@aesop.rutgers.edu

Abstract
The majority of consumers report making frequent use of nutritional labelling when purchasing food products. However, certain segments appear to place a greater emphasis on food product labels than others. This study empirically evaluates which demographic characteristics encourage consumers to be more likely to take nutritional labels into account when purchasing grocery products. The results indicate that females, older individuals, and those living in suburban and rural areas are the most likely to make use of nutritional labelling. The results also indicate that larger households were less likely to use nutritional labelling.

Position in the analytical framework
Question: How effective are quality labels in influencing consumer perceptions/behaviour?
Stakeholders: Consumers

Background and context of the study
Nutritional labelling has been commonly provided on food products for nearly three decades. For much of this century, nutritional labelling was largely voluntary and only loosely regulated to prevent fallacious and misleading representation. The Nutrition Labelling and Education Act (NLEA), passed in 1990, was intended to ensure the consistency and validity of the information presented in food labelling. Conceptually, improvements in label design and data were anticipated to increase the healthfulness of eating habits and improve consumer diets. However, any modifications in consumer behaviour arising from new label policies are intrinsically limited by the existing use of nutritional labels. Examination of food label use is now required to determine the effectiveness of the NLEA and what, if any, changes have occurred that are directly attributable to the NLEA. One necessary step is to ascertain which consumers are most likely to make use of nutritional labelling in actual purchase practice. In addition to aggregate measures of label usage, specific consumer demographic characteristics can be tested for their marginal contributions to label usage. Interest in consumer use of nutritional labelling is held by both health and dietary professionals as well as the food marketing and food processing sectors.

Goals and Objectives of the study
The purpose of this study is to empirically evaluate which socio-economic characteristics encourage consumers to use nutritional labels when making grocery purchases.

Quality assurance or certification scheme addressed in the study
This study focuses on nutritional labelling of food products.

Scope and coverage of the study
The empirical analysis of this study uses a localized sample of New Jersey consumers only and focuses on consumers’ purchase behaviour in general in stead of focusing on specific commodities.

Dataset(s) used in the study
The data for the analysis was collected from a survey conducted by Rutgers Cooperative Extension in 1997. The survey was held at five grocery retailers throughout New Jersey where respondents were approached at random while entering the retail establishment. The survey contained questions which dealt with the several issues important to food purchasing behaviour, food risk perceptions, and the socio-demographic characteristics of the respondents. Overall, 408 surveys were physically distributed to New Jersey shoppers yielding a sample of 291 responses with a response rate of 71 percent.
<table>
<thead>
<tr>
<th>Table Title</th>
<th>Text</th>
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<tr>
<td><strong>Methodology, or methodologies used</strong></td>
<td>A logistic framework estimated by maximum likelihood estimation (MLE) is used to quantify the effects of several demographic factors on label use. The likelihood of making frequent use of nutritional labelling was estimated as a function of a gender dummy, an age dummy, a rural/suburban dummy, a household size dummies, dummies representing the number of children in the household, a dummy indicating whether the respondent was the primary household shopper, a dummy for organic purchases, a dummy indicating the use of advertisements and coupons, and an education and income dummy.</td>
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<tr>
<td><strong>Conclusions and recommendations of the study</strong></td>
<td>The logistic framework estimated using maximum likelihood estimation enables the researchers to identify the effect of consumer characteristics on the likelihood of being a frequent nutritional label user. The results indicate that females, older individuals, and those living in suburban and rural areas are the most likely to make use of nutritional labelling. However, the small sample size and highly concentrated regional makeup of the participants warrant some caution when extending the outcome of this study to other geographic areas.</td>
</tr>
<tr>
<td><strong>Strengths and weaknesses of the methodology used</strong></td>
<td>The main strength of the method used is its mathematical simplicity. However, the fact that results are based upon claimed respondents behavior, upon a small sized sample, highly concentrated regional makeup of the participants, with a limited interest of the chosen binary variables, are strong weaknesses of the methodology.</td>
</tr>
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</table>
Title: Signes de qualité et qualité des signes: une application au marché du camembert
Authors: Daniel Hassan et Sylvette Monier-Dilhan
Publication date: 2002
Journal: Cahiers d'économie et sociologie rurales, nr 65
Publisher: Institut National de la Recherche Agronomique (INRA)
Number of pages:
Availability, URL:
Contact details authors: hassan@toulouse.inra.fr ; monier@toulouse.inra.fr

Background and context of the study
A remarkable phenomenon in the evolution of the food sector is the proliferation of quality signals. Nowadays, it is very hard to find a totally anonymous food product. This could be explained by the increasing consumer demand for product information, guarantees and geographical indications of the products. In the agricultural food sector, public quality labels play an important role, such as L’appellation d’Origine Contrôlée (AOC), le Label Rouge ou l’Agriculture Biologique. Additionally, the European Union has launched some certification programs as well, such as the Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and the Traditional Speciality Guaranteed (TSG). Parallel to the development of public labels, the number of private labels (introduced by producers, farmer groups or retailers) has considerably increased as well.

The proliferation of the quality signs cannot only be found in the increasing number of different labels, but also in their overlapping on one and the same product.

Goals and Objectives of the study
The objective of this study is to examine consumers’ willingness-to-pay for a particular label when the product combines different types of labels.

Quality assurance or certification scheme addressed in the study
In this study both private labels (brands from producers, farmers or retailers) as well as public labels (AOC) are considered.

Scope and coverage of the study
In order to reach the objected as mentioned above, the researchers will measure the willingness-to-pay for a product which combines two types of labelling; one official quality label, and a private brand label. In this study they will focus on French camembert as for this product many different labels exist; they might be sold under a national label or under a retailer’s label, and at the same time having an AOC label.

Dataset(s) used in the study
The scanner-data used for this study is obtained from the Société Sécodip database, which contains all kinds of micro-economic data. After having deleted the redundant observations, the final database contained 25026 observations of a panel of 5000 consumers for the year 1998.

Methodology, or methodologies used
A hedonic price function is estimated for camembert. The endogenous variable is the price of the camembert. The explanatory variables include variables indicating the place of purchase, a retail-label dummy, a producer-label dummy, an AOC-dummy and dummies for several billboards. In addition, in order to take into account the possible cross effects, cross multiplications of these variables have been added as well.

After having estimated this price equation, the marginal price effect of each characteristic has been derived. The price for each characteristic has been obtained by comparing the price of a particular good with the price of a reference good which only differs from the particular good with respect to the concerned characteristic.

Conclusions and recommendations of the study
The method used in this study allows us to evaluate whether the valuation of a particular label is influenced by the fact that this label is combined with another label. The study results show that consumers are willing to pay a premium for a product having both an AOC and a retailer label. However, the premium paid for each of these two individual labels appears to exceed the premium for the combination of the two.

Strengths and weaknesses of the methodology used
Main strength of the methodology used is the fact that results are based upon real consumer behavior. However, the conditions underlying the hedonic price model are somewhat unrealistic, as supply must be perfectly inelastic and all consumers alike.
Position in the analytical framework

Question: Who benefits from QA schemes?
Stakeholders: Producers, wholesalers, retailers

Background and context of the study

Since the end of the 1980s, the fruit and vegetable sector in France has seen the proliferation of quality labels, including AOC (*Appellation d’origine contrôlée*), organic labels, etc, introduction of new varieties, and the extension of the marketing season for produce from specific origins. The authors note that the *Label rouge* is not widely used for fruit and vegetables, because the requirements regarding results are difficult to guarantee for this kind of produce.

Goals and Objectives of the study

The first objective is to establish the link between the price premium and the different quality attributes. The second objective is to analyse the transmission of price differentials from the farm gate through the wholesaling stage to the retail market.

Quality assurance or certification scheme addressed in the study

The focus is on table grapes, since this product is subject to the full range of quality signals (AOC, label of European origin, specific varieties etc).

Scope and coverage of the study

The study covers 8 varieties of grape, three levels in the chain (farm gate/coop, wholesale, retail), 5 different types of quality label, and the 4-month marketing season of French grapes for two consecutive years, 1998 and 1999.

Dataset(s) used in the study

The data were collected on a daily basis by the SNM (Service des nouvelles des marchés) of the French Ministry of Agriculture. At the retail end, prices (provided by SECODIP to the Ministry) relate only to supermarkets, whose share of the fruit and vegetable market is about 70% (60% for table grapes).

Methodology, or methodologies used

Methodology for the first stage of the study is a hedonic price function, which includes as attributes (1) variety (2) quality label (3) month (4) year (5) origin of product. The price explained is the price of first sale. The equation is estimated by OLS. Most varieties and quality labels contribute to a price differential, as do early (August) and late (November) marketing.

The second stage analyses the margin between producer and wholesaler, and wholesaler and retailer, and uses a regression (similar to the hedonic price regression) to determine whether these margins are constant, regardless of variety, quality label etc, or whether product attributes also play a part in determining the margin. If they do, this means that transmission of price differentials for differentiated products is not perfect (perfect transmission represents the case where the margin is constant, regardless of variety or quality label). The results show that margins are not constant. In general, these two levels in the chain increase their margin for the higher quality product. However, the AOC Chasselas de Moissac has a negative effect on the margin between producer and wholesaler, and the one between wholesaler and retailer. This indicates that, other things being equal, the price differential that the consumer is willing to pay for this AOC, given the quantities supplied, is less than the price differential received by the producer. The authors explain this by saying that retailers as still keen to supply this differentiated product, although they have to reduce their margin on it, because it increases the range of products they can offer to the consumer.

Conclusions and recommendations of the study

For the product studied, the attributes of differentiated products are linked to price differentials in a systematic way. However, margins between levels in the supply chain vary according to the quality attribute, indicating that transmission is not “perfect”.

Strengths and weaknesses of the methodology used

An interesting and innovative study. Its general strengths and weaknesses are those of the hedonic model (see deliverable 4 of this study).
Strengths and weaknesses specific to this paper
The authors assume, without discussion or justification, that wholesalers and retailers are formulating margins as an additive mark-up on the purchase price. Thus, when they find that this additive mark-up is not constant, they interpret it as a signal of less-than-perfect price transmission. However, if the basic model being used is that of a percentage mark-up, then even if this percentage mark-up is constant across all differentiated products (indicating no specific intention to increase mark-ups on the higher quality products) then one would expect to find that the more expensive differentiated products have a higher mark-up in absolute terms. Some independent evidence of the kind of process wholesalers and retailers use in forming their margins would be very valuable. If they are using a constant percentage mark-up process, then this very choice indicates a general intention to rely on the higher quality (more expensive) products for a relatively greater share of the margin, but should not be construed as a specific policy directed at quality labels.
Abstract
In this article we study one aspect of the proliferation of quality labels in the agrofood sector: the coexistence of two signs on one same product and its consequences on the value of each sign. The context is that of the competition between national brands and private labels on a certain number of products carrying a public quality label. We show that the value of a sign decreases when it is combined with another one - a manufacturer’s brand and a national quality label - on the same product. This result is verified for six products involving four quality labels. It enables us to interpret retailers’ strategy as regards private labels.

Position in the analytical framework
Question: What is consumers' willingness to pay for QA?
Stakeholders: Consumers

Background and context of the study
The development of private labels (PL) is one of the most striking phenomena in the evolution of the agro-food sector in the last 25 years. Initially, PLs developed a low-price strategy that enabled them to compete with national brands (NB). They aimed to attract low-income consumers and to show them that the high prices of NB were largely due to the cost of elements other than the product itself (packaging for example). From the mid 1980s, quality strategies of PLs changed: The aim of the leading mass retail companies was then to offer goods that would be close substitutes to national brand products (“me too” products). The “generic” brand was then attributed to low-quality products. Nevertheless, the second generation of PLs concerns standard quality or “mainstream” products. More recently, mass distributors decided to enter, using their private labels, the market of high quality products. For this purpose, a retailers’ strategy consists in introducing store brands devoted to high quality products. Another strategy consists in commercializing products with public quality labels. These labels were introduced in order to meet the increasing demand for products with an identifiable geographical origin, for products that are free from health risks and of superior quality. Public quality labels belong to the State. The latter grants private actors the right to use these quality labels and ensures that specifications are met. Some of these national labels have been harmonized at European level, such as the Protected Designation of Origin (PDO) and the Protected Geographical Indication (PGI) labels.

The addition of a private label to products carrying a public quality label gives rise to an original situation in that it creates a double vertical differentiation: First of all, a differentiation between national brands and private labels - national brands being associated with high quality and private labels being associated with low quality. Second of all, a differentiation based on the presence or absence of a public quality label.

Goals and Objectives of the study
The objective of this study is to examine the impact of public quality labels and those of brands (NBs and PLs), as well as the interactions between the two, on the consumers’ willingness-to-pay.

Quality assurance or certification scheme addressed in the study
This study focuses on both private brand names (brands from producers, farmers or retailers) and public quality labels (PGI, PDO, the BIO label and Label Rouge), as well as the combination of both.

Scope and coverage of the study
In order to achieve the objective as mentioned above, the case study will include six products: milk, yogurt, eggs, cooked ham, camembert cheese and dry cured ham. The six products selected for this study have the advantage of reflecting the diversity of public quality labels: the Bio label (3
products), the PDO, the PGI and the Label Rouge.

**Dataset(s) used in the study**

Panel data is used for the study, collected by Secodip (Bureau of Studies on Consumption, Distribution and Advertising). This database contains information about daily food purchases by 8000 consumers during the year 2000. For each purchase the following information was collected: the price of the product purchased, the brand, the existence or absence of a public quality label, the distribution network in which the product was bought (hypermarket, supermarket, small traditional shop or hard discount store) and characteristics of each product (packaging for example). The dataset used for this study only included data on milk, yogurt, eggs, cooked ham, camembert cheese and dry cured ham.

**Methodology, or methodologies used**

In order to determine the consumers’ willingness to pay for public quality labels, for the brands (NBs or PLs) and the interaction between both, a hedonic price function is estimated for each product. The endogenous variable is the selling price per unit of product and is estimated as a function of distribution variables indicating the place of purchase, variables defining the brands (NB or PL), a label variable indicating the public quality label, cross effects of NB*label and PL*label and other specific characteristics of the product in question.

Using the price of the reference product, which is a generic product sold without a label in a hypermarket, the willingness-to-pay or the price premium is calculated for each variable (attribute).

The estimation of the hedonic price equations is repeated while taking into account the difference between leading (LNB) and secondary national brands (SLB).

**Conclusions and recommendations of the study**

The estimation results of the hedonic price equations estimated in this study show consumers’ valuation of NBs, PBs, national quality labels and combinations of them. The results indicate that when two quality signals (NB and national quality labels) coexist on the same product, their value declines. One interpretation of the use of quality label signals by retail firms is a strategy that enables them to compete successfully against national brands. Indeed, it enables PL to provide consumers with clear information about their products and thus to improve their perceived quality.

**Strengths and weaknesses of the methodology used**

Main strengths of the methodology used are the fact that results are based upon real consumer behavior, that a high number of variables are considered, reflecting the diversity of public quality labels. However, the condition of the hedonic price is somehow unrealistic, as supply must be perfectly inelastic and all consumers alike.
Exploring incentives for the adoption of food safety controls: HACCP implementation in the UK dairy sector

Spencer Henson and Georgina Holt

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Abstract

This article explores the incentives that motivate the adoption of food safety controls by businesses through a study of HACCP adoption in the UK dairy processing sector. The study identifies four key factors that have motivated the adoption of HACCP, namely, internal efficiency, commercial pressure, external requirements, and good practice. Respondents to the survey are clustered according to the relative importance of these factors in their adoption decision. Four clusters are identified and related to the characteristics of firms, including farm size and type of products manufactured. The results indicate that there are systematic differences in the HACCP adoption process between individual firms.

Position in the analytical framework

Question: What motivates producers to register to a QA or certification scheme?

Stakeholder: processors

Background and context of the study

In the United States, European Union, and many other developed countries, there are heightened concerns about the nature and efficacy of food safety controls employed in the food supply chain. In many cases these concerns reflect an increase in the recorded incidence of food-borne illness and a history of high-profile and economic demands for more effective controls. Reflecting this, economists have begun to scrutinize more closely the incentives for suppliers at different levels of the food chain to undertake protective measures.

Goals and Objectives of the study

The objective of this study is to explore the incentives that motivate the adoption of food safety controls by businesses.

Quality assurance or certification scheme addressed in the study

The quality assurance scheme addressed in this study is the HACCP program.

Scope and coverage of the study

In order to achieve the objective of this study, this paper presents a case study of HACCP adoption in the UK dairy processing sector.

Dataset(s) used in the study

A total of 1196 plants that were listed under the dairy or ice cream processing sectors in the UK Yellow Pages directory were mailed a questionnaire at the end of March 1998. In total 240 questionnaires were returned, of which 192 were fully completed.

Methodology, or methodologies used

In order to achieve the objective of this study, a survey has been conducted. Respondents were presented with a list of factors that previous studies suggest can motivate the decision to implement product quality metasystems. They were then asked to indicate how important each of these issues had been in the decision to implement HACCP in their own plant using a seven-point Likert scale from very important to unimportant.
Then, the importance scores were subjected to factor analysis. In total, four factors were identified. The first factor was associated with internal efficiency as a means to enhance business performance as a motive to implement HACCP. The second factor was associated with accreditation as a motive for the implementation of HACCP. The third factor was associated with direct external requirements, and the fourth factor was associated with good/recommended practice as a motive for the implementation.

In order to identify systematic similarities/ differences in the motivation to adopt HACCP, respondents were clustered according to their loadings on each of the four identified factors, using k-means clustering. In total, four clusters were identified: commercially driven, good-practice driven, efficiency driven and externally driven implementers.

Having identified four distinct clusters of firms according to the motivation to adopt HACCP, the characteristics of respondents were examined to identify whether certain types of firms belonged to particular clusters. The main characteristics examined were the firm size, amount of time HACCP had been operated, annual turnover, proportion of sales to food retail chains, and branding of products.

**Conclusions and recommendations of the study**

The survey results, and especially the factor analysis, indicate the factors that play an important role in the decision of firms to implement HACCP. The issues judged by respondents to have been most important in their decision to implement HACCP were the need to meet legal requirements and to meet the requirements of major customers.

The cluster analysis allowed the researchers to classify firms according to the major factors that motivated their adoption of HACCP and to relate these clusters to the characteristics of these firms. The characteristics that played a role in the motivation of firms to adopt HACCP were firm size, amount of time HACCP had been operated, annual turnover, proportion of sales to food retail chains, and branding of products.

**Strengths and weaknesses of the methodology used**

**Strengths:** Factor analysis is a widely used technique to separate survey responses into a few principal components, although it is not very clear how the cluster analysis was performed.

**Weaknesses:** The study identifies the factors that play a role in HACCP adoption in a descriptive analysis, but no explanation is offered.
Title: ISO 9000 registration’s impact on sales and profitability. A longitudinal analysis of performance before and after accreditation.

Authors: Iñaki Heras, Gavin P.M. Dick and Martí Casadesús

Publication date: 2002


Publisher: MCB UP

Number of pages: 774-791

Availability, URL: 

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Abstract

Although there is a plethora of research articles that study ISO 9000 quality management systems and their association with business success, there is little empirical research that can attribute causality to certification. Contributes to the questions of causality, through a comparison against a control group of the actual sales and profitability of 400 certified companies pre and post registration. Using a longitudinal methodology finds that, although the performance of certified companies is superior to that of 400 non-certified firms, there is no evidence of improved performance after registration in the 400 certified firms studied. Concludes, from these findings, that the superior performance of certified firms is due to firms with superior performance having a greater propensity to pursue ISO 9000 registration. Illustrates the potential dangers in inferring that ISO 9000 certification leads to superior business performance. Additionally the findings should give pause for thought for decision-makers. Certification is a major investment yet the findings show that inflated expectations of performance improvement after ISO 9000 accreditation may be unfounded.

Position in the analytical framework

Question: Do QA and certification schemes improve profitability?

Stakeholders: processors and retailers

Background and context of the study

Registrations to the ISO 9000 quality management system standard have grown rapidly in recent years with over 408,000 registrations in 158 countries at the end of 2000, a growth of 50 per cent in two years. This suggests that there is a widespread belief in the business community of the benefits of ISO 9000 registration. Although there is a plethora of research articles that study ISO 9000 quality management systems and their association with business success, there is little of this research that can attribute causality. The inference often drawn is that ISO accreditation leads to higher levels of performance, what tends to be forgotten is that the opposite direction of causality could be true, i.e. that successful firms may well have a propensity to pursue certification.

Goals and Objectives of the study

The aim of this article is to examine the question of causality with respect to ISO 9000 accreditation and firm performance, by comparing the actual sales and profitability of 400 accredited firms with their achievements prior to registration, and by comparing them with a control group of firms without certification.

Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is the ISO 9000 standards.

Scope and coverage of the study

The research presented in this paper was undertaken in the Basque Autonomous Community (Spain).

Dataset(s) used in the study

The cross sectional data for this study was gathered from the Ardán database, an Entrepreneurial Informational service of the Consortium of the Exempt Zone of Vigo. This database includes data for more than 100,000 companies, and more than 500 items of annual data for each company and year. This data is recorded from, among other sources, the outcome and balance
sheets that the companies submit to the Mercantile Register. Two samples from the Ardan database are used in this study; one random sample of 400 ISO 9000 certified companies and another random sample of 400 non-certified companies. Data was available for the years 1994 – 1998 and included sales revenues and the profitability ratio. In addition, for the certified companies, the data set included information on their last quality certification registration date. In summary, the research design consists of three samples of firms: certified, “will be certified” and non-certified for each of the five years. And two variables, sales growth and the profitability ratio of returns on total assets employed.

**Methodology, or methodologies used**

In this study, a longitudinal methodology is used. First, the average growth in sales on the previous year is calculated for the certified and non-certified firms from 1995 to 1998, and compared with each other. T-tests are used to test the validity of the differences between the certified and non-certified firms. To investigate the superior sales growth of certified firms, the mean sales growth are analysed, splitting the certified sample into two groups, those that were certified in that year and those that will be certified in a future year. T-tests are used again to check the statistical validity of the differences.

The same comparisons are made with respect to the profitability ratio of non-certified, not-yet-certified and certified firms.

In order to check whether the lack of increase in profitability of the certified firms compared to the not-yet-certified firms is due to temporal limitations, the profitability data was manipulated so that comparison of the companies pre and post initial certification data could be made. The data was transformed to fictional years prior to and after certification, and the mean figures of the pre and post registration firms were compared relative to the non-certified companies.

**Conclusions and recommendations of the study**

The cross sectional analysis method used in this study indicates a significantly better sales growth and profitability in certified companies than in the control group of non-certified ones. However, the results of the analysis on the difference between pre and post registration sales growth and profitability for the certified firms did not provide any evidence to support any causal link between ISO 9000 registration and improvements in sales growth and profitability.

**Strengths and weaknesses of the methodology used**

**Strengths**

- Uses actual firm-level data.
- Allows for both a comparison between certified and non-certified firms as well as a comparison between the profitability and sales growth before and after accreditation.

**Weaknesses**

- Comparison of performance of certified versus non-certified firms is based on a comparison of the means of the two samples. Thus, it does not take into account other variables that could explain the differences in profitability (these other factors are not controlled for).
- Suffers from potential selection bias, manifested as follows: if ISO-certified firms are found to be more profitable than non-certified firms, is it due to ISO or is it because more successful firms have a higher propensity to certify?
Abstract
The fresh fruit market is dominated by large European supermarket chains, which represent globally 70% of total retail sales. Concerning co-ordination of the product chain, both generic standards, HACCP for food safety and ISO 9000 for commercial quality management, are being adopted by supplier firms in French fresh fruit industry. This paper analyses the impact of generic standards adoption on French Producers Organisations (PO), including a diversity of producers groups, co-operatives, associations and commercial alliances.

Position in the analytical framework
Question: What type of benefits and costs accrue from QA and certification schemes?
Stakeholders: Whole chain

Background and context of the study
Firms in the fresh produce chain have progressively established coordination mechanisms for quality management in order to achieve better adaptation between consumers’ demands and producers’ capacities. These coordination mechanisms include, among others, codes of conduct, standards and certification procedures. The firms can adopt specific, product-oriented quality approaches (such as brands, product certifications and labels) or more generic, management-oriented approaches (such as ISO 9000 and HACCP).

Given the short-life period of fresh fruit, the high uncertainty of both offer and demand, and the difficulties of enforceable quality assessment along the distribution chain, specific quality approaches have shown limited applicability in the sector. This kind of specific approaches have a long tradition in French agriculture and been largely analyzed in agricultural economics literature. Generic approaches have emerged as new alternatives to firms in the food sector in general and specially in the fresh fruit industry. They have been recently adopted in French agriculture. These new experiences have been relatively less studied in agricultural economics literature.

Goals and Objectives of the study
The objective of this paper is to analyse the impact of the ISO 9000 and HACCP adoption on fruit producer organizations in Southern France.

Quality assurance or certification scheme addressed in the study
This study focuses on the ISO 9000 standard and the HACCP program.

Scope and coverage of the study
The report starts with a descriptive analysis, after which it continues with a discussion of the impacts of generic standards. To analyse the problem and gain a better understanding of the research question, the researchers applied the Transaction Cost Economics (TCE) and the Dynamic Capabilities approaches.

Dataset(s) used in the study
A general survey of organizations was conducted between April and June 2001. Data have been collected through mailing questionnaires. The selected POs (60) have apples and peaches as a dominant production. The questionnaire was completed by 33 POs, concerning production and commercial characteristics, generic standards adoption, objectives and constraints for such adoption and perceptions of the impacts. Then organizations were personally visited and direct open interviews were performed with quality managers in order to have deeper explanations about generic standards adoption, quality management and related organizational adaptations.
**Methodology, or methodologies used**

First, a descriptive analysis is performed on the characteristics of the POs in the sample: the number of workers, the turnover of the organization, market orientation, product specialization, and type of quality management system.

Then the impacts of generic standards are discussed. Five different 'fields' of impacts have been distinguished: 1) impact on the quality management system of the PO, 2) impacts on the PO's information system, 3) impact on learning processes within the PO, 4) impact on the governance structure, and 5) the long run impacts on organizational development.

**Conclusions and recommendations of the study**

The results of the survey and interview give an indication of the impacts of generic standards (such as ISO 9000 and HACCP) on French fruit POs. Although the sample consisted of heterogeneous POs with respect to size, turnover and product mix, they were homogeneous with respect to the impacts.

**Strengths and weaknesses of the methodology used**

**Strength**
Brings new material to light via a survey, and contains some interesting speculation on the reasons underlying the findings.

**Weakness**
Essentially qualitative and descriptive. Not useful for evaluating QA schemes in a rigorous way.
Position in the analytical framework

Question: Who benefits from QA and certification schemes?

Stakeholders: Consumers, whole chain

Background and context of the study

In 1995 the government-financed Bavarian beef promotion program was initiated to arrest many years of declining beef consumption. During the 4-year period from 1995 to 1998, some 2.4 million US dollars were spent annually to bolster the demand for Bavarian beef. The promotion theme was “Quality from Bavaria”. Of course, both producers and the Bavarian government are interested in assessing the economic effectiveness of their demand-expanding efforts. However, in March 1996 the British Secretary of State for Health announced a possible link between bovine spongiform encephalopathy (BSE) and a new variant of the deadly Creutzfeld-Jakob disease (nv-CJD). Reports of this food safety concern resulted in heightened consumer awareness of the potential dangers of consuming beef (Becker, 2000). Bavarian producers, wishing to distance themselves from this safety concern, continued to differentiate their product by promoting safe quality beef from Bavaria. Thus, what transpired over this period was an aggressive demand expansion effort through the “Quality from Bavaria” program concurrent with the demand contraction event of BSE.

While a rich literature exists on the evaluation of generic (non-brand) promotion programs and on food scares and food safety, no study has simultaneously examined the economics of generic promotion and BSE.

Goals and Objectives of the study

The goal of this study is to evaluate the economic impact of both the promotion scheme “quality from Bavaria” and the event of BSE individually and in aggregate.

Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is the Bavarian promotion scheme “Quality from Bavaria” which was introduced by the Bavarian government with the goal to increase the demand for Bavarian beef. This scheme was introduced in a period when the event of BSE had a negative impact on beef consumption.

Scope and coverage of the study

In order to evaluate the economic impact of both the “quality from Bavaria” scheme together with the BSE event, this study is focussed on analysing the impact of these two events on Bavarian beef demand in Germany. In addition, the welfare impact of both happenings on producers and consumers will be examined as well as the cost-benefit ratio.

Dataset(s) used in the study

Monthly data over the period 1995 to 1998 were used to empirically illustrate the model. Per capita beef consumption data, beef prices and income were obtained from a commercially available household panel, the GfK panel (GfK, 1999, 2000). The Bavarian consumer price index for food products (Baystat, 1998) was used to compute real prices. Advertising expenditures on the “Quality from Bavaria” scheme were also not publicly available but were provided by the Bavarian Ministry for Nutrition, Agriculture and Forestry. Real advertising expenditures were computed using an advertising costs index (Nielsen, 1999). The BSE information variable was collected specifically for this research. The BSE information index was calculated from the numbers of articles in the
Methodology, or methodologies used
For analysing the impact of the “quality from Bavaria” advertising and the BSE information, demand for Bavarian beef is econometrically estimated as a function of its price, price of substitutes, income, generic advertising expenditure per capita, trend, a measure of BSE information and a seasonal dummy. Pork and poultry were assumed to be possible substitutes. 

For analysing the price, quantity and welfare effects (consumer and producer surplus) of the advertising, a simultaneous market model is used, where demand is assumed to be a function of the price and advertising expenditure. As the advertising scheme was financed by the government and as the marginal costs of producers are assumed not to rise due to a mandated quality control system, the supply is expressed as a function of the price for beef only. The market is in equilibrium when total supply equals demand. From this, the expression of relative change in price and quantities is derived. With the help of these expressions, the impacts of the advertising campaign on prices, quantities, expenditures and earnings are calculated using hypothetical prices and quantities computed under the assumption of no advertising, together with the estimated price elasticity of demand and the price elasticity of supply. Based on these results, the welfare impact on consumers (CS) and producers (PS) is calculated, as well as the budgetary impact, net welfare impact, and the benefit-cost ratio.

Conclusions and recommendations of the study
The estimation results of the Bavarian beef demand equation show the extent to which both BSE information and the advertising campaign had an impact on beef consumption. Although the advertising had a positive demand effect, the negative effect of the BSE information appeared to be stronger. 

With respect to the welfare analysis, the simultaneous market model constructed in this study, was able to analyse the impacts of the advertising on the beef price, supply and demand, CS, PS and total social welfare. According to the results, the gains from the advertising for consumers and producers more than over-compensated the expenditures of the program. This was reflected in a considerably high benefit-cost ratio as well.

Strengths and weaknesses of the methodology used
A drawback of this study might be that additional marginal costs for producers from the quality control provisions are not covered. As a result, the supply curve is assumed not to change due to the advertising campaign. Relaxing this assumption might considerably change the final results with respect to the change in prices, quantities and welfare. Cost-benefit ratios are greatly affected by the choice of the method. However, model is based upon data issued from real consumer behavior.
**Title:** Consumer preferences and attitudes towards organically grown produce  
**Authors:** C.L. Huang  
**Publication date:** 1996  
**Journal:** European Review of Agricultural Economics 23(3)  
**Number of pages:** 331-342  
**Availability, URL:**  
**Contact details authors:**

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<th>Abstract</th>
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<td>A two-equation bivariate probit model was formulated to analyse simultaneously consumers’ preferences and attitudes toward organically grown produce (OGP). Results suggest that consumers who are nutritionally conscious, concerned about the use of pesticides, and wanting produce tested for freedom from residues would have a higher propensity to prefer OGP. Among the potential buyers, consumers who are white, better-educated, and have large families are more likely than others to tolerate sensory defects. The study suggests that testing and certification, sensory qualities, and competitive pricing are the most important factors that would enhance the marketing potential of OGP.</td>
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<th>Position in the analytical framework</th>
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| **Question:** What are consumers’ preferences and attitudes toward organically grown produce (OGP)?  
**Stakeholder:** Consumers |

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<th>Background and context of the study</th>
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<td>Evidence of environmental degradation and health risks associated with pesticide use have made food safety a priority issue on the public policy agenda. Kramer and van Ravenswaay (1989) suggest that pesticides and their use are contemporary public issues of paramount importance and that these issues will persist in the foreseeable future. Consumers’ risk perceptions and concerns about use of pesticide chemicals in food production will translate into market behaviour and alter demand for food products in the marketplace. Thus, producers, processors, wholesalers/retailers, and government regulators and policy-makers will have to respond to consumers’ risk preferences, concerns about environmental quality and demand for safe foods (Kramer, 1990). To alleviate consumers’ pesticide fears, some retailers have initiated their own residue-monitoring programmes and are advertising their fresh produce as being specifically tested for chemical residues. Others are promoting the sale of organic foods. Jolly et al. (1989) found that about 25 per cent of the respondents indicated that they would look for organically produced foods when they shop, and 30 per cent indicated that they planned to buy foods produced organically in the next month. However, the marketplace experience of the post-Alar controversy tends to indicate that most consumers do not seem willing to pay a price premium for organically grown food, or to accept greater cosmetic damage.</td>
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<th>Goals and Objectives of the study</th>
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<td>The objective of this study is to assess consumer preference for OGP and to determine important socio-demographic characteristics, if any, that may affect their willingness to purchase OGP if it has sensory defects.</td>
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<th>Quality assurance or certification scheme addressed in the study</th>
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<td>The study focuses on analysing the factors that explain consumers’ demand for pesticide free products.</td>
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<th>Scope and coverage of the study</th>
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<td>This paper reports the results of a survey questionnaire which was designed to assess consumers’ risk perceptions towards food quality and safety with respect to the use of chemicals on fresh products.</td>
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<th>Dataset(s) used in the study</th>
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<td>The data were collected from a mail survey of Georgia residents in 1989. A random sample of 580 households stratified by income class was selected to participate in the survey. The survey resulted in 580 completed surveys.</td>
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in a total of 389 returned questionnaires, a response rate of 67 per cent. The final sample used for the analysis consists of 381 observations with complete information. In general, older, better-educated, and high-income households were slightly over-represented in comparison to census statistics. The majority of respondents was the primary food shopper in the household (89 per cent), white (77 per cent), female (69 per cent), and city resident (54 per cent).

