Evolutionary patterns in agri-food technology and global trade

Critical issues from an European perspective

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Objectives

The "strange" effects of globalisation:

when increasing integration and interdependence generates either**:**

- ✓ **convergence or common trends**
- ✓ **segmentation, re-nationalization, new barriers**

Aim:

focus on some emerging tendencies

Outline

A. Technology

B. Consumer behaviour

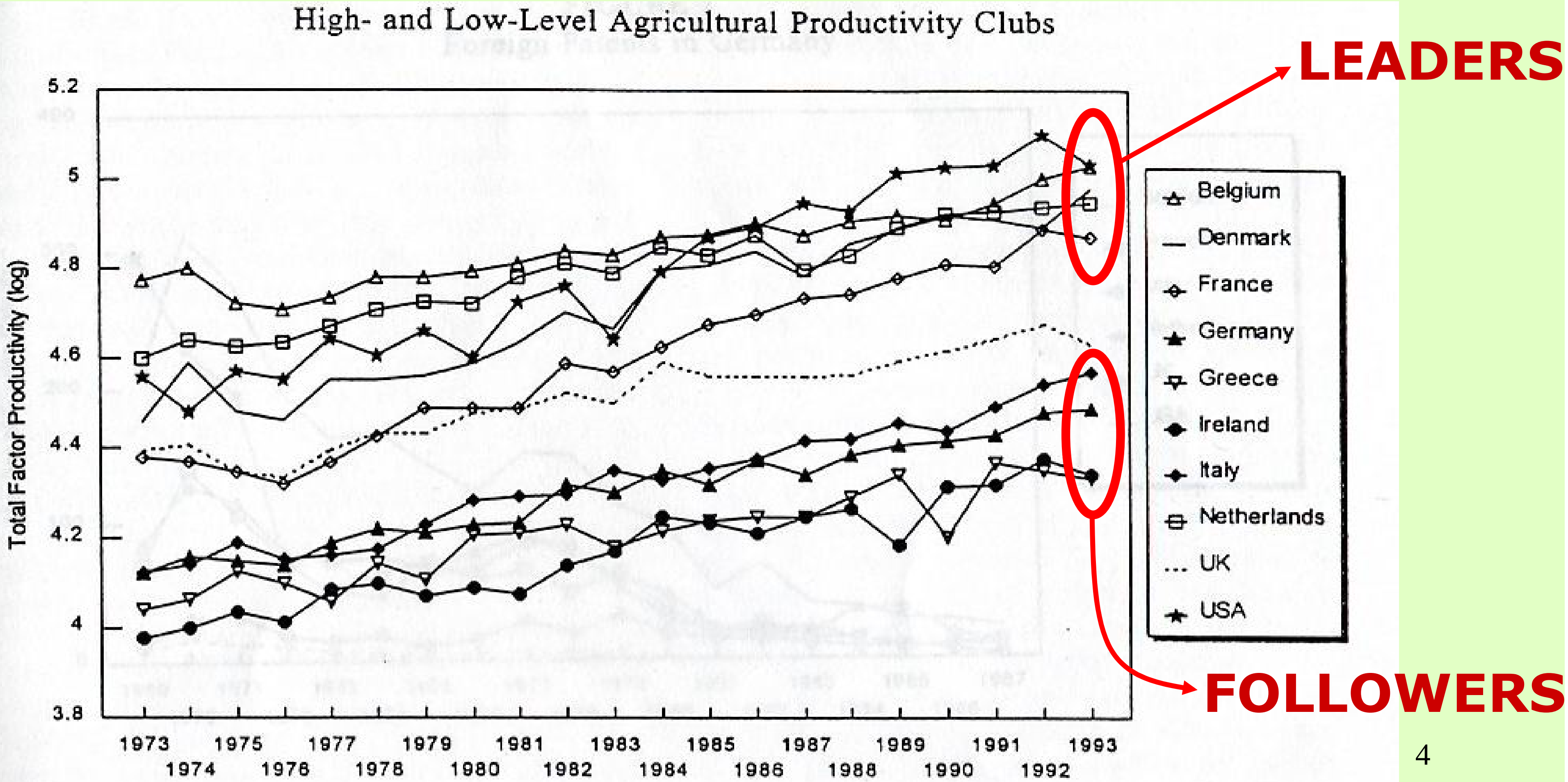
C. Trade

Some statements with "rough" evidence from the EU (Italian bias) and questions for the discussion:

- Is the EU agri-food system able to respond/sustain these (global) trends?
- Are EU countries equally able?

