Update: Trends in Food Science and Technology in Europe

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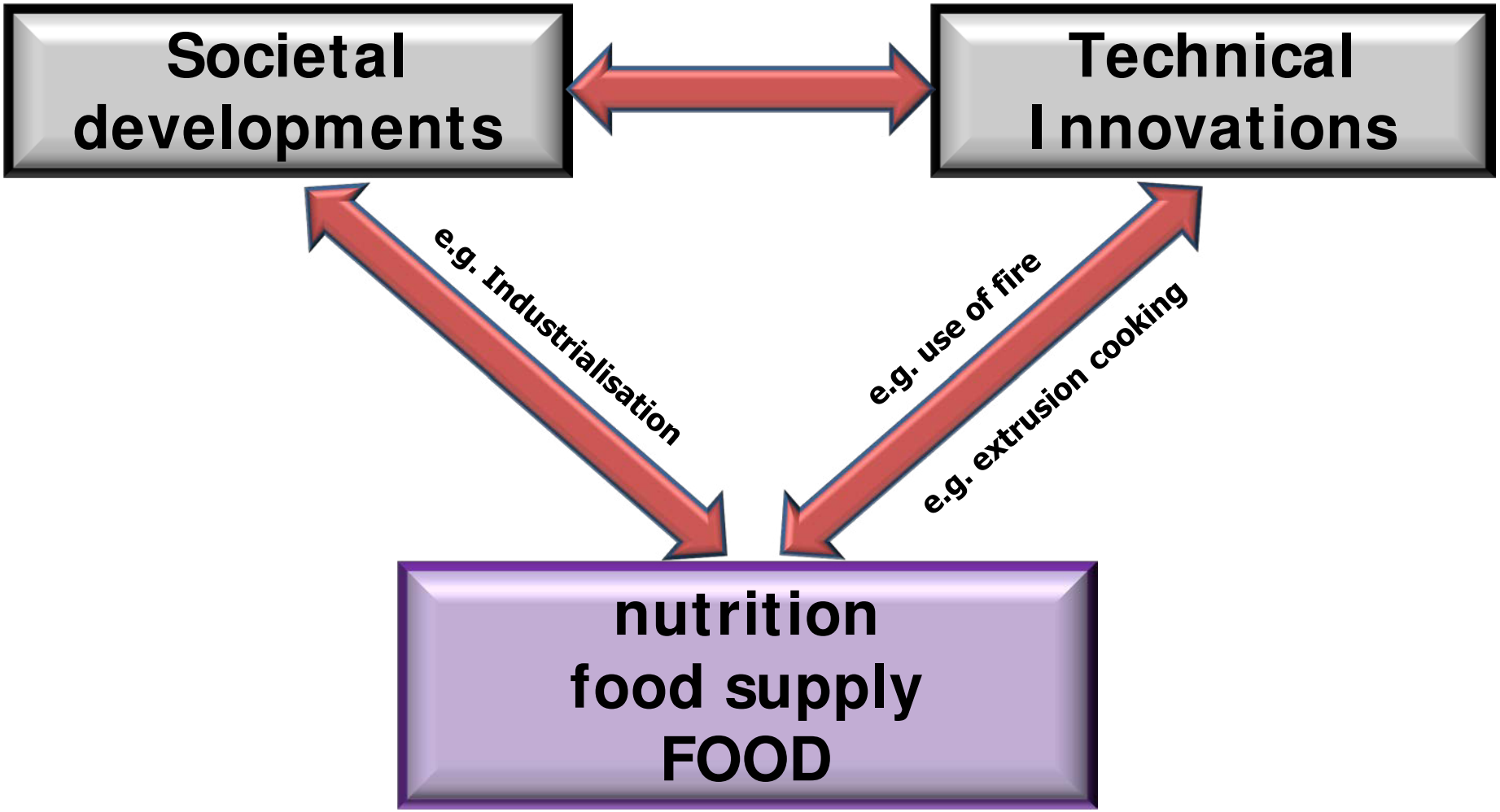
- Every society is in permanent movement and change.
- In Europe several **societal changes** cause changes in food and nutrition patterns and thus cause adaptations – or **trends** – in food science and technology.
- These trends can be categorized in:

    - **nutrition trends**
    - **product trends**
    - **technological trends**


Societal developments
Technical Innovations
e.g. Industrialisation
e.g. use of fire
e.g. extrusion cooking
nutrition
food supply
FOOD

Trends in Food Science and Technology

MEGA-TRENDS

- Convenience
- Mobility

Supporting side TRENDS

e.g.:

- Fun
- Functional
- Healthy

CROSS OVER-TRENDS

e.g.:

- organic
- ethnic
- ethic

COUNTER TRENDS

e.g.:

- freshness
- Slow food

Nutrition and product trends

Food trends caused by societal changes

- Change of consumers from buyers of raw material to buyers of convenience food
- Adipositas (→ light food)
- Changes in age pyramid (→ senior food)
- Increased mobility in society (→ finger food, snacking)
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Food trends caused by societal changes

- **Change of consumers from buyers of raw material to buyers of**

convenience food

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Change of consumers from buyers of raw material to buyers of convenience food

This trend is caused/supported by the following tendencies:

- **Traditional family structures are decreasing**
- **Professional employment of women is increasing**
- **Urbanisation**

  (2015 there will be 26 cities with a population of more than 10mio.)
- **Change in food supply (globalisation and concentration)**

CONVENIENCE ?

The New Oxford Dictionary of English, Clarendon Press, Oxford, 1998

A thing that contributes to an easy and effortless way of life.

Convenience food:

A food, typically a complete meal, that has been pre-prepared commercially and so requires minimum further preparation by the consumer.

„Ready Meals" Design Trends Trends
The World of Food Ingredients 12 (2003)

Convenience Food

Image of CF !?

Auch heute haben Fertigprodukte teilweise noch ein Imageproblem

Fertigprodukte sind im Allgemeinen …	Bevölkerung insgesamt	16–29 Jahre	30–44 Jahre	45–59 Jahre	60 Jahre und älter
genauso gut wie etwas, was man selbst gekocht hat	15 %	23 %	17 %	14 %	11 %
besser	1 %	2 %	1 %	x	1 %
schlechter	56 %	47 %	51 %	60 %	63 %
Unentschieden, kommt darauf an	28 %	28 %	31 %	26 %	25 %

x = weniger als 0,5 Prozent

[1] Allensbacher Werbeträgeranalyse 2000 - 2006

Convenience – Not only for preparation!

- **for purchase** (e.g. less weight)
- **for storage** (e.g. as long as possible without special methods)
- **for packaging** (e.g. easy to open and close again)
- **for preparation**
  - As minimal as possible
  - As fast as possible
  - As energy-saving as possible
- **for consumption** (fast, without additional tools,)

  e.g. cooling or heating package

Convenience Food
in gastronomy and out of house consumption

Convenience has always played a major role in this field and it is continuously increasing!

- **In-house Convenience**
- **Purchased Convenience**

Declaration on menu???

Convenience for packaging

ZIP-PAK® *SLIDER*™

ZIP-PAK® *SLIDER*™ can be easily opened and closed using the zipper slider, instead of pressing fingers along the zipper. It's a convenient option for a variety of products and consumers.

Our Slider "clip" is ergonomically designed for maximum comfort for all ages—from six to ninety-six

Ideal solution for manufacturers who want to provide a consumer-preferred resealable package without sacrificing fill speeds

Used for:

- Cheese
- Sliced Meats
- Snack Foods
- Pet Food
- Confections
- Personal Care Items
- Cookies & Crackers
- And more...