**Methodology, or methodologies used**

For the purpose of this study, a bivariate probit model that exhibits a form of partial observability (censored probit) discussed by Meng and Schmidt (1985) is formulated to analyse consumers' preferences for OGP and to estimate the probabilities that they would accept some sensory defects in exchange for perceived food safety and environmental benefits. Given that the sample on acceptance of sensory defects was censored, the joint maximum likelihood estimation that accounts for sample selectivity bias was used to analyse the survey data collected for this study. The survey questionnaire was designed to assess consumers’ risk perceptions towards food quality and safety with respect to the use of chemicals on fresh produce. Respondents were questioned about their food concerns, and the importance of product attributes that affect their purchase decisions, as well as their preferences for OGP. In particular, respondents were first asked if they would prefer to buy fresh produce that is grown without using chemical pesticides or fertilisers. If the response was positive, a follow-up question was asked to determine whether the respondent would buy OGP that had sensory defects such as insect holes, blemishes, and soft spots.

**Conclusions and recommendations of the study**

While there is no evidence to suggest that OGP is perceived to be of inferior cosmetic quality, the study clearly indicates that consumers are no more tolerant of poor appearance quality for OGP than for conventional produce and the majority of potential consumers were not willing to buy OGP if it has sensory defects.

Results suggest that the profile of potential OGP buyers are: consumers who are concerned about the use of chemical pesticides on fresh produce; who demand that produce should be tested and certified residue-free; and who are nutritionally conscious. Among those who would prefer to buy OGP, the results suggest that consumers who are white, better-educated, and have large families are more likely than others to tolerate potential sensory defects. However, high-income households are less willing than low-income households to accept sensory defects on OGP.

**Strengths and weaknesses of the methodology used**

The main weakness comes from the fact that the study is based on information collected from purchase intention instead of actual or observed market behaviour. Thus, caution should be exercised in the interpretation of the results, because there is no assurance that stated preferences would always translate into market behaviour.

A rare strength comes from theoretical background, as a distinction is made conceptually between preferences and attitudes. Thus, it is assumed that consumers formulate their attitudes from available information, knowledge, experiences, and given environmental factors, which may include personal characteristics and social and cultural background. In contrast, it is hypothesised that consumer socio-demographic characteristics have little influence on their preference for OGP, which is affected primarily by an individual's beliefs, perceptions, and experiences about the object.
Title: Who benefits from quality labelling? Segregations costs, international trade and producer outcomes.
Authors: Lee Ann Jackson
Publication date: November 2002
Journal: Discussion paper 0231, Centre for International Economic Studies and School of Economics, University of Adelaide, Australia
Publisher:
Number of pages: 
Contact details authors: leeann.jackson@wto.org

Abstract
This paper analyses the impact of quality based labelling on product prices, factor allocation and the resulting effects on producers within the context of an international trading system. A general equilibrium model, calibrated to 1998 data, describes United States and European Union labelling regimes for genetically modified agricultural products. The results indicate that the labelling choice of trade partners have large distributive impacts within national economies, as well as across countries and highlight the importance of using general equilibrium framework to understand the system wide impacts of segregation and quality labelling.

Position in the analytical framework

Question: Who benefits from QA and certification schemes?
Stakeholder: Whole chain, Consumers, non-agrifood stakeholders, stakeholders in other countries

Background and context of the study
Labelling regulations have been proposed as potential solutions to many international environmental policy conflicts. Advocates of labelling argue that consumers have the right to know about the environmental quality impacts of their consumption choices even when these impacts occur outside the borders of their domestic home. Armed with this information consumers can consider environmental consequences of their consumption choices, and thus a market for differentiated goods may develop in which higher quality goods (for example, environmentally friendly or GM-free) are sold at higher prices than low quality goods. These price premiums will depend upon a variety of economic conditions including consumer perception of the value of quality characteristics, who bears the costs of segregating products, and, for goods traded on the international market, whether trading partners have also adopted labelling regulations. Furthermore, the relative prices and price premiums determine which producers capture the benefits from price differentials and which producers suffer from decreases in final good prices or increases in intermediate good prices. The effects of segregation are felt broadly through the economy regardless of which sector pays for the segregation initially.

A diverse literature has arisen relating to the effects of labelling regimes on prices. In most cases, however, the research has ignored the general equilibrium economic impacts of resource re-allocation generated by labelling requirements and thus does not explore the distributive consequences of these policies.

Goals and Objectives of the study
The goal of this paper is to analyse the impact of quality based labelling on product prices, factor allocation and the resulting effects on producers with the context of an international trading system. This paper will examine how regulatory frameworks and costs associated with segregation interact to influence relative prices.

Quality assurance or certification scheme addressed in the study
This study focuses on the impact of mandated GM labelling policies.

Scope and coverage of the study
The analysis is focused on a trade relation between the EU and US; two markets that differ dramatically in attitudes towards and production of GM products. The study involves both a theoretical and empirical analysis.

Dataset(s) used in the study
The general equilibrium model constructed in this paper is calibrated to 1998 US, EU and World

Production elasticities are assumed to be the same within both countries. Demand elasticities are the same across physical products but differ in relation to quality preferences (GM or non-GM). As no data was available on quality preferences, this parameter is synthesized and sensitivity analyses are conducted to ensure a reasonable parameter.

Methodology, or methodologies used

The general equilibrium model constructed in this paper describes an economy with labelling and an economy without labelling. It is assumed that producers need additional labour when labelling is introduced. At the same time, labelling will induce segregation costs for the primary agricultural producers, which will be transferred to the agricultural marketers by an increase in intermediate prices.

The model considers 7 sectors (1 industry sector, 3 primary agricultural production sectors and 3 marketed agricultural production sectors). The three primary and marketed agricultural sectors represent traditional production, GM production (low-quality) and all non-GM production (high-quality). Each sector makes use of a specific fixed factor and uses labour. The fixed factors are assumed to be exogenous determined, whereas labour is endogenously distributed between the sectors. Sectoral value-added functions are used to define the returns to fixed factors, which is used as a proxy for the rents accrued to each sector. These returns are functions of the (intermediate) product prices and wages.

Consumers’ utility is assumed to be a function of the vector of demand for final goods and quality. In order to reflect the consumer preferences in the EU for non-GM products, their utility is assumed to increase with increased quality. US consumers are assumed to place no value on the quality characteristic. (Again, GM crops are referred to as low quality and non-GM as high quality products). The model is in equilibrium when total demand equals total supply.

In the scenario analysis, three types of equilibriums are analysed: neither US nor EU labelling, both US and EU labelling, only EU or US labelling. Each equilibrium results in different prices, labour wages and returns to fixed factors for each of the seven sectors. In this model, it is the segregation costs and cost parameters that influence all final and intermediate good prices and wages in each equilibrium.

As explained above, this general equilibrium model is calibrated to 1998 in order to perform the scenario analyses, assuming different segregation costs and different US and EU labelling policies.

Conclusions and recommendations of the study

In particular, this model illustrates the importance of the labelling decisions of trading partners and the structure of segregation costs on the impact of GM labelling on the price premiums, wages and returns of the different sectors (both GM and non-GM) within a particular country. Increasing segregation costs resulted to have different impacts on prices, wages and returns of EU and US producers. In addition, the fact whether the EU and/or US are/is labelling also has different impacts on the prices, wages and returns of EU and US producers.

Strengths and weaknesses of the methodology used

Rather than using a partial equilibrium model as a basis for comparative statics analysis, the author actually uses a general equilibrium model and then studies the comparative statics at the equilibrium. Even if the modelling framework is different (partial versus general equilibrium), the general philosophy is identical. In the way it is done, the same general strengths and weaknesses (as EDM) exist. However, in addition, it seems that using a general equilibrium framework makes the task more difficult without gaining a lot of advantages.

Strengths

- Relatively easy to parameterise (e.g. elasticities assumed or culled from the literature)
- Stylised form that is easy for policy makers to understand.
- Relatively easy to consider multiple stages in the supply chain as well as to consider
multiple markets, that is to deal with the substitution among markets.

- Possibility of evaluating the impact of QA on non participant producers.

**Weaknesses**

- Only marginal changes can be handled accurately, unless the underlying functions are Cobb Douglas functions (whose elasticities are by definition constant).
- Difficult to deal with the creation of a new market resulting from the adoption of the QA or certification scheme. This difficulty arises when the QA changes the number of goods that are available on the markets.
- The method compares one equilibrium (‘with’) to another (‘without’), with no idea of how long it takes to reach a new equilibrium. That is, it is completely static.
Abstract

There has been a growing interest in recent years in the potential use of product differentiation in seafood products (mainly through eco-type labelling), as a means of promoting and rewarding the sustainable management and exploitation of fish stocks. The potential encapsulated by product differentiation has, however, yet to be tested in the market place within many countries, including the UK. This paper draws on a study exploring the nature and extent of the response of UK consumers to the introduction of labelled seafood products and explores the potential of product differentiation to promote sustainable fisheries. From the results presented in this paper, the scale of the effect has been shown to be greater for sustainability and quality forms of product differentiation than the effect generated by any of the other potential labels. The origin and mode of production also generated sizeable and significant effects. These results suggest that moves underway to implement certification schemes can be justified in support of sustainable fisheries management. The important policy implication is that improvement in the supply-side management of fisheries will be needed to facilitate more widespread adaptation of certification schemes. Nonetheless, the opportunities for higher premiums and greater market share due to certification will provide additional incentives for the required management improvements.

Position in the analytical framework

Question: How effective are quality labels in influencing consumer perceptions/behaviour?
What are consumers’ preferences towards alternative labelling strategies?
Stakeholder: consumers

Background and context of the study

Fisheries management traditionally focuses on supply-side measures, and thus these measures are popular policy instruments in promoting responsible and sustainable fisheries management. Over the last few years, there has also been a growing recognition that traditional techniques aimed at controlling either inputs or catches may not be sufficient on their own to address adequately many challenges facing fisheries management, particularly over-exploitation. This recognition has spurred interest in the potential of fish product labelling as a means of generating market-driven incentives in support of fisheries management objectives. Traditionally, there has been little differentiation in seafood products. For example, consumers have been largely unable to exercise choice as to the location, the state of the fishery whence their seafood originated, or how it was caught. By introducing ‘eco-type’ labelling, the intention is to facilitate this consumer choice, and by employing an environmental vector in the consumers’ demand function, provide an incentive and reward structure for fisheries adopting ‘sustainable’, ‘responsible’ or ‘ecologically’ sound management practices.

Goals and Objectives of the study

The objective of this study is to analyse the influence of sustainability and quality certification and labelling for consumer choice towards seafood products.

Quality assurance or certification scheme addressed in the study

In the choice experiment conducted in this study, consumers where confronted with two types of certification: seafood certified as of high quality and seafood certified as coming from a sustainable managed fishery.

Scope and coverage of the study

In order to achieve the objective of this study, interviews, including a choice experiment, have been carried out. This paper focuses on presenting the results of the choice experiment.

Dataset(s) used in the study

600 in-home interviews were carried out in the UK in 2001. The sample represents 0.002% of the UK population. Both fish and non-fish consumers were included to elicit any switching behaviour into fish products in response to the introduction of labelling. The sample was then
stratified in accordance with the regional distribution of households within the country, and then by age of respondent, existence or otherwise of dependent children, and social class within each region.

There were five sections to the questionnaire. Section one of the questionnaire addressed the respondent’s general food purchases and the major factors that affected their existing choice of food products. Section two moved on to questions concerning the respondent's fish and fish product purchases. It elicited the major factors that affected the respondent’s choice of seafood products, where they usually bought their seafood products and which, if any, of the fish products targeted by the survey they currently purchased (frequency, quantity and total expenditure). Section three was specific to choice experiment methodology. This section set up the hypothetical market, in which the consumers were asked to choose between different products. These products differed on several attributes, such as product form, certification, certifier, origin, production method, product specific price and brand. Section four concerned general purchase choices. The final section pertained to the respondents’ socio-economic and demographic variables for use in the analysis.

Within the third section, the choice experiment, the initial design has seven attributes and each attribute had at least two levels. This generated 1728 combinations of the levels of product attributes. However, the block design was adopted in order to reduce the number of combinations. Finally, 8 choice sets of 4 choice alternatives were created. These choice alternatives in the generated choice sets were transferred on to 8 cue cards, with each respondent being presented with 5 choices.

**Methodology, or methodologies used**

Using the data gathered from the interviews and the choice experiment, a conditional logit model is estimated. This model models the probability of consumers’ choosing a particular product as a function of the levels of its attributes. The estimated coefficients of the levels are called the marginal utilities of each attribute level. The conditional logit model is estimated with two specifications: one with and one without individual specific covariates. The results of both specifications were not very different, implying that this model is robust to the inclusion of individual specific covariates.

Additionally, the marginal effects of several labelling strategies for different product forms were analysed. These marginal effects are computed as the difference in the estimated probabilities with the binary variable equal to one and zero.

**Conclusions and recommendations of the study**

The estimation results of the conditional logit model based on the choice experiment allow for an analysis of the impact of different product attributes, such as types of certification, price, origin or production method, on consumers’ purchase decisions.

**Strengths and weaknesses of the methodology used**

A strength of using choice experiments is their ability to disaggregate the effect on choice of the component attributes of a product and their various levels. By including the targeted attributes within an overall product description, the consumers also face a more realistic purchase scenario and with price being an attribute rather than a measure of preference (as in most forms of contingent valuation). This advantage is compounded by the use of a choice-based elicitation method, which further mimics the purchase scenario. Furthermore, multi-attribute tasks might place a cognitive burden upon interviewees, without forgetting that results are based upon respondents declarations.
**Title:** Modelling farm level economic potential for conversion to organic farming  
**Authors:** Eva Kerselaers, Wim Govaerts, Ludwig Lauwers, Lieve de Cock, Guido van Huylenbroeck  
**Publication date:** August 24-27 2005  
**Journal:** Paper presented for presentation at the XIth EAAE congress, Copenhagen, Denmark  
**Publisher:**  
**Number of pages:**  
**Contact details authors:** eva.kerselaers@ewbl.vlaanderen.be, wim.govaerts@bioconsult.be, ludwig.lauwers@ewbl.vlaanderen.be, lieve.decock@ewbl.vlaanderen.be, Guido.VanHuylenbroeck@UGent.be

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**Abstract**  
A farm model is developed for simulating the potential income change resulting from conversion to organic farming. The model uses conventional farm data, taken from the Belgian FADN. Given the normative character of the model, and the impossibility of calibration to historical conversion behaviour, two model variants, a rigid and a flexible, are created to broaden the analysis scope. Moreover, extra attention is paid to the verification process and sensitivity analysis. Results reveal that the economic potential for conversion is rather high, if farmers are willing to change their farm management sufficiently. Furthermore, conversion potential depends on the farm type and conventional farm characteristics. The model finally proves to be an interesting tool to analyse policy impact.

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**Position in the analytical framework**  
**Question:** Do QA and certification schemes improve profitability  
**Stakeholders:** Primary producers

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**Background and context of the study**  
Various studies try to reveal the underlying factors determining the choice between conventional and organic farming and to explain the evolution of the growth of the organic sector. In particular, the factors influencing the current stagnating conversion rate can be classified in social and psychological barriers, market structure, farm economics and the need for further technical development and training. This paper concentrates on the role of economic factors, as the lack of insight in the economic potential for conversion of individual farms may be a dominant cause of the low conversion rate. As long as the farmer estimates the conversion process as a profit decreasing event, his willingness to convert will be extremely low. Indeed, surveys among conventional farmers reveal the persisting opinion assuming that the extra constraints associated with organic farming inevitably lead to income losses. On the other hand, insight in the economic performance of organic farming is important for policy makers to allow them to tune their set of incentives to the potentials of individual farms.

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**Goals and Objectives of the study**  
The aim of this paper is to present a model able to measure the economic potential for conversion, to highlight the variation in results between farms and to explain some underlying structural factors.

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**Quality assurance or certification scheme addressed in the study**  
In this study, the conversion from conventional farming to organic farming is addressed.

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**Scope and coverage of the study**  
In this study, the difference in labour income before and after the conversion is assumed to be an indicator of the economic potential for conversion. If the labour income increases after the conversion, the farm is assumed to have a positive economic potential. Otherwise, the farm has a low potential for conversion.

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**Dataset(s) used in the study**  
The data set used in this study is based on a sample of 690 conventional farms, taken from the Belgian FADN from 1999 to 2001. The sample only includes arable farms, dairy farms and suckler cow farms. Conventional and organic data on prices and costs are derived from the Belgian FADN,

**Methodology, or methodologies used**

The economic potential of conversion is estimated, using mathematical programming, as the difference in labour income between the initial state of the conventional farm and the simulated converted state. As the original fixed costs are assumed to remain constant and as the liquidation value of equipment specific for conventional agriculture is supposed to be zero, the difference in the labour income predominantly rely on gross margin differences. The gross margin is calculated as the financial output minus the variable costs and in this case excluding fodder costs and cattle premium. Several constraints are included in the analysis, e.g. with respect to the more tight rotation scheme for organic farmers, policy restrictions (such as quotas), nutrient flow, demand for energy and proteins for cattle breeding, labour requirements, investments in weeding machines.

As well as comparing the labour income before and after the conversion, in this study a second indicator is introduced for measuring farm’s economic potential for conversion. This indicator compares the conventional income with the mean income in the first five years after the conversion. By doing so, the transition period between both equilibriums is accounted for.

In order to compare the potential of individual farms within the same farm type (arable, dairy or suckler cow), the farms are divided in three groups according to their potential (low, medium and high). These groups are compared with respect to the main value of certain characteristics (e.g. utilized agricultural area, livestock density, stocking density of dairy cows, milk yield per cow, ratio of replacement stock.

In order to gain insight in the impact of the assumptions made in the analysis, a scenario and impact analysis are done. Two scenarios are worked out; a pessimistic one and an optimistic one with respect to prices and costs. Additionally, the impact of adding premiums is analysed.

**Conclusions and recommendations of the study**

The estimation results of the model demonstrate that the mean economic potential for conversion to organic is rather high, but strongly dependent on the farm type (dairy, arable or suckler cow). However, within each farm type the economic potential appears to be very heterogeneous. The comparison between the different groups (low, medium and high potential) within each farm type with respect to the mean values for a certain characteristic indicates whether a particular characteristic plays a role in determining the farm’s economic potential. Finally, the scenario and impact analysis enable the examination of different policies.

**Strengths and weaknesses of the methodology used**

**Strengths**
- Evaluates the potential of conversion. As such it is an ex ante work to evaluate new technologies.
- Linear Programming to simulate farmers’ incentives to convert their farming systems allows the comparison of two situations that cannot be observed simultaneously on the same farm.
- Numerous cases and types of farms can be analysed.

**Weaknesses**
- It is difficult to reproduce the observed situation (the use of conventional practices) with an LP model unless the modeller introduces a lot of exogenous constraints.
- It is difficult to evaluate what are the required inputs and anticipated outputs of the non conventional practice in each case. That is, how to adapt the average information about the new technology to each specific case. In particular, it is difficult to deal with the heterogeneity of performance of the different farms. In other words, will a farm with yields 20% lower than the average yields of the area experience a yield with the new technology that is equal to the average yield or to 80% of the average yield? Choosing one of the two options will certainly have strong implications for the results.
- Difficult to deal with specific constraints that could exist on the different farms.
- Results of the study (by type of farm) could be influenced by systematic over-estimation (under-estimation) of yields (or costs) of a particular activity.
- Difficult to test the robustness of the results.
- Does not deal with the transition phase.
- Does not explain why farms that exhibit high potential for conversion (meaning that the calculation shows an a priori economic interest in the conversion) do not convert in reality. Is it due to over-estimates of the incentives or are there other reasons?
Title: Preferences and willingness to pay for GM labelling policies  
Authors: Maria L. Loureiro and Susan Hine  
Publication date: 2004  
Journal: Food Policy 29  
Publisher: Elsevier Ltd  
Number of pages: 467-483  
Availability, URL: 
Contact details authors: mloureir@eco.uc3m.es, susan.hine@colostate.edu

<table>
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<th>Abstract</th>
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<td>The use of genetically modified organisms in agriculture is currently the focus of intense public and political debate. Press articles provide evidence that US consumer concerns toward biotechnology are increasing. In this paper, we analyze whether consumers prefer mandatory or voluntary labelling schemes through contingent valuation. Additionally, we calculate the premium that consumers are willing to pay in order to subsidize their favourite labelling alternative. We find that the premium associated with mandatory labelling is lower than expected costs. This indicates that in spite of the concerns surrounding biotechnology, consumers remain fairly confident with the current Food and Drug Administration policy, which does not require mandatory labelling.</td>
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<th>Position in the analytical framework</th>
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| Question: 1. Does the kind of labelling influence consumers’ perceptions of quality or behaviour?  
2. What is consumers’ willingness to pay for ‘quality’?  
Stakeholders: Consumers |

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<th>Background and context of the study</th>
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| The use of genetically modified organisms (GMOs) in agriculture is currently the focus of intense public and political debate. As a consequence, the labelling of GMO products has become a major issue. In the United States, the Food and Drug Administration (FDA) considers GMO food products to be substantially equivalent to traditional (non-GMO) foods and has decided that a special label is not needed in most cases. Rather, the FDAs existing labelling policy permits manufacturers to label non-GM foods with voluntary statements about the production process that are truthful and not misleading in order to provide consumers with important information. Most of the US trading partners, however (including Japan, Europe, New Zealand, and Australia) follow a mandatory labelling system – much of it consumer driven.  
Since US consumers are, in fact, exhibiting greater concerns about GMO products, it also follows that they might be interested in mandatory labelling policies such as those existing in other countries. |

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<th>Goals and Objectives of the study</th>
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<td>This study attempts to answer the question whether US consumers are interested in mandatory labelling policies and to determine if US consumers would be willing to pay a premium to support a mandatory or voluntary labelling policy? Therefore, this paper has two objectives: (a) to determine US consumers’ attitudes about labelling policies and (b) to quantify the amount that consumers are willing to pay for different labelling schemes (mandatory and voluntary labelling).</td>
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<th>Quality assurance or certification scheme addressed in the study</th>
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<td>This paper is focussed on GM labelling policies (either voluntary or mandatory).</td>
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<th>Scope and coverage of the study</th>
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<td>The paper starts with a literature review after which it presents the empirical results of a contingent valuation survey carried out amongst US consumers during the summer of 2001 and spring 2002.</td>
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<tr>
<th>Dataset(s) used in the study</th>
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<td>Data were gathered from a contingent valuation survey conducted during the summer 2001 and spring 2002 in three major metropolitan cities of Colorado: Denver, Fort Collins, and Greeley. These locations were chosen because of their proximity to Denver. Denver is a city with a socia-</td>
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demographic profile very similar to that of the US Census. The surveys were conducted with shoppers in these three locations. In addition data was gathered using face-to-face surveys.

In the survey, respondents were asked different questions regarding their attitudes and knowledge about GMO products, their preferences for mandatory versus voluntary labelling policies, and their willingness to pay for their preferred policy. Socio-demographic characteristics of the sample were collected. In total, 334 completed surveys were collected.

**Methodology, or methodologies used**

In this study, the consumer’s decision process is modelled using a random utility framework. It is assumed that the consumer’s utility is a function of whether the product has a label, other product attributes and consumer demographics, and the income level. It is assumed that the consumer is willing to pay a particular amount \( c \) to switch to a GMO-labelled product, which will make his/her utility as least as great as it would be without a label. From this, \( c \) (willingness to pay (WTP)) is expressed as the difference between the utility derived from buying the non-labelled product and the labelled product. This theoretical model lays the groundwork for the empirical model.

In order to calculate WTP estimates for mandatory and voluntary labelling schemes, a single bounded dichotomous choice model for each of the sub-samples of respondents selecting each of the labelling schemes, is estimated. So first, consumers were asked about their preferred labelling scheme at no cost to them. Then they were asked whether they would be willing to pay a given bid amount (yes or no). Then, using maximum likelihood, the WTP is estimated as a function of the ultimate bid amount each consumer faced, a vector of observable characteristics of the individual and a random variable accounting for unobservable characteristics. The observable characteristics were represented by the following variables: gender, having children, age, education, income, whether the individual was familiar with GM foods prior to the survey, and whether the respondent would not mind buying GM foods.

As well as estimating a log-likelihood function, an alternative non-parametric Turnbull estimation has been carried out. This estimation provides further evidence of the magnitude of the premiums that consumers are willing to pay for GM labelling.

**Conclusions and recommendations of the study**

The estimation results of the log-likelihood estimation of the dichotomous choice model indicate what factors significantly affect the WTP for the mandatory and voluntary labelling programs. The results of the Turnbull estimation provide an estimate of the amount consumers is willing to pay more for the mandatory and voluntary program.

However, the researchers encourage further studies that employ broader consumer samples and other viewpoints about GM food policy regulation. This would allow for comparative reactions to GM foods and certification schemes.

**Strengths and weaknesses of the methodology used**

In contrast to maximum likelihood estimation techniques, which assume a closed form distribution for the latent willingness to pay variable, an alternative approach is to assume that not enough information is available to specify the underlying distribution, in which case distribution-free estimators can be used. Several distribution-free estimators for binary choice data are available. The Turnbull model is a non-parametric estimation that suits grouping, censoring and/or truncated data (Turnbull, 1976). An interesting feature of the Turnbull model is its easy computability. The direct analysis of survey responses allows the computation of the probabilities that a given respondent would say no to a particular bid amount. These probabilities are then employed for the calculation of the WTP estimates. However, WTP calculation is based upon stated and not observed consumers’ behavior. Another weakness is that face-to-face surveys may be affected by interviewer’s bias.
**Background and context of the study**

In recent years, the increasing number of informed and affluent consumers has led to elevated demand for high quality food products. This escalating demand for high quality and high status products and a desire for cultural identification have created a growing market for value-added products that carry a strong identification with a particular geographical region. The recent food safety scares in Europe have added to the demand for origin-specific foods. This trend in consumers’ preferences has led the European Union (EU) to introduce protected designations of origin (PDO), protected geographical identification (PGI) labels and certificates of specific character (CSC). These regulations protect traditional products from imposter products in domestic and international trade. Another rationale for these regulations is to promote traditional European products and ensure the survival of the traditional way of life.

**Goals and Objectives of the study**

The goal of this study is to study the effect of PGI labels and quality perception on the purchase of fresh meat in Spain.

**Quality assurance or certification scheme addressed in the study**

The quality assurance scheme addressed in this study is the PGI label Galician Veal (Ternera Gellega).

**Scope and coverage of the study**

In this study, in order to assess consumer response to PGI labels, the price of fresh meat is analysed as a function of several characteristics, amongst which the consumer’s perception of the level of quality and a dummy indicating the presence the PGI label Galician Veal. Although all for-observation-selected households are from the Province of A Coruna, the results are assumed to represent total Spanish population.

**Dataset(s) used in the study**

A data set of 962 observations was collected from 157 families who reported their consumption and attributes toward meat during five weeks, from March 31 to June 1, 1997, to researchers from the Department of Economics, Universidade de A Coruna, Spain. The selection criteria that were used follow the Spanish Ministry of Agriculture, Fisheries, and Food’s Guidelines for Cross-sectional Panel Studies, which are to obtain a sample that approximately represents the population as measured by the Census. All selected households were from the Province of A Coruna.

The data contains consumer behaviour information, intrinsic quality cues of the meat, consumer perception information, and socioeconomic characteristics. The consumer behavioural information includes type of meat (cut) purchased, purchase date, price, quantity, type of establishment where the meat was purchased (large wholesaler, supermarket, butcher, market, and others), and whether the product was featured in a sale advertisement. The variables that describe the intrinsic quality cues of the meat include perceived quality, amount of fat, freshness, colour, and presentation of the meat, and presence of the PGI label. The quality indicators were represented by consumers’ perceptions at the point of purchase (which may differ from scientific assessments). The intrinsic characteristics of the meat were represented by four categorical dummy variables representing an ordinal measure for each particular meat characteristic (for example, very low fat, low fat, average fat, and high fat).

**Methodology, or methodologies used**
In this study, the hedonic price technique is used to determine how much the consumer is willing to pay for a PGI label. Following the standard hedonic price model, the price of fresh meat is assumed to be a hedonic function of several product characteristics. The hedonic price of an additional unit of a particular characteristic is determined as the partial derivative of the hedonic price function with respect to that particular attribute. The marginal willingness to pay for a change in a meat attribute is equal to the coefficient of the characteristics.

Using the data set as described above, the price of fresh meat is estimated as a linear function of perceived quality, a dummy indicating the presence of a PGI label, a supermarket label, a dummy for sale, colour, fat, and the type of meat cut (each having a different quality level). In addition, the same equation is estimated again adding several interaction variables. These variables are the product of the label dummy and the type of meat cut.

**Conclusions and recommendations of the study**

The hedonic model used in this study explains the extend to which consumer perception variables (quality), quality signal variables (supermarket dummy and the existence of a label), standard intrinsic quality variables (fat and colour) and other intrinsic and extrinsic variables have an impact on the price of fresh meat. In addition, the results with respect to the interaction variables show to what extend the quality of the cuts influences the willingness to pay for labelled products. These results not only explain the consumer behaviour with respect to their willingness to pay for several product attributes. It might have important implications for firms that use or plan to use PGI labels as well. Because according to the results of the interaction variables, the question whether the use of PGI labelling is efficient or not, depends on the quality level of their meat cuts.

**Strengths and weaknesses of the methodology used**

According to Berndt (1991), hedonic prices can only be interpreted as reflecting consumers’ valuation in some special cases. More precisely, if the supply of characteristics is fixed, i.e. if supply is perfectly inelastic, and if all consumers are alike, then the hedonic prices reflect valuations of the representative consumer. However, it does not allow for heterogeneity in consumers. This might be a weakness of the hedonic price technique, considering the condition of the hedonic price are somehow unrealistic. Furthermore, only one region has been tested, which is meant to represent the whole country. A strength of the method is that it is based upon real consumer behavior and that a high number of variables are considered.
Title: Modelling the effects of country of origin labelling on meat producers and consumers

Authors: Jayson L. Lusk and John D. Anderson

Publication date: 2003

Journal: Staff paper nr. 03-07, Dept. of Agricultural Economics, Perdue University

Publisher:

Number of pages:

Availability, URL: http://www.agecon.purdue.edu/staff/lusk/COOL%20Staff%20paper%2003-07.pdf

Contact details authors: jlusk@purdue.edu, Anderson@agecon.msstate.edu

Abstract

Although several studies have estimated the costs of implementing and maintaining country of origin labeling (COOL), no previous study has documented how increased costs imposed by COOL will be distributed throughout the livestock sector and how producer and consumer welfare will ultimately be affected. This paper develops an equilibrium displacement model of the farm, wholesale, and retail markets for beef, pork, and poultry that is able to document how producers and consumers will be affected by added costs of COOL. In addition the model is able to determine the level of increased consumer demand needed to make producers welfare neutral to the policy. Empirical results indicate that as COOL costs are shifted from the producer to the processor and retailer, producers are made increasingly better off while consumers are made increasingly worse off. Empirical model results also indicate that an increase in aggregate consumer demand (willingness-to-pay) on the magnitude of 2% to 3% is likely sufficient to offset lost producer welfare due to increased costs imposed by COOL.

Position in the analytical framework

Question: What are the welfare benefits from QA and certification schemes? How are they distributed?

Stakeholders: Primary producers, processors, retailers, consumers

Background and context of the study

The 2002 Farm Security and Rural Investment Act (FSRIA) includes a provision that will require meat, fruits and vegetables, and peanuts to be labelled as to their country of origin. For the first two years of the program, labelling will be voluntary; however, beginning on September 30, 2004, country of origin labelling (COOL) will be mandatory, except for poultry meat.

A number of individuals and organizations have put forth estimates of the cost of COOL implementation, focusing primarily on the beef and/or pork sectors. These estimates vary widely depending on the assumptions underlying the analysis. Given that USDA has not decided exactly how to implement mandatory COOL, it is impossible to know whose assumptions are accurate. Perhaps a more significant problem with existing COOL cost estimates is the fact that none provide any real insight into the impact COOL will have on meat prices and production or ultimately on producer and consumer welfare. Further, no previous study has rigorously assessed how anticipated costs or potential benefits of COOL will be distributed amongst producers and consumers.

Goals and Objectives of the study

The purpose of this research is to determine how COOL will affect the welfare of participants in the livestock sector.

Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is the US Country-of-Origin-Labelling (COOL) legislation. Currently (2004), this certification scheme is mandatory for most products, except for poultry products.

