PROCESSED FOODS: FRIENDS & FOES

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A COMPLEX MULTIFACETED CONTEXT

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FOOD PROCESSING

- Health effects
- Shelf life and stability
- Food safety

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- Definition of processing
- Degree of food processing
- Classification of food products

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NOVA OR NOT SO NOVA

Group 1: unprocessed or minimally processed foods  
  e.g. fresh fish, meat, pasteurized milk, milk powder  
  - Allows processes such as drying, grinding, fractionating, roasting, boiling  
  - No addition of salt, sugar, oils or fats

Group 2: processed culinary ingredients  
  e.g. salt, sugar, butter, refined oils,  
  - Obtained from group 1 by pressing, refining, grinding, milling and spray drying.

Group 3: processed foods  
  e.g. unpacked bread, canned vegetables, salted nuts  
  - Made by adding group 2 substances to group 1 foods. Have mostly 2 or 3 ingredients. Processes include various preservation or cooking methods.

Group 4: ultra-processed foods  
  e.g. ice-cream, margarines, burgers  
  - Not modified foods, but formulations made mostly or entirely from substances derived from foods and additives. Typically include many ingredients.
GOOD REASONS FOR FOOD PROCESSING

• Preserve food and increase food safety
• Reduce food waste
• Change flavor, texture, aroma, color or form
• Align with the rest of the requirements of (modern) life
• Business model
• Innovation, creation
FOOD PROCESSING

**Thermal processing:**
- To inactivate pathogens and spoilage organisms
- Increase bioavailability

**Packaging:**
- To avoid post contamination
- To inhibit microbial and chemical changes

**Freezing:** to inhibit microbial, enzymatical and chemical spoilage

**Novel:** HHP, ILP, Cold plasma, …
MILLING IMPACT ON MYCOTOXINS IN CEREALS

Distribution of deoxynivalenol in milling fractions of wheat

Sample B
rest (shorts, losses) 14%
1st break flour 5%
2nd break flour 5%
3rd break flour 2%
1st reduction flour 17%
2nd reduction flour 5%
3rd reduction flour 2%

Lancova et al., 2008

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ACRYLAMIDE FORMATION IN FRENCH FRIES

Impact of blanching prior to frying
extraction of reducing sugars
⇒ reduction of acrylamide

Impact of time and temperature
during frying

Mestdagh et al. 2008

Grob et al., 2003

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**FAT REDUCTION OF FATTY SPREADS**

**Butter (80% fat):**
- 737 kcal

**Low-fat (35%) spread:**
- 325 kcal

Water droplet
Crystalline milk fat (mainly saturated)

Desired **textural stability** can only be achieved with:
- Suitable emulsifiers
- Gelling of water droplets with hydrocolloids

= additives

Gelled water droplet
Reduced amount of saturated fat

Desired **microbial stability** can only be achieved with:
- Preservatives

= additives

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(GOOD) REASONS FOR ADDITIONS

- **Organic acids** to lower pH, but also as an antimicrobial agent.
  e.g. lactic acid, acetic acid, citric acid
- **Food preservatives & anti-oxidants** to inhibit microbial, chemical as well as enzymatical spoilage.
  e.g. sorbic acid, nitrite, ascorbic acid, vitamin E
- **Texturizers** such as thickening agents, emulsifiers: to give and maintain structure during the shelf-life.
  e.g. carragene, modified starch, monoglycerides
- **Fortifiers** to restore and/or raise nutrient levels in food.
(GOOD) REASONS FOR ADDITIONS

*Bacillus cereus* in 0% added salt salt environment

*Bacillus cereus* in 3% added salt salt environment
MESSAGES

• Food processing and responsible food additions ≠ stuffing food with sugars
• No processing & no (some of the) additives = no today’s food choices and way of living
• Risk/benefit assessment → not to be ignored
• Better food → asks more time
• Consumer needs:
  • clear information
  • policy that is protective & based on scientific evidence
  • respect for food, health and environment: food waste!
  • holistic thought (eg life style, …)
MESSAGES

Energy dense,
high in salt, sugar (known and hidden), saturated fats,
low in micro-nutrients and dietary fiber
and not processing sensu stricto
is linked with overweight, obesity, increase risk of cardio-vascular disease,
type II diabetes, NAFLD, NASH and cancer.

My choice:
minimally processed, clean label,
OMAD, lifestyle,
freedom to eat healthy ≠ eating ad libitum
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