A. Technology: any convergence?

- **Agricultural Total Factor Productivity**



(Source: Schimmelpfenning-Thirtle, 1999)

Most NARS have changed strategies

- NARS: National Agricultural Research Systems
- Public expenditure decreased in real terms (?)

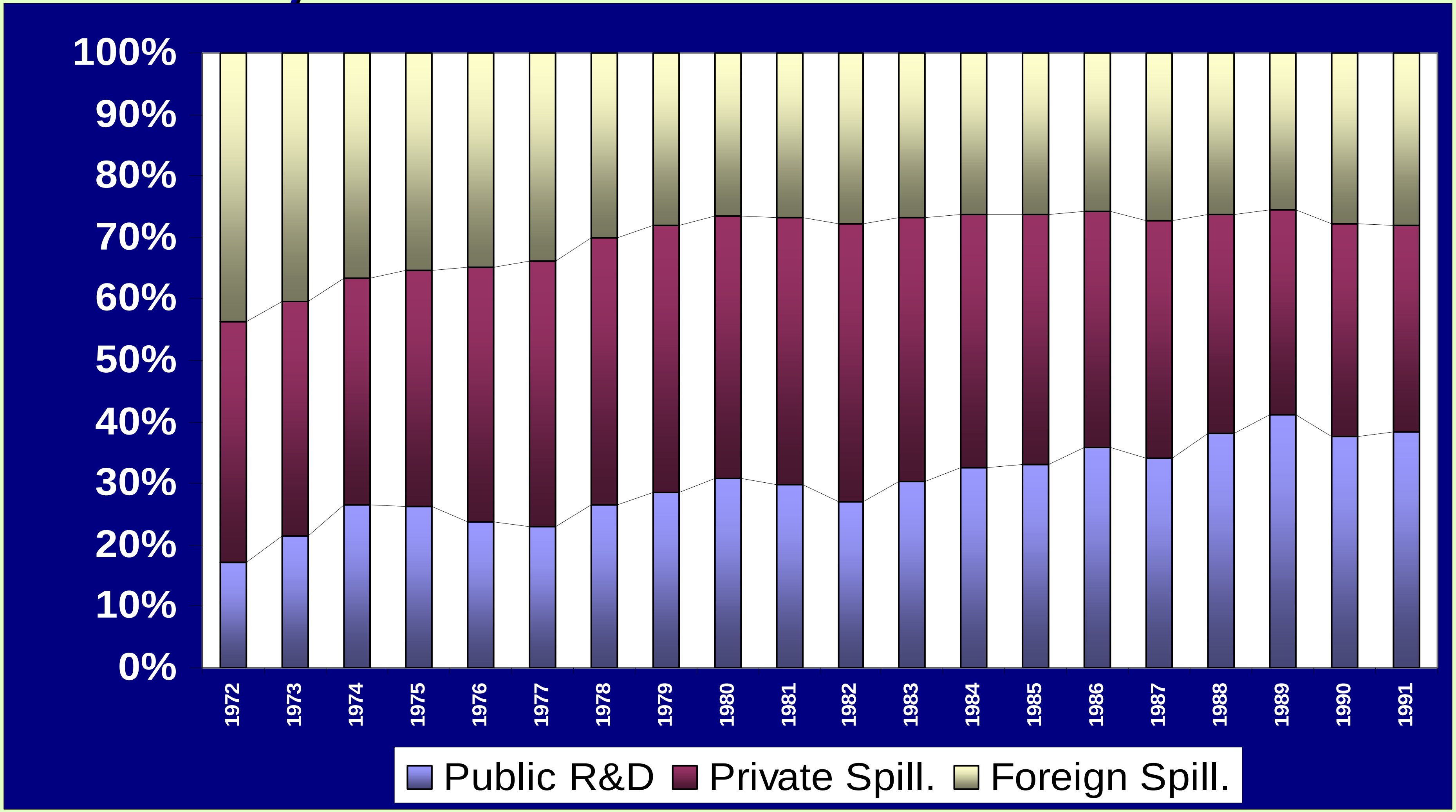
Huffman-Just (1999) data:

	Expenditure in $ PPP 1993			Growth rate	
	1971	*1981*	*1993*	*1971-81*	*1982-1993*
Western Europe	1451	2005	2608	3,2	2,2
of which:					
France	298	410	503	3,2	1,7
Italy	68	188	360	10,1	5,4
Spain	51	98,6	214,2	6,6	6,4
UK	274,5	371	370,8	3	0
USA	1236	1620	2054	2,7	1,9
18 OECD countries	3041	4078	5129	2,9	1,9

- Actually, we observe decrease in growth rate rather than in levels in a first stage; then, decrease in levels (real terms)

Spillovers are decreasing (?)

- Ex. Italy:



Source: Esposti (2002)

NARS (AKIS) – Strategic options

- **More self-reliant**: reduction of public R&D in leading countries and of spillovers (more site-specific and not transferable knowledge) makes followers' strategy more difficult
- **More public-private partnership**: focus public R&D on base (upstream) research and leave applied research and development to private sector (or regional/local context)
- **Exploit (adopt/adapt) GPT**: *converging technologies* can make the agri-food sector particularly suitable for *modular products*

Converging General Purpose Technologies (GPT)

The emergence of 3 major new GPT, Biotechnologies, ICT, Nanotechnologies, shift attention from upstream research to efforts in their application in the productive (agri-food) context and in exploiting the great potential of their convergence