Scope and coverage of the study

In order to determine the impacts of COOL on the welfare of the participants of the livestock sector, this study focuses on the impact of the estimated COOL costs on producer and consumer surplus. Special attention is paid to the question whether the costs are borne by producers or processors and retailers. In addition, this research investigates how much consumer demand would have to increase to offset COOL costs, whether they are borne by producer or processor.

In doing so, both the vertical structure of the livestock industry from producer to processor to
consumer as well as the horizontal relationship between beef, pork, and poultry sectors in accounted for.

**Dataset(s) used in the study**
In order to perform scenario analysis with the EDM constructed, values are assigned to the model’s parameters and the COOL and marketing costs. The model’s parameters are obtained from various sources; Brester and Schroeder (1995), USDA/ERS average value from years 1998-2002, Wohlgenant (1989), Wohlgenant (1993) and USDA/NASS average value from years 2001-2002. For the cost estimates, two sources are used: VanSickle et al. (2003) and Sparks Companies inc. (2003), for respectively the lower and upper-bound costs.

**Methodology, or methodologies used**
To determine the effects of COOL on meat producers and consumers, an equilibrium displacement model (EDM) is used, which is comprised of horizontally linked beef, pork and poultry demands at the retail level as well as the vertical linkage of farm, wholesale, and retail sectors. The elasticity of substitution between farm and marketing inputs is incorporated in order to allow for variable input proportions.

A structural model of supply, demand and mark-up relationships in the beef, pork and poultry industries for both the farmers and retailers provides the framework for the equilibrium displacement model. The endogenous variables are the % changes in prices and quantities supplied and demanded of each type of meat at each market level. Changes in consumer demand and COOL and marketing costs are assumed to be exogenously determining the changes in prices and quantities of each sector at each level. Once parameter values have been assigned, the system of equations is solved using matrix algebra.

Based on the changes in the endogenous variables, the PS is calculated as a function of the change in price and quantity and the COOL costs.

Next to this three-good EDM, a simpler model is considered which only analyses one meat sector. Although substitutability between meats at the retail level is not allowed for, this model has an advantage in that it can be used to calculate changes in producer and consumer surplus and that it allows for analysing how much consumer demand would have to increase to offset any producer surplus losses that would be incurred from an increase in COOL or marketing costs. Different scenarios are analysed, (i) where all the costs are borne by the producers and (ii) the costs are born by the retailer. Given the solutions of the endogenous price and quantity change, the change in consumer surplus is calculated as a function of these two changes and the demand elasticity.

Finally, the initial EDM is extended with the inclusion of trade. Imports of beef and pork are incorporated in the model. This implies that the model is extended with additional supply, demand and mark-up equations for foreign meat.

**Conclusions and recommendations of the study**
The simple one-sector model is able to examine the effect of different levels of COOL costs on producer and consumer surplus. In addition, this model succeeds in investigating different possibilities with respect to the incidence of costs increases. The results indicate that as COOL costs are shifted from the producer to the processor and retailer, producers are made increasingly better off while consumers are made increasingly worse off. Furthermore, this one-sector model is able to determine the level of increased consumer demand needed to make producers welfare neutral to the policy.

The multiple-market model, both with and without trade, is able to estimate the changes in producer surplus in each of the sectors allowing for different possibilities with respect to the incidence of costs increases, for different costs estimates and for changes in consumption.

**Strengths and weaknesses of the methodology used**
A strength of using the EDM is that allows for incorporating the three potential effects of COOL on meat producers: the added costs to producers, the added cost to processors and retailers, and the potential increase in consumer demand.

Another strength of using an equilibrium displacement model could be the fact that the effects of different COOL costs estimates are simultaneously analysed for all sectors and actors in a particular industry, while allowing for the interrelationship between several sectors.
Although the one-sector model is useful for investigating how costs are distributed and how the surplus of consumers is affected, a disadvantage of this one-sector analysis is that it ignores consumers’ ability to substitute between different meats as prices change due to COOL.

The methodology that consists to build several models (simple one-good model, three-good models, three-good model with trade) is interesting because this is a way to answer to specific questions with the different models.

The methodology that is used (even if it is not extensively explained in the paper) to infer the impact of the new regulation is also interesting. The introduction of the COOL regulation has first a non marginal impact on the market which is taken into account by designing the trade version of the first model (that ignored the existence of foreign products). This is a way to deal with the structural changes that some new regulations can create (especially if they lead to the creation of new goods).

A weakness of the EDM model is the difficulty to get (or to estimate) the different parameters that are needed, especially if one wants to take into account numerous interrelated markets or the different stages in the chain.
**Title:** Determinants of retailers' decisions to use public or private grades and standards: evidence from the fresh produce market of Sao Paulo, Brazil

**Authors:** Denise Y. Mainville, Decio Zylbersztajn, Elizabeth M.M.Q. Farina, and Thomas Reardon

**Publication date:** 2005

**Journal:** Food Policy

**Publisher:** Elsevier Ltd

**Number of pages:** 334-353

**Availability, URL:**
Contact details authors: mainvill@vt.edu, dezylber@usp.br, fea@edu.usp.br, reardon@msu.edu

### Abstract

This paper models retailers' choices between public and private grades and standards (G&S) and their means of administering them. It focuses on the firm-specific factors influencing the decision. Increasing use of private G&S worldwide, particularly by large, powerful retail chains has implications for competition, participation, and the effectiveness and efficiency of public policy regarding G&S. Drawing from a study of fresh produce markets in São Paulo, Brazil, the paper shows that the importance of the product in the firm's activities or sales, market power, scale of operations, and investment in brand capital and reputation are key firm-specific factors encouraging the use of private G&S regimes over public. Important contextual determinants are the strategic objective of the standard, the institutional environment, and the characteristics of the product and market. A range of formal and informal, private and public methods for administering G&S was found. The paper discusses policy implications of the results, focusing on issues of substitutability and complementarity between public and private G&S regimes.

### Position in the analytical framework

**Question:** What is the optimal mix of publicly and privately funded labelling or certification?

**Stakeholders:** Retailers

### Background and context of the study

Firms' choices between public and private G&S are important to policy for a number of reasons. First, private G&S generally entail new investments by suppliers and require stricter supply chain coordination, which increase barriers to entry and mobility for suppliers. This has implications for competition and participation at the retail level and along the marketing chain. Second, private G&S are less accessible to public policy makers than public G&S, with implications for the effectiveness of quality control and food safety, as well as efficiency implications. Finally, private and public G&S can be complementary in consumers’ minds, so that understanding retailers’ choices among them is key to the effective and efficient design and employment of public G&S and the regulation of private G&S. At the same time, however, private G&S can be potentially more consumer-responsive, and understanding firms’ decisions between them can also help policy makers understand where it is appropriate to maintain a “hands off” approach. Though the determinants of retailers’ decisions to use public vs. private G&S constitute an important policy issue, this issue is largely unexplored in the literature.

### Goals and Objectives of the study

This paper seeks to fill the literature gap on the determinants of retailers' decisions to use public vs. private G&S, by addressing two questions:

1. What are the environmental and firm-specific factors that condition firms’ choices between public and private G&S?
2. How do firms implement and regulate compliance with public and private G&S?

### Quality assurance or certification scheme addressed in the study

The empirical analysis presented in this paper focusses on G&S regimes for ensuring food safety in the fresh produce market of Sao Paulo.
**Scope and coverage of the study**

This paper starts with presenting five hypothesis. Subsequently, these hypotheses are analysed using empirical data on fresh produce in Sao Paulo.

**Dataset(s) used in the study**

Data were collected using key informant interviews with industry experts as well as during the open discussion section of a survey of 33 retailers in metropolitan Sao Paulo, during which respondents were asked about their views on the adequacy of the different grades and standards regimes, their use of different regimes, and how they undertook to ensure the quality of the fresh produce they bought. Retailers were selected from publicly available listings, based on their willingness to participate in the study and with the aim of obtaining a sample that represented the diversity of firms in the market.

**Methodology, or methodologies used**

This paper is based on the assumption that the decision maker under consideration is the individual retail firm that seeks to minimize the costs of obtaining fresh produce reflecting a specific vector of attributes. In making its decision, the firm must evaluate publicly available and private standards for their relative suitability, costs and benefits. The adoption decision is conditioned by both the firm's characteristics as well as the characteristics of the product and its market and the general environment in which the firm operates.

Then it is hypothesized that five variables will lead a firm to choose private G&S over public. These are non-mainstream product requirements, the importance of the product in the firm’s activities or sales, scale of operations, bargaining power, and investment in brand capital and reputation.

Using the data gathered by interviews and discussions, retailers’ adoption behaviour is analysed. The total number of retailers is divided into three groups: large supermarkets, small undifferentiated supermarkets and specialty retailers. For each group of retailers, their choice of public or private G&S is analysed for bulk produce, organic produce and fresh cuts. The outcomes for each type of retailer are explained in terms of their level of non-mainstream product requirements, the importance of the product in the firm’s activities, bargaining power, investment in brand capital and reputation, and scale of operations.

**Conclusions and recommendations of the study**

The analysis presented in this study on retailers’ adoption behaviour with respect to private and public grades and safety standards, allows for analysing the degree to which large supermarkets, small undifferentiated supermarkets and specialty retailers rely on public and private standards. The outcomes for each type of retailer are explained in terms of their level of non-mainstream product requirements, the importance of the product in the firm’s activities, bargaining power, investment in brand capital and reputation, and scale of operations. These outcomes seem to support the hypotheses defined in the first part of the study.

**Strengths and weaknesses of the methodology used**

**Strengths:** interesting hypotheses and discussion of substitutability and complementarity between public and private G&S regimes.

**Weaknesses:** the study concludes that the hypotheses are confirmed, but it does not present any evidence. Nor does it state how the hypotheses were tested.
Abstract
This paper reports the levels of HACCP implementation, costs of implementation and operation, and benefits of implementation for the Mexican meat industry. One hundred and sixty Federal Inspection Type (TIF) enterprises were surveyed, with a 58% response rate. Only 18% of the TIF enterprises interviewed had totally adopted HACCP, while 20% had no interest in adoption. The norm of ISO 9000 appeared to be an intermediate step in HACCP implementation. The results show that investment in new equipment and microbiological tests of products accounted for most of the implementation and operational costs, respectively. The main benefit reported was reduction in microbial counts, while staff training was reported as a significant problem. The study shows that although the level of total HACCP implementation is not high, HACCP has implications for both the domestic and international markets.

Position in the analytical framework

Question: What are the types of benefits and costs of QA and certifications schemes?

Stakeholders: processors

Background and context of the study
In Mexico, the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) has direct control of food quality on meat processing in the 160 Federal Inspection Type (TIF) meat processing plants. These plants incorporate new control points for materials used to handle residues and detect possible causes of ecological contamination. Additionally, the National Food Safety and Quality Program (Programa Nacional para la Inocuidad y Calidad Alimentaria—PRONINCA) has been incorporated to promote the implementation of HACCP in the processing and handling of fresh vegetables and meats processing and handling. Unfortunately, there are county slaughterhouses that supply meat to local markets that have no direct supervision by SAGARPA. The TIF industries are under Mexican norms (Norma Oficial Mexicana—NOM), in which there is no mandatory implementation of HACCP systems to get access to domestic market and consumers are not well-informed. Nevertheless, these systems have become indispensable requirements for exporting companies and enterprises that have not implemented them will face loss of customers and markets. Thus, it is useful to evaluate the present situation of the food industry in Mexico and analyze its implications for domestic and international trade.

Goals and Objectives of the study
The objective of this study is to analyse the degree to which the HACCP system has been implemented by the Mexican meat industry, and the relationship between HACCP and ISO 9000. In addition, this study aims at indicating the importance of major costs, problems, and benefits of implementation and their impact on domestic and international markets.

Quality assurance or certification scheme addressed in the study
The quality assurance or certification scheme addressed in this study is the HACCP program.

Scope and coverage of the study
This paper presents the results of a survey conducted in 1999 among meat processors in the 25 Mexican states.

Dataset(s) used in the study
Fieldwork was conducted with questionnaires adapted to the Mexican meat industry. The target population was all 160 TIF plants supervised by SAGARPA (1999). The questionnaires were sent by courier in 1999 to meat processing plants in the 25 Mexican states, which were divided into three regions. The north included Baja California, Chihuahua, Coahuila, Durango, Nuevo Leon,
Sinaloa, Sonora and Tamaulipas. The center included Aguascalientes, Federal District, Mexico, Guanajuato, Hidalgo, Jalisco, Michoacan, Morelos, Puebla, Queretaro, San Luis Potosi, Tlaxcala and Zacatecas. Finally, the south included Chiapas, Tabasco, Veracruz and Yucatan. Only 92 surveys were fully answered, which constituted the final sample. In addition to general information, the questionnaires asked about aspects related to costs, benefits and difficulties of HACCP implementation. The respondents ranked these factors in order of importance according to their own conditions.

Methodology, or methodologies used

In order to achieve the objective of this study, a survey has been conducted. First the entire sample was asked about their HACCP and ISO status and the proportion of sales to exports.

Then the enterprises with HACCP in full operation were included in the analysis of the costs, benefits and difficulties of implementation. They were presented with a list of six different costs of implementing HACCP and asked to rank them in order of importance. These costs can be divided into three groups: costs of investment in new equipment, costs related to contracting external consultants and staff time spent on documentation, and costs of personnel training. Then, they were asked to rank different operating costs in order of importance. Both regarding the operational and implementation costs, the participants were asked to compare the actual costs with their expected costs.

Then the participants were asked to rank the difficulties faced in implementing and operating HACCP. The same holds for the benefits accrued from implementing and operating HACCP. Again, they were asked to compare the actual benefits with their prior expectations.

Conclusions and recommendations of the study

This study reports the first assessment of the implementation of HACCP in the Mexican meat industry. The results indicate that the prior adoption of ISO 9000 had a direct influence on the implementation of HACCP. In addition, the survey used in this study, provides important data on costs, difficulties, and benefits involved in HACCP implementation and operation.

The survey, however, does not really examine the impact of HACCP on domestic and international markets which was defined as being one of the study’s objectives.

Strengths and weaknesses of the methodology used

Strength Brings new information on the table about an under-researched area.
Weaknesses The analysis is basically qualitative. Descriptive statistical method were used to summarise the data gathered. These data were gathered in the form of rankings. Thus, this kind of study cannot quantify exactly what the costs and benefits arising from ISO 9000 are, measured in money terms, because the relevant data was not collected. This would have been difficult to do (a) because of commercial secrecy (b) because firms could find it difficult to say exactly what the monetary costs and benefits are unless a full analytical study has been made!
We use cartel theory to analyze the influence of common labeling in agricultural markets. An analytical framework of adverse selection where consumers are imperfectly informed about the quality of products is used to investigate the welfare effects of a cartel. In the absence of a cartel, market inefficiencies may arise as a result of asymmetric information. We show that given a high cost of labeling, a cartel that provides information about product quality may improve overall welfare even if producers collude to reduce quantity competition.

**Position in the analytical framework**

**Question:** What are the welfare benefits from QA and certification schemes?

**Stakeholder:** Consumers, whole chain

**Background and context of the study**

Private or public institutions that certify product quality are very useful in providing information to buyers. A third-party certification is a voluntary way for producers to signal product quality, and may be organised by the private or the public sector. Part of the existence of these institutions is explained by the cost and the complexity of laboratory or auditor services for reliably establishing a product’s content. The cost of setting up certification schemes is generally prohibitive for an individual producer. This may lead producers to act collectively to label or promote their products, thereby generating economies of scale by sharing some costs of certification or promotion. However, some studies have shown that common labelling may lead to a stringent co-ordination among sellers to reduce quantity. Thus a regulator has to take into account anti-trust implications and determine whether the signalling effect offsets the collusion effect.

**Goals and Objectives of the study**

The objective of this study is to analyse the influence of common labelling in agricultural markets by investigating the overall welfare effects of a cartel.

**Quality assurance or certification scheme addressed in the study**

This study is focused on common labelling of agricultural products in general, where growers are allowed to commonly label the quality of their products. No specific certification scheme is addressed.

**Scope and coverage of the study**

In order to achieve the study’s objective, an analytical framework of adverse selection where consumers are imperfectly informed about the quality is constructed. The overall welfare effects of the cartel are defined as the sum of producers’ and consumers’ surplus. Note that in the analytical analysis, ‘producers’ refers to all suppliers, including primary producers, processors and retailers. It is not clear how the producer surplus is distributed amongst them. Therefore, this study is partly allocated in the analytical framework under the heading ‘whole chain’.

**Dataset(s) used in the study**

In this study, only some numerical simulations are performed. Therefore, no specific dataset is used.

**Methodology, or methodologies used**

An analytical framework is constructed of adverse selection where consumers are imperfectly informed about the quality of products. This framework is mainly based on cartel theory with Cournot competition. The analytical framework starts from the assumption that the quality level of the products produced by individual sellers is known by the seller but is not observed by buyers and other sellers. Sellers can form a cartel to benefit from the same certification process. In this case, they share the costs of certification with or without quantity collusion. The indirect utility of the
consumers is a function of the price, a taste parameter and the quality. The latter attribute is not known to the consumer before purchasing. Each buyer only knows the prior probability of high or low quality.

Based on these assumptions, the expressions of consumers’ and producers’ surplus (CS and PS) are defined for the general case with no certification and no cartel. In order to analyse the impact of common labelling and collusion, the CS and PS expressions are redefined for three situations; 1) where the high quality producer has the opportunity to certify his product, 2) where high quality sellers have the possibility to collude and share the costs, and 3) all high quality producers have to collude for signalling. In order to compare the CS and PS of each situation, numerical simulations are performed.

Conclusions and recommendations of the study

The analytical framework presented in this study is able to assess the impact of common labelling with and without collusion on consumers’ and producers’ surplus, while accounting for the level of certification costs. The results show that given a high cost of labelling, society can be better off allowing cartels to exist, even if these cartels attempt to restrict production. Conversely, for a low cost of labelling, society is better off preventing quantity collusion.

Strengths and weaknesses of the methodology used

Strengths of IO based models in this case
- They focus on an issue that is well defined and provides the key economic mechanisms that are involved.(here common labelling could imply some collusion, there is thus a trade off for the public regulation between a gain due to information to the consumers and a loss due to collusion).
- They lead to analytical solutions – a strength for a theoretical model.
- Mechanisms involved that lead to the results can be explained. Parameters that have a key influence on the results can be determined
- Consistency of the model can be easily checked. Assumptions of the model are explicit, which allows for precise evaluation of the validity and realism of the model.

Weaknesses of IO based models in this case
- Difficult to develop. Advanced skills are required.
- Results provided are mainly qualitative rather than quantitative.
- Difficult to calibrate, as they frequently use simplifying assumptions that do not change qualitative results but could change quantitative ones. They also rely on parameters that are sometimes difficult to quantify.
Title: Is country-of-origin labelling a secondary trade barrier? An empirical analysis
Authors: Shigeru Matsumoto
Publication date: April 4, 2005
Journal: Department of Economics, Kansai University, Japan
Publisher:
Number of pages:
Availability, URL: [http://www2.ipcku.kansai-u.ac.jp/~kshigeru/res/cool.pdf](http://www2.ipcku.kansai-u.ac.jp/~kshigeru/res/cool.pdf)
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### Abstract
A provision listed in the 2002 Farm Security and Rural Investment Act requires retail grocery stores to identify certain agricultural products by the country of their origin. Several key trading partners of the U.S. express their concerns over the negative impacts of the country-of-origin labeling (COOL) on trade. Using a panel data set of meat trades and information on the COOL practices of US trading partners, we empirically examine whether COOL functions as a nontariff barrier. We find that net import penetrations were lower in countries that have mandatory COOL programs. However, we find that meat trade flows were not altered by the introduction of mandatory COOL programs. Therefore, a typical consumer puts a premium on domestic meats, but she does not modify her consumption behavior based on government certification activities.

### Position in the analytical framework
**Question:** What are the types of benefits and costs of QA and certifications schemes?
**Stakeholders:** Other countries

### Background and context of the study
A provision in the 2002 Farm Security and Rural Investment Act requires retail grocery stores to identify certain agricultural products by the country of their origin. Country-of-origin labelling (COOL) was made mandatory on September 30, 2004. Presently, a grocery store that intentionally violates the new labelling law faces fines of up to $10,000. The prime purpose of this new labelling law is to provide information to consumers regarding the origin of their food and permit them a choice of purchasing either domestic or imported products. However, several key trading partners of the US express their concerns over the negative impacts of COOL on trades.

Before the COOL program was introduced in the US, similar programs requiring the country-of-origin identification had been used in some foreign countries. The US General Accounting Office (GAO) surveyed the COOL practices of major trading partners. They reported the survey result to the US Congress in 2003. This report revealed that most trading partners practiced COOL in a certain form. However, these practices varied among the trading partners.

### Goals and Objectives of the study
The purpose of this paper is to empirically verify whether COOL functions as a secondary trade barrier. The intention is to examine whether trade flows were affected by the implementation of COOL.

### Quality assurance or certification scheme addressed in the study
The certification scheme addressed in this study is the country-of-origin label (COOL) provision, which requires retail grocery stores to identify certain agricultural products by the country of their origin.

### Scope and coverage of the study
The analysis of this study focuses on two issues. In the first place, it analyses whether a typical consumer puts a premium on domestic meats, by comparing the net import penetrations of countries with COOL programs with those of countries without mandatory COOL programs. Secondly, it is examined whether net import penetrations were affected by the introduction of mandatory COOL programs.

The analyses presented in this study focus on meat cuts and processed meat only.

### Dataset(s) used in the study
Panel data has been used including thirty-nine countries and eight meat varieties. The trade data of 1997 and 2001 used for the analysis presented in this research is obtained from FAOSTAT, available at [http://www.fao.org/waicent/portal/statisticsen.asp](http://www.fao.org/waicent/portal/statisticsen.asp). In addition, the results of the GAO's
Methodology, or methodologies used

In order to examine consumers’ evaluation of domestic meat, the net import penetration ratios (net imports divided by total trade) of countries with COOL programs are compared with those of countries without COOL program. This has been done by conducting a weighted ordinary least squares estimation using the livestock information from the previous year as a weighting variable. The net import penetration ratio of each meat variety was regressed upon a COOL dummy (1 if the country used COOL for that specific meat product, 0 otherwise), the tariffs used, GNP per capita and the factor intensity variables. In order to check for the robustness of the weighted OLS model, a two-stage sample selection model has been employed without taking account of the meat variety. First, the COOL dummy is regressed upon a 2001 dummy, the tariffs used, GNP per capita and the factor intensity variables. In the second step, the estimated likelihood of COOL programs estimated in the first step is added to the original net import penetration equation. However, the results did not significantly change.

To examine whether trade flows were affected by the introduction of mandatory COOL programs, the first-differencing method is used. i.e. the equation estimated above has been re-estimated, using the first-difference values instead of the levels. Weighted OLS regression has been used, using the livestock information from 1996 as a weight. In order to take meat variety-specific effects into account, a fixed effects model has been used, which significantly improved the model. However, a random effects model has been tried as well. The results of the Hausman test rejected the fixed effects model in favour of the random effects model.

Conclusions and recommendations of the study

In both the initial OLS equation as well as in the two-stage sample selection model of the net import penetration ratio (in levels), the coefficient of the COOL dummy variable had a significant negative sign. This implies that the net import penetration was lower in countries with COOL programs.

However, in all the three models used for estimating the net import penetration ratio in differenced form, the COOL dummies (in differenced from) were not significantly different from zero. From this it is concluded that the introduction of mandatory COOL programs did not alter the trade flows.

Combining these results, it is concluded that the effect of the country-of-origin identification on trade is believed to have prevailed even before COOL was made mandatory.

Strengths and weaknesses of the methodology used

Strengths Panel data regression allows a large number of countries to be processed, and changes over time (especially pre-COOL post-COOL differences) to be estimated.

Weaknesses The underlying hypothesis – that net import ratios of 39 countries - can be explained by a single equation with constant parameters, is perhaps too restrictive. Many factors (historical/geographical/historical) could cause parameter variation over the sample, and if random effects were for the intercept only then this heterogeneity will not be recognised and could distort the results.
Title: Willingness to pay for organic foods: a comparison between survey data and panel data from Denmark
Authors: Katrin Millock, Lars Garn Hansen, Mette Wier, and Laura Morch Andersen
Publication date:
Journal: Working paper CIRED
Publisher:
Number of pages:
Availability, URL: http://weber.ucsd.edu/~carsonvs/papers/5065.pdf
Contact details authors: millock@centre-cired.fr, lgh@akf.dk, mw@akf.dk, lma@akf.dk

Abstract
We present a project aiming at estimating the willingness to pay for organic foods through panel data and a survey. The panel data is based on weekly reporting of household purchases by 2000 Danish households with information on their demographic and socio-economic characteristics. Detailed information on organic foods exist from 1997. A questionnaire asking consumers to distinguish and rank various food attributes will be sent out to all households in the sample in June 2002. For survey purposes, organic foods are defined as products carrying the Danish state label guaranteeing public control and certification of organic production. The food product attributes include environmental concerns, animal welfare, and food safety (health concerns). Here we present the results from the pilot study sent out in 2001 to 400 randomly chosen households, representatively distributed on geographical regions however. Among the results we note that the order of valued attributes do not differ across organic product types and that avoidance of chemicals is the highest valued attribute. We also present some preliminary estimations on purchase data in order to compare the contingent valuation results with observed willingness to pay. Both valuation methods entail uncertainty; a comparison may indicate the magnitude of this.

Position in the analytical framework

Question: What is consumers' willingness to pay for 'quality'?
Stakeholder: Consumer

Background and context of the study
Demand for organic foods has increased considerably during the past decade, though organic consumption still only constitutes a few percent of total food consumption in most countries. This growth has been especially high in Denmark, which is estimated to have the highest per capita consumption in the world. The Danish market is especially well suited for consumer analyses, because the Danish market for organic foods is relatively mature, meaning that it does not suffer seriously from the supply shortages and barriers which dominate most of the markets outside Denmark. This holds especially for organic dairy and cereal products, since these products exhibit higher budget shares than other organic products, and to a lower extent for meat products. This means, that the Danish organic market may offer information about future markets of organic foods in other countries. The well-functioning Danish market makes it possible to collect and analyse reliable data on purchases. As such data is not found in any country until recently, almost no studies on the estimation of the demand for organic foods based on actual purchases have been published previously. Almost all previous studies on organic foods are based solely on postulated behavior, i.e. stated willingness to pay. However, stated willingness to pay may not reflect revealed behaviour. Several studies have found that hypothetical (stated) willingness to pay exceed revealed willingness to pay.

Goals and Objectives of the study
The aim of this paper is to present the preliminary results of a project aiming at estimating the willingness to pay for organic foods through panel data and a survey.

Quality assurance or certification scheme addressed in the study
This study is focussed on organic labelled products.

Scope and coverage of the study
This paper will present the preliminary results of the estimation of the willingness to pay for organic foods of Danish consumers using panel data and a survey.

Dataset(s) used in the study
The data used in this study is provided by a marketing research company, GfK Denmark, part of the GfK Group. GfK Denmark registers the consumption of approximately 2300 households of (certified) organic and conventional foods and the corresponding prices. 20% of the households are exchanged every year, partly because of households leaving the survey, and partly in order to
ensure that the panel is representative of the Danish population. The panel is representative with respect to the location and size of the household, as well as age of the consumer. The consumers respond by recording their weekly purchases in a diary. This record encompasses a large variety of commodities, representing 80% of the consumer’s budget for grocery shopping. Data for organic foods exist for the period from the beginning of 1997 and onwards. For this paper, data were available until the end of 2000. In addition to these data, we will mail the panel a questionnaire (in June 2002), in order to reveal information on attitudes, values and food habits, with special attention to valued food attributes and perceived food safety risks. We also ask the panel member of stated willingness to pay making it possible to compare stated (revealed from questionnaire data) and actual (revealed from purchase data) willingness to pay for the same individuals in the panel.

For the present paper, the questionnaire data is not available yet. Instead, we use pre-test data from a sample of 400 randomly chosen respondents, representatively distributed across geographical regions. The questionnaire consisted of four sets of questions: questions on purchase habits and food culture (choice of store, important product characteristics, statements on risks from eating certain foods), questions on organic food production (identification of the Danish O-label, statements on organic production and its effects), questions on habits and environmental attitudes (use of recycled toilet paper, aluminium foil, membership of environmental associations, statements on the consumer’s role in environmental protection), and finally questions on willingness to pay for four different products (milk, rye bread, potatoes and minced beef). The respondent had to indicate whether (s)he agreed with the attitudinal questions on a scale from 1 to 5. The WTP questions were formulated as: 1) Conventional milk costs 6 DKK per litre. Would you pay more than 6 DKK for a litre of organic milk? 2a) If yes, how much? 2b) If no, why are you not willing to pay more for organic milk?

The respondents who stated a positive willingness to pay were asked a follow-up question asking them to rate whether different characteristics of the organic product were more or less important in their decision to pay more for the organic product (taste, absence of pesticide residue, environmental concerns, good conscience).

Methodology, or methodologies used

First, using the results of the open-ended WTP questions, the average stated WTP was estimated. Then logistic maximum likelihood estimation was performed in order to estimate the probability of being willing to pay a premium for organic foods as a function of the consumers’ characteristics, and attitudes.

The results of these stated WTP estimates are compared with the actual average premiums and actual willingness to pay for a premium. This comparison is made for several products, such as potatoes, rye bread, beef and milk.

Conclusions and recommendations of the study

The results of the maximum likelihood estimation, give an indication of the degree to which different consumer characteristics and attitude influence the probability of being willing to pay a price premium on organic foods.

Additionally, using panel data as well as survey data allows for a comparison of stated and revealed willingness to pay for organic foods. It allows for a comparison of the premiums consumers are willing to pay with the premium they are actually paying.

Strengths and weaknesses of the methodology used

The main strength of the methodology is the comparison of stated versus real buying behavior, which is possible thanks to the mode of information gathering. Geographical diversity is also an advantage of the method used. One the other hand, estimated results derived from the use of open-ended questions might further overestimate WTP. Results assume a closed form distribution for the WTP variable.
Abstract
The first aim of this paper is to analyse the average production costs of citrus cultivated under EUREPGAP protocol regulation in the Comunidad Valenciana (Spain). To this end, we shall study a sample of plots administered under the same management, specifically a citrus cooperative located in one of the most important production areas of the region. The results obtained shall then be compared with the average standard regional costs employing traditional production methods. The second aim of this study is to draw attention to the extraordinary effort made by the Spanish citrus cooperative sector to offer products to European consumers in compliance with the new standards of food quality and safety. The farmers who produce citrus following the EUREPGAP protocol must face a series of extra costs (registration fees), or controls (analysis and certification costs), in addition to the obligation of implementing the code of Good Agricultural Practices (GAP).

Position in the analytical framework
Question: Do QA and certification schemes improve profitability?
Stakeholders: Primary producers

Background and context of the study
After recent crises in the European agrifood system, as the case of the mad cow disease (BSE), chicken dioxin or the overuse of antibiotics in animal production, food quality and safety has become one of the main concerns of European consumers. Consequently, the concept of quality has experienced a change in recent years. In fact, food quality is not only limited to the absence of external failures as it was before. Consumers actually value other kinds of food attributes, including the use of good agricultural practices within the production process, a good market preparation, the absence of empty flavours, the best organoleptical qualities, the absence of genetic modifications in raw animal and plant materials or the implementation of traceability systems (Planells, 2003).

Goals and Objectives of the study
The first aim of this paper is to analyse the average production costs of citrus cultivated under EUREPGAP protocol regulation in the Comunidad Valenciana (Spain) and to compare these costs with the average standard regional costs employing traditional production methods. The second aim of this study is to draw attention to the extraordinary effort made by the Spanish citrus cooperative sector to offer products to European consumers in compliance with the new standards of food quality and safety.

Quality assurance or certification scheme addressed in the study
This study focuses on citrus cultivated under the EUREPGAP quality protocol.

Scope and coverage of the study
In the first part of the study, a description is given of the EUREPGAP requirements. The second part of the study involves the analysis of the production costs when producing under the EUREPGAP protocol regulation, and a comparison of these costs with the conventional production method.

Dataset(s) used in the study
The field work for this study was done in the cooperative “La Constancia”, located in Pobla de Vallbona (Valencia). Established in 1978, it currently has 2,500 members, 450 of whom are farmers. Of the entire cooperative land surface, the holdings taken as samples to analyse their
production costs are completely managed by the cooperative staff. In addition, the citrus produced are certified following the EUREPGAP quality protocol.

Data on the average production costs of conventionally grown citrus are obtained from Caballero and Fernández (2002). The holdings that constitute the conventional sample present practically the same characteristics as those of the EUREPGAP sample. Consequently, they are also classified as small sized, with flow irrigation systems and narrow planting distances. Their standard machinery pools are simple and small. Moreover, special treatments as pesticide sprays or chemical flowering controls are always contracted to cooperatives or agricultural services’ firms.

Methodology, or methodologies used
The production costs’ analysis has been carried out employing the full costing methodology. Normally, this methodology takes into account variable, fixed and opportunity costs. However, in this study, opportunity costs are not accounted for as they are considered not to add any new information to the objective of the study.

Six types of variable costs and four types of fixed costs were distinguished relevant for citrus cultivation. Using the data gathered from the cooperative; the average, minimum and maximum values were calculated for each cost item. These costs have been compared with the average production costs of conventionally grown citrus.