Convenience for packaging

Figure 2. The Fresh-Check label. (Photo courtesy of TempTime Corporation)

Convenience for preparation – steps of food preparation

- Ready to eat
- Read to regenerate
- Ready to mix
- Ready to cook
- Ready to prepare
- Raw, ready to eat (fresh-cut)
- Basic step

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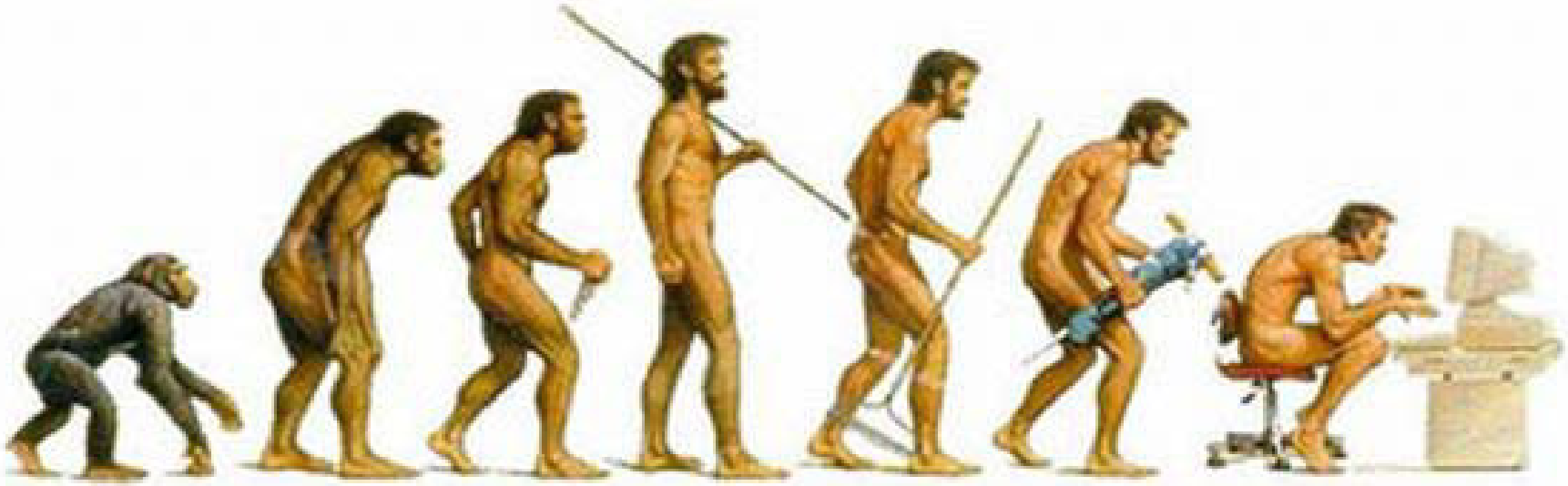
Facts, Consequences and disadvantages of the new age of nutrition