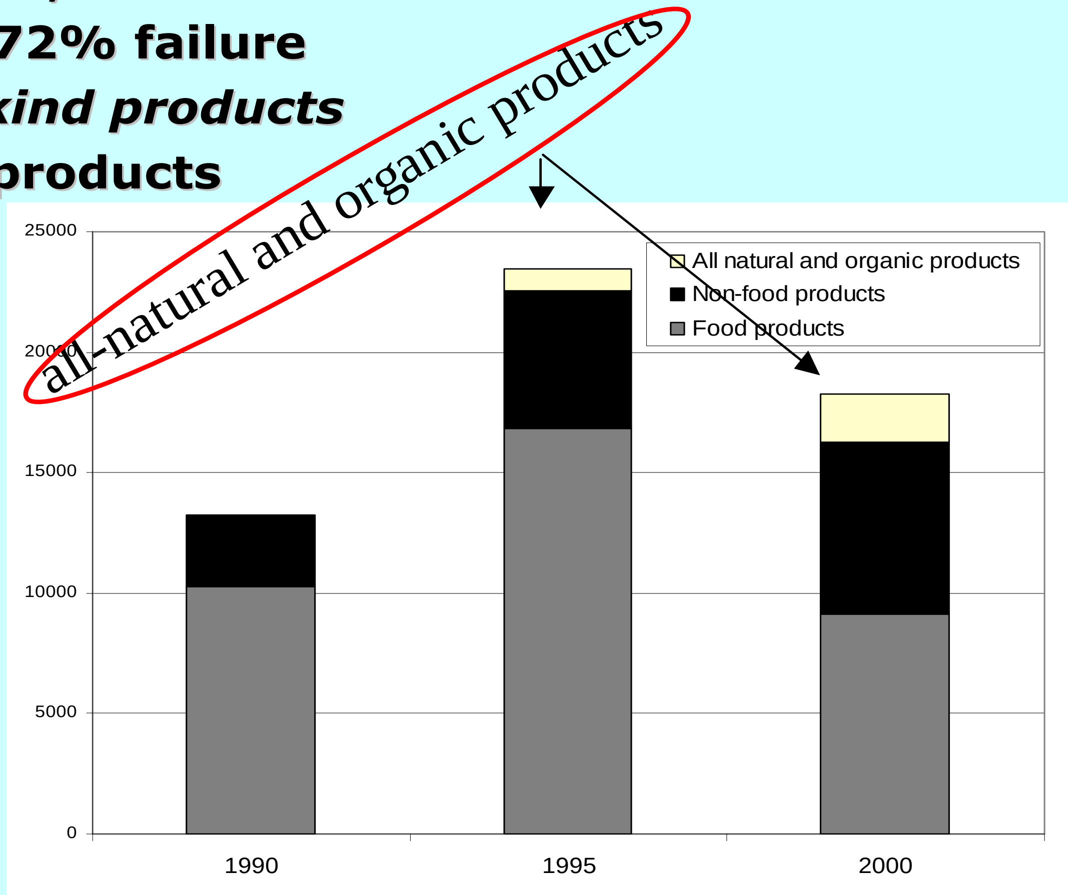
CONVERGING TECHNOLOGIES

The application and convergence of GPT generates new paradigms and an huge expansion of innovation possibilities.

New technological paradigms

Actually, a continuous and intense flow of new products:

- **USA: 13K-23K/year**
  - **78% *line extensions*, 55% failure**
  - **22% *new brands*, 72% failure**
    - **14% *one-of-a-kind products***
    - **mostly *me-too* products**



Critical issues (sustainability) of <u>new paradigms (modularity)</u>

- **<u>IPR</u>**: combination of technologies and increasing complexity means complex IPR issues and differences among countries/firms in terms of:
  - ✓ **IPR regimes and the "tragedy" of a*nticommons***
  - ✓ **Technology Portfolio Management**

- **<u>Concentration</u>**: modular production tends to increase concentration even in less concentrated sectors (agri-food) due to:
  - ✓ ***New comers* from highly concentrated sectors** (ex.: Novartis Consumer Health)
  - ✓ **Modular production increases scale economies**

B. Consumer behaviour: convergence?

<u>Some common trends:</u>

✓ decline food expenditure on total consumption (ex. Italy: 23% in 1985, 15% in 2005)

✓ increase in out-of-house consumption (in Italy currently more than 1/3 of food expenditure; it was 18% in 1995)

✓ decline in meat consumption; increase in fruits and vegs (in relative terms)

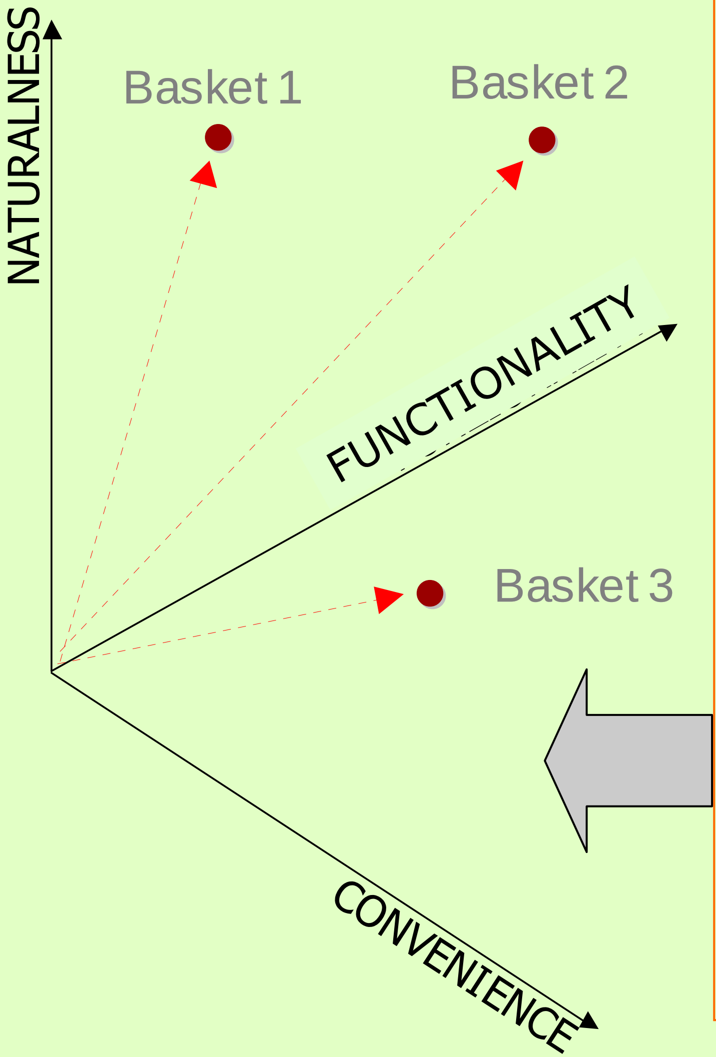
✓ increasing concerns about obesity and food-related diseases even in child-hood