Conclusions and recommendations of the study
The costing methodology used in this study is able to show the differences in variable and fixed production costs between conventional citrus producers and producers producing under the EUREPGAP protocol regulation. The results indicate that the total costs are higher in the conventionally grown system than in the EUREPGAP case.

Strengths and weaknesses of the methodology used
Strength due to the detailed list of costs that are analysed, and to the use of actual data (namely, accounting cost coming from production plots). Weaknesses of this study are numerous:

• Very small size of the sample (only 9 for EUREPGAP plots) with thus problem of representativeness of the sample, validity of average calculation
• Costs of conventional production come from a different study which makes the comparison with the EUREPGAP production costs difficult
• Comparison does not take into account all the other characteristics of the farm. There is no ‘control’ for other factors that could affect costs.
Title: Analyzing the perceived impact of ISO 9000 standards on US agribusiness
Authors: G.A. Mumma, J.A. Albert, C. Warren, C.I. Mugalla, and A. Abdulkadri
Publication date: May 2002
Journal: this paper is a selected paper for presentation at the annual American Agricultural Economics Association meeting, Long Beach, California
Publisher:
Number of pages: 27
Contact details authors: mumma@lycos.com, allen@agecon.msstate.edu, couvillion@msstat.edu, illekomugalla@hotmail.com, bodemola@usa.net

Abstract
We used a non-competitive market framework to assess the perceived impact of ISO 9000 standards on the operational efficiency of registered US agribusiness sites. Kendall Coefficient of Concordance, W, was used to rank selected reasons for seeking registration to ISO 9000 standards. The results indicated that registered sites seem to be achieving their goals.

Position in the analytical framework
Question: 1. What motivates producers to register to a QA or certification scheme?
   2. Do QA and certification schemes improve profitability?
Stakeholders: whole chain

Background and context of the study
The first US agribusiness site registered in 1992, and by 1996, 103 agribusiness sites had registered. Despite the slow initial adoption of these standards by US agribusiness sites, there is evidence of increasing use of QMS and QA activities to manage food quality in an attempt to differentiate products, enhance traceability, better manage waste and risk, and demonstrate compliance with quality standards in response to domestic and global market forces. However, few studies have looked into the reasons for which sites register to these standards, or their impact, on agribusiness firms.

Goals and Objectives of the study
The objective of this study is to examine the perceptions of quality management representatives of registered agribusiness sites on the impact of these standards on the internal benefits of their sites, and how these relate the reasons for registering to the standard.

Quality assurance or certification scheme addressed in the study
This paper is focussed on ISO 9000 standards.

Scope and coverage of the study
In order to achieve the objective of this study, this paper will:
1. analyze ten selected reasons advanced by quality management representatives of ISO 9000 registered US agribusiness sites for seeking registration to a model of ISO 9000 standards,
2. estimate equations for the reported perceived operational efficiency due to adoption of one or more models of ISO 9000 standards for registered agribusiness sites based on selected QMS indicators,
3. verify whether registered firms are meeting their reported goals for registration to the standards.

Dataset(s) used in the study
Data on perceptions of quality management representative of registered ISO 9000 agribusiness sites in the US were obtained through a telephone and mail national survey of registered sites between March and October 1999. Based on careful study of the two-digit SIC codes, four-digit SIC codes, information and description of SIC codes provided by the US Department of Labor’s Occupational Safety and Health Administration on SIC codes, and scope of registration as
described in the Registered Company Directory, North America, some three hundred and sixty six registered sites were identified as involved in business activities related to agribusiness. The survey used a graphic scale rating to register the perceptions of quality management representatives on ten selected reasons for implementing ISO 9000 standards, and the impact of ISO 9000 standards on the operational efficiency of their sites. The net response rate representing only usable returned surveys was 32.23 percent of all survey sent to respondents in two mailings.

Methodology, or methodologies used
First, the paper presents a ranking of the reasons given by US agribusiness sites for seeking registration to a ISO 9000 standard. The Kendall Coefficient of Concordance W is used to determine whether quality management representatives (QMR) of US ISO 9000 registered sites showed substantial agreement in their judgement of selected reasons. The Friedman ANOVA test was used to determine whether there were significant differences between the responses by QMR on the reasons.

Then a logistic regression analysis is performed. The probability of a registered site being perceived internally operationally efficient due to registration to one or more models of ISO 9000 is regressed upon the number of employees, perceived total sales, number of registered product lines, level of inventory, domestic product prices, documentation of quality system, and whether they had encouraged suppliers to adopt ISO standards.

Conclusions and recommendations of the study
This study first gives an indication of what motivated US agribusiness sites to seek ISO 9000 registration. In addition, it showed what factors influenced the perceived internal operational efficiency of those sites.

Strengths and weaknesses of the methodology used
Weaknesses: respondents are the “quality management representatives” of US agribusiness. More than likely they are the same persons who had introduced ISO certification earlier. Therefore respondents with a vested interest in the system and hardly the ideal respondent.
Abstract
Recent U.S. pathogen reduction and HACCP food safety regulations, which increased the costs of producing meat and poultry products, may have affected the rate of plant exit during the 1996 to early 2000 time period over which the regulations were implemented. We estimate and compare probit models for U.S. federally inspected meat slaughter (920 plants), poultry slaughter (280 plants), and meat and poultry processing-only (4,300 plants) plants to determine which factors most contributed to the probability of plant exit. The factors we consider include plant-level, company-level, and regional-level characteristics and regional supply conditions. Although plant size affected the probability of exit for slaughter plants, it did not affect exit for processing-only plants. Other variables, such as measures of market structure and competition, have different effects for each of the industries.

Position in the analytical framework
Question: What is the impact of QA and certification on market structure?
Stakeholder: processors

Background and context of the study
The U.S. meat and poultry industries have been characterized historically by frequent plant entry and exit (MacDonald et al., 1996). Recent food safety regulations could have hastened the rate of exit and reduced entry into these industries. In particular, the 1996 Pathogen Reduction and Hazard Analysis and Critical Control Points (PR/HACCP) regulation increased the costs of producing meat and poultry. Plants with different characteristics and types of processes may have been affected differently, and policymakers were concerned particularly about the effect of the regulation on smaller plants. If smaller plants were indeed more likely to exit, the regulations may have affected the structure of the meat and poultry industries.

Goals and Objectives of the study
The objective of this study is to determine which factors most contributed to the probability of plant exit during the 1996 to early 2000 time period over which the PR/HACCP regulations were implemented. The intention is to compare differences in factors that affect exit across large and small companies and across meat slaughterers, poultry slaughterers and processing-only plants.

Quality assurance or certification scheme addressed in the study
This study focuses on the HACCP safety regulation for pathogen reduction.

Scope and coverage of the study
In order to achieve the objective mentioned above, this study will focus on plant exit in the US meat and poultry industries. Both a theoretical model and an empirical analysis are presented in this paper.

Dataset(s) used in the study
The data used in this study are cross-section data on the characteristics of plants in 1996, the year in which the HACCP regulations were published but not yet implemented. The plant, company, and regional characteristics come directly from or are derived from plant-level Food Safety and Inspection Service (FSIS) databases, and the supply condition variables are from published Bureau of Labour Statistics (BLS) and National Agricultural Statistics Service (NASS) data sets. Additionally, information about the number of plants in 1993, 1996 and 2000 is obtained from FSIS as well.
In total, 920 meat slaughterers, 280 poultry slaughterers, and 4300 meat and poultry processing-only plants are included in the sample.

Methodology, or methodologies used
According to the theoretical model, a plant will exit the industry when its current year profits plus its discounted present value of profits are less than the value of the firm from exiting. Based on this
view, the probability of exiting the industry is expressed as a function of a vector of variables influencing the present value of profit for the individual firm. This vector includes plant/company characteristics (plant size, capacity, productivity (represented by plant age), and vertical and horizontal integration), regional-level characteristics (regional entry rate, the plant’s market share, Herfindahl index for the region, ratio of Herfindahl index to market share, competitive fringe index, number of slaughters and processors in the region), and local supply conditions (input prices, livestock prices, wage rates, energy prices) for each plant.

A dummy indicating the presence or absence in 2000 of an in-1996-existing plant is regressed upon the variables mentioned above, using a probit model. Probit models are estimated for the meat slaughters, poultry slaughters and processing-only plants.

**Conclusions and recommendations of the study**

Using a plant-level database of meat slaughter plants under federal inspection, this study compares rates of plant entry and exit prior to and during PR/HACCP implementation and analyses the factors contributing to plant exit during PR/HACCP implementation. The empirical results presented in this paper are useful for providing information on the general characteristics that increase the probability of plant exit. Among other things, the model allows for analysing the impact of plant size on its probability of exit. The results demonstrate that very small and small slaughterers were more likely than large plants to exit during implementation of the regulation. Additionally, it allows for a comparison between poultry slaughters, meat slaughters and processing-only plants.

**Strengths and weaknesses of the methodology used**

**Strengths**

Rich data base.

**Weaknesses**

Despite references to a ‘theoretical model’, the choice of factors determining plant exit is ad hoc.
**Title:** Eco-labels and international trade in textiles  
**Authors:** Wesley Nimon and John C. Beghin  
**Publication date:** 1999  
**Journal:** CARD publication, Centre for Agricultural and Rural Development, Iowa State University  
**Publisher:**  
**Number of pages:**  
**Availability, URL:** [http://www.card.iastate.edu/publications/DBS/PDFFiles/99wp221.pdf](http://www.card.iastate.edu/publications/DBS/PDFFiles/99wp221.pdf)  
**Contact details authors:** wnimon@ers.usda.gov, beghin@iastate.edu

### Abstract

This paper provides a formal analysis of the welfare and trade implications of eco-labeling schemes. A simple model of vertical (quality) differentiation captures major stylized features of the textiles market in which trading takes place between an industrialized North (domestic) and a developing South (foreign). The paper investigates several labeling scenarios (labeling by North, labeling by both North and South, and harmonization). A labeling scheme in the North without the South’s participation is detrimental to both the North’s and the South’s producers of conventional textiles. In aggregate, the North’s textiles industry benefits from the introduction of the label. If the South creates its own label, it regains market share in aggregate, but at the cost of its conventional textiles sector; both of North’s industries lose. Consumers gain with a wider choice and with higher quality of textile goods. They would favor upward international harmonization of eco-labels towards the higher quality of the North, as long as the South participates in production and provides some cost discipline.

### Position in the analytical framework

**Question:** What are the welfare benefits from QA and certification schemes? How are they distributed?  
**Stakeholders:** Consumers, whole supply chain, other countries

### Background and context of the study

Both in Europe and North America environmental concerns arose in the 1970s and 1980s to a prominence in public discourse never before known. Consumers were urged to put their money where their mouth was and purchase environmentally friendly goods so as to pressure firms to mend their ways. “Green consumerism” was born and with it came a deluge of greener than thou claims by manufacturers. Claims such as “eco-friendly,” “environmentally safe,” “recyclable,” “biodegradable,” “ozone friendly,” “safe in a landfill,” etc., bombarded consumers (West). Differentiating fact from fiction and meaningful from irrelevant became difficult and so the idea of third party certification via eco-labels was born. Eco-labels are designed to inform consumers that the labelled product is more environmentally friendly than most in its product category. The hope is to harness latent or undirected consumer preferences for green goods to encourage firms to develop and adopt products and technologies that mitigate ecological externalities. The successful widespread implementation of eco-labels has yet to be achieved in part because of de facto barrier to trade concerns. Despite of the, especially Least Developed Countries’ concerns with respect to the trade distorting impacts of these labels, there still exists a considerable gap in the literature on eco-labelling and trade.

### Goals and Objectives of the study

The objective of this study is to formally analyse the welfare and trade implications of eco-labelling schemes.

### Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is the eco-labelling scheme on textiles, which involves production-process standards. If the importing, say Northern/domestic country introduces such a scheme, two goods will be present on the domestic market: eco-labelled textiles produced in the North and conventional textiles produced by the North and the South (foreign).

### Scope and coverage of the study

In order to achieve the objective as formulated above, the analysis is couched in the context of a stylized model of the textiles market in which trading takes place between an industrialized North (domestic) and a developing South (foreign). Several labelling scenarios are investigated (labelling by North, labelling by North and South, and harmonization of both labels). This study involves both the construction of an analytical framework as well as numerical simulations and comparative statics of the domestic CS, domestic PS, foreign PS and total world welfare.
Dataset(s) used in the study

In this study, an analytical framework has been constructed which is employed using numerical simulations and comparative statics. Synthetic values were used for the different parameters. Therefore, no specific dataset has been used.

Methodology, or methodologies used

The analysis is based on the classical model of vertical (quality) differentiation. It starts from the assumption that the quality of a good is heterogeneous and translated into a quality index (k), which is valued by the consumer via a taste parameter. Three textile goods are assumed; 1) the conventional good either produced domestically or abroad, 2) eco-labelled domestic good and 3) eco-labelled foreign good.

Three situations are considered. In the first, reference case, there is one demand function for the conventional good only. It is a function of the price and the quality. Based upon profit maximisation, two supply functions are derived; for the domestic and foreign conventional producer. After having equated demand with total market supply, the equilibrium price and quantity are derived, which results in the definition of the domestic CS, domestic PS, foreign PS and total world welfare, which is the sum of these three plus the import revenues minus the costs of the label. In the second case, only the Northern country introduces a label. This results in one demand function for the conventional good and one for the labelled good. Domestic supply has become the sum of both conventional and labelled supply. Again, after having equated total demand with total supply, expressions of the equilibrium price, quantities, domestic CS, domestic PS, foreign PS and total world welfare are derived. In the third case, the South introduces a label as well. This results in a third demand function for the foreign labelled good. Additionally, total foreign supply has become the sum of foreign conventional and labelled supply. Again, the equations of CS, domestic and foreign PS and total world welfare are derived.

Then, numerical simulation and comparative statics are undertaken using synthetic values for the costs and quality parameters involved in the model. Different sets of values are tried and fortunately, the comparative statics results hold for a wide range.

Conclusions and recommendations of the study

The results of the numerical simulations and comparative statics indicate the impact of different labelling regimes (only domestic country labelling, both countries labelling, or harmonization) on domestic CS, domestic PS, foreign PS and total world welfare.

Strengths and weaknesses of the methodology used

Strengths

This very stylised approach represents a first attempt to capture the mechanisms and responses in an inherently complex situation.

Weaknesses

A weakness of the analytical framework formulated in this study could be the fact that trade diversion from the exporting (foreign/southern) country’s point of view has not been accounted for. Use of synthetic parameter values means that the empirical content of the model is low. Comparative static approach means that adjustments are ‘timeless’.
Background and context of the study
While traditional trade barriers in agriculture such as tariffs continue to decline, technical and regulatory barriers are increasingly subject to debate. This includes discussion over the appropriate levels of sanitary and phytosanitary standards (SPS) and related food safety concerns. Public discourse and concern about the health risks of food and appropriate sanitary standards is particularly evident in industrialized countries. Debate over food safety has been especially prominent in Europe. In particular, the use of import bans and regulatory intervention by the European Commission is increasingly justified, in part, under the precautionary principle. This principle suggests that regulatory action against risk be taken, even when science has not established direct cause and effect relationships. The Commission's approach has been challenged in trade policy talks on the basis that import restrictions have been imposed without sufficient support in international science. The ban in Europe of hormone-treated beef is one recent high-profile example.

How regulatory costs for exporters compare with possible gains in higher sanitary and phytosanitary levels in importing countries is a key part of today's trade policy debate. Information on how standards affect trade flows when an international standard is in place and shared bilaterally, as opposed to conditions in which differing national standards are imposed on exporters, is at the centre of our questions in this paper. As recently reviewed in Maskus and Wilson (2001a,b) the empirical evidence and information on the trade impact of standards is extremely limited. This fact motivates the importance of providing economic estimates based on empirical analysis of how standards impact trade flows and of predicting changing trade patterns under alternative food safety standards.

Goals and Objectives of the study
The main objective of this paper is to explore how EU food safety standards affect trade flows from African countries to the EU.

Quality assurance or certification scheme addressed in the study
The case study presented in this study focuses on the European Commission (EC) proposal to harmonize aflatoxin standards announced in 1998, which was scheduled for enforcement and implementation in April 2002. The harmonized aflatoxin standard for the EU is tighter than those which have been applied in most member countries and tighter than the Codex standard.

Scope and coverage of the study
In order to achieve the objective of this study as mentioned above, the case study will focus on EU aflatoxin standards. The objective is to predict the trade effect of setting aflatoxin standards at differing levels. Bilateral trade flows between Africa and Europe are examined under three regulatory scenarios: standards set at pre-EU harmonized levels (status quo), the new harmonized EU standard adopted across Europe, and a standard set by the Codex. In addition, the trade-off between human health and trade flows for each of these three regulatory scenarios will be analysed.

The analysis will focus on trade in cereals, dried fruits, nuts and vegetables between 15 member states of the EU and nine African countries in the 10 years prior to 1998.

Dataset(s) used in the study
Data on food safety standards were obtained from the Food and Agricultural Organization's (FAO) cross country survey. A risk assessment conducted by joint FAO/WHO Expert Committee on Food Additives (JECFA) provided the comprehensive information on aflatoxin risk to human health. Trade flow data, between 1989 and 1998, were obtained from the World Bank calculations and the United Nations Statistical Office, for 15 European countries and 9 African countries. Additionally, COMTRADE data was used.
Methodology, or methodologies used

In the first stage of the empirical analysis, an econometric approach is used to determine the effect of European Aflatoxin standards on African exports. The framework in the empirical study follows a gravity model developed in Otsuki, Wilson and Sewadeh. A gravity model is a widely used method to explain trade patterns between countries using each country’s measure of ‘mass’ and geographical distance between countries to assess changes in trade flows.

In the gravity model, the value of trade in a particular product from a particular African country to the EU member state is regressed upon both the importer’s and exporter’s GNP per capita, the year concerned, the distance between the African country and the EU country, a colonial tie dummy and a maximum level of aflatoxin imposed on imports of the particular product in question. Additionally, dummy variables for exporting countries are included in order to control for unobserved factors such as environment and product quality. First, the analysis is conducted at an aggregate level that is defined by the two digit level under the STIC Revision 2 castigation. So, the value of trade of ‘cereals and cereal preparations’ and ‘fruits, nuts and vegetables’ are regressed on the variables presented above. However, the analysis is repeated with a higher level of desegregation of the product categories as well.

In the second stage of the analysis, simulations have been performed for estimating the value of trade flows under three regulatory scenarios: (1) the pre-EU harmonized standard is maintained on African exports, (2) the new EU harmonized standard is imposed and (3) a standard is developed using Codex guidelines.

Conclusions and recommendations of the study

Using regression analysis, the researchers were able to obtain the elasticity of the pre-EU harmonized aflatoxin standards on the value of trade flows from nine African countries to 15 European countries. These elasticities have been used in the scenario analysis, of which the results indicate the African countries’ trade loss in three different scenarios. These results have been compared with the estimated reduction of liver cancer under each scenario, as predicted by the joint FAO/WHO Expert Committee on Food Additives (JECFA).

Recommendations, as mentioned in the paper:

“Our results also suggest several areas for further empirical research and extension of the analysis in this paper. A gravity model is unable to disentangle demand and supply effect of standards. The application of a system of equations with unit prices would make welfare analysis feasible. The utility gain of consumers in the importing countries can thus be estimated and compared with welfare losses from the exporting countries. A dynamic of consumers and exporters’ decisions could also be considered in the model framework used in this paper. Consumers’ response also can better be modelled by incorporating their dynamic behaviour, since their current purchase decisions are typically influenced on their perception of product quality and safety that is characterized through repeated purchases”.

Strengths and weaknesses of the methodology used

The advantage of empirical analysis based on a gravity model includes the ability to examine the relationship between policy variables and bilateral trade flows where cross-sectional or panel data is available. In contrast, a gravity model is not suitable for obtaining separate estimates of the effect of standards on compliance costs of firms in meeting a particular standard or on consumers’ demand schedules. Furthermore, a gravity model cannot be used to identify the demand, supply and welfare effects of standards.

Additionally, trade diversion effects are not accounted for in this model. Also, this simulation does not consider African countries’ potential benefits from compliance. If African countries are able to comply with the European standards, liver cancer deaths of African population would decrease as well, which would offset the export losses.
Nutritional label plays an important role in providing the relevant nutrition information to consumers. Inclusion of a nutritional label on food items may be an important packaging decision for the Sri Lankan food processors. Hence, a study was conducted with a view of identifying the market for nutritional labelling and the factors that influence the consumer willingness-to-pay for nutritional labelling. Data were collected from a random sample of 90 consumers selected from three supermarkets - Dhanasiri, Cargill's Food City and Royal Garden Mall - located in Kandy. Market for nutritional labelling were identified by exploring data and a logit method of analysis was performed to identify the factors that influence the willingness-to-pay for nutritional information on food items. A significantly greater proportion of individuals in the age category 36 to 50 years, individuals with tertiary education, individuals with special dietary status and households with less than four members were willing to pay more for the nutritional labels. Logit analysis showed that gender, level of education and special dietary status have a significant positive effect and the household size has a significant negative effect on the willingness to pay for nutrition information. Accordingly, it could be stated that incorporation of a nutritional panel in the package would enhance the demand for food products and it would be an appropriate strategic task for the local food processors.

Position in the analytical framework
Question: What is consumers’ willingness to pay for quality?
Stakeholder: Consumers

Background and context of the study
In Sri Lanka, inclusion of a nutritional label is not a legal requirement, hence; many products enter the market without a nutritional label. Given the liberalized environment in Sri Lanka, local food producers face immense competition from the imported products and from the products of multinational companies that have nutritional labels. Consumers have a better selection for their money. Therefore, it is imperative to study the impact of nutritional labelling on consumer buying behaviour. Accordingly, local producers can decide whether they should put a nutritional label on their product or not.

Goals and Objectives of the study
This study is conducted with the objectives of identifying the market for nutritional labelling on food products (objects, objectives, occasions and occupants) and the factors that influence the willingness to pay for nutritional labelling on food items.

Quality assurance or certification scheme addressed in the study
This study focuses on nutritional labelling of food items.

Scope and coverage of the study
The empirical analysis of this study is based upon a regional sample of consumers only; consumers from supermarkets located in Kandy.

Dataset(s) used in the study
A random sample of 90 consumers was selected from three supermarkets - Dhanasiri, Cargill's Food City and Royal Garden Mall - located in Kandy. Primary data were collected from these customers by means of a questionnaire. The questionnaire was designed to address the knowledge and attitudes toward diet, health, and nutrition labels. It consisted of several questions pertaining to the consumer’s awareness on nutritional label information, the effect of nutrition
labelling on buying decisions and willingness to pay for nutrition label information. Respondents were contacted at random while entering the supermarket’s food sales section.

<table>
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<tr>
<th>Methodology, or methodologies used</th>
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<tr>
<td>In order to identify the market for nutritional labelling on food products, descriptive statistics have been used for examining the relation between nutrition label use and individual characteristics such as sex, age, education, household size, special diet status and monthly income and individuals’ attitudes towards and knowledge of diet, health and nutrition labels.</td>
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<tr>
<td>In order to determine the factors that influence the willingness to pay for nutritional labelling on food items, a dummy indicating whether consumers are willing to pay a premium is modelled as a function of gender, age, education, household size, special diet status and monthly income. The logit regression analysis technique is selected as the analytical technique for estimating this empirical model.</td>
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<tr>
<th>Conclusions and recommendations of the study</th>
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<td>The descriptive analysis enables the researchers to identify the market for nutritional labelled food with regards to ‘what does the market buy’, ‘why does the market buy’, ‘when does the market buy’ and ‘how does the market buy’.</td>
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<tr>
<td>The results of the logit regression analysis of the WTP equation show the factors influencing consumers’ willingness to pay for nutritional labelled food.</td>
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<tr>
<th>Strengths and weaknesses of the methodology used</th>
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<td>The main weakness concerns the shortcoming of the logit regression analysis of the WTP as presented in this study is that it only analyses the question whether a consumer would be willing to pay an additional amount for nutritional labelled food. From this methodology, it does not become clear how much consumers are willing to pay extra for nutritional labelled food.</td>
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</table>
Title: Food quality and safety – consumer perception and public health concern  
Publication date: 2005  
Journal: Food Control 16  
Publisher: Elsevier Ltd  
Number of pages: 649-655  
Availability, URL:  
Contact details authors: aroehr@nutrfoodsc.uni-kiel.de, sdrusch@foodtech.uni-kiel.de.

Abstract  
Food safety has become an important food quality attribute within the last decade. In 2002, we conducted a consumer survey with 449 subjects in Kiel to determine actual consumer perceptions to food quality and safety. We compared these data with our former consumer surveys in Kiel. Over the past decade food quality is perceived to have improved. Regarding to food related health risks, the feeling of uncertainty appears to have decreased. With respect to the willingness to pay for food safety, two segments of consumers emerged, i.e. price-sensitive and safety-sensitive consumers. Food manufacturers have gained credibility from 1997 to 2002 although still on a low level. They should communicate actively their food safety initiatives as part of their ethical and social responsibility.

Position in the analytical framework  
Question: 1. What is consumers' willingness to pay for quality?  
2. How effective are quality labels in influencing consumer perceptions/ behaviour?  
Stakeholders: Consumers

Background and context of the study  
In Germany recently the so-called “QS” label for meat and meat products has been launched. The aim of QS is to install a system for quality management and control which covers all stages from birth through to slaughtering, cutting and processing and including transportation and storage of meat and meat products and to regain the confidence of consumers over the long term. As Powell (2000) states, it is essential for risk managers to communicate that they are reducing or mitigating a particular risk, but they also have to make sure that actions match their words.  
Due to the measures taken by public authorities and the industry, it is postulated that consumers trust in food safety has increased within the last years. The aim of the present study is to determine whether consumer perceptions of food quality and safety reflect these developments.

Goals and Objectives of the study  
The objective of this study is to determine actual consumer perceptions to food quality and food safety.

Quality assurance or certification scheme addressed in the study  
This study does not address one quality assurance or certification scheme in particular. Instead, it focuses on all measures in general taken by public authorities and industry aiming at mitigating or reducing a particular risk.

Scope and coverage of the study  
The study presents the results of a consumer survey conducted in Kiel (Germany) in 2002.

Dataset(s) used in the study  
The data used in this study is gathered through a survey conducted in Kiel (Germany) in 2002. The sample consisted of 449 persons. The survey consisted of 16 questions divided into four parts:  
1. perception of food quality (in terms of purchase criteria)  
2. perception of food safety and health risks,  
3. attitudes belonging to food safety (stated willingness to pay)  
4. attitudes towards communicators of food safety.

Methodology, or methodologies used  
The results of part 1, 2, and 3, on the criteria that play an important role in the purchase of food, the perception of food safety and health risks, and attitudes towards credibility of different
communicators, were analysed using a descriptive analysis of the survey results. With respect to the willingness to pay question, first, a descriptive analysis was performed in order to analyse the price premium (in percentages) that consumers were willing to pay for increased safety of apples, beef and eggs. Then a factor analysis was performed on the purchase criteria. Three main factors were found: price, safety and appearance. Then the correlation was examined between these factors and the willingness to pay for safety. Finally, correlation analysis was performed to determine the prevailing attitudes of price- and safety-sensitive consumers.

**Conclusions and recommendations of the study**

The results of the comparative analysis give an indication of consumers’ purchase criteria with respect to food in general and eggs, beef and apples in particular, of the consumers’ perception of food safety and health risks in 2002 and 1997, the stated willingness to pay for improved safety and their attitudes towards the credibility of communicators of food safety.

The results of the factor analysis and correlation analysis give an indication of the relationship between the willingness to pay and the consumers’ purchase criteria. The findings show that consumers how attach a higher value to safety (safety-sensitive consumers), are willing to pay a higher premium for increased food safety. Consumers how attach a higher value to price (price-sensitive consumers), are less willing to pay a premium for increased food safety.

**Strengths and weaknesses of the methodology used**

The main strength of the method is the usage of a longitudinal survey that allows comparisons along time. However, the article does not address one QA scheme or CS scheme in particular. The analysis is descriptive only and based upon consumers perceptions. Finally, the criteria are predetermined.
Abstract
Food safety scares have led to loss of consumer confidence in the quality and safety of beef products in Europe. To counteract such concerns, firms and regulators can use brands or labels to signal quality. Using data from mail surveys in France, Germany, and the United Kingdom, we analyze consumer preferences for alternative beef labelling strategies: brands, origin labels, and mandatory labelling of beef from cattle fed genetically modified feed. The analysis suggests that consumers place more importance on labels of origin as opposed to private brands. More than 90% of surveyed consumers wanted a mandatory labelling program for beef produced from cattle fed genetically modified crops.

Position in the analytical framework
Question: What are consumers’ preferences toward alternative labelling strategies?
Stakeholder: Consumers

Background and context of the study
Recent food safety scares demand new actions on the part of beef producers and regulators to maintain and restore consumer confidence. The EU has recently enacted mandatory labelling of meats to indicate place of slaughtering and processing and production (Regulation 1760/2000/EC). In the UK, the BSE crisis has encouraged the creation of grocery-store specific beef labels and the cooperation of actors along the production chain. Lusk (2001) has recently analyzed the potential of transforming beef from a “generic” into a quality-differentiated product. In that context, the objective of this article is to assess the ability of such branding and labelling initiatives to enhance consumers’ trust in meat products.

Goals and Objectives of the study
In particular, the objective of this study is to analyse the effectiveness of two existing labelling approaches—private brands and labels of origin. In addition, demand for mandatory labelling of beef from cattle fed GM crops is estimated.

Quality assurance or certification scheme addressed in the study
In this study, three types of labels are considered:
1. A brand signalling on behalf of an individual firm and not accredited by a third party nor by government,
2. A label indicating origin of the product, signalling that the producer belongs to a regional collective, and thereby conveying some indication as to product and process characteristics,
3. A mandatory label for beef from cattle fed GM crops, signalling process (but not product) characteristics and certified by a government agency.

Scope and coverage of the study
This paper reports the empirical results of a mail survey conducted among beef consumers in France, Germany, and the UK.

Dataset(s) used in the study
A mail survey was developed and mailed to randomly drawn samples of 1,000 consumers in France, Germany, and the UK in the Spring of 2000. The instrument included questions on demographic characteristics, meat consumption habits, beef attributes considered in purchasing decisions, and concern about different food safety issues and food production technologies. In the first section consumers were asked to indicate the importance of several factors including brand
and product origin in their beef steak purchasing decision. Other factors included in the analysis were steak marbling (intramuscular fat content), colour, external fat, and price. To illustrate the marbling attribute pictures were included of steaks with various degrees of marbling. Consumers were asked to indicate on a Likert scale how important (1_not important, 5_very important) each factor was in their purchasing decision. Additionally, consumers were asked to indicate, on a scale from one to five, how concerned they were about the following food safety issues: bacterial contamination, food spoilage, pesticides, additives, antibiotics, irradiation, hormones, and biotechnology/genetic engineering. Questions in the second section of the survey were designed to investigate demand for mandatory labelling of beef from cattle fed GM crops. Using a referendum design with follow-up, consumers were first asked whether they would prefer a mandatory label on beef from cattle fed GM crops if it involved no increase in product price. Then, the follow-up question asked consumers to indicate their preference for mandatory labelling program if it resulted in a 2% increase in beef prices.

Eventually, with some questionnaires not returned or incomplete, the analysis is based on 76, 43, and 105 observations for France, Germany, and the UK, respectively.

**Methodology, or methodologies used**

First, a descriptive analysis is presented of the sample characteristics, consumers’ concerns about food safety issues and importance of factors in the beef purchasing decision. Two factors included were among others the presence of an origin label or a private label.

Then, two ordered probit models were estimated, in order to estimate the importance of 1) a private label and 2) an origin label, in the purchase decision. The importance of both brands were estimated as a function of a dummy indication the country, a variable indicating consumers’ concerns about biologic food safety hazards, consumers’ concern for production technology, gender, age, education and income.

Then, the preferences for the mandatory GM labelling program was analysed using the double-bounded logit framework designed by Hanneman, Loomis, and Kanninen. The independent variables were the same as in the ordered probit models, except for the fact that the price has been added to the model.

**Conclusions and recommendations of the study**

In this study, the relative importance that consumers place on private brands and origin labels in France, Germany, and the UK were estimated. Results suggest that consumers place a higher level of importance on information about the origin of a product than on private brands. Additionally, consumer demand for mandatory GM labelling for beef from cattle fed GM crops is estimated. The level of consumers’ concerns about biologic food safety hazards and production technology seem to play an important role in their demand for the three different labels.

**Strengths and weaknesses of the methodology used**

**Strengths** Some interesting questions asked, but no underlying theory to generate hard hypotheses.

**Weaknesses** Without underlying theory, the results remain descriptive of the samples rather than generalisable to consumers at large. Implicit response rate is low. Interesting opportunities to test whether responses differ between the 3 countries were not exploited, although this could have easily been done in the framework used. The very significant intercept dummies for countries in the ordered probit suggest that slope parameters could also have been different, but this was not allowed for or tested. A framework in which errors can be correlated across equations/opinions/choices would have improved estimation.
**Title:** The impact of labelling practices on perceived quality of GM food products: a revealed preferences approach  
**Authors:** Sara Scatasta, Justus Wesseler and Jill Hobbs  
**Publication date:** 2005  
**Journal:** Paper prepared for presentation at the 99th seminar of the EAAE, Copenhagen, Denmark, August 24-27, 2005  
**Publisher:**  
**Number of pages:**  
**Availability, URL:** [http://www.eaae2005.dk/CONTRIBUTED_PAPERS/S1_656_Scatasta_etal.pdf](http://www.eaae2005.dk/CONTRIBUTED_PAPERS/S1_656_Scatasta_etal.pdf)  
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### Abstract

This paper contributes to the ongoing discussion about the impact of different labelling practices on the quality of genetically modified (GM) food products as perceived by the consumer. Thus far, many studies have adopted a stated preferences approach, finding that consumers have different willingness to pay for GM and non-GM products. Yet there is a lack of empirical studies adopting a revealed preference approach. This paper offers an empirically tractable theoretical model that can be used easily to investigate the impact of GM labeling practices on the perceived quality of GM food products, making use of market data.