The Shape of Things to Come

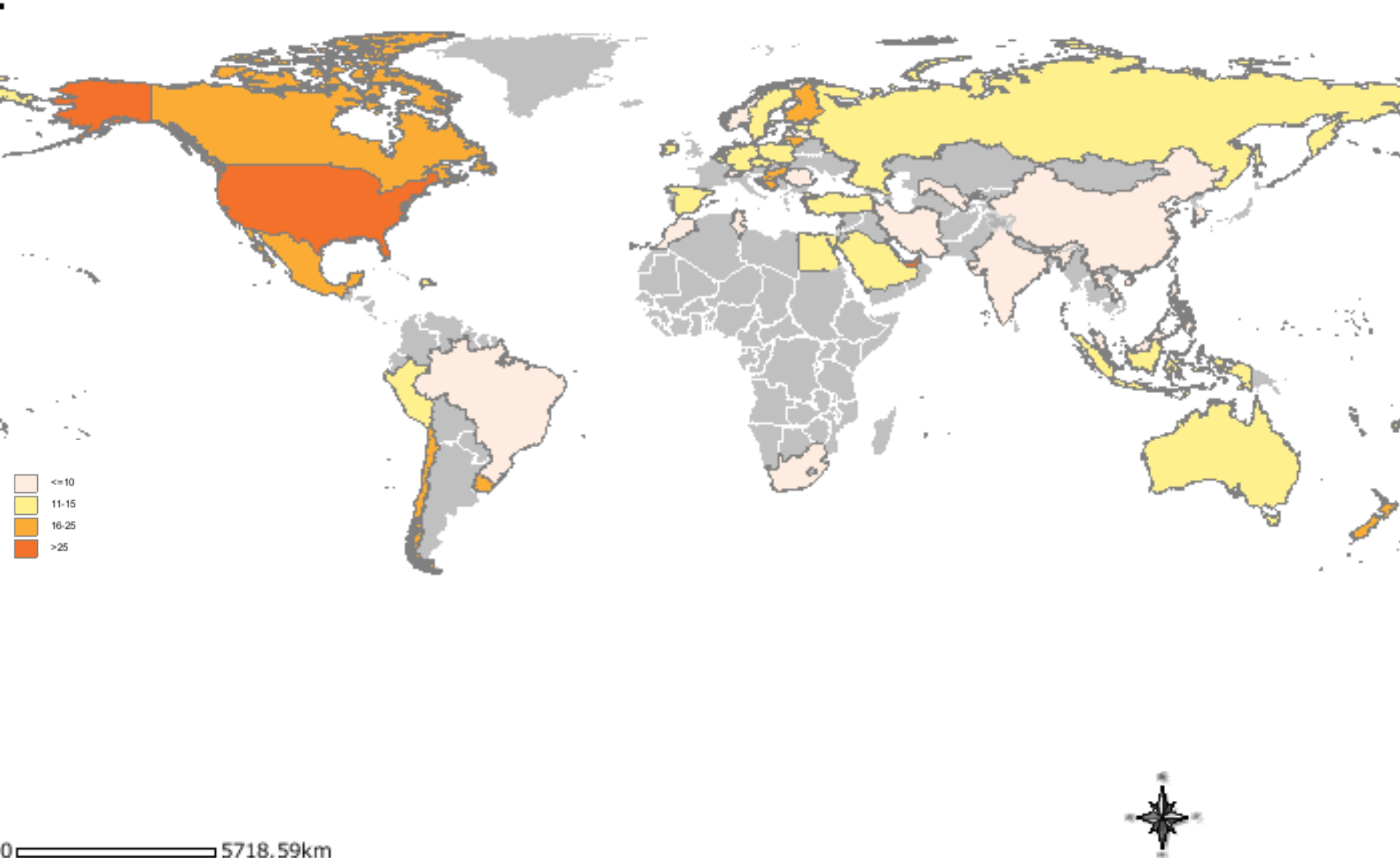
Book written by H.G. Wells in 1933

http://ebooks.adelaide.edu.au/w/wells/hg/w45th/



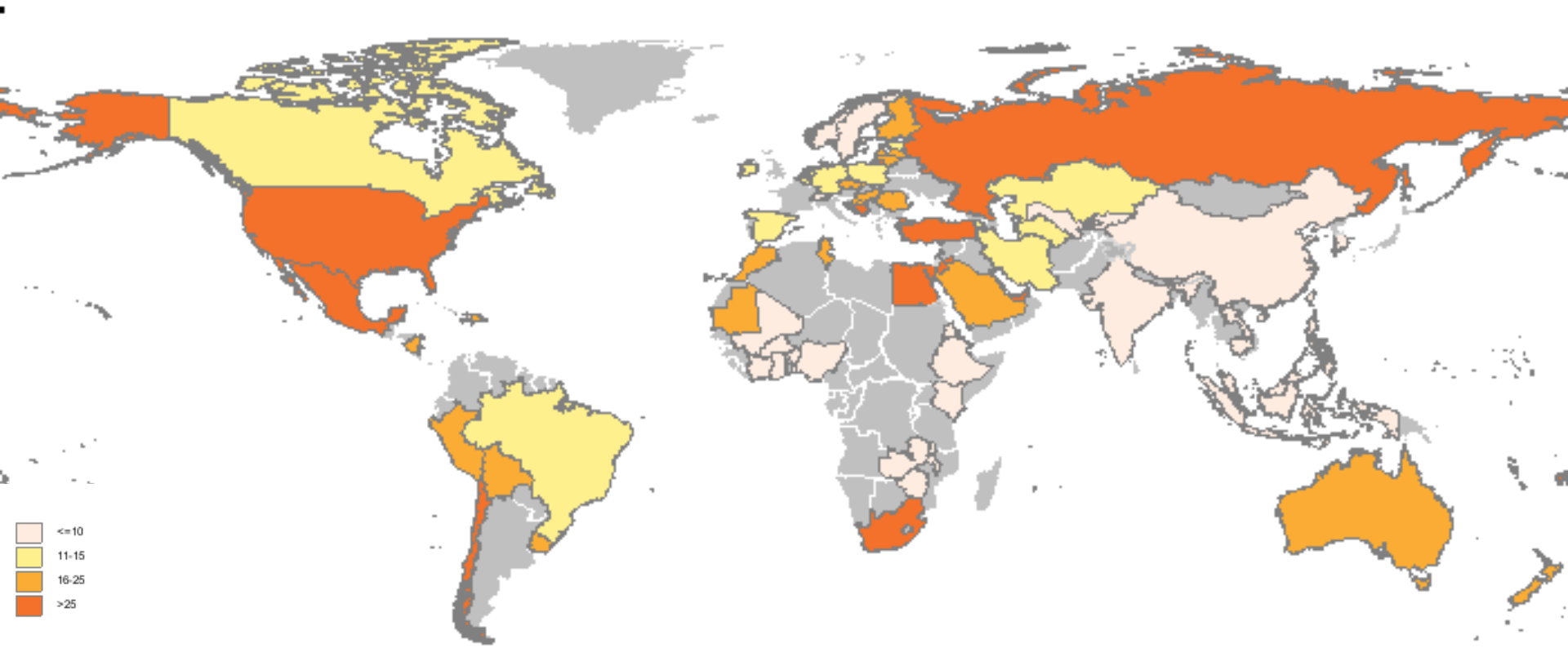
Adult obesity prevalence, Male

For Latest available data



Adult obesity prevalence, Female

For Latest available data



0 5718.59km

Adipositas

United Sates: The Revis familiy of North Carolina. Food expenditures for 1 week: $ 342

P. MENZEL and F. DÁLUISIO: HUNGRY PLANET – What the World Eats. Material World Books and Ten Speed Press, USA (2005)

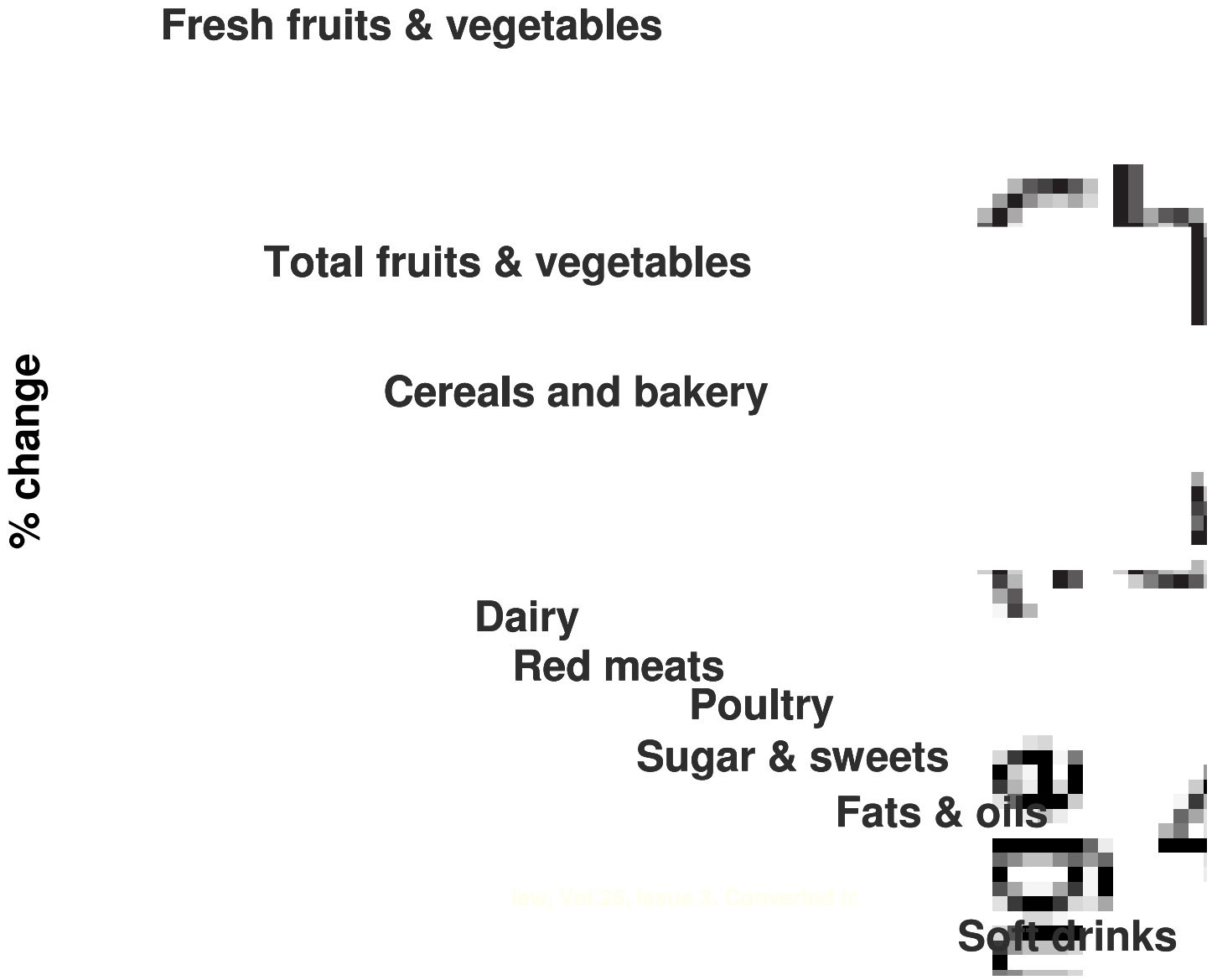
Obesity and income in the UK

"Children's obesity levels are closely linked to their family income".
For the UK, 2007, girls'/boys' obesity levels per income quintile are as below:

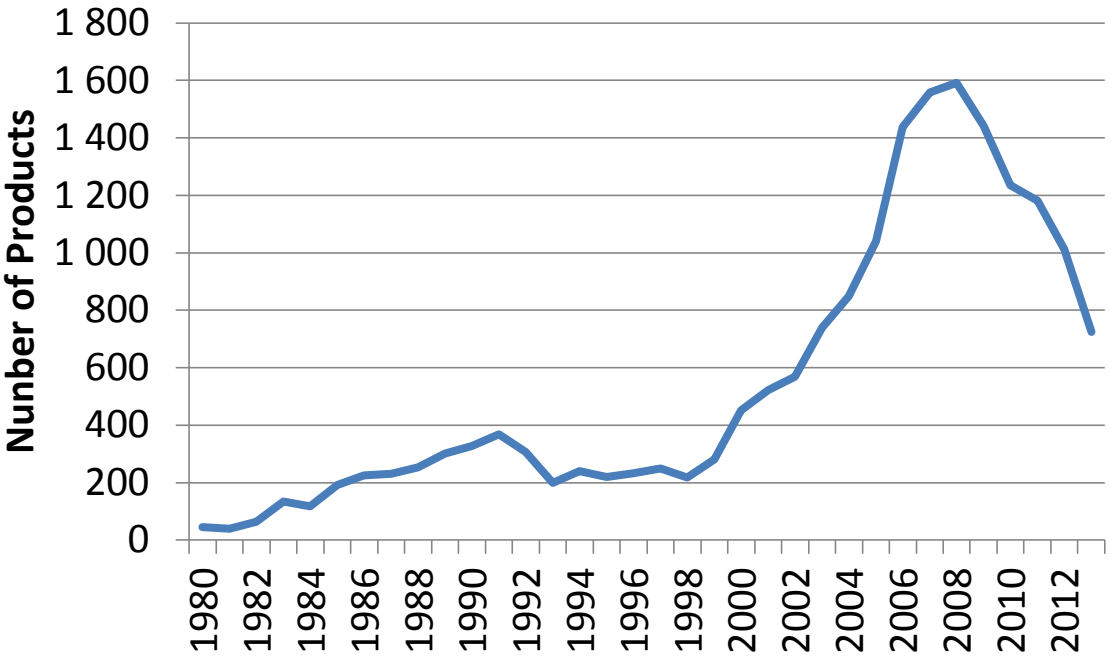
Income quintile	% girls obese	% boys obese
Lowest	8.2%	6.0%
2nd lowest	8.9%	5.2%
Middle	5.9%	4.5%
2nd Highest	5.6%	4.1%
Highest	3.9%	4.2%

