International comparative experimental study: objective understanding of front-of-package nutrition labels in 12 countries

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Front of Pack labels (FOPL) = efficient tool to increase consumers’ awareness of foods nutritional quality and encouraging healthier choices

Influence of the label format on its effectiveness

Understanding = one of the key step of the FoPL use

Objective understanding: defined as the consumer’s capacity to interpret the information conveyed by the FoPL as intended by its designers

Influence of the label format on the consumers’ objective understanding of the labels

Graphical design
Adapted from Grunert et al., 2007

Perception

Attitude
Understanding

Use in purchasing situation

Potential impact on health
Introduction – Objectives – Methods – Results – Conclusion and perspectives

- Various types of FoPLs implemented in the world

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<td>Scale-based graded (e.g. Nutri-Score, Health Star Rating system)</td>
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- **Interpretive** FoPLs (using colours, texts, symbols) more effective than informative labels
- Growing number of studies comparing the effectiveness of various FoPLs but **few labels included** and **recent models understudied**
- Different social and cultural backgrounds → Differences in consumers’ responses to FOPLs suggested

Very few studies studies comparing different FoPLs across diverse cultural contexts
Objectives of the study

• Assessment of consumers’ response to five FoPLs currently in use in the world
  – **Objective Understanding**
  – Attitudes
  – Effect on food choice

• International comparison across 12 countries: Argentina, Australia, Bulgaria, Canada, Denmark, France, Germany, Mexico, Singapore, Spain, United Kingdom, United States
• Participants
  - 12,015 adults recruited in twelve countries (~1000/country) using an international web panel provider
  - Quota sampling on:
    - Sex: 1/1 ratio
    - Age: 1/3 in 18-30 years, 31-50 years and over 51 years
    - Socioeconomic status: 1/3 in high, medium, low income households
  - Regular consumers of the food categories tested

• Design and stimuli
  - 3 food categories (pizzas, cakes, cereals) with high variability in nutritional quality within the category and consumed in all 12 countries
  - Within each food category: 3 products with distinct nutritional profiles (lower, intermediate, and higher nutritional quality)
  - Creation of mock packages
Introduction – Objectives – **Methods** – Results – Conclusion and perspectives

- **Procedure**

  Ranking task without any FoPL (3 food categories successively)

  1

  ![Pizza images](image1)

  Randomisation in one of the 5 FoPLs groups

  2

  ![Pizza images](image2)

  Ranking task with one of the 5 FoPLs (3 food categories successively)
• Descriptive analyses
  - Number of correct answers in no label and FoPL conditions by food category
  - Change in number of correct answers: % of change compared to no label

• Multivariate analyses
  - Outcome: objective understanding assessed by comparing the ranking task results of participants between the no label and FoPL conditions
    - final score between -3 (deterioration of participant’s ability between no FoPL and FoPL tasks) and +3 (improvement of participant’s ability)
  - Association with FoPLs
    - Overall sample
    - By country
• Overall description of the population sample

Sociodemographic
- 50% men
- 33% over 50y
- 34% with a University undergraduate degree

Diet – grocery shopping
- 65% with a mostly healthy diet
- 61% somewhat knowledgeable about nutrition
- 74% responsible for the grocery shopping
- 62% recalled seeing the FoPL during the survey

• Similar trends across countries
• All FoPLs improved the number of correct answers compared to no label

- **Pizzas**
  - No label: +19.2%
  - Label: +30.0%
  - +46.7%
  - +12.1%
  - +12.5%

- **Cakes**
  - No label: +86.5%
  - Label: +142.9%
  - +229.3%
  - +16.6%
  - +92.4%

- **Breakfast cereals**
  - No label: +45.8%
  - Label: +49.9%
  - +95.0%
  - +26.7%
  - +39.8%

• Heterogeneous results depending on the FoPL:
  1 – Nutri-Score
  2 – Multiple Traffic Lights
  3 – Health Star Rating system
  4 – Warning symbol
  5 – Reference Intakes
• Results of the associations between FoPLs and the ability of correctly rank products

Odd Ratios and 95% confidence intervals of the association between FOP labels and improvement of ranking ability compared to RIs

* Significant associations after multiple testing correction
Nutri-Score is the FoPL associated with the highest improvement in participants’ ability to correctly rank nutritional quality of products, followed by the MTL, the HSR and the Warning symbol.

• Similar trends in all 12 countries

• Similar trends by food category

• No interaction with level of income: high understanding of Nutri-Score irrespective of the level of household income

• In sensitivity analyses on participants recalling having seen the FoPL during the survey: Nutri-Score performed best followed by the Warning symbol
1 – Interpretive vs. informative labels
Higher understanding of FoPLs providing guidance to consumers (colours, symbols, etc) than labels providing only numeric informations such as the RIs label.

2 – Colour-coded vs. monochromatic labels
Higher understanding of FoPLs featuring a colour-coding, using in particular the green-red polychromatic scale, than monochromatic labels.

3 – Summary vs. Nutrient-specific labels
Higher understanding of FoPLs using a summary indicator of the overall nutritional quality of the food.

4 – Similar patterns across countries
Higher understanding of labels with the two key features (summary and colour-coded, such as Nutri-Score) in all countries included in the study, even in countries where another FoPL is already implemented (UK, Australia). These graphical assets appear to outweigh the effect of potential familiarity of consumers with a FoPL.
Introduction – Objectives – Methods – Results – Conclusion and perspectives

• Perspectives of this international comparative experimental study
  ❑ The comparison of these 5 FoPLs on food choices

  Although most respondents did not change their choice of food with the addition of a FoPL, a sizeable minority shifted towards a healthier product, especially when the Nutri-score or MTL was used.

• Other perspectives
  ❑ Experimental comparison of the Nutri-Score with other FoPLs formats on portion size selection

  The Nutri-Score is the most effective FoPL to decrease the portion size selected by participants for less healthy products.

  ❑ Validation of the underlying algorithm of the Nutri-Score in the EPIC cohort of 471,495 adults

  The consumption of food products with a higher FSAm-NPS score (lower nutritional quality) is associated with an increased risk of cancer.
Objective Understanding of Front-of-Package Nutrition Labels: An International Comparative Experimental Study across 12 Countries

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