### Position in the analytical framework

**Question:** Does the kind of labelling influence consumers’ perceptions of quality or behaviour?  
**Stakeholders:** Consumers

### Background and context of the study

Policymakers have been faced with the conundrum of how to handle diverse consumer preferences towards GM technology in an environment of uncertainty. As a result, different labelling policies have emerged. The European Union (EU) requires mandatory labelling of food containing more than 0.9% GM content, while the US instead has rules for voluntary labelling of non-GM food.

Consumer perceptions of GM food quality, the divergence in GM labelling policies, and the likely consumer response to different types of GM/Non-GM labels have become important topics for policy makers and have generated a plethora of research studies. Several studies have provided a qualitative analysis of the impact of different labelling practices on the quality of GM food products as perceived by the consumer. Empirically, many studies have adopted the stated preferences approach (SPA), finding that consumers have a positive willingness to pay (WTP) for non-GM food products of GM food.

Stated preference analyses have been heavily criticized due to potential shortcomings with the associated contingent valuation methodology (Carson et al., 2001). Noussair et al. (2002) note that there is usually a large difference between stated and revealed purchasing behaviour. Yet there is a lack of empirical studies adopting a revealed preference approach (RPA) for GM labelled food products.

### Goals and Objectives of the study

The objective of this study is to investigate the impact of GM labelling practices on the perceived quality of GM food products.

### Quality assurance or certification scheme addressed in the study

The certification schemes addressed in this study are the certification schemes of GM and non-GM products.

### Scope and coverage of the study

In order to investigate the impact of GM labelling on the perceived quality of GM food products, the consumer demand and willingness-to-pay are calculated for different US soymilks. The soymilks differ in both variety as well as in that some are labelled GM-free and others not. In this study, the impact of GM labelling on perceived quality of GM products is analysed by focussing on three questions:

1. Is it possible that the introduction of a label identifying the lower quality product may impact consumer welfare differently than a label identifying the higher quality product?
(2) Under what conditions will the introduction of a label identifying GM-free soymilk have the greatest positive impact on consumer welfare?

(3) How do consumers’ perceptions of quality and consumers’ interest in variety shape the effects of GM labelling on consumer welfare and do we need information on both dimensions of consumer preferences?

**Dataset(s) used in the study**

In this study, a theoretical model is constructed which is simulated assuming different alternative levels of quality perception and different values for the relevant parameters. The model is simulated for different labelling policies. Therefore, no specific data set is used.

**Methodology, or methodologies used**

In this paper, an empirically tractable theoretical model is developed, based on a RPA. The model explicitly incorporates the complexities of horizontal (quality levels) and vertical (varieties) differentiation that characterize food markets in a world with GM technology. The theoretical model starts with an expression of the C.E.S. utility function which expresses the consumer’s utility derived from consuming different varieties and quality levels. From this utility function, the consumers’ willingness-to-pay for a product with different quality levels and different varieties can be expressed as a function of the quality levels and the price levels of each variety. From the WTP expression, the relative demand function is expressed as a function of relative quality and prices.

The C.E.S. utility (as a measure of welfare), the demand and WTP equations are estimated using simulation analysis. As US soymilk is highly differentiated, both vertically as well as horizontally, US soymilk is used for the simulation analysis. Using different perceived quality ratio’s of GM and GM-free and assuming the same prices, four different cases are simulated: (1) strong preference for variety and label on all GM-free products, (2) weak preference for variety and label of all GM-free products, (3) strong preference for variety and label only on chocolate GM-free products and (4) weak preference for variety and label only of chocolate GM-free products. By doing so, different labelling policies are analysed.

**Conclusions and recommendations of the study**

The theoretically-consistent empirical model introduced in this model has been successful in analysing to what extent consumer perception of quality determines the direction of the impacts of the introduction of GM labels on consumer welfare and producer market share. Secondly, the different scenarios have shown that positive and negative labelling can have different impacts on consumer welfare. In addition, results are generated with respect to the extent to which consumer interests in variety are influencing the size of those impacts.

The results imply that knowing ex-ante consumers’ perceptions of the quality of GM-free products relative to GM products through contingent valuation studies, and a measure of consumers’ interest in having variety in a specific market, may help regulators to forecast impacts of different labelling schemes on producer welfare. Another way of thinking about the results is that knowing the consumers’ preferences for variety might help GM producers to make a decision on whether to introduce a GM label by introducing new flavours that are not available as GM-free.

**Strengths and weaknesses of the methodology used**

A strength of this theoretically-consistent empirical model is that it is able to analyse the extent to which consumer perception of quality and preferences for variety determines the direction and size of the impact of the introduction of GM labels. In addition, it allows for simulating different cases, e.g. different labelling policies.

In addition, the proposed empirical model can be extended to include other components of horizontal differentiation, such as place of origin.

One weakness is that modeling without revealed preference market data, the complex interaction of consumer perceptions with respect to GM food might be unrealistic.
Title: What makes consumers pay more for national brands than for store brands – image or quality?
Authors: Raj Sethuraman
Publication date: 2001
Journal: Review of Marketing Science WP No. 318
Publisher: Number of pages: 37
Contact details authors: rsethura@mail.cox.smu.edu

Abstract
Private labels or store brands have become a major force to reckon with in grocery products. They account for over one-fifth of total volume sales in the United States and are growing faster than national brands. Generally, prices of national brands are higher than store brand prices. Therefore, a consumer would purchase the national brand (store brand) if the premium s/he is willing to pay for the national brand over the store brand is more (less) than the actual price differential between the two brands. Thus our understanding of why some consumers purchase national brands and others purchase store brands would be enhanced by gaining insights into why consumers are willing to pay a price premium for national brands over store brands. In this study, I attempt to understand why consumers are willing to pay a higher price for national brands than for store brands in grocery products. Is it because of perceived quality differential or non-quality utility? Non-quality utility is defined as the price premium that consumers would pay for a national brand over a store brand even when they perceive the quality of the two brands to be the same. The utility arises from positive brand image, brand associations, or brand equity. The study draws upon a general utility framework and develops an econometric model for separating the total price premium that consumers are willing to pay into three components – perceived quality differential, quality sensitivity, and non-quality utility. The econometric model is estimated using a survey that collected information on what consumers reported that they are willing to pay for national brands vs. store brands. The paper also discusses several other finding and their implications for segmentation and promotion strategies for both manufacturers and retailers.

Position in the analytical framework
Question: What makes consumers pay more for national brands than for store brands?
Stakeholder: Consumers

Background and context of the study
It has been traditionally believed that national brands are of relatively higher quality than store brands. So, an obvious answer to why consumers pay more for national brands is that consumers perceive the national brands to be higher in quality. Recently, however, retailers have given greater importance to quality of store brands and have attempted to close the quality gap. For instance, in a 1991 Gallup survey, 67% of consumers (up from 42% in 1984) reported that "store brand items usually perform as well or taste as good as nationally advertised brands". The PLMA website reports that in a more recent (1999) Gallup study, 75% of consumers ascribed the same level of product quality to national brands and store brands. Yet, national brands continue to command some premium even in commodity products (e.g., milk, flour) suggesting that consumers derive utility from the national brand beyond what is dictated by quality. Thus the premium consumers are willing to pay for national brands over store brands can arise from three sources:
(i) Consumers may believe that there is a quality difference between national brand and store brand that warrants payment of a higher price for national brand
(ii) Consumers may not necessarily feel that quality difference is high, but they may be very sensitive to quality changes and so they are willing to pay a higher price for national brand.
(iii) Consumers may believe that there is little difference in quality between national brand and store brand on average, but may still want to pay a higher price for national brand simply because of their familiarity, imagery or other positive associations with national brands that go beyond quality perceptions.
These three possibilities provide the motivation for this paper.

Goals and Objectives of the study
The objective of this study is to analyse why consumers pay a premium for national brands over store brands.
### Scope and coverage of the study

In the first section of the study, the econometric model is constructed which is based upon the basic utility framework. After describing the data, this econometric model is empirically estimated using data from 132 households on 20 grocery products.

### Dataset(s) used in the study

Data on perceived quality differential and premium willing to pay for national brands were obtained by directly asking consumers through a survey. The researchers stated to the consumers that the quality of the national brand is 100 and asked them to rate the quality of the store brand on a scale between 0 and 200 with intervals of 10. The quality differential is then calculated as the difference between 100 and the stated rate by the consumer. Data on the price differential (premium) is measured in the same way.

A sample of 350 randomly selected households from a medium-sized metropolitan area received the questionnaire. They were asked to provide their perception of quality differential and premium willing to pay for 20 grocery products. Demographic information was collected as well. Eventually, 132 completed questionnaires were used for the empirical analysis.

### Methodology, or methodologies used

The econometric model used in this study is derived from the basic utility framework. In this framework, consumers’ utility derived from a certain brand is expressed as a function of their quality sensitivity, the quality of the product, and a constant representing non-quality utility. It is assumed that a consumer will only buy the national brand if the utility differential between the national and store brand is higher than the price differential. From this, the price premium is expressed as a function of non-quality utility differential and quality-based utility differential (which equals quality sensitivity * quality differential). This latter expression forms the basis of the econometric model.

In order to analyse which factors play an important role in the consumers’ decision of how much premium to pay for a national brand, the following final econometric model is constructed: the price premium paid by each consumer for each product is regressed upon a consumer dummy, a product dummy, a consumer dummy * the perceived quality differential and a product dummy * the perceived quality differential. This equation is estimated in two steps using linear regression techniques:

- **Step 1:** the price premium is estimated as a function of the consumer dummy, the consumer dummy * the perceived quality differential, and a residual.
- **Step 2:** the residuals from the first step are regressed upon the product dummy and the product dummy * the perceived quality differential.

By doing so, the 264 consumer parameters and 40 product parameters are estimated. The quality sensitivity parameters are calculated as the sum of the estimated parameters for 1) the consumer dummy * the perceived quality differential and 2) the product dummy * the perceived quality differential. This quality sensitivity parameter measures the average increase in the percentage premium consumers are willing to pay for national brands over store brands for a 1% increase in perceived quality differential across categories. The non-quality utility constant is calculated as the sum of the parameters of 1) the consumer dummy and 2) the product dummy.

Now that the quality sensitivity parameters and non-quality utility constant are known, the price premium (as indicated by the consumers) is decomposed into three parts: quality sensitivity, quality differential (as indicated by the consumers) and non-quality utility. This allows for an analysis of the importance of each ‘attribute’ in determining the price premium that consumers would be willing to pay.

In order to assess the influence of demographic characteristics on the role of the different premium components, four other regression models were estimated: the non-quality utility, as well as the quality sensitivity, quality differential and the price premium were all estimated as a function of the type of product, age, income, gender, education and family size, using ordinary least squares.

After having obtained predictions (per consumer, per product) on the non-quality utility and quality sensitivity, they are combined with the stated quality differential and premium and compared for different types of consumer groups (exclusive national brand consumers, consumers of which national brands represented over 50% of total purchases and consumers of which national brands represented less than 50% of total purchases). This allows for an analysis of which factors play an
important role in a consumer deciding whether or not the purchase a store brand.

In order to compute national brand equity, the objective quality differential measure (obtained from Hoch and Banerji (1993) and which appeared to have a strong positive correlation with the perceived quality differential) was used. National brand equity is calculated for each product category as the sum of quality-based equity and non-quality-based equity. Quality-based equity is measured as the difference between (perceived and objective quality differential)*quality sensitivity. Non-quality-based brand equity is measured by the non-quality utility.

**Conclusions and recommendations of the study**

The two-step estimation results of the price premium, indicate the extent to which the premium each consumer is willing to pay for national brands over store brands for each product category, is depending upon their quality sensitivity, their indicated quality differential and other (non-quality) utility. The findings indicate that a substantial portion of the premium consumers are willing to pay for national brands over store brands would be paid even when the perceived quality differential between the two brands is small or zero.

In addition, the results of the four additional regressions enable the analysis of how demographic characteristics influence the importance of each of these three components in the determination of the price premium.

When comparing different consumer groups (based upon their buying behaviour), the results indicate that perceived quality differential is the major factor in a consumer deciding whether or not to consider purchasing a store brand.

The results of the calculations of brand equity for each product category indicate the proportion of total national brand equity accounted for by quality-based equity and by non-quality-based equity.

**Strengths and weaknesses of the methodology used**

This methodology has some limitations. First, the measure of perceived quality differential and price premium is based on self-report. Secondly, it does not reveal the source of the non-quality utility. Is it reputation, loyalty, experience, or habit? Apart from these reservations about the way the data were collected, and the limits to interpretation of the results, the empirical method used and its underlying theoretical model seem well suited to the research question.
**Title:** Enhancing the financial performance of small meat processors  
**Authors:** John W. Siebert, Rodolfo M. Nayga Jr., Gina C. Thelen and Don Kuker  
**Publication date:** 2000  
**Journal:** International Food and Agribusiness Management Review 3  
**Publisher:** Elsevier Science Inc.  
**Number of pages:** 269-280  
**Availability, URL:**  
**Contact details authors:** j-siebert@tamu.edu, rnayga@tamu.edu

**Abstract**  
The small firms examined produce meats in the State of Texas and emphasize such products as sausage, jerky, brisket, and fresh meats. The authors test hypotheses with the intent to identify operational factors associated with firm financial success. A quartile model and an econometric model are both used for this purpose. Results generally suggest important factors for firms to be profitable include product selection, pricing strategies, special equipment, and location.

**Position in the analytical framework**  
**Question:** Do QA and certification schemes improve profitability?  
**Stakeholders:** Processors

**Background and context of the study**  
IBP and other large meat processors are now placing increased emphasis on value-added sales to both food service and retail. In this environment, smaller processors, most of whom have long emphasized value-added, must adjust their strategies to succeed. As a decision aid, economic research pertaining to the meat industry is of little help. This is because the literature has focused on industrial organization issues such as economies of scale, industry concentration, and the competitive nature of livestock markets. Past economic research has generally not focused on further processing opportunities nor on the strategies smaller processors might adopt to enhance profitability.

**Goals and Objectives of the study**  
The objective of this study is to identify operational factors associated with firm financial success.

**Quality assurance or certification scheme addressed in the study**  
The main objective of this study is not to explicitly address a particular quality assurance or certification scheme. However, in the empirical analysis presented in this paper, compliance with the HACCP standards is tested for being a significant determinant of a firm’s financial success.

**Scope and coverage of the study**  
In order to achieve the objective of this study, this paper presents the results of an empirical study on Texan meat processors.

**Dataset(s) used in the study**  
The data were gathered in the winter of 1999 by surveying firms belonging to the Southwest Meat Association, the Texas Association of Meat Processors, and also firms simply listed as being inspected by either a federal or a state inspection agency. Questionnaires were faxed to 137 firms of which 65 firms completed all questionnaire information in full for an effective response rate of 47%.

The key information collected in the surveys can be organized into four groups identified as sales, location, facility, and financial. The sales group includes the number of different products made by the firm, the percentage of sales made at the store location, as opposed to those made off-site, the percentage of sales by type of product, such as sausage, jerky, fresh meat, wild game, and other, and a dummy variable indicating advertising in excess of $15,000 per year. The location group variables include those pertaining to the manufacturing plant site. These are a downtown, industrial park, shopping centre, and rural area dummy, a dummy variable indicating a sales radius exceeding 100 miles, a dummy variable indicating all sales are within the State of Texas, and the percentage of off-site sales made by the manufacturer’s own trucks as opposed to outside
distributors. The facility group includes a dummy variable indicating the firm's manufacturing plant is over 25 years old, the number of employees, a dummy variable indicating the owner works over 50 hours per week, the cost, in cents per pound, for firm compliance with the new USDA Hazard Analysis at Critical Control Points regulation, the square footage of the retail store and a dummy variable indicating the presence of a restaurant. The last variable group pertains to financial performance. These variables include the net book value of firm assets, the firm's annual dollar sales volume, the firm's annual profit, profits divided by sales (return on sales), and profits divided by assets.

Methodology, or methodologies used

First, quartile analysis is conducted. The entire sample of firms is sub-divided into three groups on the basis of their return on sales. The mean values of all variables are calculated for each group in order to allow for a comparison. Based on these results, several hypotheses were defined with respect to the relation between firms' profitability and some operational factors. Secondly, the total sample is divided differently, on the basis of the return on assets. Again, several hypotheses were defined based on these results.

In order to test the hypotheses and to understand the relationships between, sales, profits, and other variables, four different general linear econometric models were used. Sales, profits, return on assets and return to sales were all estimated as a function of all the variables. The general linear models were estimated using the SHAZAM ordinary least squares regression program.

Conclusions and recommendations of the study

The quartile analysis used in this study resulted in some hypotheses with respect to the relation between profitability and some operational factors. These hypotheses were tested using general linear firm profitability. The variable included accounting for the costs associated with the compliance with the HACCP standards appeared to have no significant impact on firm profitability.

Strengths and weaknesses of the methodology used

Strength

- Because 19 other variables (apart from the accreditation to HACCP) are controlled for in the multiple regression, the analytical framework is less subject to the criticism that differences in performance might be due to factors other than HACCP.

Weaknesses

- The main weakness is linked to the fact that there is no theory underlying these single-equation models. It is just an ad hoc analysis of correlation that is not linked to a theoretical approach that could help in the selection of variables.
- Statistical significance is limited by the size of the sample: 65 firms.
Title: Eco-labelling consequences in general equilibrium: a graphical assessment  
Authors: Stephen K. Swallow and Roger A. Sedjo  
Publication date: 2000  
Journal: Land Economics 76(1)  
Publisher:  
Number of pages: 28-36  
Availability, URL:  
Contact details authors: Swallow@uri.edu, sedjo@rff.org

Abstract  
International environmental groups propose to implement new standards of forest management through programs that certify producers who meet criteria to enhance biodiversity or sustainability. These producers could earn an “eco-label” that identifies their products for consumers. We consider whether a market economy might generate feedbacks that produce undesirable side effects as consumers respond to price changes. While the general case is ambiguous, the theoretical framework shows the potential that certification may lead to a reallocation of land towards less ecologically sustainable uses, with the possibility of sufficient impact to diminish global biodiversity or sustainability of forest products.

Position in the analytical framework  
Question: What are the types of benefits and costs of QA and certification schemes?  
Stakeholders: environment

Background and context of the study  
Concern over the condition of the world’s forests has lead to proposals for new standards of sustainable forest management. One significant set of proposals concerns “eco-labels” which inform consumers of whether final wood products derive from forests that are managed according to certifiable standards promoting sustainability or biodiversity protection. These proposals involve the certification of forest management practices and the monitoring of on-the-ground performance of individual producers. Certification procedures would be implemented and monitored by a third party, such as affiliates of the Forest Stewardship Council, so that consumers could confidently identify and reward producers who adopt sustainable or ecologically friendly production practices. While certification may improve the environmental sensitivity of firm-level or forest-level operations, little economic analysis exists to identify whether certification might generate market feedbacks with additional positive consequences or overlooked negative consequences for ecosystem health.

Goals and Objectives of the study  
The objective of this study is to analyse whether ecosystem quality, on a broad regional or global scale, will necessarily improve after the economy adjusts sources of supply to the demands generated by the implementation of eco-labelling.

Quality assurance or certification scheme addressed in the study  
The certification scheme addressed in this study is the eco-labelling scheme, which informs consumers of whether final wood products derive from forests that are managed according to certifiable standards promoting sustainability or biodiversity protection.

Scope and coverage of the study  
In order to achieve the objective of this study, this paper will present a conceptual/theoretical analysis only.

Dataset(s) used in the study  
As this paper only presents a conceptual/theoretical analysis, no specific data has been used.

Methodology, or methodologies used  
A simple model of a competitive economy with two products, wood and ‘all other goods’, produced through the use of a single input, land, establishes the main conceptual points of the
theoretical model developed in this study. Market demand is assumed to depend on the prices of both goods, and the demand for wood also depends on consumers’ response to the certification program (which is assumed to be mandatory).

Using a graphical analysis, the researchers first show the partial equilibrium effects of the introduction of an eco-label, which segregates aggregate demand into the demand from eco-consumers and the demand from consumers who are indifferent between certified and non-certified wood. As a response, aggregate supply, in case of the eco-label, is segregated into supply to eco-consumers and supply to indifferent consumers. The graphical representation shows that the aggregate quantity consumed increases only if consumption by eco-consumers increases and that increase is sufficient to offset the price-induced decline in consumption by non-eco-consumers.

Proponents of certification might argue that a decline in aggregate consumption, if it occurs, will reflect a less intensive use of existing forest land and thereby increase ecosystem qualities. However, this decline in aggregate consumption overlooks such general equilibrium effects as the possible withdrawal of land could generate some negative impacts on regional ecosystems if land is allocated for production of other goods. In order to assess these ‘allocation’ impacts, the researchers employed a general equilibrium model.

In the general equilibrium model, demand for all other goods is segregated into the demand of eco-consumers and the demand of non-eco consumers. Again, using graphical analysis, the impacts of the introduction of the eco-label are analysed. As the introduction of the eco-label will increase the price of wood, non-eco consumers will substitute toward other goods. However, eco-consumers respond to opposing considerations: (1) since mandatory certification implies higher utility from wood consumption, eco-consumers have an incentive to reallocate expenditures toward wood and way from other goods; and (2) since the price for wood is increasing, eco-consumers have an incentive to substitute back toward all other goods. The final outcome will alter the derived demand for land as an input to production in either or both sectors and leads to indeterminate effects on the allocation of land between forestry and other goods.

Conclusions and recommendations of the study

The graphical assessment presented in this paper of the impacts of the introduction of eco-labels on demand, supply and derived demand for land shows that market changes from certification will not exclusively lead to large-scale ecological improvement. It raises the possibility that eco-labelling instigates market feedbacks that cause the economy to reallocate land from forestry, or from ‘idle’ land, to production of other goods. The example shows that empirical research, from ecologists and economists is needed to determine whether the improved ecological quality of land retained under certified forestry offsets any potential loss of global ecological quality due to land reallocation.

Strengths and weaknesses of the methodology used

Evaluation: A GE framework is needed to address this question. On a theoretical level, conclusions in the general case remain ambiguous, suggesting the need for empirical work if the question is to be answered accurately. The graphical model consists of a suite of market (supply and demand) diagrams. Presumably, it could be made empirical, although the data requirements would be considerable.
Abstract
Cost/benefit analysis justifies regulations altering the amount of health-related information presented to consumers. The current method of benefit analysis, the cost of avoided illness, is limited; it assumes the benefits of health-related information are adequately represented by changes in illnesses. The manuscript develops a benefit estimation method to measure the welfare impacts of providing nutrient information. Nutrient labeling significantly affects purchase behavior but may not lead to increased consumption of healthy foods. Nutrient labeling may increase welfare without any change in health risk. Thus, the cost of avoided illness approach can underestimate the social benefits of providing nutrient information.

Position in the analytical framework
Question: What are the welfare benefits from QA and certification schemes? How effective are quality labels in influencing consumer perceptions/behaviour?
Stakeholders: Consumers

Background and context of the study
Policy makers are often required to use cost/benefit analysis to justify regulations that alter the amount of health-related information presented to consumers. Currently, the method used to estimate the social benefits of a change in health-related information on a food label is a "cost of avoided illness" approach. However, this approach to the measurement of social benefits is often misleading and does not generally equal the more accepted willingness-to-pay concepts. First, because these medical costs do not adequately capture an individual's welfare losses due to illness, since there is direct disutility from illness. Additionally, this measure is not based on individuals' preferences for risk taking and does not reflect their ex ante welfare gains from being able to adjust their behaviour optimally. Better nutritional information will cause changes in demand for products and increases in welfare even though it may not always cause a backwards shift in all risk increasing foods nor even a positive change in health status. Therefore, in our treatment of the problem, nutritional information is valuable to individuals because it allows them to increase utility, where utility is a function of both health risks incurred and taste preferences for different varieties and types of food products. With this idea in mind, we will try to estimate the welfare effects of changing health-related information.

Goals and Objectives of the study
The objective of this study is to estimate the welfare effects of changing health-related information. This study aims at capturing the effects of providing simplified nutrient information on consumer purchase behaviour and measuring the impacts on consumers' welfare.

Quality assurance or certification scheme addressed in the study
The certification scheme addressed in this study is nutrient labelling of food products.

Scope and coverage of the study
In order to achieve the study's objective, this paper will focus on analysing changes in food purchases behaviour that took place in the late 1980s in the context of an experimental nutrition-labelling program. In this experiment, 25 shops participated, of which 13 were designated as the treatment group, with the remaining 12 designated as the control group. During 1986 and 1988, both groups introduced shelf tags to provide information about the product. However, in the control group, this information only concerned unit and price, while in the treatment group nutritional information was provided as well.

Dataset(s) used in the study
In this study, monthly scanner data on sales, prices and promotional data are used at the product level (approximately 11,600 products from over 100 food categories) for all participating stores from 1986 to 1988. Additionally, socio-demographic data were obtained from Stop& Shop that collected these data by phone using a random-digit-dial method.
Methodology, or methodologies used

The theoretical framework presented in this study follows the approach introduced by Foster and Just to estimate the welfare effects associated with information about a food contamination incident. It starts from the assumption that an individual's utility is a function of the food of interest, its quality and a numeraire good. The individual chooses the good and the numeraire good to maximize his subjective assessment of expected utility, subject to his income. This results in an expected indirect utility function and finally leads to the expenditure function. The latter one is expressed as a function of the price, the expected (maximized) utility and the quality distribution. Then, assuming imperfect information, the value of information (= costs of ignorance) is expressed as the difference between the Compensating Surplus (= difference between consumption expenditure before and after the change in quality distribution, assuming no change in the quantity of goods purchased) and the Compensating Variation (= difference between consumption expenditure before and after the change in quality distribution, assuming the consumer is aware of the change in quality distribution).

Based on the theoretical framework, the empirical model is constructed. This model is based on Deaton and Muelbauer’s Almost Ideal Demand System, expanded to include information effects and demographic characteristics. The share of household income spent on a particular good is estimated as a function of the extent that label information is available, trend in background knowledge, the mean of consumers’ age and education, an income variable and the price. Each demand system is composed of three equations, one equation for the healthy goods in the food category of interest, one for the unhealthy one and one equation for the spending on all other goods. 6 different food categories are targeted; milk, cream cheese, refried beans, peanut butter, mayonnaise and salad dressing. The non-linear system of equations is estimated by using iterative seemingly unrelated regression. Only two of the three share equations are estimated because the three sum to unity.

Finally, the Value of the Nutritional Labelling program is estimated as the difference between the Compensating Surplus and the Compensating Variation.

Conclusions and recommendations of the study

The results of the estimation of the non-linear system of share equations have been used to calculate the estimated Marshallian Price and Income Elasticities for each of the 6 products for both the healthy and unhealthy version.

In order to assess the effect of the labelling on consumer behaviour, the healthy and unhealthy shares with and without labelling are calculated holding all other variables constant. This enabled the researchers to compare the income shares spent on both categories of the good in both the labelling and non-labelling situation.

The estimates of the Value of Nutrition Information indicate the extent to which consumers value the existence of the label, compared to the situation of no labelling. These estimates are interpreted as the social benefit of the labelling regime, i.e. the consumers’ welfare.

Strengths and weaknesses of the methodology used

A strength of using the theoretical approach of consumer’s expected utility and expenditure functions, and the measure of ‘Value of Nutrition Information’ presented in this study might be the fact that it is able to account for the two possible effects of providing nutrient information on food products; the substitution and the ‘health’ effect. The latter effect arises when consumers reduce their ‘unhealthy’ consumption and increase their ‘healthy’ consumption. The substitution effect occurs when health-related information increases the consumer’s ability to substitute across food categories so as to maintain an overall health risk, while increasing utility associated with other food attributes (e.g. flavour). If this substitution effect is large, then nutrition labelling programmes can have significant welfare effects even if the net consumption of ‘healthy’ products changes little. As a result, cost-of-illness measures can vastly underestimate true welfare gains from information.
Title: Can Eco-labels tune a market? Evidence from dolphin-safe labelling?
Authors: Mario F. Teisl, Brian Roe and Robert L. Hicks
Publication date: 2002
Journal: Journal of Environmental Economics and Management 43
Publisher: Elsevier Science
Number of pages: 339-359
Availability, URL:
Contact details authors: teisl@maine.edu, roe.30@osu.edu, rhicks@vims.edu

Abstract
In this paper we test whether the dolphin-safe labels altered consumer purchases of tuna. We also provide a partial measure of the total welfare effects of the dolphin-safe labelling policy. The results confirm our hypothesis that the dolphin-tuna controversy and the subsequent implementation of dolphin-safe labelling affected consumer behaviour. Further, the paper provides market-based evidence that consumers can respond to eco-labels; the dolphin-safe label increased the market share of canned tuna. The welfare analysis provides a partial measure of society’s willingness to pay to avoid personally contributing to dolphin mortality as a result of tuna fishing.

Position in the analytical framework
Question: What are the welfare benefits from QA and certification schemes?
How effective are quality labels in influencing consumer perceptions/behaviour?
Stakeholder: Consumers

Background and context of the study
In order for eco-labels to achieve policy objectives, consumers must hold preferences for certain environmental amenities and respond to the information presented on eco-labels by altering purchases toward eco-labelled goods. Their widespread use suggests that eco-labelling is perceived as an effective method of altering consumer behaviour. However, although implementation of eco-labels is widespread, research concerning its impact and effectiveness is limited and aggregate quantitative results are rare. Much of the research has measured effectiveness either by identifying changes in consumer awareness after exposure to label information or by asking consumers whether eco-labelling programs would affect their purchase behaviour. However, a change in awareness does not necessarily translate into a change in behaviour and consumers do not necessarily follow their own purchasing assertions. Evaluating the policy effectiveness of eco-labelling programs requires understanding how information affects market behaviour. Evaluating the economic efficiency of labelling programs requires measuring the benefits and costs of such information.

Goals and Objectives of the study
The objective of this study is to measure the policy effectiveness of dolphin-safe labelling of canned tuna and to test whether the dolphin-safe labels altered consumer purchases of tuna. In addition, the aim is to estimate the total welfare effects of the dolphin-safe labelling policy.

Quality assurance or certification scheme addressed in the study
The quality assurance scheme addressed in this study is the Dolphin-Safe labelling policy, which ensures that no dolphins were used to capture tuna.

Scope and coverage of the study
In order to achieve the objective of the study, this paper presents both a theoretical as well as an empirical analysis. The welfare measure used in this study is partial in the sense that it only captures the values of individuals who are canned tuna purchasers. Other individuals may also obtain a welfare gain due to the increased protection of dolphin brought about by the dolphin-safe labelling of tuna.

Dataset(s) used in the study
Market-related information market share, retail-sponsored advertising indices, and share prices was obtained from SCANTRACK scanner data supplied by the A.C. Nielsen Marketing Research Company. The scanner data include monthly sales, price, and retail-support information for all scannable food items in 3000 supermarkets in the United States with at least $2 million in annual
sales (estimated to cover 84% of all supermarket sales). Nielsen then projects the data to provide national estimates for all supermarkets with annual sales of over $2 million. For the analysis, package sizes and prices are converted into standardized 16-oz. equivalent units. The retail-sponsored advertising indices denote the percent of stores in the SCANTRACK data that used a special display, coupon, or advertisement to promote the specific product during the month. This study uses a monthly data series beginning in April 1988 and ending in December 1995.

Information used to construct the media index was obtained using the DIALOG Information Retrieval Service. The newspaper and magazine databases accessed through DIALOG include the full text of all news stories and feature articles in over 60 newspapers and 400 different magazines. The researchers searched the databases for the following keyword combinations: tuna/dolphin, dolphin-safe/tuna, dolphin safe/label. Results of the searches were scanned to eliminate any articles that were deemed inappropriate. The index was constructed as a sum of all articles discussing the tuna/dolphin issues during the relevant time period. Articles were not coded based upon the articles content nor weighted by the prominence of each article within the newspaper/magazine because previous research indicates that these “corrections” do not add additional information. Essentially, the number of negative and positive articles tends to be highly correlated and article prominence is correlated with reporting frequency.

Methodology, or methodologies used
The theoretical model starts with the definition of the consumers’ indirect utility function. The indirect utility is expressed as a function of a vector of environmentally related assessments for m products given a particular information set, a vector of other quality characteristics, a vector of prices and income. The subjectively assessed environmental impact of purchasing a particular product given a particular information set, is expressed as a function of the environmental information displayed about the product at the point of purchase, the consumer’s prior stock of environmental information, and the time the individual devotes to processing the environmental information. Via the construction of the expenditure function, the expression of the compensating variation (CV) is defined. The CV measures the change in individual welfare when the quality of a good changes along with a corresponding change in information about the quality change. In other words, it measures the maximum amount of money an individual is willing to pay (receive) to gain (lose) the better quality, given that he or she knows about the quality change.