The Food magazine, July/September 2007, p.16

Changes of food prices in the US from the year 1985 to 2000

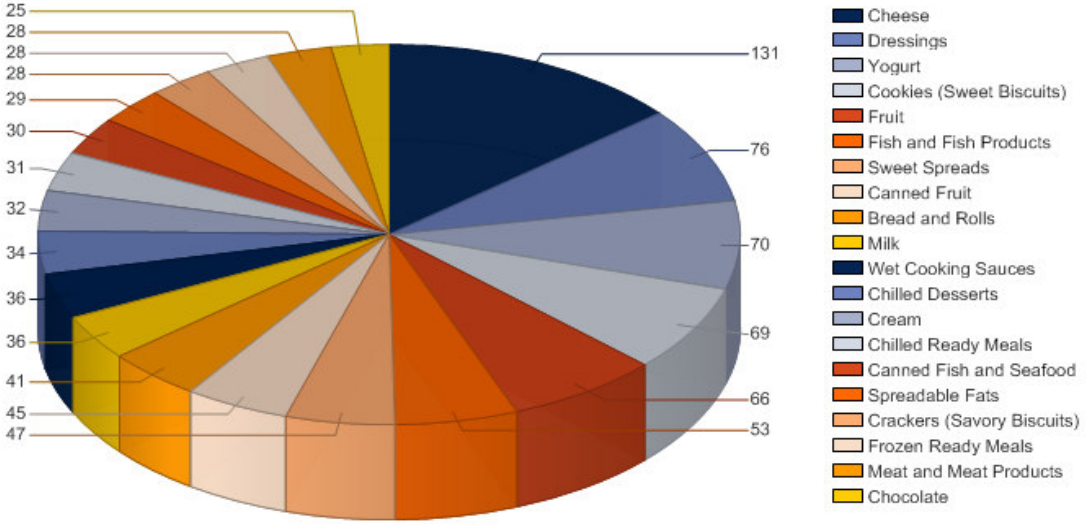


Light food from 1980-2013



Categories of light food

in the year 2012/13



Product Launch Analytics, 2014

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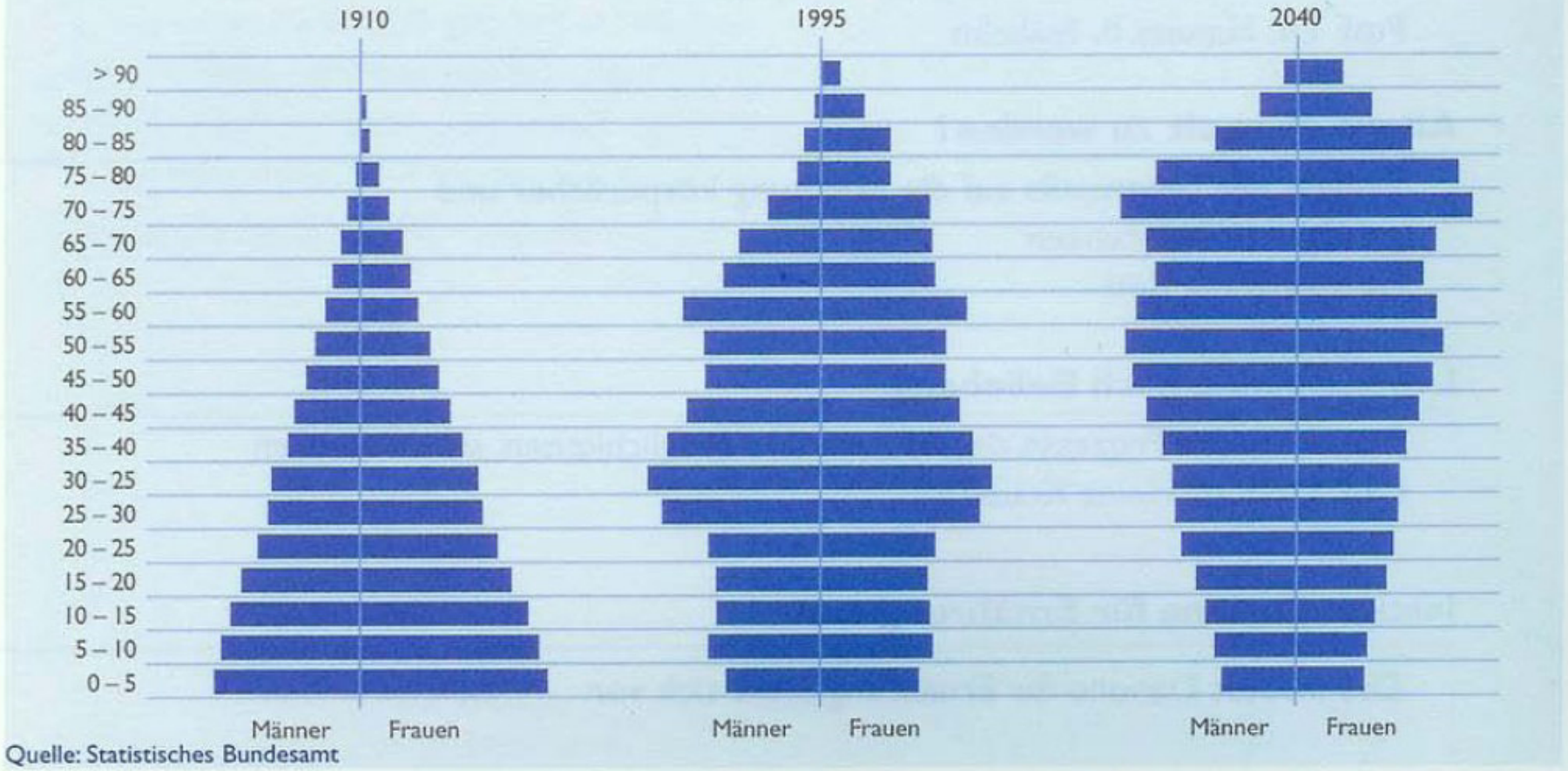
Age development in population



Quelle: Statistisches Bundesamt

Abbildung 1: Die Veränderung des „Lebensbaumes" in Deutschland von 1910 bis 2040

Share of persons with more than 65 years within population

in the year 2000

in the year 2050

less than 10 %

between 10 % & 19,9 %

more than 20 %

Dr. Sibylle Meyer (Institut für Sozialforschung und Produktberatung GmbH) (2012)

???? Questions ????

- **Do elderly people have a different nutrition/consumption pattern than the average population?**
- **Do they in fact have different nutritional needs, which will definitely influence the consumption pattern?**
- **If yes, at which age do these specific needs occur?**

And:

- **What is age? When is a person considered to be old?**

Physical and psychological changes caused by age, which can influence the food consumption pattern of elderly persons

- Reduced energy need
- But need for nutrients remains the same (with some exceptions)!
- Less intake of beverages
- Reduction of sensory impressions (smell and taste perception)
- Problems with chewing and digestion
- Climacteric period
- Aging processes of body cells
- Decrease of eyesight and musculoskeletal system
- Social changes

Food for specified consumption groups

In our supermarket we find specific food product groups for :

- **Infants**
- **School children**
- **Adolescents**
- **Working people**
- **Overweight persons**
- **Sportsmen/women**
- **Diabetic persons**
- **Pets**

?

Food for seniors

Until now only very few products specific for seniors on the market in Europe, AT LEAST with a specific identification!

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Increased mobility in society

- **traditional times and customs for meals are disbanded**

  (⇨ destructuring)

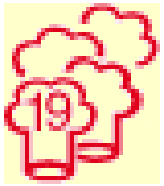
- **Food evertime and everywhere**
- **Restaurant meals or home delivery**

  (*dining out / bringing in (⇨ call food)]*

Increased mobility in society

Counter trends ?

- Home Cooking / Slow Food
- Ceremonial Meals
- Disconter ⇔ Gourmet Temple
- Fast Food-Chain ⇔ Restaurant
- Molecular Gastronomy (hype?!)