Still significant differences: yearly consumption (kg per capita)

	1997		2004	
	Germany	Italy	Germany	Italy
Meat	88	91	91	95
Cereals	75	118	88	115
Fruits	92	121	108	141
Vegetables	81	177	93	218

Source: Inea

Emerging common trends



We can think about emerging trends of food consumption in terms of combination of 3 different specific product characters:

- **Naturalness** (incl. **Safety** concerns)

- **Functionality**

- **Convenience**

➢ Consumers are increasingly moving along these axes

➢ Any consumer is looking for her own desired combination of these characters, an "ideal" basket or an "ideal" product

Mass-Customization

The combination of GPT applied to agri-food production (modular production) and of a consumer seeking for her own “ideal” food, creates the condition of *on-demand* production even in agri-food:

Mass-customization

“*Mass customization is, in short, the mass production of individually customized goods and services*”

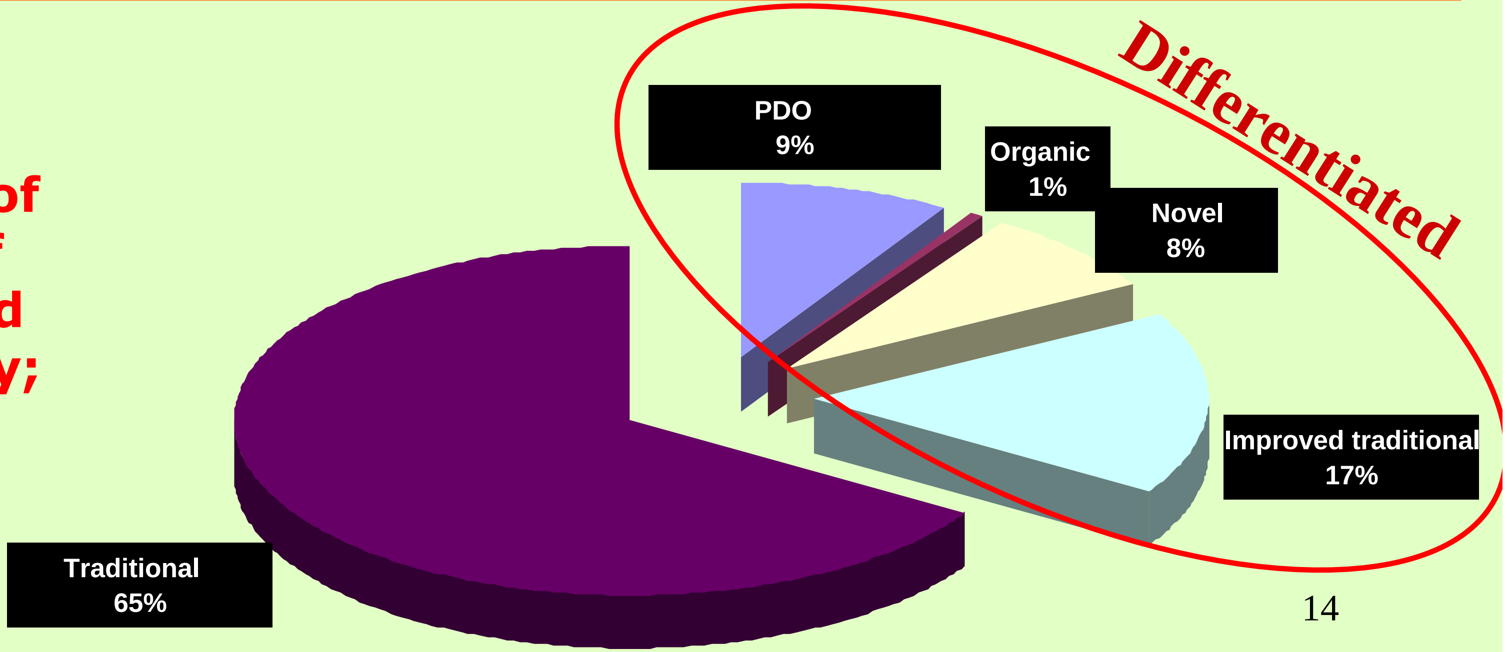
The decline of traditional (undifferentiated) products?