The empirical model consists of four expenditure share equations for canned tuna and three substitutes. The expenditure share of each good is estimated as a function of a time trend, the number of newspaper and magazine articles discussing the tuna/dolphin issue, a three month time period after the Sam La Budde video, the diffusion of the label information across the population, the level of retail sponsored advertising, a seasonal indicator, and the price. The model is estimated using Deaton and Muelbauer’s almost ideal demand system (AIDS) using iterated seemingly unrelated regression. The model is estimated using a switching regressions approach, with the announcement of the dolphin-safe tuna-labelling program in April 1990 as the breakpoint, in order to account for a possible parameter shift. By substituting the parameters of the demand system into the CV expression, an estimate is obtained for the value of dolphin-safe labelling for a representative canned tuna user. This CV indicates the average amount of money households would need to be compensated per month if the labelling program had not existed.

Conclusions and recommendations of the study
The results of the AIDS estimation indicate to what extent the behaviour of tuna consumers had changed after the dolphin/tuna controversy and the introduction of the label. The statistical significance of the label coefficient in the tuna share equation indicates that the dolphin-safe label did increase the market share of canned tuna and that this increase continued over time. Additionally, the estimation of the CV, shows the impact the introduction of the label had on the welfare of the consumers.

Strengths and weaknesses of the methodology used
A weakness of using the CV as a welfare measure is that it only captures the values of individuals who are canned tuna purchasers. Other individuals may also obtain a welfare gain due to the increased protection of dolphins brought about by the dolphin-safe labelling of tuna. This gain is not accounted for in the CV measure.
Title: Regional-origin labelling with quality control: an economic analysis
Authors: Stanley R. Thompson, Sven Anders, Roland Herrmann
Publication date: 2005
Journal: Paper prepared for presentation at EAAE Congress, Copenhagen, Denmark, August 24-27, 2005
Publisher:
Number of pages:
Contact details authors: Thompson.51@osu.edu, Sven.Anders@agrar.uni-giessen.de and Roland.Herrmann@agrar.uni-giessen.de

Position in the analytical framework

Question: What are the effects of PDO/PGI certification?
Stakeholders: consumers

Background and context of the study
Within the last decade, an increasing number of food scares has affected the food markets in industrialized countries. Consequently, food quality uncertainty by consumers has become a major issue in food and agricultural policy and in food marketing. Given this background and the fact that consumers continue to be more health conscious, quality signals have become increasingly important on food markets. One of these quality signals is the regional origin of foods. The protection of the regional origin of foods is a major part of the EU quality policy in agriculture. There are two kinds of regional origin which can be registered and protected according to this Council Regulation: (i) protected designation of origin (PDO); (ii) protected geographical indication (PGI).

Despite the high value the EU addresses to the promotion of regional products, there is not much analytical work on the economic impacts of those initiatives. There is, however, a well-established literature on the economics of generic promotion. Typically, the effects of generic advertising on demand for the advertised food are estimated or modelled and the redistributive and welfare impacts elaborated. These analyses were mainly carried out within models where one uniform price at one stage of the marketing chain is determined. However, when a regional marketing programme includes regional-origin labelling as well as additional costs for quality control, as is the case under the EU Council Regulation 2081/1992, different qualities have to be distinguished. This implies that segmentation occurs between a higher-quality market for the labelled product and an average quality residual market. There have been models of segmented agricultural markets, e.g. on country-of-origin labelling and on markets for foods with and without genetically modified organisms. However, a segmented-market approach has not yet been applied to regional-origin labelling and its specific characteristics.

Goals and Objectives of the study
The objective of this paper is to provide a methodological framework and to model the economic implications of state-financed programs assuring both quality control at a superior level and the regional origin of an agricultural product.

Quality assurance or certification scheme addressed in the study
The theoretical model constructed in this study is designed for any combination of regional-origin labelling and quality control scheme. However, the empirical application of this theoretical model refers to Regionally-labelled Bavarian beef in the German beef market.

Scope and coverage of the study
In this study, the economic analysis is based upon the estimation of the change in market prices and in CS and PS. So both the direct and distributional effects are assessed.

Dataset(s) used in the study
For the empirical application of the theoretical EDM developed in this study, own- and cross-price elasticities of supply and demand, market shares, own- and cross- advertising elasticities of demand, parameters associated with added costs of regional program participation, price data and participation costs have been either obtained from the literature or from simulations or sensitivity analysis. Literature sources were Herrmann et al. (2002) and Wildner (2000).
**Methodology, or methodologies used**

A multi-equation equilibrium displacement model (EDM) is developed, assuming a market which is segmented both by quality and regional origin. Each region can produce the uniform lower-quality (mass) product, or incur additional program participation costs and produce the higher-quality product which is then regionally labelled. The demand in a particular region is expressed in three equations; one for the mass-product (function of its price), one for the own-region high-quality product and one for the other-region high-quality product (both functions of the two regions’ prices and advertising costs). The supply in a particular region is divided into two equations; one for the mass product (function of own price and the high-quality price) and one for the high-quality product (its price and the participation costs).

The EDM in this study considers a market with two regions. The prices and quantities are determined endogenously according to the market equilibrium, where the supply of each commodity (mass, own high-quality, or other high-quality) equals its demand. The three endogenous price change variables are solved by using the market shares, advertising quantities and participation costs as exogenous variables.

Then, starting from equilibrium (multi-market in this example), the authors analyse the impact of exogenous changes (advertising expenditure, cost to participate to the program) on the equilibrium (price and quantities). To do so they differentiate the supply, demand and equilibrium conditions equations and then solve a system of equations that describe how an endogenous variable (price, quantity of each product) is affected by an exogenous change in some variables. The solutions to the endogenous price changes are used to evaluate the total and distribution of economic welfare due to regional labelling and advertising. This is done by computing the changes in PS and CS, assuming parallel shifts in demand and supply.

An empirical application of the model is illustrated for one selected European example, i.e. “Geprüfte Qualität – Bayern”. The methodology used is named ‘multi-equation equilibrium displacement model’ by the authors. Actually, it is a comparative static model.

**Conclusions and recommendations of the study**

The EDM developed in this study is able to perform a combined analysis of regional-origin labelling and quality control. It allows the user to assess the impacts of changes in market shares, advertising quantities and program participation on market prices and CS and PS. The application to Bavarian beef showed that both an increase in advertising expenditure and participation costs had an increasing impact on the market price of this type of meat.

**Strengths and weaknesses of the methodology used**

A strength of the theoretical EDM constructed in this study is its potential to serve other purposes as well. It could be applied to other relevant issues where market segmentation plays a major role, such as strategies of country-of-origin labelling, differentiation of ecological and conventional foods, or GM and GM-free foods.

Another strength is its ability to analyse simultaneously the impacts on producers and consumers. The model should be used to evaluate the impact of marginal changes of the exogenous variables on the equilibrium.

To apply this methodology, the first step requires the development of a partial equilibrium model of the market that considers different varieties or qualities of the good. That is either to estimate (or calibrate) the different equations or to use an existing model of the market.
Title: Country-of-origin labelling of beef products: US consumers' perceptions

Authors: Wendy J. Umberger, Dillon M. Feuz, Chris R. Calkins and Bethany M. Sitz

Publication date: 2003


Abstract

In 2002, consumers in Chicago and Denver were surveyed and participated in an experimental auction to elicit their willingness-to-pay for country-of-origin labeling (COOL) of beef. Survey results indicate that the majority of consumers (73%) were willing to pay an 11% and 24% premium for COOL of steak and hamburger, respectively. In the auction, consumers were willing to pay a 19% premium for steak labeled “Guaranteed USA: Born and Raised in the US.” Food safety concerns, a preference for labeling source and origin information, a strong desire to support U.S. producers, and beliefs that U.S. beef was of higher quality, were the most common reasons consumers preferred COOL.

Position in the analytical framework

Question: What is consumers’ willingness to pay for quality?

Stakeholders: Consumers

Background and context of the study

Proponents of US mandatory Country-of-Origin Labelling have expressed concerns about the safety of imported food, and have argued that consumers have a right to know where their food is coming from. Additionally, supporters of mandatory labelling believe that COOL would provide US producers with a competitive advantage in the supermarket. Opponents of the law have argued that the costs incurred by producers, importers, packers, wholesalers and retailers to segregate and preserve the identity of meat products as well as the government expenditures that would be necessary to insure compliance would be too high and would outweigh the benefits of the label. Other critics have argued that mandatory COOL would impose a trade barrier and fuel trade wars.

Labelling of COOL may be beneficial in that it would transform country-of-origin attributes into search characteristics. However, the impact COOL will have on beef demand is unknown. Furthermore, the estimated costs of a mandatory COOL are large, and it is not yet known which sectors of the industry will ultimately bear the costs of mandatory COOL. Thus an important question is whether consumers prefer a product guaranteed to be born, raised and processed in US; and whether they are willing to pay more for a product with a country-of-origin label.

Goals and Objectives of the study

The objective of this research is to quantitatively and qualitatively evaluate US consumers’ preferences and willingness-to-pay for a product with a country-of-origin labelling of beef products and steaks with a “USA guaranteed: born and raised in the USA” label.

Quality assurance or certification scheme addressed in the study

The certification scheme addressed in this study is the US Country-OF-Origin Labelling (COOL) certification. For a meat product to be labelled as a “USA product”, the meat animal must be born, raised and processed in the US. Until 2004, COOL had been voluntary. From 2004 however, it has become mandatory for a wide range of products.

Scope and coverage of the study

In this study, the US consumers’ preferences and willingness-to-pay for a product with a country-of-origin label will be assessed by focussing on beef products only. Both a survey and an experimental auction will be used.

Dataset(s) used in the study

In June and July of 2002, consumers from Denver and Chicago were randomly screened and selected for both participating in a survey and in an experimental auction. In total, 273 consumers participated. The survey contained questions on their meat-purchasing behaviour, eating...
preferences, knowledge of beef and socio-demographic characteristics. In addition, they were asked to rank the importance of a series of food characteristics that are important to them when purchasing beef. Furthermore, they were asked to indicate their preference (and rationale) and willingness-to-pay for different beef products with and without labels identifying the country of origin where the beef was produced.

Data on the consumers’ willingness-to-pay was collected as well through the bids elicited in the random \( n \)th price auction.

**Methodology, or methodologies used**

First the consumers were asked to fill in a survey on their meat-purchasing behaviour, eating preferences, knowledge of beef and socio-demographic characteristics. In addition, they were asked to rank the importance of a series of food characteristics that are important to them when purchasing beef. Furthermore they were asked to indicate their preference (and rationale) and willingness-to-pay for different beef products with and without labels identifying the country of origin where the beef was produced.

In a random \( n \)th price auction were consumers were asked to bid on two steaks (identical, except for one having a label) in several auctions. They were told that their bids would determine the price paid for the steaks in the auctions.

The premium a consumer would be willing-to-pay for the labelled steak was calculated as the difference between the bid for the labelled steak and the bid for the labelled steak, divided by the bid for the unlabelled steak. Then the variable USAPREF (consumers’ likelihood of preferring and willing to pay a substantial premium for US labelled steaks) was created, having a value of 1 when the premium was higher than 10%, and zero otherwise. A binomial logit model is used to specify the relationship between this variable and their domicile, age, gender, ethnic, kids present in household, income and education. Safety, source, COOL, local, fresh and organic are dummy variables added, indicating that food safety, source assurance, country-of-origin, locally produced, fresh and organic are extremely desirable attributes in a consumer’s shopping decision. Furthermore, dummies were used for indicating if the meat product was most commonly consumed in the household, where they most commonly buy their meat and if they mostly buy US labelled food.

**Conclusions and recommendations of the study**

The survey results of this study indicate how much the consumers would be willing to pay for a COOL labelled steak. In addition, it provided information about consumers’ reasons for preferring a COOL labelled steak.

In addition to the survey, the experimental auction also resulted in an indication of the premium consumers’ were willing to pay for a COOL labelled product.

The logit analysis was able to examine the relationship between the consumers’ likelihood of preferring and willing to pay a substantial premium and consumers’ socio-demographic characteristics, habits and desires.

**Strengths and weaknesses of the methodology used**

A strength of the \( n \)th price auction is that it is less hypothetical and more realistic than contingent valuation methods.

However, as far as weaknesses are concerned:

- The indication of the premium of the WTP is based on experimental auction and not real observation.
- Potential market risks cannot be replicated in an experimental auction
- Focus on one food attribute that leads to overrepresentation of this attribute
- No real budget constraint
Abstract
This article examines how new regulations to reduce microbial pathogens may influence competitiveness among, beef, pork and poultry. A multi-market model is used to simulate the effects of increased costs on producer welfare losses, taking into account cost differences among meats and substitutions in consumption. Producer losses will be higher for meat products with more processing plants, larger own-price elasticities, and substitution effects that work against them. For example, poultry’s estimated losses are the lowest, due to a relatively small number of plants, small own-price effects, and substitutions into poultry with the increased relative prices of other meats.

Position in the analytical framework
Question: What are the welfare benefits from QA and certification schemes?
Stakeholder: Whole chain

Background and context of the study
On July 25, 1996 the US Department of Agriculture published the proposed Final Rule for Pathogen Reduction: Hazard Analysis and Critical Control Point (HACCP) Systems. HACCP represents a new approach to food safety in the meat industry because it focuses on prevention of microbial hazards, rather than ex post inspection for contamination.

While the philosophy that food safety is a shared responsibility between consumers and producers is widely accepted, the issue of who bears costs and risks is still controversial. Federal legislation does not require an efficient allocation of resources among the various aspects of food safety and health policy. Health and safety regulations are only coincidentally efficient in the sense that an additional dollar spent on each program yields the same risk reduction.

USDA FSIS carried out an economic impact assessment of the regulation that showed that expected benefits would greatly exceed expected costs. In spite of the demonstrated benefits, the assessment was met with controversy. Main reasons for controversy were the difficulty in estimating ex ante costs and the uncertainty associated with the distribution of the costs across the meat sector and forecasting the regulation’s ultimate impact on foodborne illnesses.

Goals and Objectives of the study
The study is to examines how the incidence of costs from new regulation may vary among the three major meat industries: beef, pork and poultry. The article addresses three questions:
- What would be the incidence of pathogen reduction costs among producers of beef, pork and poultry?
- How would substitution effects among these three meats influence the rule’s incidence?
- How would an alternative pathogen standard influence the distribution of costs among beef, pork and poultry?

Quality assurance or certification scheme addressed in the study
This study focuses on the HACCP safety regulation for pathogen reduction.

Scope and coverage of the study
In order to achieve the objective mentioned above, this paper will present an analytical framework and some comparative statics analyses used for assessing the changes in producers’ welfare for different scenarios. However, before doing so, the paper presents an estimate of the annual costs due to HACCP for each species.

Note that in the analytical analysis, ‘producers’ refers to all suppliers, including primary producers, processors and retailers. It is not clear how the surplus is distributed amongst them. Therefore, this study is allocated in the analytical framework under the heading ‘whole chain’.

Dataset(s) used in the study
In order to estimate the annual costs due to HACCP, published cost estimates from the US Department of Agriculture, Food Safety and Inspection Service (USDA FSIS), and the Institute for
Food Science and Engineering at Texas A&M University (IFSE) were used as a basis. In order to perform comparative static analysis, the elasticities were obtained from various sources in the published literature. Together these sources give a range of plausible demand elasticities.

Methodology, or methodologies used

The paper starts with the calculation of the estimated annual costs due to HACCP for each species. Published cost estimates from the US Department of Agriculture, Food Safety and Inspection Service (USDA FSIS), and the Institute for Food Science and Engineering at Texas A&M University (IFSE) were used as a basis. However, they were adjusted constructing annualized initial investment costs to account for the medium term private cost of raising capital to make these investments, adding process modification costs and allocating costs across species based on the number of plants per specie.

To analyze the incidence of food safety regulation, a horizontal displacement model is employed which allows for substitutions in demand in response to changes in relative prices. This multi-market model is used to perform a comparative statics analysis.

The model is a system of six equations, where prices and quantities are endogenous and HACCP costs are exogenous shifters in the supply equations. The demands are functions of the prices of all species and the supply equations are functions of the own prices and the exogenous shocks reflecting changes in costs. The equations have been transformed in their elasticity forms in order to allow for estimating percentage changes in prices and quantities. Additionally, the equations representing the change in producer surplus are defined.

Using the range of costs estimated by IFSE and FSIS and the elasticity estimates, changes in producer surplus are estimated for three cases: a) current regulation with substitution effect, b) current regulation without substitution effects, c) assuming an alternative policy in which all meats meet the same pathogen standard.

Conclusions and recommendations of the study

The theoretical framework and the results of the simulations indicate how the welfare of the beef, poultry and pork producers is affected assuming different HACCP estimates and different levels of substitution in demand. The results demonstrate how industry cost structure (depending on the number of farms) and substitution in demand have a strong influence on welfare impacts of HACCP costs among beef, pork and poultry producers. The results show that producer losses will be higher for meat products with more processing plants, larger own-price elasticities, and substitution effects that work against them.

Strengths and weaknesses of the methodology used

The equilibrium displacement model employed in this study is able to analyse the distribution of gains due to HACCP among different sectors (substitution between meats). However, it is not able to analyse how gains are distributed among the different actors within each chain (only final market). Another strong weakness is the fact that the evaluation completely ignores the effect of HACCP on consumer health. The analysis is thus restricted to market effects.

Strengths

- The functional form does not have to be specified. Thus, the model can be used whatever the demand and the supply functions are.
- Relatively easy to parameterise (e.g. elasticities assumed or culled from the literature)
- Relatively easy to consider multiple stages in the supply chain as well as to consider multiple markets, that is to deal with the substitution among markets.
- Possibility of evaluating the impact of QA on non participant producers.

Weaknesses

- Only marginal changes can be handled accurately, unless the underlying functions are Cobb Douglas functions (whose elasticities are by definition constant).
- The method compares one equilibrium ('with') to another ('without'), with no idea of how long it takes to reach a new equilibrium. That is, it is completely static.
Abstract
This paper tests the hypothesis that region-of-origin cues and EU certificates of origin (PDO protection labels) influence regional food product preferences directly, and not only indirectly through perceived quality, as has sometimes been affirmed. Conjoint analysis is applied to data on Italian consumers’ quality perceptions and preferences for extra virgin olive oils from the Sabina and Canino regions of Lazio, Italy. The region-of-origin cue and the PDO label were both found to influence regional product preferences through perceived quality, although the effect is limited to specific consumer segments. Furthermore, the region-of-origin cue has a direct effect on regional product preference for some consumer segments, especially those resident in the product’s region of origin. No direct effect of PDO labels on product preference was found.

Position in the analytical framework
Questions: How effective are quality labels in influencing consumer perceptions/behaviour? What are the effects of PDO/PGI certification?
Stakeholders: Consumers

Background and context of the study
In 1992, the European Union Regulation (EEC) 2081/92 established a harmonised set of rules and associated certified for promoting and protecting agricultural and food products linked to a specific place of origin (PDO: Protected Designation of Origin; PGI: Protected Geographical Indication). The Regulation assumes that the perceived utility of food products increases for quality-seeking consumers if they are aware of the products’ origin and the production methods used. According to this assumption, the region-of-origin label is perceived as being a quality signal to consumers which influences regional product preferences. This effect is also referred to as the indirect effect of a product’s region of origin.

However, the region-of-origin cue also evokes general regional beliefs (traditions, inhabitants, culture). If consumers’ regional beliefs concerns those related to and are consistent with their ideal self-images (identification), and consumers have a strong desire for belonging, the region-of-origin cue provides them with social value. This might directly influence regional product preference. In addition, a product’s place of origin may elicit feeling of pleasure and happiness based on consumer’s experience with the region. The emotions elicited directly influence regional product preference.

Goals and Objectives of the study
The main goal of the study is to investigate whether and how the region-of-origin cue and PDO certification influence regional product preferences. The intention is to examine how consumers evaluate a product when they are aware of its region of origin and when the product has a PDO certificate. The objective is to investigate whether the region of origin and the PDO label might be more than a mere signal of quality, i.e. it might influence regional product preference directly and not only via perceived quality.

The hypothesis tested is that region-of-origin cues and PDO labels influence regional food product preferences directly and not only indirectly through perceived quality.

Quality assurance or certification scheme addressed in the study
The certification schemes addressed in this study are the region-of-origin labels and the PDO (Protected Designation of Origin) labels.

Scope and coverage of the study
The hypothesis was tested in a study on extra virgin olive oil (EVO), carried out in Italy.

Dataset(s) used in the study
Respondents were randomly sampled at shopping malls in three Italian towns: Rieti (54
respondents), Viterbo (56) and Rome (55). Rome is a metropolis where economic activity occurs mainly in the tertiary sector. Rieti and Viterbo are smaller towns, still closely linked to the local agricultural sector within which olive cultivation is a leading activity and has a strong tradition. In total 165 persons were interviewed and asked to rate their overall perception of product quality and their product preference for 22 EVOs. 152 respondents completed both tasks. The sample was representative of the Italian population both regarding gender and age. It was not representative with respect to educational level, with more highly educated respondents over-represented. It is assumed that this bias does not significantly affect the results of the study.

The hypotheses were tested in a conjoint analysis. Next to the region-of-origin cue and the PDO label, price, colour and appearance were included as attributes. For the attribute Origin, 5 levels were selected (normal EVO, EVO from Sabina with region-of-origin label, EVO from Canino with region-of-origin label, EVO from Sabina with PDO label and EVO from Canino with PDO label). However, in order to limit the number of profiles, each respondent was asked to rate EVOs from either Sabina or Canino only, in addition to standard EVO. For the attribute price, 4 different price levels were used. The attribute colour was either green or yellow and the appearance was opaque or clear. As six holdout profiles were generated, the total number of profiles to be evaluated by each respondent was 22.

The respondents were asked to rate the profiles with respect both to their overall perception of quality and to their preference. Both preferences and quality perceptions were rated on a scale from zero to 100.

**Methodology, or methodologies used**

The consumers' preferences (P) and quality perceptions (X) of profile (k) are estimated using Ordinary Least Squares regression with a dummy variable indicating the presence of each level (l) of each attribute (j) in each profile. In addition, respondent-specific intercepts were added to the equations. The estimated coefficients of each dummy (attribute) are called the part-worth estimates, which give an indication of the relative importance of the different attributes in the evaluation process.

Multivariate normal mixture regression models were fitted for post hoc segmentation of the sample in order to account for possible heterogeneity of consumer's preferences. Five different (homogenous) segments could be distinguished. Repeated measures analyses of variances have been used for testing the effect of the region-of-origin and PDO label on preference, quality and affective preference, of the entire sample and for each segment individually. The effect on affective preference is obtained by partialling out the quality effect from the preference effect.

The same tests have been repeated for different levels of place*region combinations, in order to account for a possible relationship between the consumer’s residence and their preferences for EVO coming from the same region. So the segment-wise analyses was repeated but instead of the post hoc segmentation, the a priori segmentation was used given by the place*region combination.

**Conclusions and recommendations of the study**

The results of the conjoint analysis and the multivariate normal mixture regression models show that the region-of-origin cue and the PDO label both influence regional product preferences indirectly, through the perceived regional product quality, but the effect is limited to (different) specific consumer segments in the market. Thus some consumers use the cues to make inferences about the regional product quality. Furthermore, the results show that the region-of-origin cue has a direct effect on regional product preference for some consumer segments, especially among those consumers who live in the product’s region of origin. However, no direct effect of PDO labels on product preference was found. This suggests that consumers consider PDO labels merely as indicators of quality, if they consider them at all.

**Strengths and weaknesses of the methodology used**

It is not clear whether the mixture regression model, which regresses preferences on conjoint attributes, is the best choice for modelling heterogeneity vis-à-vis Baron and Kenny’s (1986) procedure for testing mediation. Other possible candidates mentioned are mixture regression models that incorporate both regressions of preferences as well as of perceived quality.

The methods used in this study are able to prove the existence of a direct effect of the region of origin cue on regional product preferences. However, they are not able to measure the affective feelings and affective influence, which are assumed to be the reason of these direct effects. Therefore, more research is needed on the affective influence of a geographical indication on the product evaluation.
Title: A survey of dairy producer practices and attitudes pertaining to dairy market beef food safety  
Authors: Matthew J. VanBaale, John C. Galland, Doreene R. Hyatt, and George A. Milliken  
Publication date: 2003  
Journal: Food Protection Trends 23(6)  
Publisher: International Association for Food Protection  
Number of pages: 466-476  
Availability, URL:  
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Abstract  
A national survey of dairy producers assessed their willingness to improve safety of food products from their farms (response rate 9%). The majority considered a veterinarian as their first choice for information concerning dairy market food safety, with more than 33% reporting that they would pay for veterinarians to perform food safety assessments. Nearly half reported that they had been well informed by their veterinarians concerning food safety issues. Income from market beef was important to 75%, but few had toured a slaughter facility and less than 35% were aware that HACCP was required in US slaughter facilities. Most believed that consumer food safety concerns affected their profits, but less than half reported that on-farm HACCP would reduce the risk of foodborne disease. Several reported that they would change practices if doing so would increase profits, and most preferred that profits come from incentives paid by slaughter establishments. Few preferred government subsidies, and most opposed on-farm government regulatory programs. Ultimately, respondents expected consumers to pay for on-farm food safety practices and expected little of the corresponding increase in price to trickle to them. Overall, results indicate that producers might benefit from better knowledge of HACCP. Further research is needed to help producers determine if implementing on-farm HACCP improves profits as well as public health.

Position in the analytical framework  
Question: What are producers’ attitudes towards QA and certification schemes?  
Stakeholder: Primary producers  

Background and context of the study  
Dairy market cows have reached the end of their milk production profitability and may be ill, non-ambulatory, or weak. Animals in these conditions may harbour greater numbers of pathogens, and their slaughter may increase spread of pathogens at the slaughter establishment. The United States Department of Agriculture (USDA) requires beef slaughter establishments to have hazard analysis critical control point (HACCP) plans designed to identify and reduce any physical, chemical, or biological hazards that are reasonably likely to cause injury or illness to consumers, and these pathogen reduction performance standards must be met. Such regulations portend regulation at dairy farms, but the USDA currently has no jurisdiction there, so dairy farm HACCP implementation must be voluntary. Some have proposed that veterinarians could help dairy farms adhere to production practices that minimize food safety hazards. Previous studies used questionnaires to investigate production management practices, and recently a survey targeting slaughter establishments and veterinarians was used to identify the perceived market or client demand for dairy on-farm food safety services. However, to the authors’ knowledge, no one has surveyed dairy producers about their management practices and attitudes regarding food safety.

Goals and Objectives of the study  
The objective of this study is to assess attitudes of dairy producers about practices that might affect the safety of food and food products derived from market dairy beef.

Quality assurance or certification scheme addressed in the study  
The certification scheme addressed in this study is the HACCP regulation.

Scope and coverage of the study  
The survey covers four regions in the USA. In order to achieve the objective of the study, this study focuses on assessing dairy beef farmers’ knowledge of what happens to market cows and their knowledge of how foodborne diseases impact dairy market cows and associated profit. The
survey also assessed producers' willingness to adopt food safety practices, their opinion about “certified/labeled production practices”, incentives for changing their practices, and handling and disposal practices of non-ambulatory (downer) and dead cows.

**Dataset(s) used in the study**

The data was gathered by a questionnaire with 59 questions, which required ordinal, binomial, and ranking responses. A total of 6,736 questionnaires were sent by US postal mail during the first week of June 2001. A total of 607 questionnaires were returned and used for analysis. The dairy farms surveyed were representative of farms nationally.

**Methodology, or methodologies used**

The data gathered by the survey was analysed using Statistical Analysis System (SAS) files. The Chi-square test was used to detect pair-wise differences in response frequency to questions requiring multinomial or binomial responses. For ranking questions, each rank was treated as a repeated measure and averaged, using the Least Square mean procedure. Responses were categorized by the 5 geographical regions defined by NAHMS (1996), and the responses among regions were compared statistically.

**Conclusions and recommendations of the study**

The results of the survey conducted in this study give an indication about dairy beef producers’ perceptions about 1) the role of veterinarians, 2) the processing and distribution of dairy market beef, 3) consumers of dairy market beef, 4) threats and/ or risks to dairy market beef, 5) the profitability of HACCP, and about 6) practices that may affect food safety.

**Strengths and weaknesses of the methodology used**

Even though 607 questionnaires could be used for the analysis, a response rate of 9% is too low to be considered reliable unless some secondary analysis is carried out to ascertain that the respondents are representative and that there were not systematic reasons for farmers not to reply. Unless one can be sure of the representativeness of the sample, it is hard to claim as a strength that such a study brings new information to light. As for the way he information is analysed, it remains descriptive/qualitative, and thus lacks power from the scientific point of view.
Abstract
Signs and labels designating specificity or quality increasingly appear in food products as a response to consumer demand for safety, wholesomeness and guarantee. This paper focuses on motivational structures of consumers who purchase labelled food from short market channels in Belgium. Specifically, it concerns beef from “Produits Qualité d’Autrefois” or “Coprosain”, and cheese from “Fermière de Méan”. The research methodology builds on means-end-chain (MEC) theory. Data are collected either through laddering or through the Association Pattern Technique (APT). Hierarchical value maps, which visualise consumer motivational structures, are presented for each of the case studies. The strongest motivational cluster pertains to the values health and security. Labels are the basic attributes in this health/security cluster. Further, distinct hedonistic and universalistic motivational structures are discovered. The revealed motivational structures form the basis for more effective and efficient communication with end consumers.

Position in the analytical framework
Question: How effective are quality labels in influencing consumer perceptions/behaviour?
Stakeholders: Consumers

Background and context of the study
The emergence of consumer-driven food marketing systems is clearly recognized and well documented in recent literature. Changing consumer preferences and shifts in demand urge for adequate response strategies from all food chain participants. One of the responses at the producer level pertains to the development of short market channels for fresh food. Previous research has focused on consumer valuation of vegetables and milk produce sold at farmers markets and through food teams. Through these short market channels producers sell self-produced fresh food directly to consumers. In their purchase decision-making process, consumers were found to attach top importance to the freshness and the natural and pure character of the food, especially out of concerns for their own health and interest in the specific food taste.

Goals and Objectives of the study
This study aims in the first place to better understand consumer behaviour toward buying beef and milk products with specific quality characteristics, with a quality label and from collective marketing initiatives. Specific objectives are twofold. First, the aim is to represent the consumers’ network of motivating concepts in the form of hierarchical value maps. The second specific objective is to analyze the role of labels to signal specific quality, and to determine how consumers attach meaning to such labels and take the labels into account in their search for information and decision making.

Quality assurance or certification scheme addressed in the study
The case studies presented in this research are dealing with three collective initiatives in Belgium. The first two initiatives involve meat products, namely “Produits Qualité d’Autrefois” and “Coprosain”, both butcheries selling beef with the label “Blanc Bleu Fermier”. This label is an official quality label of the Regional Government in Wallonia. The third case study focuses on “Fermière de Méan”, a co-operative producing cheese with the official “Bio-guarantee label” and selling through farmers’ markets and self-owned shops.

Scope and coverage of the study
This paper presents the results of three case studies.

Dataset(s) used in the study
Data were collected through personal interviews with consumers, either applying Laddering or the Association Pattern Technique (APT). The Laddering method consisted of three phases. First, salient attributes were elicited, by asking 20 costumers which tangible characteristics of products
and marketing channel they found important. Second, the 10-12 most frequently mentioned attributes were selected and used in the Laddering interviews (Another 20 customers). Starting from an attribute which the person found very important, variations of the question “why is this important for you” were used to guide the person “up the ladder of abstraction”, until and end-value was reached. In this manner the means-end chains related to 5 attributes of the product and the market channel elicited. Third, the Laddermap software was used to encode and categorize the data as attributes, consequences or values.

In the APT method too, attributes were first elicited. Then attribute-consequences and consequence-value matrices were constructed, based on those attributes and the consequences and values which transpired from previous research. These matrices were handed over to 50 customers at the butchery, with the request to complete and return them. Fourteen respondents returned the questionnaires.

Methodology, or methodologies used

In this study, the means-end-chains theory has been applied. This theory seeks to explain how a product facilitates the achievement of desired end states. Through learning processes, consumers link product attributes to positive consequences of product usage. In turn, consequences are linked to values or end states.

Using the data gathered from the Laddering interviews and encoded and categorized by the Laddermap software, an implication matrix was established. In the end this produced a hierarchical value map, which indicates how often different attributes, consequences and values have been linked to each other.

Using the completed attribute-consequence and consequence-value matrices, which also give an indication of the link between certain attributes and consequences, and consequences and values, another hierarchical value map was drafted.

The hierarchical value maps are represented for each case study.

Conclusions and recommendations of the study

For each case study, the hierarchical value map indicates (HVM) to what consequences each product attribute is linked, and the link between these consequences and consumers’ values. In general, the HVMs give clues as to what the consumers want to be controlled. It concerns the absence of artificial growth hormones, hygiene throughout the chain, and origin of the products. Product freshness and the artisan production method are the most relevant attributes.

With respect to the attribute “label”: both in the case of beef and dairy products, the label is perceived as a sign of purity and naturalness. In consumers’ perceptions, labels signal a guarantee related to the origin of the product, be it from a limited number of farms, a specific region, or a specific production method. Also there is rising concern over animal welfare, for which the label too offers a guarantee in some cases.