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Increased mobility between people

- Ethnic food, ethno food
- world cuisine or global dishes
  - Asia (CH/J/T)
  - Pasteria
  - Texmex

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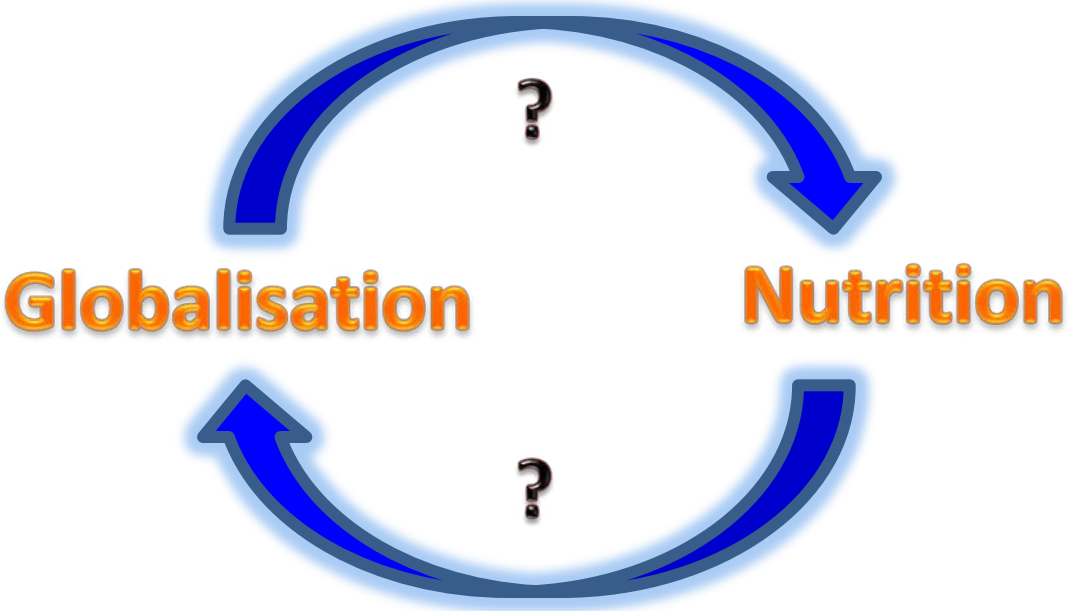
Nutrition and Globalisation

FACT!

Change in World Nutrition

Why?



Nutrition and Globalisation

Change in World Nutrition

- Loss of agricultural biodiversity
- Dominance of wheat and rice
- Increased consumption of energy dense plant raw materials (plant oils and sugar)
- Increased consumption of meat worldwide
- Incrased consumption of highly processed food with high content of salt, sugar and fat
- Convergence of world nutrition („One World, One Taste?“)

Nutrition and Globalisation

Nutrition Transition (transformation of diet)

„Replacement of dietary diversity with a limited number of high-energy plant and animal sources, paricular refined carbohydrates and fats.“

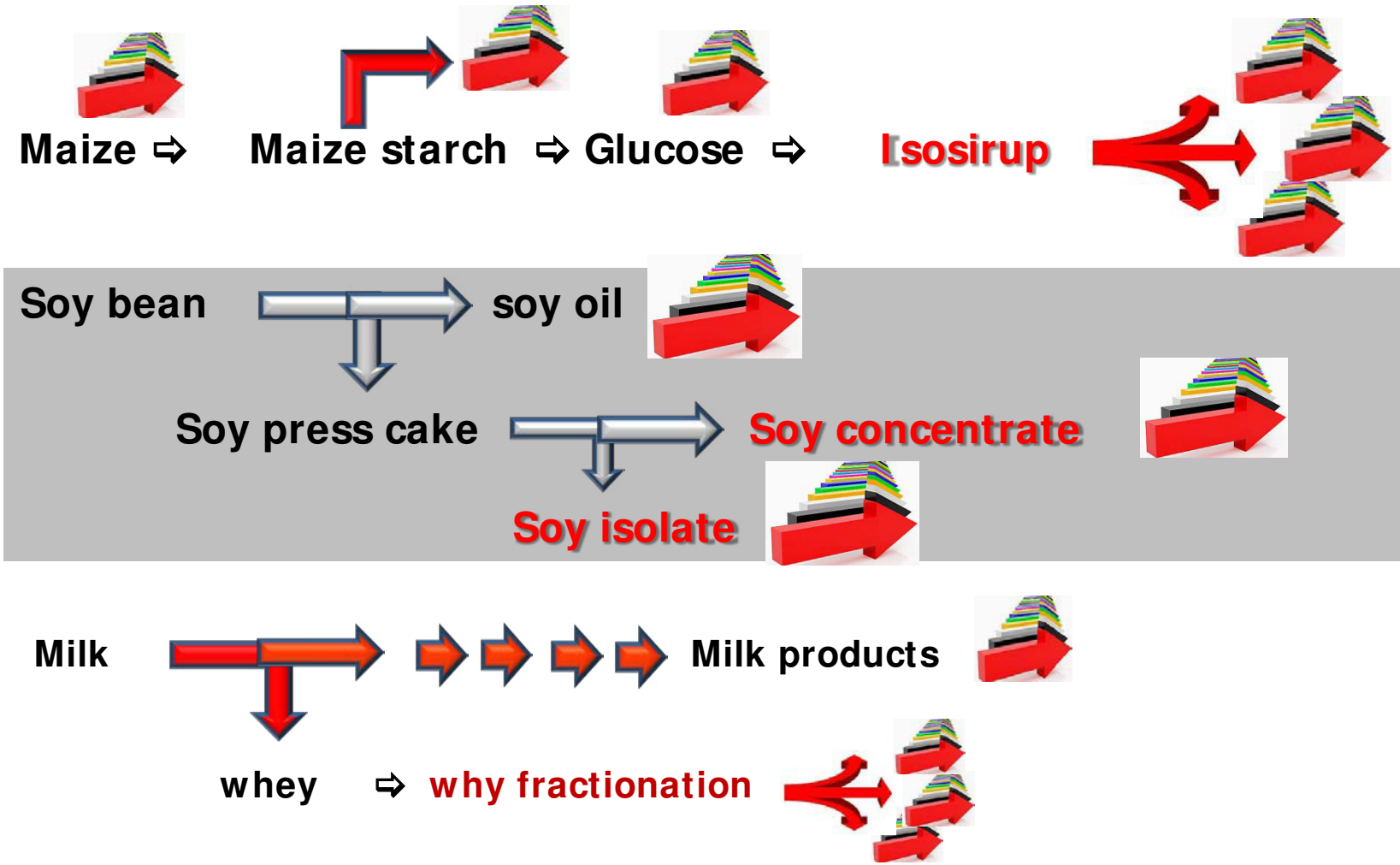
Hermann: Food Policy 34 (2009) 499-507

From a decreasing number of raw materials an increasing number of food products is manufactured.

How?

New foods through novel ingredients

Raw materials are fractionated and the single components are further processed. Subsequently they are again added to a large number of food products. Examples:



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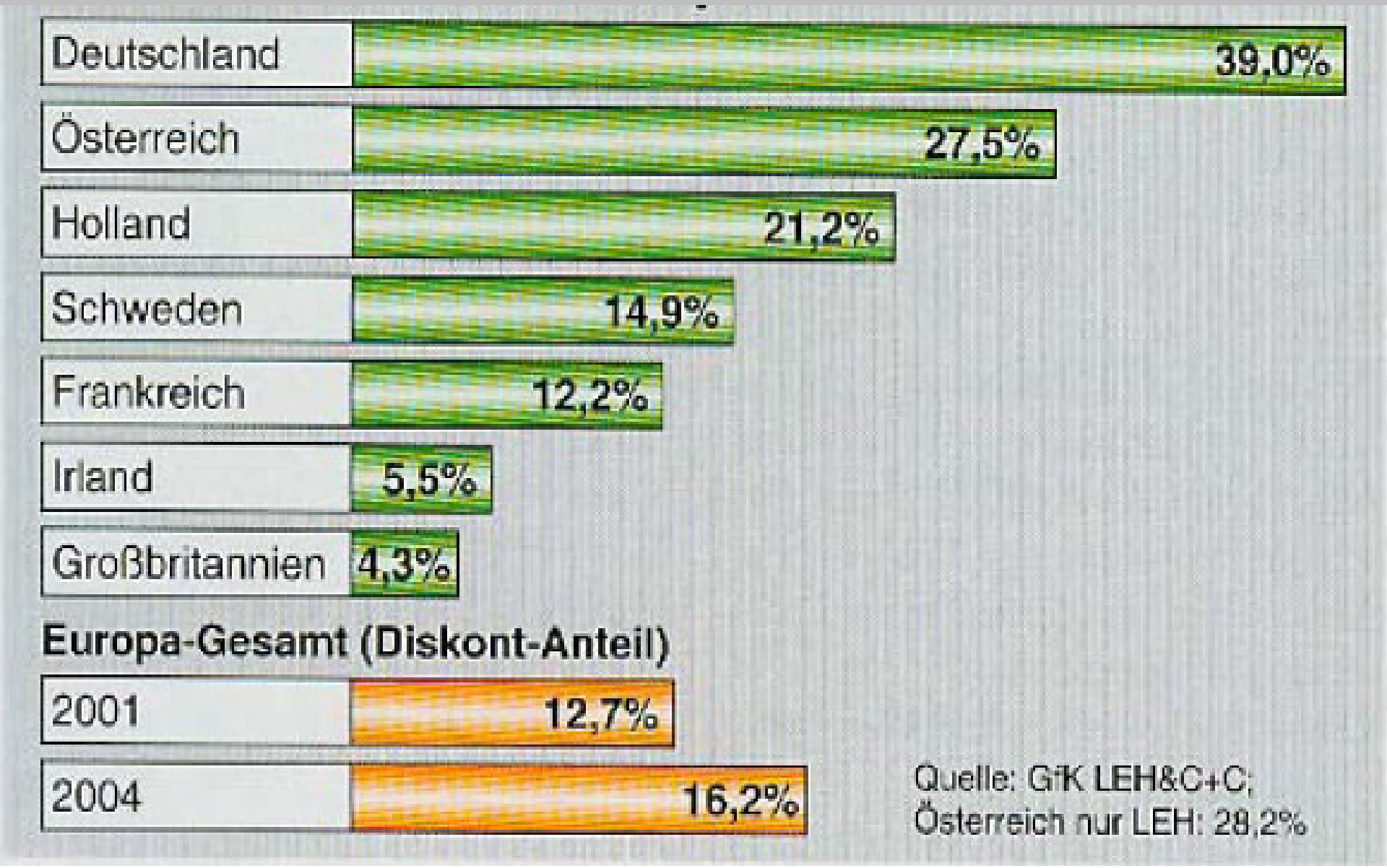
Increased awareness of food quality ?

The most important quality criteria for the cosumer is the „PRICE“

„PRICE“ ⇔ PRODUCT QUALITY

Share of discount shops in Europe



Nutritional Situation in European

- **Quantity is not the problem (rather the opposite)**
- **(European) food is safer than ever**
- **Nutritional situation is still not always positive (too much fat, too much sugar, not enough dietary fibre, some vitamin and mineral deficiencies, not enough sport)**

→ **the most important overall trend**

Health benefit

(functional food, neutraceuticals…)

In Europe: health claims (EFSA, health benefit needs to be scientifically proven by clinical studies)

Ten Key Trends 2010 and 2012

The 10 Key Trends in Food, Nutrition & Health for 2010 are:

1. Digestive health
2. Natural health
3. A benefit the consumer can feel
4. Energy
5. Fruit: the future of functional foods
6. Antioxidants
7. Weight management
8. Snacking
9. Packaging and premiumisation
10. Bones and movement

Presented by - *Julian Mellentin*

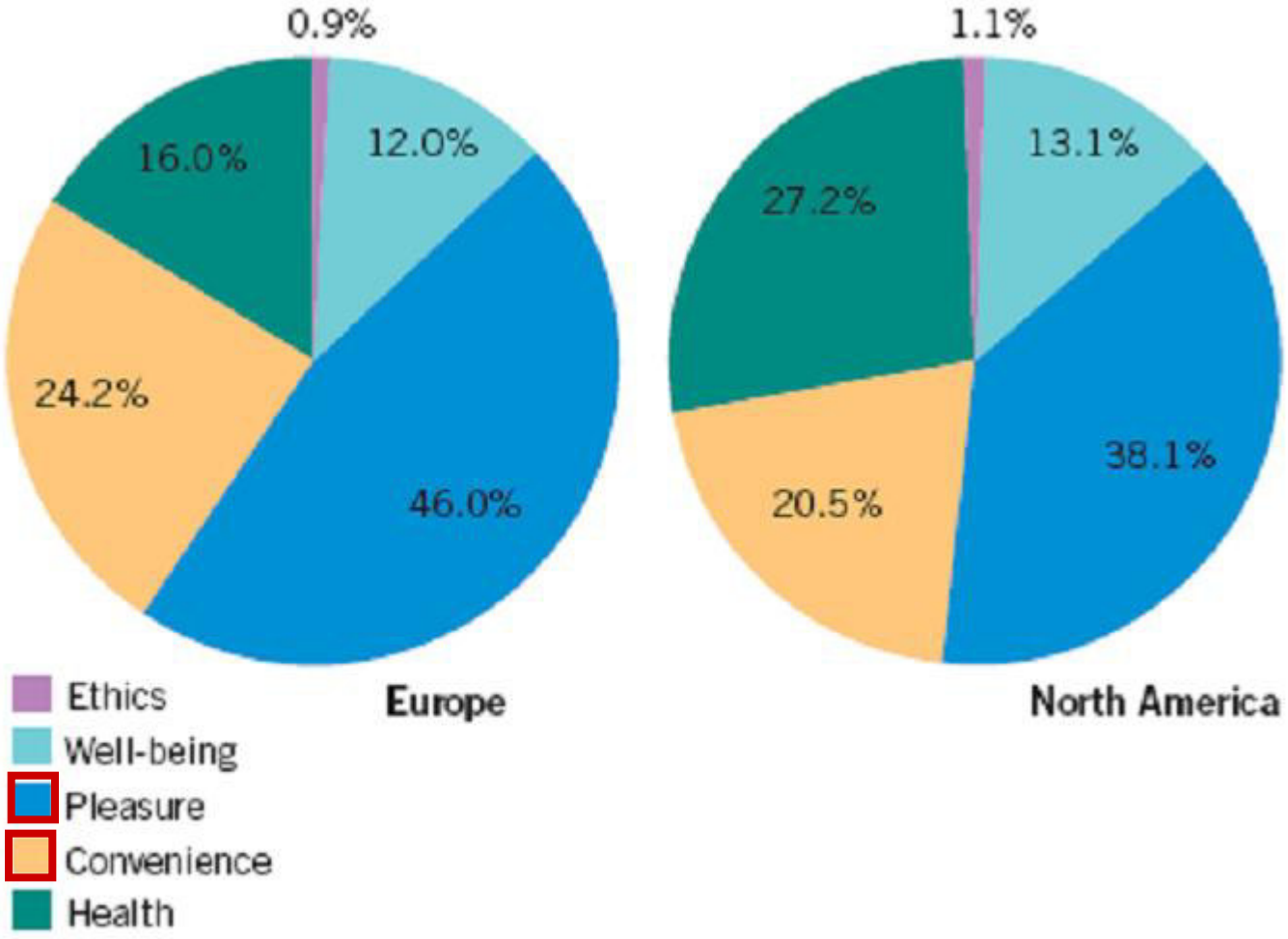
NEW NUTRITION BUSINESS

The 10 Key Trends in Food, Nutrition & Health for 2012 are:

1. Naturality – a trend that's powering successful innovations
2. Energy
3. Digestive health
4. Feel the benefit – most powerful marketing tool
5. Weight management
6. Movement – muscles, bone and joint health
7. Senior nutrition – the key driver in food and health
8. Who needs health claims when you have fruit and vegetables?
9. Dairy – science boosts its "naturally healthy advantage
10. **Good grains – set for growth**