The major consequence of modularity and mass-customization may be the (relative) decline of traditional (undifferentiated) products:

- **improved products** in terms of naturalness-functionality-convenience substitute analogous traditional products

- **novel products** gain increasing market shares

Market share of categories of industrial food products (Italy; 2004)

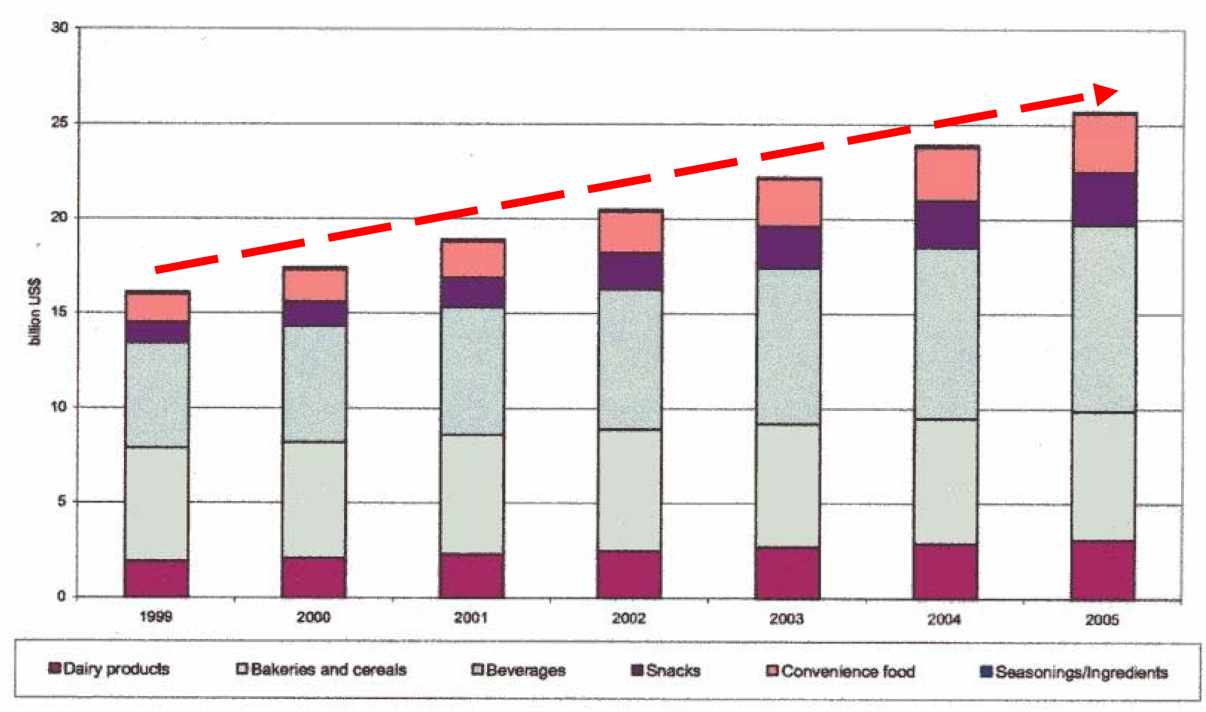


Source: Federalimentare

Ex.: Functional food

The ***Phood Market*** (Food+Pharma) is increasing in the US but even in most EU countries (especially Northern countries)