Strengths and weaknesses of the methodology used

Both the Laddering method and the APT method have been used to draft hierarchical value maps. A difference between both methods is that the APT-method leads to more links that are more intensive too. This is due to the fact that the method is based on recognition which is easier for respondents than the unaided recall-based on process used in the laddering interviews. The more detailed HVM resulting from the APT method has the advantage that some links are shown which respondents might overlook in an interview. On the other hand, there is the risk that respondents include links in the laddering interview which are not really relevant for them, as part of a response strategy or out of social desirability.
**Position in the analytical framework**

**Question:**?

**Stakeholders:**

**Background and context of the study**

In recent years, different food safety crises like BSE, dioxins, and foot and mouth disease have resulted in a decrease of consumer trust in the performance of the food chain and an increase in the need for a guarantee of food safety and food quality. There is a newly awakened attention among industry, policy makers and scientists for the consumers’ interest in food production and their lack of knowledge about it. Consequently, several initiatives (e.g. quality labelling) to communicate typical product attributes, like safety and healthiness issues, have been developed by a number of different actors: the government, food industry, retailers, farmers’ associations and primary producers.

Most literature dealing with the role and consumer perception of food quality labelling is situated in the area of animal proteins like meat and fish. Nevertheless, the use of quality labelling is also widespread in the fresh fruit and vegetable category. There exist some studies focussing on fruit and vegetable labelling in the “organic” atmosphere, while a few studies about fruit and vegetable labelling initiatives focus on origin or specific production methods. However, literature dealing with the role and consumer perception of food quality labelling in the fresh fruit and vegetable sector have remained scarce.

**Goals and Objectives of the study**

The objective of this study is to investigate consumer perception of the Belgian quality label “Flandria” in the specific case of tomatoes. In order to achieve this objective, firstly the consumers’ attitude towards tomatoes and health benefit beliefs about tomatoes are investigated in a broad sense. Secondly, attribute importance upon tomato purchase is analysed and used to segment the market. Finally, consumer perception of Flandria-labelled tomatoes is assessed and compared across buyers and non-buyers.

**Quality assurance or certification scheme addressed in the study**

The certification scheme addressed in this study is the “Flandria” quality label. Today, more than 50 fruits and vegetables are sold under the Flandria quality label, including tomatoes, salad, broccoli, apples, etc. The label stands for products of excellent quality, cultivated by family farm businesses in Flanders, of which traceability is perfectly feasible owing to the use of unique product codes.

**Scope and coverage of the study**

Although the “Flandria” quality label is used for more than 50 fruits and vegetables, this study focuses on the specific case of tomatoes only.

**Dataset(s) used in the study**

The empirical analysis of this study is based upon cross-sectional data collected in February-March 2003 through a consumer survey in Belgium. The response of 373 respondents appeared to be valid and thus useable after having performed a quality check. However, as the sample was a convenience sample, it is not representative for the Belgian population.
Methodology, or methodologies used

First, general consumer attitude towards tomatoes was assessed on five-point scales with multi-attribute construct. These attributes are grouped on the basis of a principal components analysis which yields three factors; nutritional and sensory, credence and convenience. Then perceived health benefits from eating tomatoes are measured by means of frequency distribution of a five-item construct on a scale from 1 to 5.

The second part of the analysis was a principal component analysis and cluster analysis based on the importance of evaluation criteria upon tomato purchase. The principal component analysis revealed four factors playing an important role in tomato purchases; credence characteristics, search characteristics, experience attributes and quantitative search characteristics (price). The cluster analysis was performed in order to divide the consumers into three clusters, which significantly differ from each other in gender, health benefit beliefs and food-health awareness.

Then the sample is divided into three sub-groups based on their claimed awareness and use of Flandria-labelled tomatoes in order to analyse and compare consumers’ perception of Flandria-labelled tomatoes. Using one-way ANOVA, each group is analysed with respect to their characteristics (age, children, education, food-health awareness, time of purchase, perception of the price, quality, safety etc…) and compared with each other.

Conclusions and recommendations of the study

The principle component analysis used in this study reveals the three factors (nutritional and sensory, credence and convenience) which play an important role in consumers’ general attitude towards tomatoes. These factors appear to include most of the characteristics found in the Flandria profile. In addition, the principle component analysis revealed the four factors (credence characteristics, search characteristics, experience attributes and quantitative search characteristics) which determine consumers’ purchase behaviour. Based upon these characteristics, the sample is divided in three clusters and the cluster analysis is able to compare the clusters with each other. Finally, the one-way ANOVA analysis allows the researchers to compare non-Flandria (either aware of unaware of the label) and Flandria consumers with each others.

Strengths and weaknesses of the methodology used

Among the strengths of the methodology, we can emphasize the simplicity of the procedure used and a good estimate of which attributes are important in attitude of consumers towards tomatoes. On the other hand, the sample is a convenience one. Results are based upon claimed awareness of consumers. The attitude only is estimated, and it is through descriptive analysis. Finally, it reveals no clear reason why the group of buyers of the Flandria label is so small.
Abstract
This study investigates consumer attitudes to and associations with quality labels for beef. Beef quality labels were introduced as part of the marketing response strategy by the beef industry aiming at restoring the declining beef image and regaining consumer confidence in Europe. The objective of this paper is to add insights to the discussion about the potential role of quality labels in meat marketing, based on empirical research in Belgium. The research methodology focuses on consumer surveys with two representative samples: 157 respondents in 1996 and 303 respondents in 1998. Significant differences in consumer attitude towards and associations and beliefs with beef quality labels across time and across age, gender, education level, buyer status and claimed television impact are discovered. The research indicates that quality labels are a valuable and promising part of response strategies by the beef sector to negative media coverage. Important hurdles to overcome include establishing a water proof traceability and control system, as well as setting up effective marketing communication aiming at correctly informing consumers.

Position in the analytical framework
Question: How effective are quality labels in influencing consumer perceptions/behaviour?
Stakeholders: Consumers

Background and context of the study
The BSE-scare that was initiated in Belgium during 1996, and subsequent discoveries of BSE infected cattle during 1997 and early 1998, were not stand-alone issues impacting on beef consumption. Since 1980, beef consumption per capita fell 22%. Since 1995, poultry meat took over the second place, after pig meat, at the expense of beef consumption. This long-term evolution pertains to changing taste and preference patterns at the consumer level, similar to what has been reported according to the beef consumption evolution in Germany, the U.K., Italy, France, the U.S. and many other countries. Regular reports and media attention to hormone use, antibiotic residues, animal welfare issues, export incidents, and disease outbreaks in Belgium, caused timely lows adding to the overall negative trend in beef consumption. During the period 1995-1997, examples of crises fitting in each category of the crises typology by Marcus and Goodman (1991) are found: accidents, scandals, and product safety incidents. All this has resulted in a considerable loss of image and sales by the beef sector, as well as a heavy search for response strategies.

Already since 1992, attempts at European, national, and regional level were set up aiming at reassurance of beef consumers. One of the major challenges dealt with setting up systems of cattle identification as a prerequisite for allowing traceability and quality labeling of beef and beef products.

As a part of the agricultural promotion policy of the EU, the project 'European Quality Beef' (EQB) was introduced and adopted in several Member States including Belgium. Quality labeling implies that a product gets the certificate in question only when it meets a set of specific requirements.

Goals and Objectives of the study
The objective of the empirical research of this study is to investigate consumer associations with, perceptions and beliefs about beef quality labels. First, the research aims at comparing the set of associations and the attitude of consumers towards beef quality labels between 1996 and 1998. Second, differences in perception of beef quality labels across age, gender, education level, buyer status and claimed television impact at present times, namely 1998, are assessed. The study further aims at revealing and describing differences in consumer knowledge, attitude, intention and behaviour, as proposed in several response hierarchy models.
### Quality assurance or certification scheme addressed in the study

The survey conducted for this study did not address one quality assurance scheme in particular. However, the second survey was conducted just after the introduction of the “European Quality Beef” in Belgium, which played an important role while analysing the results.

### Scope and coverage of the study

After having reviewed relevant literature, this paper presents the results of a consumer survey conducted in Belgium.

### Dataset(s) used in the study

Empirical research was conducted among meat consumers in Belgium. Primary quantitative data was gathered through two questionnaire-based surveys. The first survey was organized during April 1996. During this survey, 165 personal interviews were executed, of which 157 could be used for analysis. The field work of the first survey was realized shortly after the introduction of the official “European Quality Beef” in Belgium, but also immediately following the heights of the BSE-crisis of late March 1996. The second survey was organized two years after the first, namely in April 1998. This survey included 320 personal interviews, of which 303 fitted for analysis. Research methodology, questionnaire, wording and scaling were similar for both surveys. The major exception to this constitutes the inclusion of the variable relating to the impact of media coverage, which was not included in the 1996 survey since this issue became paramount for beef especially after the BSE-crisis and consequent negative publicity for the greater part on television. The questionnaire containing closed-end questions with answering categories based on preliminary literature review and qualitative exploratory research. Each of the items pertaining to attitude, perception, beliefs and associations with beef quality labels were accompanied by a 3-point Likert scale indicating the degree of agreement with the presented statements. During the interviews, no specific label was kept in mind and neither shown nor mentioned to the respondents. Consumer characteristics of age, education, label-buying status, gender and level of stated TV-impact were measured categorically.

### Methodology, or methodologies used

The research methodology focuses on consumer research. The data (as described above) are analyzed by means of SPSS 7.5. The analysis includes descriptive analyses procedures with appropriate statistical testing methods.

The presentation of the results is split up in results related to (1) beef quality statements (about importance of quality in purchase decision, importance of price in purchase decision, willing to pay a premium...), (2) beef labelling statements (labels are needed, labels guarantee a better quality, labelled goods may be more expensive...), and (3) beef label associations and beliefs (labelled beef is more expensive, free of hormones, healthier, more lean...). For each of the three categories, the percentage of respondents who agree with the presented statements is reported, both for 1996 and 1998. The chi-square and p-values are presented as well, in order to test for a significant difference between the two years.

Secondly, the responses of labelled beef buyers and non-buyers are compared. Again using the chi-square statistic and the p-values.

Finally, the correlation between the responses on each statement, with the consumer characteristics (age, income, gender, education, claimed level of TV impact) is analysed.

### Conclusions and recommendations of the study

The empirical results presented in this paper indicate significant shifts across time in consumer attitude towards beef and associations with and beliefs in beef quality labels. Apart from some notable exceptions, few significant associations between consumer characteristics age, gender and education level on the one hand and consumer attitude to beef quality labelling and associations with beef quality labels on the other hand are found. Meanwhile buyer status (experience) and claimed television impact (influence from negative media coverage) are found to largely shape attitude and beliefs associated with quality labelled beef.

### Strengths and weaknesses of the methodology used

The main strength of the methodology used is that the repetition of survey allows perception of significant shifts across time. However, results are based on descriptive analysis only, and the size of the first sample leads to more exploratory than conclusive findings.
Title: A review and meta-analysis of country-of-origin research
Authors: Peeter W.J. Verlegh and Jan-Benedict E.M. Steenkamp
Publication date: 1999
Journal: Journal of Economic Psychology 20
Publisher: Elsevier Science B.V.
Number of pages: 521-546
Availability, URL:
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Abstract
Despite a large body of research, country-of-origin effects are still poorly understood. Combining the strengths of a narrative review with those of a quantitative meta-analysis, our study seeks to establish a firm grounding for country-of-origin research. We review previous country-of-origin research, focusing on cognitive, affective, and normative aspects of country of origin. In a quantitative meta-analysis, we assess the magnitude of country-of-origin effects on three types of product evaluations, viz., perceived quality, attitude, and purchase intention. In addition, we develop and test hypotheses concerning the role of economic development, the impact of multinational production, differences between consumers and industrial purchasers, and a number of methodological aspects. We find that country of origin has a larger effect on perceived quality than on attitude toward the product or purchase intention. We also find that differences in economic development are an important factor underlying the country-of-origin effect. The country-of-origin effect does not differ between industrial and consumer purchasing, nor is it affected by multinational production. We conclude with suggestions for future research on the country-of-origin effect. Specifically, more research is needed on the symbolic and emotional aspects of country of origin, and on the role of competitive context.

Position in the analytical framework
Question: How affective are quality labels in influencing consumer perception/behaviour?
Stakeholders: Consumers

Background and context of the study
Consumers are constantly confronted with a wide variety of product information, supplied through packaging, branding, advertising and other channels. This information is used by consumers to form preferences and purchase decisions, but it also elicits emotions, feelings, imagery, and fantasies. The present study focuses on the product's country of origin, an aspect of product information with a complex effect on consumer behaviour. Dichter (1962) was the first to argue that a product's country of origin may have a "tremendous influence on the acceptance and success of products". The first empirical test of this notion was conducted by Schooler (1965). He found significant differences in the evaluation of products that were identical in all respects, except for the name of the country specified on a "made in" label. Since Schooler's seminal paper, the "country-of-origin effect" has been the subject of a large number of studies. Most of these studies have focused on assessing the occurrence, magnitude and significance of country-of-origin effects for different products. In spite of a large body of research, consensus with regard to the importance of the effect has not been reached. Obermiller (1993) observed that the substantial differences in effect sizes most likely stem from differences in study characteristics. In an attempt to synthesize the literature on the country-of-origin effect, Peterson and Jolibert (1995) showed that country of origin has a strong influence on product evaluation. They also found that the size of the effect is significantly affected by a number of study characteristics. Their findings lead them to conclude that "country-of-origin effects are only somewhat generalizable and that the phenomenon is still not well understood (Peterson & Jolibert, 1995).

Goals and Objectives of the study
This study attempts to achieve a better understanding of the role of country of origin in consumer behaviour.

Quality assurance or certification scheme addressed in the study
The labelling scheme addressed in this study is the country-of-origin labelling scheme.
**Scope and coverage of the study**

The paper starts with a review of the theoretical developments in country-of-origin research. Then, a set of hypotheses is developed concerning the impact of various methodological and conceptual factors on country-of-origin effects. These hypotheses are tested in a meta-analysis.

**Dataset(s) used in the study**


**Methodology, or methodologies used**

The first part of this study presents a detailed overview of existing literature on the aspects of country-of-origin labelling. This review is structured according to the framework developed by Obermiller and Spangenberg (1989) and distinguishes between cognitive, affective and normative processing of the country-of-origin cue.

Then the paper presents the results of a meta-analysis, which enables the researchers to determine the robustness of empirical findings on country-of-origin effects on consumers. In addition, it allows them to examine the extent to which the magnitude of country-of-origin effects is affected by study characteristics. This analysis is performed using the method of parametric adjustability. This method consists of three consecutive steps.

First, the researchers collected empirical studies that performed empirical analysis of country-of-origin effects on consumers. This search was backed-up by means of a computer bibliographic search using the ABI Inform system. From each study, the Pearson’s product-moment correlation coefficient was derived as a measure of effect size.

The next step involved the identification of study characteristics that are expected to cause systematic differences in the results of individual studies. The following study characteristics were identified: the types of product evaluations (perceived quality, attitude or purchase intentions) studied, type of goods (consumer or industrial goods) studied, hybrids (uninational products/hybrid product), country of origin studied, and characteristics of the study design (single cue/multiple cue; between-subjects/within-subjects, student sample/representative consumer sample).

Third, the model is analyzed by regression analysis using dummy variables. The parametric adjustability model is estimated through a weighted least-squares procedure. The effect size is the dependent variable and the explanatory variables are dummies indicating the various study characteristics. As most studies yielded more than one size parameter, the model is estimated in two rounds. First, the model is estimated as described above. In the second round, the residuals of this estimation are regressed upon the same variables but study dummies were added as well; dummies representing each study.

**Conclusions and recommendations of the study**

The results of the meta-analysis presented in this paper allow for an analysis of the impact of various product evaluations, economic development (country studied), multinational production, type of good (consumer or industrial) and methodological characteristics, on the impact of country-of-origin labelling on consumer behaviour.

**Strengths and weaknesses of the methodology used**

The meta-analysis provides an exhaustive review of cognitive, affective, and normative aspects of COOL at the time of survey.
Title: Moral hazard, vertical integration and public monitoring in credence goods  
Authors: H. Vetter and Kostas Karantininis  
Publication date: 2002  
Journal: European Review of Agricultural Economics 29  
Publisher: Oxford University Press  
Number of pages: 271 – 279  
Availability, URL:  
Contact details authors: kok@kvl.dk  

Abstract  
Moral hazard is a problem in markets where the qualities or characteristics of products can not be verified with certainty by consumers. Here we demonstrate that vertical integration is one possible way of dealing with such problems. When the saving of monitoring costs is the driving force behind vertical integration, public monitoring freely available to the market may prevent vertical integration.

Position in the analytical framework  
Question: (a) What is the optimal mix of publicly and privately funded labelling or certification?  
(b) What is the impact of QA and certification schemes on market structure?  
Stakeholders: Primary producers, processors  

Background and context of the study  
The situation considered is where a number of farmers deliver either an ordinary or an organic intermediate product to processors, who in turn sell the (possibly manufactured) products as final goods to consumers. The moral hazard problem, deriving from less than perfectly observable quality attributes, is solved by vertical integration or by a combination of monitoring (of farmers) and a price premium for the organic quality. We set forth the conditions for vertical integration and we suggest that public monitoring may deter vertical integration. This issue is of great importance today, since the organisation of the agri-food industries world-wide is changing dramatically towards more integration and coordination. Key to this analysis are information asymmetries between producers, processors and consumers in the food markets.

Goals and Objectives of the study  
Assuming that vertical integration effectively deals with the moral hazard problem, the paper asks: under what conditions will vertical integration occur? Might the presence of public monitoring affect the occurrence of vertical integration?

Quality assurance or certification scheme addressed in the study  
An organically produced primary product, which passes through an intermediate (processing) stage before reaching the final consumer. Although in the paper an organic product is taken as an example, the argument could apply to any good with credence attributes (i.e. attributes that the consumer cannot ascertain prior to purchase, or even after consumption, but for which the producer knows whether or not they are present).

Scope and coverage of the study  
The study reports result obtained in a stylised, theoretical model. No product-specific detail is included, and no empirical work is attempted.

Dataset(s) used in the study  
No data are used.

Methodology, or methodologies used  
Theoretical analysis. The structure of the relationships is formalised, and general results are deduced, according to the rules of logic and mathematics.

Conclusions and recommendations of the study  
Assuming that vertical integration effectively deals with the moral hazard problem, the conditions for vertical integration to occur are identified. It is shown that public monitoring may prevent vertical integration, and that in cases where vertical integration would contribute to increased welfare, then public monitoring could reduce welfare. Vertical integration increases welfare when the costs of monitoring (no longer required with vertical integration) exceed the extra profit from the credence attribute. Assuming that public monitoring prevents vertical integration in such a case, then public monitoring works against welfare improvement.

Strengths and weaknesses of the methodology used  
Strengths  
This paper is of interest because it considers market structure effects vertically (i.e. structure of the chain) rather than horizontally (i.e. number of producers within each stage of the
This interest is compounded by incorporating the public authorities as active players, as a potential source of monitoring distinct from any of the stakeholders in the chain. Its somewhat counter-intuitive results – public intervention can prevent the spontaneous occurrence of a market-driven welfare improvement – is very useful.

**Weaknesses** The very simple, stylised model omits many relevant factors. This prompts the authors to mention, as a caveat, that despite their result it should be recognised that public monitoring can enhance welfare for other reasons, for example when public monitoring is seen as more trustworthy compared to private initiatives.
**Title:** Exclusion of farmers as a consequence of quality certification and standardisation  
**Authors:** Anne Vuylstekte, Eric Collet, Guido Van Huylenbroeck and Marc Mormont  
**Publication date:** 2003  
**Journal:** Paper presented at the 83rd EAAE Seminar ‘Food quality products in the advent of the 21st century’, Chania, Crete, 4-7 September 2003  
**Publisher:**  
**Number of pages:** 14  
**Availability, URL:**  
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**Abstract**  
In recent years, the Belgian and European agriculture experienced several crises and food safety and quality became governmental issues. This led to the appearance of quality conventions between links in the food supply chain. In practice, the quality conventions initiated by changed institutional settings turned out to be compulsory. This research aims to assess a side effect of this process, the exclusion-effect. This is done by statistical analysis of data on farmers’ participation in certification initiatives and homogeneity analysis.  
The results of a survey of 320 Belgian farmers show that 25% of the farmers are not involved in any initiative to increase quality. They are significantly older and less educated, but have also little access to farmers’ organisations and extension. Their gross margin is lower compared with participants; they are more oriented to one specialisation and are less labour intensive. The combination of these elements can be seen as a constraint to adopting initiatives and as a cause of excluding those farmers from the market. The paper also studies farmers’ opinion on laws, contracts and labels. Finally, some recommendations towards public policies are made.

**Position in the analytical framework**  
**Question:** What motivates producers to participate in QA schemes?  
**Stakeholders:** Primary producers

**Background and context of the study**  
There are different kind of norms and standards and that classification can be done using several key elements. Holleran et al. distinguish three main groups of quality assurance systems: (i) private voluntary international quality assurance standards such as ISO 9000, (ii) national farm-level assurance systems that may be linked with labels and (iii) proprietary quality assurance systems that specify retailers’ specific safety and quality requirements. Existing initiatives can be grouped according to the origin of the initiative (public or private) and the fact that the participation is voluntary or mandatory. The initiative to participate in a voluntary system lies in general with the farmer, but the origin of the certification initiative or norm may be different (government, buyer or other institution).  
This paper discusses the selection or exclusion effects of the voluntary initiatives, although the term ‘voluntary’ is rather relative. Participation is thought to be voluntary in the sense that it is not enforced by law, but in certain cases the farmer has often no choice if he wants to maintain his current outlet. The existing certification and normalization initiatives in the Belgian supply chain are grouped into three categories according to their characteristics and origin: Buyers’ norms, chain norms, and labels and hallmarks.

**Goals and Objectives of the study**  
The aim is to investigate why farmers decide to participate in quality assurance schemes and agri-environmental policies, and their possible effects on the individual farms or companies.

**Quality assurance or certification scheme addressed in the study**  
Survey respondents were divided into 4 groups: (a) not participating in any quality initiative, and participating in (b) buyers’ norm (c) integral chain management and (d) hallmarks.

**Scope and coverage of the study**  
Five product groups were selected: dairy, fruits, vegetables, pork and beef. The area covered was Belgium (Flanders and Wallonia). The analysis focuses particularly on dairy.

**Dataset(s) used in the study**  
The data were collected by a questionnaire with the farmers and in total there were 319 respondents. Farmers were contacted by telephone and the questionnaires administered by a pollster during a visit to the farm.

**Methodology, or methodologies used**  
Homogeneity analysis (a visual technique for grouping farms according to various characteristics).  
Description. The authors considered that the sample is too small for any multivariate analysis.
Conclusions and recommendations of the study

The different standardisation approaches make differing demands in terms of time, capital, and training investments. It is the availability of these factors that is important. It is also clear that the difficulties that the less well endowed farmers face could be offset, at least in part, by supportive and guidance or management, whether such initiatives come from public bodies or the private sector. Nevertheless, a group of older farmers, without successors, will probably remain outside the standardisation approach system. The time factor would seem to exclude farmers who work alone from the standardisation approach, which is one that demands a time investment, partly in training, but above all in terms of record-keeping and following procedures. The degree of specialisation within the farm may be a factor, as mixed farms can more easily take the risk, or make the effort, to adapt a part of the farm to production under a standardisation approach. For more specialised farms, such a decision impacts on the whole farm and all the work to be carried out. Usually specialised farms adopt standardisation approaches when they are ‘buyer’ ones, and thus imposed from the outside. Farms that are engaged in mixed farming are the ones most involved in standardisation approaches - and in the most demanding of those approaches.

Finally, there is the sectoral ‘crisis’ factor, suggesting that certain farmers, provided that they are well established, can develop quality initiatives and above all specific quality initiatives when they are forced to do so by the failure of intensive farming methods in a declining market.

In this context of increasing ‘standardisation’, it is clear that farms want an increased role for the government, or protection from the government, just as the better-placed farmers tend to opt for standardisation approaches that work to their advantage by giving them negotiating power.

Strengths and weaknesses of the methodology used

**Strengths**
The issue addressed and questions asked bring some new information to light.

**Weaknesses**
The procedures are entirely descriptive, and results can be generalised beyond the sample only with extreme caution.
**Title:** Front-label health claims: when less is more  
**Authors:** Brian Wansink, Steven T. Sonka, and Clare M. Hasler  
**Publication date:** 2004  
**Journal:** Food Policy 29  
**Publisher:** Elsevier Ltd  
**Number of pages:** 659-667  
**Availability, URL:**  
**Contact details authors:** wansink@uiuc.edu, s-sonka@uiuc.edu, cmhasler@ecda-vis.edu  

### Abstract
Growing global attention has been directed toward labeling the ingredients, processing methods, and health claims of food. Accompanying this attention is an interest in how consumers process or understand the information on such labels. This article examines how the length of a front-label claim influences the nutritional beliefs and evaluation of a product when used in combination with complete back-label information. The results indicate that the presence of a shorter health claim on the front of the package (in combination with a more complete claim on the back) leads a person to generate more attribute-specific thoughts about the product and fewer general evaluative thoughts compared to longer health claims. These shorter health claims also led to more favorable beliefs about the product and to a more positive image of the product. This article concludes with a discussion of the implications of the findings for policy makers, consumers and researchers.

### Position in the analytical framework
- **Question:** How effective are quality labels in influencing consumer perceptions/behaviour?  
- **Stakeholders:** consumers  

### Background and context of the study
A major issue related to the global food supply is that of food labeling as it relates to food safety and nutrition. Concerns with BSE and biotechnology have led to interest that has been directed at labeling the ingredients, processing methods, and nutritional content of foods. As a result, there has been labeling legislation in Europe and Asia, and wide-spread debates of labeling by the Food and Drug Administration in the United States. There are important globally strategic issues related to labeling, but there are also important tactical questions.

One tactical question that has been raised across continents is what form of labeling would most effectively communicate the benefits or the risks of consuming a particular food. Consider nutritional labeling. How much nutritional label information is “too much”? There is much debate on how the amount and type of product information on a label might influence nutritional beliefs and purchase patterns. Some researchers have empirically shown that a miss comprehended nutrition label or one containing too much information can decrease the accuracy of one’s judgments about products. Other researchers argue that more information can instead lead to better understanding and willingness to purchase the product. Because consumers can make inferences from small amounts of product information, it may be the case that a small amount of the right information can still go a long way in influencing the inferences a person makes about a product.

### Goals and Objectives of the study
The purpose of this research is twofold: (1) To examine whether the length of a health claim on the front-label of a package influences a person’s processing of nutritional information, and (2) to identify whether or not shorter claims on the front of a package provide more persuasive and motivating information when accompanied by a more complete health claim on the back-label of a product.

### Quality assurance or certification scheme addressed in the study
This study is focused on nutritional labels.

### Scope and coverage of the study
This study presents the results of an experiment carried out. The intention of this study is to test the following hypothesis:
In comparison with a longer front-label claim, a shorter claim will:
1) generate a greater number of specific attribute-related thoughts,
2) generate a smaller number of general evaluative thoughts.

Dataset(s) used in the study
The data used in this study is gathered through an experiment among 118 shoppers at a grocery store in central Illinois. The experiment was conducted on eight afternoons over a 2 week period. After agreeing to be involved in the study, shoppers were told they would be asked a variety of questions about one product. They were then randomly given one of the two packages of soy burgers (either with a small or long label). Following their investigation of the product’s package (10–40 seconds), they were asked to write down their thoughts and feelings about the product and to evaluate a number of health-related statements about the product by indicating whether they agreed or disagreed on a 9-point scale (1 = strongly disagree; 9 = strongly agree).

In order to measure how people react to package labels they had to write down any and all thoughts and feelings that came to mind as they read the label. Each of these thoughts or feelings were then coded as to whether they were attribute-specific or are instead more general or evaluative. Attribute-specific thoughts are thoughts that involve the restating or the processing of an attribute-related fact. General evaluative thoughts make no explicit reference to attributes or to health consequences, but tend to be summarising.

Methodology, or methodologies used
In order to test whether short claims on the front-label leads people to generate a smaller number of general evaluative thoughts and a greater number of attribute-specific thoughts compared to longer claims, the interaction was tested using the F-test between the length of the claim people saw and the type of thoughts they generated. Additionally, the one-tailed t-test was used to analyse whether shoppers generated more favourable beliefs about the product when they read a short claim on the front-label compared to a long claim.

Conclusions and recommendations of the study
The results of this study indicate the extent to which shorter health claims generate a greater number of attribute-specific thoughts and a lower number of general evaluative thoughts. However, it does not become clear how the information is processed by the consumer and how it eventually might influence their behaviour.

Strengths and weaknesses of the methodology used
The simplicity of the research design leads to cognitive thoughts that are not oriented by the researcher which is a good point. However, the shopping context is obtrusive, as is quite unrealistic the type of product exposure which is retained, leading to a low external validity of the results.
Title: Willingness to pay for food produced in accordance with nature conservation criteria, a survey throughout the whole food chain.
Authors: A. Wirthgen
Publication date: 2004
Journal: Journal of Chain and Network Science
Publisher: Wageningen Agricultural Publishers
Number of pages: 45-54
Contact details authors: wirthgen@ifgb.uni-hannover.de

Abstract
Within the European Union, environmentally friendly produced food is receiving increasing interest. This can be seen in the growing demand for organic food as well as in the policies of some countries, which supports the production and the marketing of environmentally friendly produced food.
This contribution is part of an interdisciplinary project looking at the central question, “How can agriculture and nature conservation be brought in accordance with one another?”. The main objective of the marketing part and of this article is to identify the willingness to pay and the buying probability for food from nature conservation. A consumer survey was undertaken and the results analysed by means of descriptive and multivariate data analysis (factor, linear and logit regression analysis). To complete the demand analysis additional research was undertaken surveying food retailers, the processing industry and caterers by means of expert interviews.

Position in the analytical framework
Question: What is consumers’ willingness to pay for quality?
Stakeholders: consumers, marketers, retailers

Background and context of the study
The region of research in this study is the Elbe-Valley in Lower Saxony (Northern Germany). In this region, in 1998, an interdisciplinary research project was established to look at the central question, “How can agriculture and nature conservation be brought in accordance with one another?” The project as a whole intends to show perspectives for sustainable agricultural development especially giving equal weight to both economic and ecological aspects. The economic part is split into two sub-projects: production cost accounting and marketing. This paper is part of the marketing side. The main objective of the marketing project is to investigate the opportunities and threats to regional marketing of environment-friendly produced food from this specific production area. A regional marketing concept is to be developed, which shall lead through product differentiation and niche marketing to a competitive advantage for the producers from the Elbe-Valley. It is aimed to improve the efficiency of distribution channels and adding value through the development of a regional brand strategy, taking into account consumer and marketer preferences and willingness to pay. For a successful customer-orientated regional marketing concept, consumers play the central role. On the other hand, regional traders are needed as marketing intermediaries with marketing power and a filter function (gatekeeper) as well as producers as the essential basis.

Goals and Objectives of the study
This study aims to answer the question: Can the concept of nature conservation be used in marketing food to add value to agricultural raw products? The study focuses on ‘food of nature conservation’, which is defined as: ‘food produced under well defined and officially controlled criteria of nature conservation, such as limited pesticide use or cattle units per hectare. These criteria are not comparable with organic production – sometimes they are more strict, sometimes less.’
The article discusses selected results concentrating on the WTP for food identified with nature conservation activities considering all market participants involved on the demand side. The focus lies on the consumer research. A formal questionnaire was undertaken to reveal quantitative relationships between consumers WTP, buying probability and the affecting factors (attitudinal and socio-demographic). Additionally retailers, food processing companies and caterers are explorative considered in terms of expert interviews, as these groups are more sensitive.

Quality assurance or certification scheme addressed in the study
This study is focuses on WTP for environment-friendly (‘nature conservation’) produced products, especially milk.
Scope and coverage of the study  
This paper presents the results of surveys conducted in 1998, 1999 and 2000 amongst consumers, retailers and farmers.

Dataset(s) used in the study  
The data used in this study was conducted in and nearby the Elbe Valley from June 1999 to June 2000. The surveys were mostly based on face-to-face interviews on all levels of the food chain. Retailers (n=16) and farmers (three stages: oral survey in 1998 n1= 30, written in 1999 n2= 20, and round tables accompanying the project) were questioned by means of expert interviews, whereas the consumer survey followed standardized questionnaires directly at the place of purchase (n=600). The survey was undertaken at three different places: the Elbe Valley itself, where the consumer characteristics mirror the typical living situation of rural areas. Besides the Elbe Valley, two close cities (Lüneburg and Hamburg) were included in the sample due to the higher market potential.

Methodology, or methodologies used  
To identify the WTP for food of nature conservation, as the main step of the research a consumer survey (n=600) was conducted and the results analysed by means of descriptive and multivariate data analysis methods (e.g. factor, linear and logistic regression analysis). It was aimed to quantify and explain the WTP for food of nature conservation by identifying which underlying socio-demographic factors and attitudes increase the buying probability for and therefore characterise the potential buyers of food of nature conservation. To put the consumer analysis into perspective and bridge the distance between producers and consumers the second step was to survey the food retailers, the processing industry and caterers by means of explorative expert interviews.

The WTP information obtained through interviews at supermarkets was related to consumer socio-demographic characteristics through cross-tabs, linear and logistic regression. Linear regression was used to identify and quantify the factors affecting consumers’ stated WTP values (price premiums), logit analysis was applied to estimate consumers’ buying probabilities and underlying determinants. Explanatory variables were used in factor analysis to identify five attitudinal factors. The logit regression was used in further analysis.