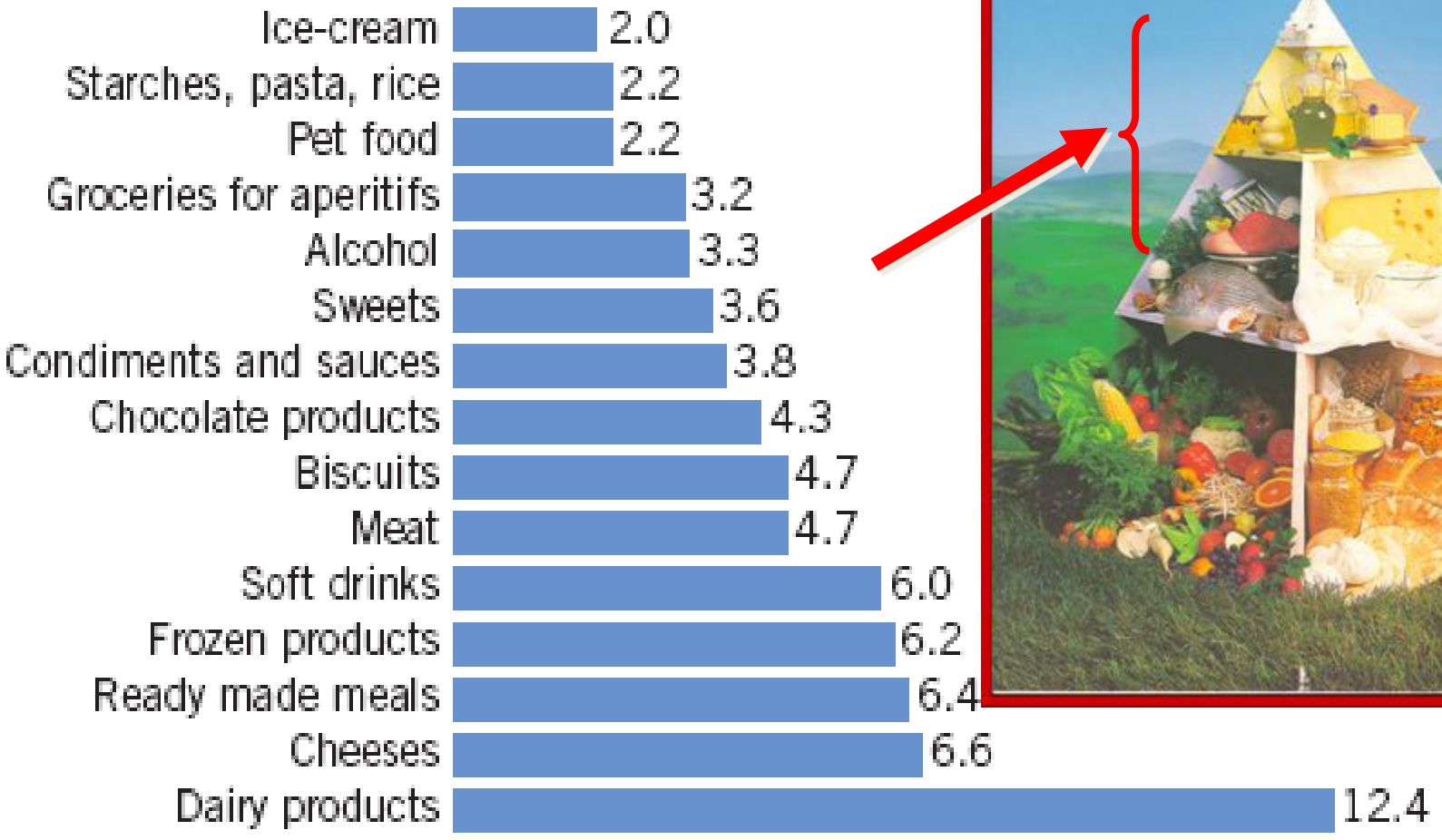
Ancient grains lend a health halo...

Fig. 1 - Share of the main drivers for innovation in Europe and in North America



100% Total food innovation over the period in the region
Source: World Innovation Panorama, International trends & Innovations Book (SIAL, 2004)
Food Issues Monitor 2004, GlobeScan.

Fig. 2 - The 15 most innovating categories in Europe (share %)



Source: SIAL, International trends & Innovations Book, 2004
Food Issues Monitor 2004, GlobeScan.

Functional Food

Nutritional Food
Healthy Food
Healthfood
Wellness Food
Wholefood
Fortificated Food
Dietetic Food
Designer Food

Nutraceuticals
Pharmafood
Agromedical Food
Medical Food
Dietary supplements

Food ⇔ Medicine

The most favourite phrases on food packages

Free from….

No…..

Natural…..

Fresh…..

Free-from moves from trend to industry standard

Since 2000 we have highlighted the growing consumer interest in terms such as “free-from artificial additives and preservatives” and “all-natural” and “natural ingredients”.

These are now key terms of reassurance for consumers in most countries. The use of such messages have become a basic requirement for the label of any brand, even those without an overt health position.

Likewise any company that can use as many “natural ingredients’ as possible has to do so (even if its products aren’t “all natural”). What were once messages in the health food store have become mainstream in every supermarket.

© NEW NUTRITION BUSINESS

Children food : “Free-from what’s bad” is the first need

Even a mainstream brand such as Nestlé now puts “no added” centre-stage. “Whether their kids are under two, or two to five years old, or six-plus,” said Victoria Nuevo-Celeste, Juicy Juice Marketing Manager at Nestlé USA, “if we asked them what benefits most interested them in foods or beverages, low sugar and extra calcium were the things they were most interested in across the board. So we decided to make the products lower in sugar. It’s harder to differentiate by adding calcium.”

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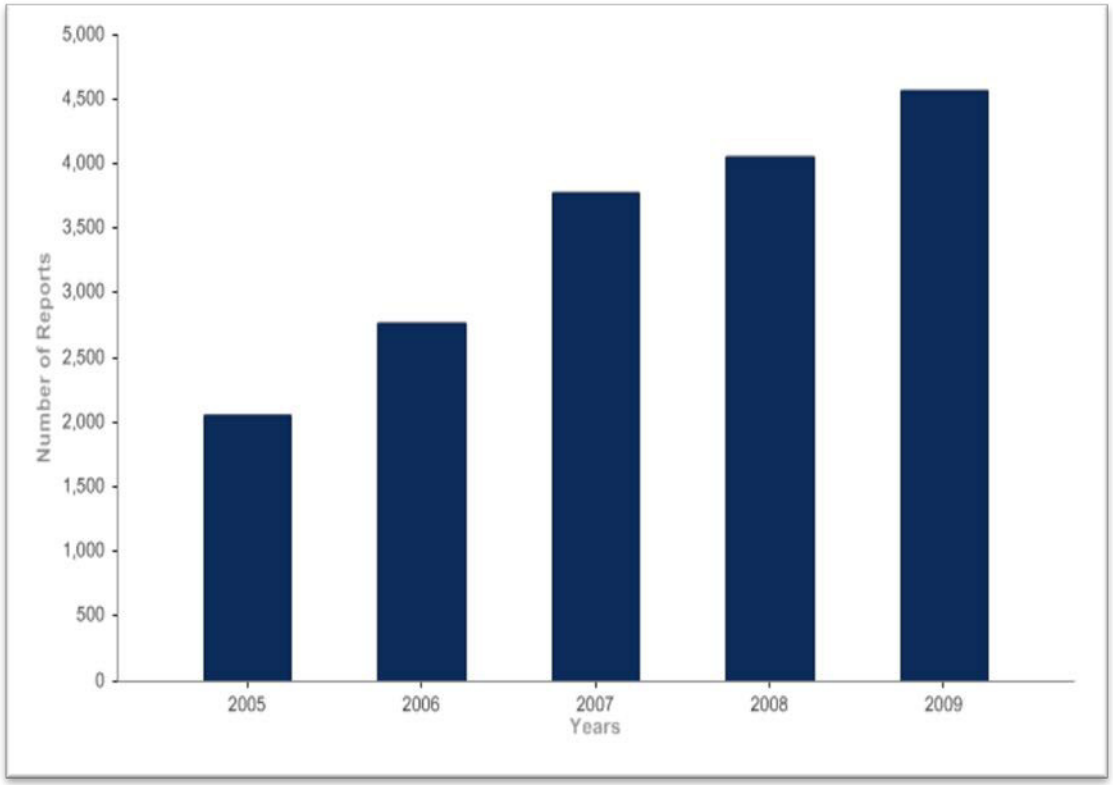
NO…. (e.g. food additives)

- Clean labelling
- Clear labelling



Product Launch Analysis
Datamonitor
(http:/ / www.datamonitor.com; 15.01.2010)