Phood market in the US (billions $)



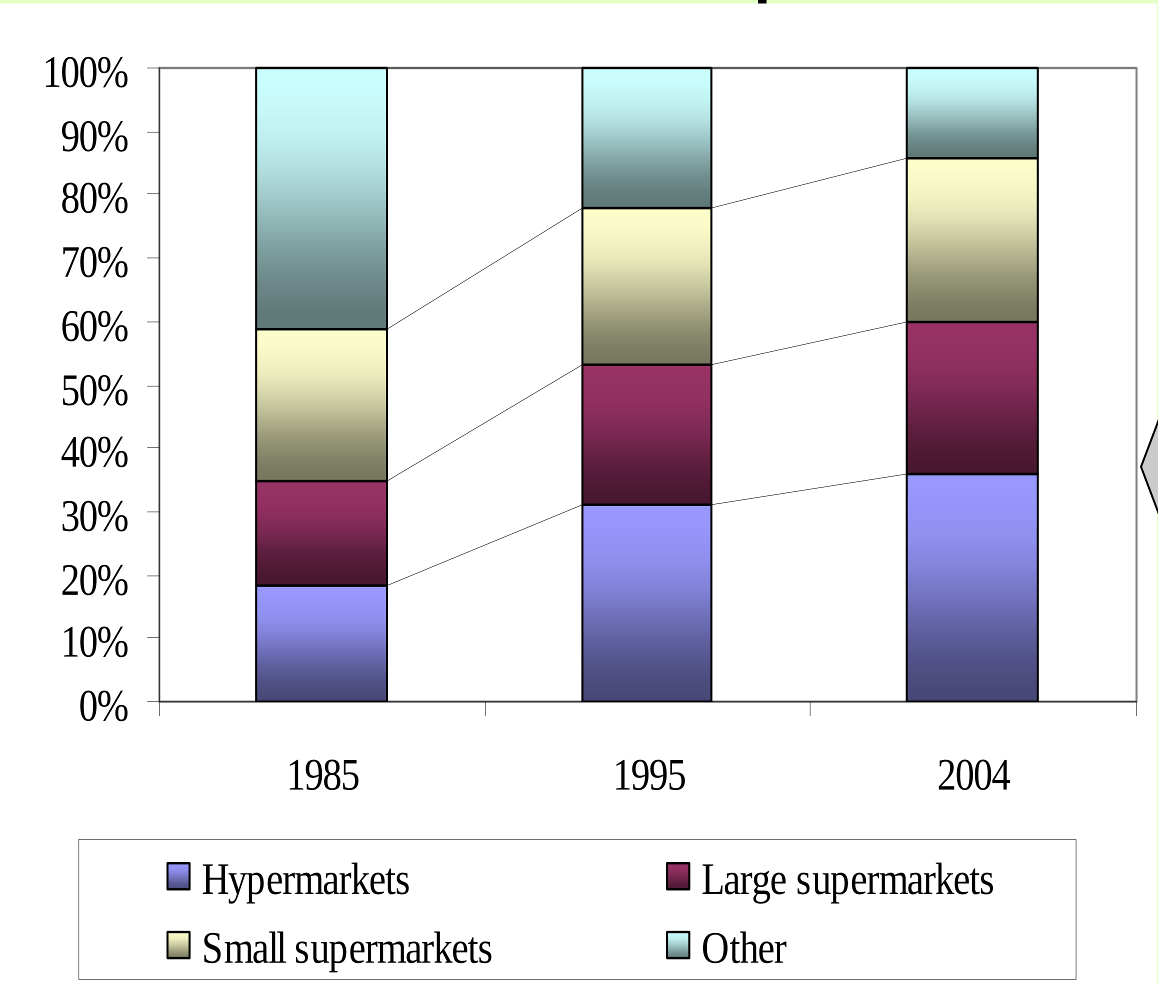
Source: Nutrition Business Journal 2001 cited in CMA 2002