Conclusions and recommendations of the study  
The findings show that there is WTP for food of nature conservation. From the consumer analysis it can be seen at the example of fresh milk, that about 70 % of the consumers are prepared to pay a quite high price premium – on average a price premium of 30 % compared to conventionally produced food. More than 60 % of the consumers stated to be prepared to pay a price premium of 10 % and still more than 20 % indicated to accept a premium of 40 %. Especially consumers characterised by high nutrition consciousness, low trust in conventional food, high environmental consciousness, low price sensitivity as well as a positive image of food of nature conservation could be identified as potential buyers.

The explorative marketers’ analysis indicates with new, but not very far-reaching findings that there are also marketers who are interested in processing and selling on food of nature conservation to the consumers. The price premium for the producers depends on the product and the chosen channel, while retailers indicated the lowest price premiums due to small margins and high competition.

In conclusion, this study shows from the demand side that nature conservation could be one way of differentiating and adding value to the raw product throughout the whole food chain.

Strengths and weaknesses of the methodology used  
Strengths:
- Survey covers several links in the food chain consumers, retailers, caterers, processors
- Uses a combination of methods to analyse WTP in relation to consumer characteristics

Weaknesses:
- “Food of nature conservation” is not a well-defined concept. WTP for what?
- The study uses a binary logit model to study WTP for one product (milk of nature conservation) which is likely to contain a bundle of attributes, and which is a relatively simple approach to analyse a complex product.
Abstract
Regional marketing concepts can be a successful strategy for product differentiation. A research project in Northern Germany reveals the following results: consumers' stated preferences show clearly potential demand for regional food, in particular if environment-friendly produced and controlled. The main influencing factors that could be identified by means of a rank-ordered logit analysis are consumers' regional, nutrition, and environment consciousness as well as a low price sensitivity and mistrust in conventional food from somewhere else.

Also some retailers indicated interest in regional marketing concepts, but rarely in environment friendly produced food: listing of regional specialties and a seasonal offer as well as a farmer's market outlet in a shopping centre. Further, farmers showed general interest in regional marketing, but not combined with environment-friendly production. Overall, one can conclude of these results, that the limiting factor for regional marketing seems to be more the supply than the demand side.

Position in the analytical framework
Question: How effective are quality labels in influencing consumer perceptions/behaviour?
What are producers' attitudes towards QA and certification schemes?
What are the effects of PDO/PGI certification?
Stakeholders: farmers, retailers, consumers

Background and context of the study
The region of research in this study is the Elbe-Valley in Lower Saxony (Northern Germany). In this region, in 1998, an interdisciplinary research project was established to look at the central question, “How can agriculture and nature conservation be brought in accordance with one another?” The project as a whole intends to show perspectives for sustainable agricultural development especially giving equal weight to both economic and ecological aspects. The economic part is split into two sub-projects: production cost accounting and marketing. This paper is part of the marketing side. The main objective of the marketing project is to investigate the opportunities and threats to regional marketing of environment-friendly produced food from this specific production area. A regional marketing concept is to be developed, which shall lead through product differentiation and niche marketing to a competitive advantage for the producers from the Elbe-Valley. It is aimed to improve the efficiency of distribution channels and adding value through the development of a regional brand strategy, taking into account consumer and marketer preferences and willingness to pay. For a successful customer-orientated regional marketing concept, consumers play the central role. On the other hand, regional traders are needed as marketing intermediaries with marketing power and a filter function (gatekeeper) as well as producers as the essential basis.

Goals and Objectives of the study
This study, which is part of the interdisciplinary research project described above, aims at assessing the product differentiation and sales opportunities for regional and environment-friendly produced food products. It analyses consumers’ preferences, retailers’ perceptions, and listing criteria as well as farmers’ attitudes towards vertical regional marketing concepts that focused on environment-friendly production.

Quality assurance or certification scheme addressed in the study
This study is focussed on product differentiation which arises from 1) the marketing of regional originating products and 2) the use of environment-friendly production methods.

Scope and coverage of the study
This paper presents the results of surveys conducted in 1998, 1999 and 2000 amongst consumers, retailers and farmers. The example used in this study is focused on potatoes.

Dataset(s) used in the study
The data used in this study was conducted in and nearby the Elbe Valley from June 1999 to
June 2000. The surveys were mostly based on face-to-face interviews on all levels of the food chain. Retailers (n=16) and farmers (three stages: oral survey in 1998 n1= 30, written in 1999 n2= 20, and round tables accompanying the project) were questioned by means of expert interviews, whereas the consumer survey followed standardized questionnaires directly at the place of purchase (n=600). The survey was undertaken at three different places: the Elbe Valley itself, where the consumer characteristics mirror the typical living situation of rural areas. Besides the Elbe Valley, two close cities (Lüneburg and Hamburg) were included in the sample due to the higher market potential.

**Methodology, or methodologies used**

The underlying theoretical framework, which was applied to assess the product differentiation possibilities on the three main levels of the food channel, is based on two different theoretical concepts:

1. An adapted and extended structural consumer behaviour model that explains consumers’ preference for environment-friendly and regionally produced food with the help of attitudes and socio-demographic variables. The model is presented as an extended neo behaviouristic purchase decision model (Stimuli-Organism-Reaction model). It assumes that the food purchase decision consists of three processes; a cognitive, normative and emotional process.

2. The gatekeeper model, which shows retailers’ power and product filter function between producers and consumers.

In the empirical section of the paper, the data of the producer and retailer surveys were qualitatively analyzed, while the consumer survey was analyzed by means of innovative multivariate methods, including conjoint measurement and rank-ordered logit analysis. The innovative aspect is the combination of a traditional conjoint with a rank-ordered multi-nominal logit analysis.

In order to perform the conjoint analysis for the consumer section, consumers had to rank potatoes from two different origins and four different production methods. Conjoint analysis was used to estimate, based on indicated ordinal preference data, a traditional additive utility model, assuming a product is seen as a bundle of product characteristics. Due to the ordinal data level, a monotone analysis of variance was applied. A conjoint analysis measures the relative importance of the research attributes as well as so-called partial benefits expressing the relative preference of the different attribute levels. To measure the price influence, the conjoint sample was split into two groups. One group got stimuli to rank without price information and the other group with price information. So the price effect was not measured as an individual attribute, but as an influence on the preference comparing the results of the two groups.

In order to explain consumers’ preferences using underlying attitudes and socio-demographic variables, factor analyses have been conducted. This resulted in a list of 6 different attitudes (regional consciousness, trust in conventional food, appreciation of regional products, low environment consciousness, nutrition consciousness and price consciousness). A rank-ordered logit model was applied to estimate the influence of these attitudes and the socio-demographic variables on the consumers’ preferences for each of the 8 potato types.

**Conclusions and recommendations of the study**

The combination of a conjoint measurement and rank-ordered logit analysis allows the researchers not only to estimate the relative market potentials of the selected products, as well as the relative importance of the research attributes (such as the type of production method or regional origin) and the partial benefits of the investigated attribute levels, but also to explain consumers’ product choice, depending on underlying attitudes and socio-demographic factors.

The qualitative analysis of the retailers’ and farmers’ responses indicates the extent to which they support product differentiation according to regional origin and process quality.

**Strengths and weaknesses of the methodology used**

The main strength is an appropriate combination of a traditional conjoint measurement and rank-ordered logit analysis. Price measurement is evaluated through a comparison of the two subgroups. The main weakness concerns the results which are based on consumers’ answers.
Abstract
This study characterized the costs and benefits associated with adopting ISO 14001 environmental management system (EMS) standard, based on a survey of ISO 14001-registered organizations in Canada. Decision makers are contemplating whether it is necessary to register to one or more of the ISO and other international standards and, if so, which ones. Furthermore, an organization that has registered separate departments to different standards and contemplates integrating such standards across the different units may be interested in attributes of particular units that will facilitate integration. Discriminant analysis was conducted to characterize the factors that distinguish between organizations that adopted ISO 14001 alone (single standard), versus those that registered to ISO 14001 along with other quality, health, and safety standards (multiple standards). The most important factor that motivated adoption to ISO 14001 was to establish a positive environmental profile, thereby promoting goodwill and integrity. Internal factors tended to dominate the motivations for adopting ISO 14001, supporting the hypothesis that external benefits may not be fully realized due to market and policy failure. Internal costs associated with registration depended on the size of the organization and ranged, on average, from CND$17,000 (for organizations with less than 100 employees), to CND$42,000 (for organizations with more than 500 employees). External costs depended more on the type (i.e., sector of the Canadian economy) than on size of the organization. The most important variable that distinguished between Canadian organizations that adopted ISO 14001 alone versus those that adopted ISO 14001 and other standards was whether the organization had an international orientation, that is, those with more than 50% of services or exports to other countries.

Position in the analytical framework
Question: 1. Do QA and certification schemes improve profitability
2. What motivates producers to register to a QA or certification scheme?
3. What are the reasons of using more than one label / standard ?
4. What are the types of benefits and costs are accrued from QA and certifications schemes?

Stakeholders: processors

Background and context of the study
Members of ISO have recognized that ISO's (quality and environmental) management standards share generic management templates. ISO 14001 is touted as the most appealing and logical template on which to model integrated management systems. The synergy in implementing ISO 14001, for example, after having an existing alternative standard (such as one or more of the ISO 9000 series), stems from various factors and philosophies that are common to all of them. Fixed costs associated with implementing one standard can be carried over to others, thereby lowering overall transactions costs of implementing a new standard if an old one already exists. The ISO 9000 and ISO 14000 series of standards both focus on general management issues with a philosophy of continuous improvement. In addition, many of these standards emphasize processes and systems that an organization must follow, as opposed to specifying particular goals or outcomes. In other words, before implementing the ISO 14001 EMS, if an organization is already subject to significant environmental regulatory schemes, then such an organization is likely to have a quasi-EMS in place that is in a large measure compatible with ISO 14001 requirements.

In contrast, while the ISO 9000 series of standards focus more attention on purchasing processes, contract review, and the handling, servicing and traceability of products, ISO 14001
takes a more strategic approach by addressing the policies, goals, and objectives of the organization. A key question for entrepreneurs and decision makers then centres around whether it is necessary to register to one or more of these standards and, if so, which standards to register to. On the other hand, an organization that has registered separate units or sections to different standards and contemplates integrating such standards across the different units may be interested in attributes of particular units that will facilitate integration. So far, limited published research has analyzed measured characteristics of organizations registered to only one of the ISO standards versus organizations registered to that standard and one or more other standards. Differences among groups can guide decision makers contemplating the appropriate standards to register to, or integrate.

**Goals and Objectives of the study**

The purpose of this study is to understand the factors that motivate Canadian organizations to register to ISO 14001, and to characterize the actual costs and benefits involved in registering to the standard. In addition, discriminant analysis is conducted to identify and rank factors that distinguish between Canadian organizations that adopted ISO 14001 alone (single standard), versus those that registered to ISO 14001 and other standards.

**Quality assurance or certification scheme addressed in the study**

The standards studied in this article, besides ISO 14001, include HACCP, EMAS, AS 9000, QS9000, along with (the 1994 editions of ) ISO 9001, ISO 9002, and ISO 9003.

**Scope and coverage of the study**

First, in order to analyse the factors that motivate Canadian organizations to register to ISO 14001, and to characterize the actual costs and benefits involved in registering to the standard, this reports reports the findings of a survey conducted in December 1999 and January 2000. Secondly, discriminate analysis is conducted by estimating a discriminant function, in order to identify the factors that distinguish between Canadian organizations that adopted ISO 14001 only, versus those that registered to ISO 14001 and other standards.

**Dataset(s) used in the study**

A mail survey was conducted during December 1999 and January 2000. The survey instrument is available from the authors upon request. The contact information of the survey participants was obtained from the Globus Registry (http://www.globusregistry.com), which is an internet database of Canadian organizations that have registered to various quality and safety assurance, and ISO 14001 standards. There were a total of 109 Canadian organizations listed when the registry was accessed in November 1999. However, from the 109 potential respondents surveyed, 41 useable questionnaires were returned, representing a response rate of 38%. Among the 41 Canadian organizations studied, 12 (29%) registered to ISO 14001 only. The remaining 71% that registered to ISO 14001 also obtained registration to one or more other standards. The standards that the organizations registered to included ISO 9001, ISO 9002, ISO 9003, AS 9000, QS 9000, HACCP, and EMAS. The majority of respondents (29%) were from the automotive, transport, and aerospace industry. Another 27% represented organizations from the industrial manufacturing, chemical, and petroleum sectors of the Canadian economy, while 24% were from the pulp and paper, forest, and agriculture sectors. Other sectors included waste/ environmental management (7%), power generation (5%), and a variety of organizations involved in mining, distribution, and government agencies (7%).

**Methodology, or methodologies used**

In order to analyse the factors that motivated Canadian organizations to register to ISO 14001, the respondents were asked to indicate the importance of several internal and external motivations according to a five-point scale. Internal factors included increase production efficiency, increase working environment safety, and promote company goodwill and integrity. External factors include compliance with existing government regulations, anticipating future regulatory requirements, anticipating future market demands, and pressure or demands from existing clients/customers. The impact of ISO 14001 implementation and registration cost was investigated by first asking respondents whether cost was a major consideration in obtaining ISO 14001 registration, on a three-category scale ranging. Respondents were also asked to report the one-time internal and
external costs associated with developing and implementing an EMS and registering to ISO 14001. Internal costs included expenses on staff training, the opportunity cost of employee time spent on activities such as EMS development, documentation, and record-keeping, redeployment of internal resources, internal auditing, and other costs. In contrast, external costs include the cost of acquiring information, third party (external) auditing, consultant fees, registrar fees, and marketing and promotion. The estimated costs are reported separately for small, medium and large firms, in order to allow for a comparison. The impact of ISO 14001 registration on benefits is analysed in terms of the actual benefits and/ or cost savings, and the ranking of specific areas where benefits accrued to the organization. Additionally, respondents were asked about their level of satisfaction with respect to five issues.

To analyse the factors that distinguish between organizations that adopted ISO 14001 only from organizations that adopted ISO 14001 along with one or more other standards, discriminant analysis is conducted. A discriminant function is estimated, where the dependent variable scored 1 for organizations that registered to ISO 14001 only and zero for organizations that adopted other standards along with ISO 14001. Explanatory variables are a dummy indicating the importance of trade with international customers, the number of employees, annual average gross revenue, age of organization before registration, a dummy variable indicating the organization’s involvement in the agricultural, forestry and fishing sectors, a dummy indicating whether the organization makes use of other standards, and a dummy indicating whether the organization undertook a gap analysis to determine the degree of conformance with the ISO 14001 requirements.

**Conclusions and recommendations of the study**

The results reported in this paper indicate the internal and external factors that motivated Canadian organizations to register to ISO 14001. Additionally, the results of the survey show the types of costs and benefits involved in registering to the standard. As well, the results indicate an estimate of the real costs and benefits of the registration by small, medium and large companies.

Secondly, discriminant analysis is conducted by estimating a discriminant function, in order to identify the factors that distinguish between Canadian organizations that adopted ISO 14001 only, versus those that registered to ISO 14001 and other standards. The most important variable was whether the organization had an international orientation, that is, those with more than 50% of services or exports to other countries. The size and age of the company appeared to have no significant impact.

**Strengths and weaknesses of the methodology used**

Strength: obtaining actual data on the cost of adopting the QAS.

Weakness: Survey that frequently deals with a small number of firms and which are thus difficult to be used in a statistical analysis.
Background and context of the study
This study considers the intervention of the European Union (EU) in markets for typical products, i.e., agricultural commodities or finished products with specific organoleptic characteristics related to a production area or technology, via regulation No. 2081/92 on the protection of Products with Geographical Indications (PGIs) and Designations of Origin (PDOs). According to the regulator, consumers with higher willingness to pay get what they pay for it, while producers find the incentives to provide the quality level sought by richer consumers and ensure themselves higher profits.

Economists and policy makers have become increasingly aware of the importance of information for the proper functioning of markets for typical products: higher quality products cannot be recognized as such by consumers with higher willingness to pay, and thus high-quality producers cannot have appropriate incentives. Most are familiar with the many instances of market failures due to information problems and many agree on the need to overcome them in order to increase social welfare. What is more controversial, though, is whether a public intervention or the emergence of a different institution, such as warranties, reputation, labelling, etc., is the most suitable correction.

Goals and Objectives of the study
The objective of this study is to investigate the welfare effects of the EU regulation on the protection of Products with Geographical Indications (PGIs) and Designations of Origin (PDOs), which grant producer groups the right to label typical products to make them easily recognizable by consumers.

Quality assurance or certification scheme addressed in the study
In this study the EU regulation on PGIs and PDOs is used as a starting point for the construction of the model which considers a vertically differentiated market.

Scope and coverage of the study
In this study, the welfare effect of labelling policies is analysed by focussing on the surplus of the different consumers and producers.

Although the EU regulation on PGIs and PDOs is used as a starting point, the theoretical model constructed in this study could be applied to any other vertically differentiated market with two distinct products. In addition, no specific commodity is addressed in this model.

Dataset(s) used in the study
No specific data set is used in this study. In order to show the impacts of the regulation, numerical simulations have been performed on the vertically differentiated market model after having calibrated and normalized it.

Methodology, or methodologies used
In order to achieve the study’s objective, a theoretical model is constructed which considers a vertically differentiated market with two distinct products: one with higher quality and the other with a lower quality level. The model results in a specification of the consumer surplus (CS) and producer surplus (PS) of high- and low-quality producers, for both before and after the introduction of the regulation. In general, the CS is expressed as a function of the endogenous price and a quality and taste parameter, and the PSs result to be a function of the endogenous price,
endogenous quantity and a cost parameter. The main difference between before the regulation (when consumers are unable to distinguish between the different quality levels and only form expectations about it) and after the regulation (when distinction is made possible), is the fact that, after the regulation, the CS is no longer depending upon a weighted average of the quality of the two varieties but split up in the CS of low-quality consumers and the CS of high-quality consumers. In addition, after the regulation, the PS of the high-quality producers is reduced by the expenditures for the program.

After having calibrated the model, numerical simulations have been performed in order to analyse the impacts of the regulation on total CS and the PS of low- and high-quality producers. Several levels of quality and cost differences between the high and low-quality product have been analysed. In addition, the impacts of the level of administrative costs, land restrictions (where the high-quantity production level is limited by a maximum) and price determination are analyzed.

Conclusions and recommendations of the study
The theoretical model presented in this study which considers a vertically differentiated market with two distinct products (with respect to their quality level), is able to explain the effect of the introduction of the regulation on the consumer surplus, low-quality and high-quality producers’ surplus and total welfare.

In addition, this theoretical model is able to explain the change in consumer surplus, low-quality and high-quality producers’ surplus and total welfare in case of different levels of administrative costs and quality differences. Finally, it is capable of analysing the impacts of market power, either in the form of land restriction or joint price determination.

Because the results of the study are more general, the analysis can easily be extended to encompass other similar emerging issues in food markets. In addition, the authors believe that, in order to avoid potential negative welfare effects, decisions on these matters should pass a cost-benefit analysis.

Strengths and weaknesses of the methodology used
An important shortcoming of the methodology used is the fact that it does not allow for other externalities arising from the regulation. It is assumed that the utility of the high-quality consumers consuming labelled products is only derived from their perception of buying a higher-quality product. However, these consumers might buy these labelled products for other reasons as well. For example, some may want to buy a specialty product because they care about a particular region or production process, or because they are afraid of losing biodiversity in the form of those animal and vegetable species or cultivars deemed endangered in develop countries. Taking this into account might change the results presented in this research.

Finally, as the regulation might be an incentive for former low-quality producers to increase their quality and become high-quality producers, the possible additional costs of improving the quality level and the possible shift from low to high quality production should be incorporated in the model as well.

Strengths of IO based models
- They focus on an issue that is well defined and provides the key economic mechanisms that are involved.
- They lead to analytical solutions – a strength for a theoretical model.
- Mechanisms involved that lead to the results can be explained. Parameters that have a key influence on the results can be determined.
- Consistency of the model can be easily checked. Assumptions of the model are explicit, which allows for precise evaluation of the validity and realism of the model.
- Easy to analyse the impact of the creation of new markets resulting from the adoption of a QA.
- Possibility of dealing with non-participant producers and evaluating the impact of a QA on them (in this paper, it is low quality producers).

Weaknesses of IO based models
- Difficult to develop. Advanced skills are required.
- Results provided are mainly qualitative rather than quantitative.
- Difficult to calibrate, as they frequently use simplifying assumptions that do not change qualitative results but could change quantitative ones. They also rely on parameters that are sometimes difficult to quantify.
**Title:** Compliance to HACCP and competitiveness of Oman fish processing  
**Authors:** Lokman Zaibet  
**Publication date:** 2000  
**Journal:** International Food and Agribusiness Management Review 3  
**Publisher:** Elsevier Science Inc  
**Number of pages:** 311-321  
**Availability, URL:**  
**Contact details authors:** lzaibet@squ.edu.om

**Abstract**  
Exports of fish products are very important for the Sultanate of Oman to diversify sources of income and achieve higher standards of living to fishermen. In the past government regulations and support were sufficient to reach markets such as the European Union and the United States. During the last decade, however, there has been more focus on the application of more stringent quality regulations according to international norms namely Hazard Analysis Critical Control Point (HACCP). This paper investigates the perception and compliance of Oman fish companies to HACCP and consequences for corporate success and competitiveness. The paper develops an empirical framework to investigate empirically the relation between the adoption of international quality control procedures and success in export markets using an export penetration index. The paper findings show that up to 1998, Oman fish quality regulations differ in scope and objectives from HACCP. For instance, there is no requirement of plant-level quality management system equivalent to HACCP. Also, Oman regulations were based on regular inspections by government agents whereas HACCP is a system-based approach aiming at reducing repeated inspections. Empirical results support the hypothesis put forward; variables reflecting on the quality of fish products, that is, HACCP and sanitation were found to be positively correlated to the export index.

**Position in the analytical framework**  
**Question:** Do quality and certification schemes affect international trade flows?  
**Stakeholder:** Processors

**Background and context of the study**  
Since 1997, Oman, like other developing countries, has experienced periodic difficulties with exports to the European Union (EU) because of the apparent lack of quality control measures. The Ministry of Agriculture and Fisheries has addressed these problems by sponsoring research on food safety and quality control, training programs for fish processing companies as well as inspection visits to assess quality and safety at fish processing facilities. The Ministry has developed hygiene and quality regulations and taken several measures to improve landing conditions and handling of fish to assure the quality of the marine products harvested in Oman.

**Goals and Objectives of the study**  
This paper examines the adoption of quality control measures [Hazard Analysis Critical Control Point (HACCP)] in the fisheries industry in Oman. Emphasis will be placed on HACCP as a tool to improve export performance and to regain and expand higher value fish export markets in the EU and the U.S.A. The objectives of this paper are threefold:  
1. To provide an overview of the state of international and national fish market arrangements with emphasis on Oman;  
2. To link the adoption of and attitudes toward internationally recognized quality control procedures (HACCP) to export performance; and  
3. To draw implications about the impact of HACCP on corporate success and competitiveness of the fisheries sector in Oman.

**Quality assurance or certification scheme addressed in the study**  
The quality assurance scheme addressed in this study is the Hazard Analysis Critical Control Point (HACCP) program.

**Scope and coverage of the study**  
After a short discussion about international and national fish market arrangements, and Omani plants' attitudes toward HACCP and export performance, this paper presents a theoretical
framework that links the adoption of quality control based on HACCP to competitiveness in international markets. This theoretical framework forms the basis of the empirical section of the paper.

### Dataset(s) used in the study

Cross-section data were collected through a questionnaire and site visits to fish processing companies in Oman. They interviewed 16 companies, which represents about 85% of the total number of fish processing companies available at the time of the study. The questionnaire is composed of three sections. The first section concerned general information on the company: labour, freezing capacity, storage capacity, average processing per day, ice plant, management, main products and, destination. Section two describes production and exports to different markets (regional, EU, U.S.A., and other). The last section gauged to the implementation of HACCP and sanitation measures.

### Methodology, or methodologies used

First, a theoretical framework is constructed that links the adoption of quality control based on HACCP to competitiveness in international markets. It assumes that a firm produces an output which is decomposed into two proportions: one proportion having good quality intended to be exported to countries requiring high quality and a second proportion with lower quality intended to be marketed in countries with lower standards. After having constructed the firm’s cost function and profit function, the firm’s supply for each type of the product (either high or low quality), is expressed as a function of its quality level, and fixed and variable costs. This latter function is the basis for the empirical analysis of exports and competitiveness of Omani fisheries.

Then the empirical model is estimated. The dependent variable is the export penetration index (EPI) with respect to the EU and US. This EPI is defined as the sum of exports going to the EU and US, divided by the firm’s total production. The independent variables were a HACCP dummy indicating the firm’s status of HACCP, the number of employees, capital (defined by investments in freezing and storage capacities), and sanitation. The latter variable was defined by a dummy and takes the value of 1 if the plant required minor modification to meet EU sanitation requirement. The model is estimated using OLS.

### Conclusions and recommendations of the study

The theoretical and empirical model estimated in this paper indicate the relationship between the adoption of international quality and safety procedures (HACCP) and success in export markets by constructing an index of export penetration.

### Strengths and weaknesses of the methodology used

**Qualitative survey on firms to evaluate if and how they implement HACCP.** 16 firms are surveyed which is a small number for statistical analysis. However, it represents 85% of the total number of fish processing companies.

**Weaknesses**

There is no link between the theoretical model and the estimated one. Very basic analysis of correlation between the export penetration index and the exogenous variables. Wrong interpretation of the coefficient. Choice of exogenous variables debatable.
ISO 9000 standards have become normal business practices in the European food sector. The reason is that it meets widely differing objectives in the member states and can meet the needs of widely differing legal systems. It also appears that ISO certification has increased the efficiency of the whole food chain. Such argument is used in this article to show that ISO certification can generate gains to consumers and food processors. The case of beef processing in the United Kingdom is analyzed using the framework of inter-linked markets.

**Position in analytical framework**

**Question:** What are the welfare benefits from QA and certification schemes?

What types of benefits and costs accrue from QA and certification schemes?

What motivates producers to register to a QA or certification scheme?

Do QA and certification schemes improve profitability?

**Stakeholders:** Processors, whole chain and consumers

**Background and context of the study**

ISO 9000 standards represent a new development in the European Union (EU) food sector. There are several factors pointing towards wide spread adoption of ISO standards, and towards it becoming an accepted business practice in the European market. The most important of these factors is the active support of national governments of several member states. ISO certification meets widely differing legal systems and provides some guarantee of market access in the export markets. It also appears to have increased the efficiency of the entire food chain.

**Goals and Objectives of the study**

The objective of this study is to analyse the gains generated to consumers and food processors due to ISO certification.

**Quality assurance or certification scheme addressed in the study**

The certification scheme addressed in this study is the ISO 9000 standards.

**Scope and coverage of the study**

In order to empirically analyse the gains generated to consumers and food processors due to ISO certification, this study will focus on the case of beef processing in the United Kingdom. However, before analysing the gains, this paper will give a short overview of the motivations of firms to implement the standards, the cost of achieving the certification and the cost reductions due to ISO registration in general.

Note that in the analytical analysis, ‘producers’ refers to all suppliers, including primary producers, processors and retailers. It is not clear how the surplus is distributed amongst them. Therefore, this study is allocated in the analytical framework under the heading ‘whole chain’.

**Dataset(s) used in the study**

The first part of this paper is based upon personal interviews conducted with four plants (dairy, cheese, meat and poultry). In the second part of the study (the empirical analysis of the gains), comparative static analysis is conducted using the framework of inter-linked markets. The data used for this analysis only comprise estimates for cost shares and the elasticity of substitution. They are obtained from the study of Mullen et al. In order to derive the supply elasticities of meat, supply equations are estimated using time series data from 1982 and 1992.

**Methodology, or methodologies used**

The brief analysis of the motivations of firms to implement the standards, the costs of achieving the certification and the cost reductions due to ISO registration is based on personal interviews conducted with four companies.

In order to analyse the gains from ISO certification, an inter-linked market’s model is used assuming lower transactions and production costs due to the adoption of standards. The model considers the case of a meat processor contracting with a cattle supplier. The algebraic model
used to evaluate the effects of ISO certification is a single-output, two-input model. The model incorporates six equations that describe the beef industry and relate the input market to the output market. The equations include six endogenous variables (one output, two inputs, and their prices).

Then, the expressions of consumer and producer surplus are derived. They suggest that consumers always gain from a downward shift in the supply of beef. The reduction in transactions costs and, consequently, in the farm-input price will be captured by beef producers and will generate positive surplus.

This system of six equations is used for comparative static analysis, using an exogenous shifter. The exogenous shifter is a 1% cost reduction for inputs due to ISO certification. Estimates for cost shares and the elasticity of substitution are obtained from the study of Mullen et al. The demand and supply elasticities of the different types of meat however, are derived from the estimation of the demand and supply functions. The meat demand used in this study is a function of meat prices and income, estimated using OLS Cochrane-Orcutt method. The cattle supply in this study follows a Nerlove partial adjustment model and is estimated as a function of feedstuff prices, producer price and the lagged number of cattle. The equation is estimated using Maximum Likelihood.

Conclusions and recommendations of the study

The results of the personal interviews show that the main reasons for implementing the standards are improvement of communication internally, speaking the same language in different plants, enhance competitive position and increase food safety and efficiency. The costs of achieving ISO certification are mainly the training and the acquisition costs of equipment and only represent one per thousand of the turnover. The cost reductions come mainly from a reduction in management and production costs and a reduction in transaction costs.

The simulation performed on the constructed framework of inter-linked markets was able to assess the impact of a 1% costs reduction at the input side on prices, outputs and producer and consumer surplus.

Strengths and weaknesses of the methodology used

A strength of the paper is that it considers the cost and benefit of ISO (cost of implementing it, benefits in reduction of transaction costs and management costs). One weakness of the use of EDM in this paper is the very simplified representation of markets. Only one product is considered (Do not take into account impact on other producers due to substitution) and only the final market is analysed and thus it is not possible to analyse how the potential gains for producers are shared in the chain.

Strengths of EDM

- The functional form does not have to be specified. Thus, the model can be used whatever the demand and the supply functions are.
- Relatively easy to parameterise (e.g. elasticities assumed or culled from the literature)
- Stylised form that is easy for policy makers to understand.
- Relatively easy to consider multiple stages in the supply chain as well as to consider multiple markets, that is to deal with the substitution among markets. (but not done in this paper)
- Possibility of evaluating the impact of QA on non participant producers. (but not done in this paper)

Weaknesses of EDM

- Only marginal changes can be handled accurately, unless the underlying functions are Cobb Douglas functions (whose elasticities are by definition constant).
- Difficult to deal with the creation of a new market resulting from the adoption of the QA or certification scheme. This difficulty arises when the QA changes the number of goods that are available on the markets.
- The method compares one equilibrium (‘with’) to another (‘without’), with no idea of how long it takes to reach a new equilibrium. That is, it is completely static.

Because of strength 2 and weakness 2, there is a danger that when EDMs are constructed, they assemble elasticities from various sources obtained in different structures and for different “reaction times” so that the parameter set is not internally consistent, and in fact represents some kind of unrealistic hybrid. It is often difficult for readers and users of such models to form an idea of whether such models are realistic. Ideally, one would evaluate their performance against data on real-world changes, or at least perform some sensitivity analysis – but often this is not done.
Annex 1: List of Methodological Papers

Articles on Internal Chain Standards

Antle, J.M. (1998). No such thing as a free safe lunch: the cost of food safety regulation in the meat industry. Research Discussion Paper no. 9, Trade Research Center, Montana State University, Bozement, MT.


Articles on Region-of-Origin Labelling and EU Certificates of Origin


**Articles on Country-of-Origin Labelling**


Lusk, J.L. and J.D. Anderson (2003). Modelling the effects of country of origin labelling on meat producers and consumers. Staff Paper No.03-07, Department of Agricultural Economics, Purdue University, West Lafayette.


**Articles on Specific Quality Assurance Schemes**


**Articles on Biotech/Non-Biotech Labelling**


Articles on Food Safety Assurance Schemes and Food Safety Standards


Articles on ECO-labelling


Articles on Environmental, Organic, Animal Welfare and Sustainable Standards


Millock, K., Hansen, L.G., Wier, M., and Andersen, L.M. Willingness to pay for organic foods: a comparison between survey data and panel data from Denmark. CIREC (EHES-CNRS), Nogent-sur-Marne, France.


Articles on National and Store Brands


Articles on Nutritional Labelling


Articles on Food Labelling in General

Annex 2: Literature List of Background Papers

Articles on Internal Chain Standards


Articles on Region-of-Origin Labelling and EU Certificates of Origin

Argüelles, M., Benavides, C. and Pérez-Bustamente, G. The protected designations of origin as a strategy of endogenous regional development. University of Oviedo, Spain.


**Articles on Country of Origin Labelling**


**Articles on Specific Quality Assurance Schemes**


**Articles on Biotech/Non-Biotech Labelling**


**Articles on Food Safety Assurance Schemes and Food Safety Standards**


**Articles on ECO-labelling**


**Articles on Environmental, Organic, Animal Welfare and Sustainable Standards**


**Articles on National and Store Brands**


**Articles on Food Labelling in General**