Date: in the last 5 years; Type of data analyzed: Reports;
Categories: Beverages - Alcoholic OR Beverages - Non-Alcoholic OR Food;
Claims / Tags: No Additives OR No Artificial Color OR No Artificial Flavor OR No Artificial Ingredients OR No Artificial Sweeteners OR No Saccharin OR No Sweeteners OR No Preservatives;
Countries: Asia-Pacific OR Europe OR Middle East and Africa OR N. America OR S. and Central America;

bread and bakery products

Package Tags Or Claims	No. of Reports	Package Tags Or Claims	No. of Reports
High Amino Acids	3	Low Calories	249
High Antioxidants	15	Low Carbohydrates	118
High Bran	34	Low Cholesterol	60
High Calcium	212	Low Fat	459
High Carbohydrates	11	Low Glycemic	19
High Collagen	2	Low Lactose	10
High Fiber	572	Low Protein	2
High Iron	72	Low Salt	69
High Magnesium	13	Low Saturated Fat	33
High Minerals	89	Low Sodium	99
high omega	3	Low Sugar	74
High Omega-3	66	Low Trans Fat	2
High Omega-6	3	Natural	919
High Polyphenols	1	No Carbohydrates	3
High Potassium	4	No Chemicals	65
High Protein	164	No Cholesterol	393
High Vitamins	272	Organic	333
Total bread products	**6986**		

Copyright 2007, Productscan Online

cross over trends

⇨ functional /wellness / mood food

⇨ ethnic food

⇨ organic food

⇨ fair trade food

⇨ authentic / DOC / DAC

Denominazione d`Origine Controllata
Districtus Austriae Controllatus

⇨ vegetarian/vegan

⇨ fun food

e.g. Dietary fibre enriched, vegetarian organically produced pizza

Technological trends

Technological Innovations
New Biotechnology

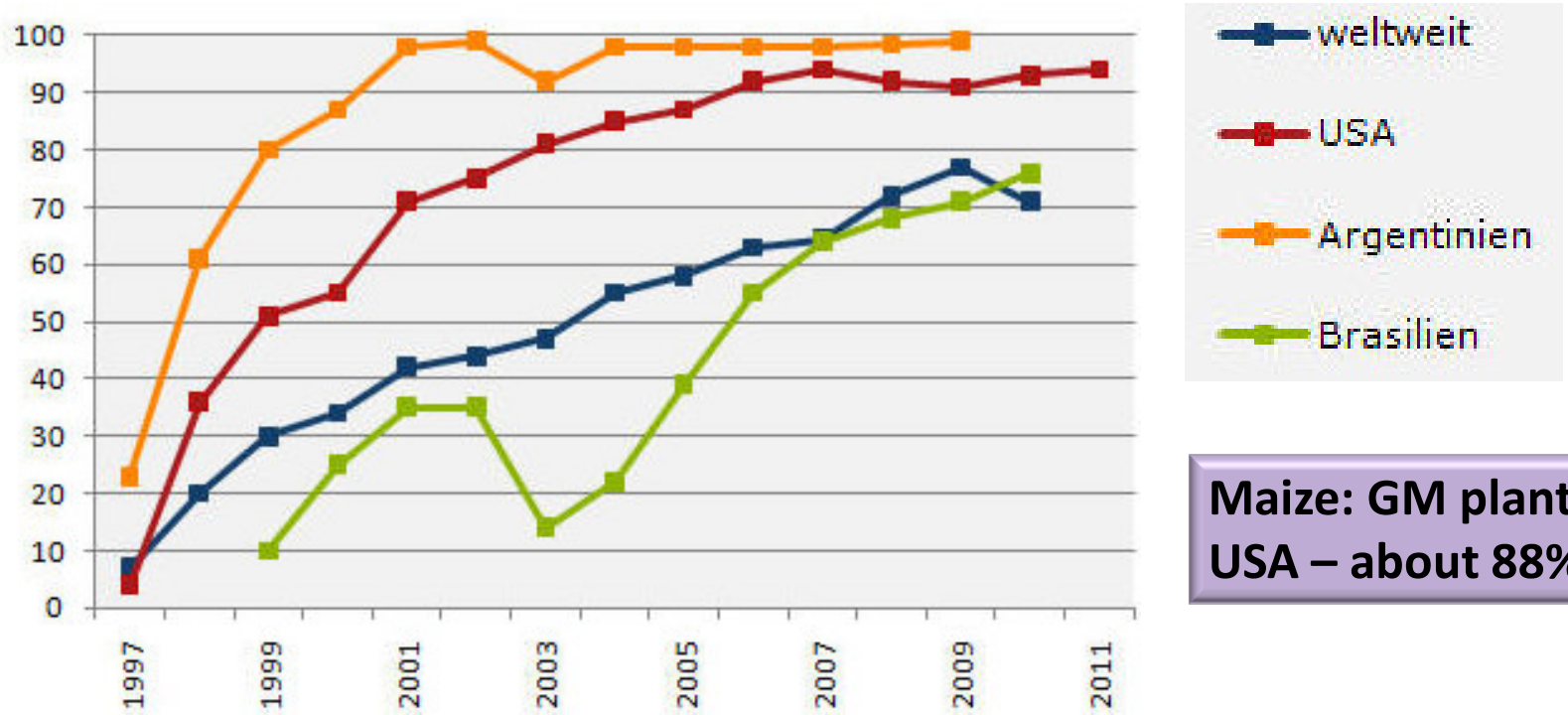
- Use of plant and animal cell cultures
- Cloning
- Genetically modified microorganisms(GVMO) for the production of
  - Primary products (proteins, enzymes)
  - Secondary metabolites (indirect use)
  - Fermented foods (direct use)
- Production of transgenic plants
  - Improving the resistance against herbicides, pests, pathogenic organisms, stress factors)
  - Increase of yield and quality
  - Change of properties
- Production of transgenic animals
  - Increase of production, synthesis and reproduction performance
  - Improvement of resistance against diseases

Biotechnology

Technological Innovations
New Biotechnology

- **Production of transgenic plants**

Share of GM soy on total production area (%)



Maize: GM plants in the USA – about 88%

http://www.transgen.de/anbau/eu_international/201.doku.html - Zugriff 29.09.2011

In the aera of Convenience Food

Increased demand for:

1. **New, gentle food processing methods**
2. **New gentle cooking methods**
3. **New, gentle non-thermal preservation methods**

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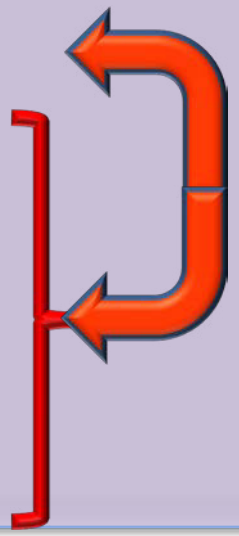
Technological trends - Technological Innovations

- **New structuring and form giving processes**
  - **NANOTECHNOLOGY**
  - **Use of supercritical carbon dioxide**
    - **CPF-Technology (Concentrated Powder Form)**
    - **PGSS-Technology (Particles of Gas Saturated Solutions)**
    - **Supercritical fluid extrusion**
  - **New Emulsion techniques**
  - **(Membrane-, Ultrasonic emulsification; Microfluidizer Technology)**



- **Separation processes, e.g.:**
  - **High pressure extraction (SCFE - supercritical fluid extraction)**
  - **Osmotic Drying**

- **Minimally processed food („fresh cut“)**

In the aera of Convenience Food

Increased demand for:

1. New, gentle food processing methods
2. **New gentle cooking methods**
3. New, gentle non-thermal preservation methods

2. New gentle cooking methods

- partially precooked instead of fully cooked convenience products
- Gentle cooking methods, e.g.:
  - sous vide-cooking
  - microwave induced steaming
  - frying with superheated steam

In the aera of Convenience Food

Increased demand for:

1. New, gentle food processing methods
2. New gentle cooking methods
3. **New, gentle non-thermal preservation methods**

3. New, gentle non-thermal preservation method, e.g.:

- ➔ Cold and hot aseptic packaging
- ➔ clean room technology
- ➔ Packing under modfied athmosphere
- ➔ Intelligent, active, communicative packaging
- ➔ Enzymatic preservation
- ➔ Use of electromagnetic energy
  (Electro pulse- and Light pulse method)
- ➔ Used of mechanical energy (pascalisation)
- ➔ cold preservation with supercritical carbondioxide

Nonthermal processes

TRENDS?

The future of nutrition will be diverse and colourful

Everything will be available!

Everything will be possible!

Everything will exist in parallel!

Luis Meléndez (1716-1780); Prado, Madrid