Critical issues (sustainability) of <u>new consumer attitudes:</u>

- **<u>Safety issues</u>**: combination of technologies and increasing complexity also means complex (and largely unknown) safety concerns:
  - ✓ **Liability recognition**
  - ✓ **"Safe" also means:** does it maintain the expected characters (natural, functional etc.)?
- **<u>New barriers</u>**: standards and regulations upon new-improved products may create barriers across countries:
  - ✓ **Global standards and harmonization**
  - ✓ **Co-existence of conflicting products (on biological but also technical-commercial ground)**

C – Trade: converging patterns

Market share in Europe



<u>Major retailers represent the dominant players in agri-food markets. In most EU countries they concentrate more than 80% of food purchases.</u>
<u>In Italy almost 50% of agri-food Value Added goes to retailers</u>

Lead Retailers=Concentration=Market Power

Ex. Italy:

Perfect Competition

- **Farms: 2,5 millions (2000 Census)**
  - **Food industry firms: 70K (2003)**
    - **Supermarkets: 7358 (2003)**
      - **Hypermarkets: 569 (2003)**
        - **Market share top 5 Retailers**

- Italy = 30%
- France and UK = 55%
- Sweden = 90%

Monopoly/ Monopsony

Emerging global trends: Lead Retailers “aggressive” strategies

- ***branding (private labels)***
- ***(global) sourcing***
- ***grading (private standards)***
- *advertising*

Private Labels (PL)

Penetration of PL in some major EU retailers:

Carrefour	23%
Auchan	16%
Casino	27%
Metro	13%
Tesco	42%
Sainsbury	44%
Asda	43%

Market Penetration of PL:

- Italy > 10%
- USA > 15%
- France > 20%
- Germany > 25%
- Continental Europe ≅ 25%
- UK > 45%

❑ Increasing penetration in high quality products and market niches: **Multibranding** (quality brands: PDO, Organic products, etc.)

Global sourcing and buyer power

➢ **Multinational retailers and retail chains overcome region/local retailers**

➢ **Global (international) supply chains overcome regional/local supply chains: this implies substitution of regional/local sourcing.**

✓ **BUYER POWER:** increasing oligopsonistic power on small-medium industrial and agricultural producers both in developed and LDC; power increased by B2B alliances among retailers (*buyers' alliances*)

✓ **PRICE COMPETITION:** increasing price competition among producers on a global scale

Private standards

- Lead retailers impose their own product standard to suppliers (benchmarking, Minimum Quality Standard-MQS)
- Multinational retailers+global sourcing are making these standards global
- To reduce B2B transaction costs and simplify food chain management, multinational retailers try to fix common global standards (ex. Global Food Safety Initiative, GFSI)

However, this:

- creates strong product **homogenization**
- transfers **costs** of standardization and control (if not liability) upward (to suppliers)
- strengthens retailer oligo/monopsonistic **power**

Critical issues (sustainability) of <u>retailer power</u>:

- **<u>Food sovereignty</u>**: increasing global power of large/multinational retailers homogenizes products, then tastes; limited market access for non-homogeneous (ex. PDO and niche) products:
  - ✓ **Short supply chains**
  - ✓ **Higher penetration in retailer chains through public policies**
  - ✓ **National legal vs. global private standards**

- **<u>Distribution/equity issues</u>**: through a set of strategies, large/multinational retailers "transfer" competition pressure on suppliers:
  - ✓ **New trade barriers:** competition with LDC suppliers, caused by global sourcing of their own retailers, induces developed countries to protect domestic markets
  - ✓ **Global safety standards:** are positive but costs should be more equally distributed along the food chain

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