

„Has the nature of risks changed?
New challenges for regulatory
authorities“

Reiner Wittkowski

Main goal: safe foods

According EC No. 178/2002 article 14 food is not safe if it is clear that it is

- a) harmful
- b) unsuitable for the consumer consumption

Main goal: To bring safe foods to the market

If a decision has to be made whether a food product is not safe one has to take into account:

the probable effects on human health (by short or longterm exposure)

possible cumulative toxic effects

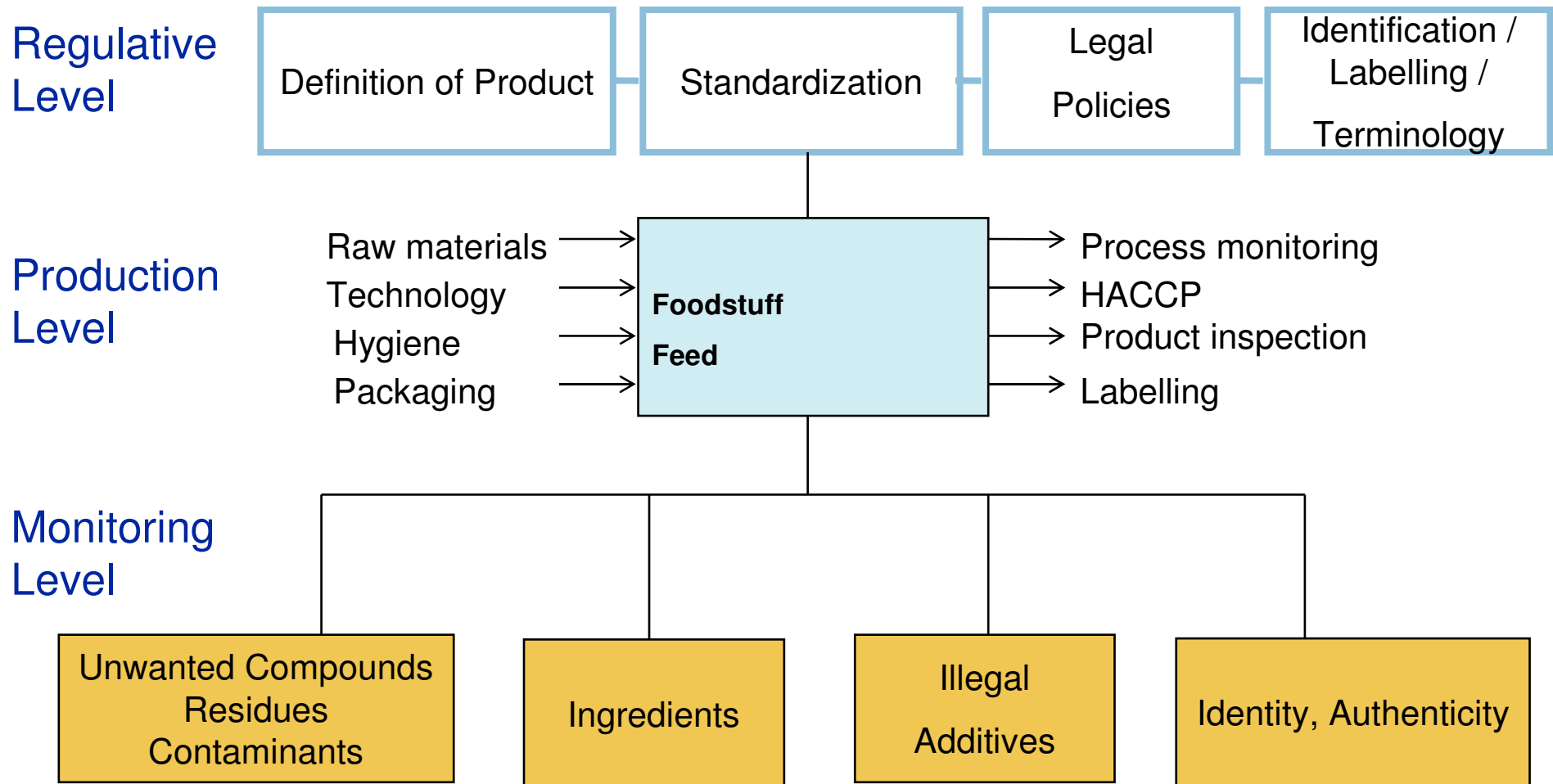
population groups with special sensitivity.

Risk versus Hazard

Hazard means the potential of a substance or situation to cause an adverse health effect

Risk means the likelihood of an adverse effect in an organism, system or a (sub) population on exposure to hazardous substances

Feed and Food - a Joint Food Chain – an interconnected Network



Professional risk assessment – a rational factor in consumer safety

- Less subjectivity - more objectivity
- Less undercover influence of stakeholders, more transparency
- Less prejudices - more science based information

- **Better reasons and arguments**
 - for **interpreting existing law**, e.g. Art. 14 Reg 178/2002.
target groups: authorities, food businesses, law courts

 - for **changing / not changing existing law**.
target groups: politicians, associations, parliament)

How many consumers potentially eat from one slaughtered pig?

~ 100 kg liveweight

~ 80 kg slaughtered

results in

~ 48 kg meat

sale as meat 50 %

50 % processed

24 kg

24 kg

66 slices Schnitzel
46 slices chops of meat,
steaks, fillets, etc.

processing to knackwurst
(30 % pork)
240 knackwurst

**Far more than 380 different
consumers (!)**

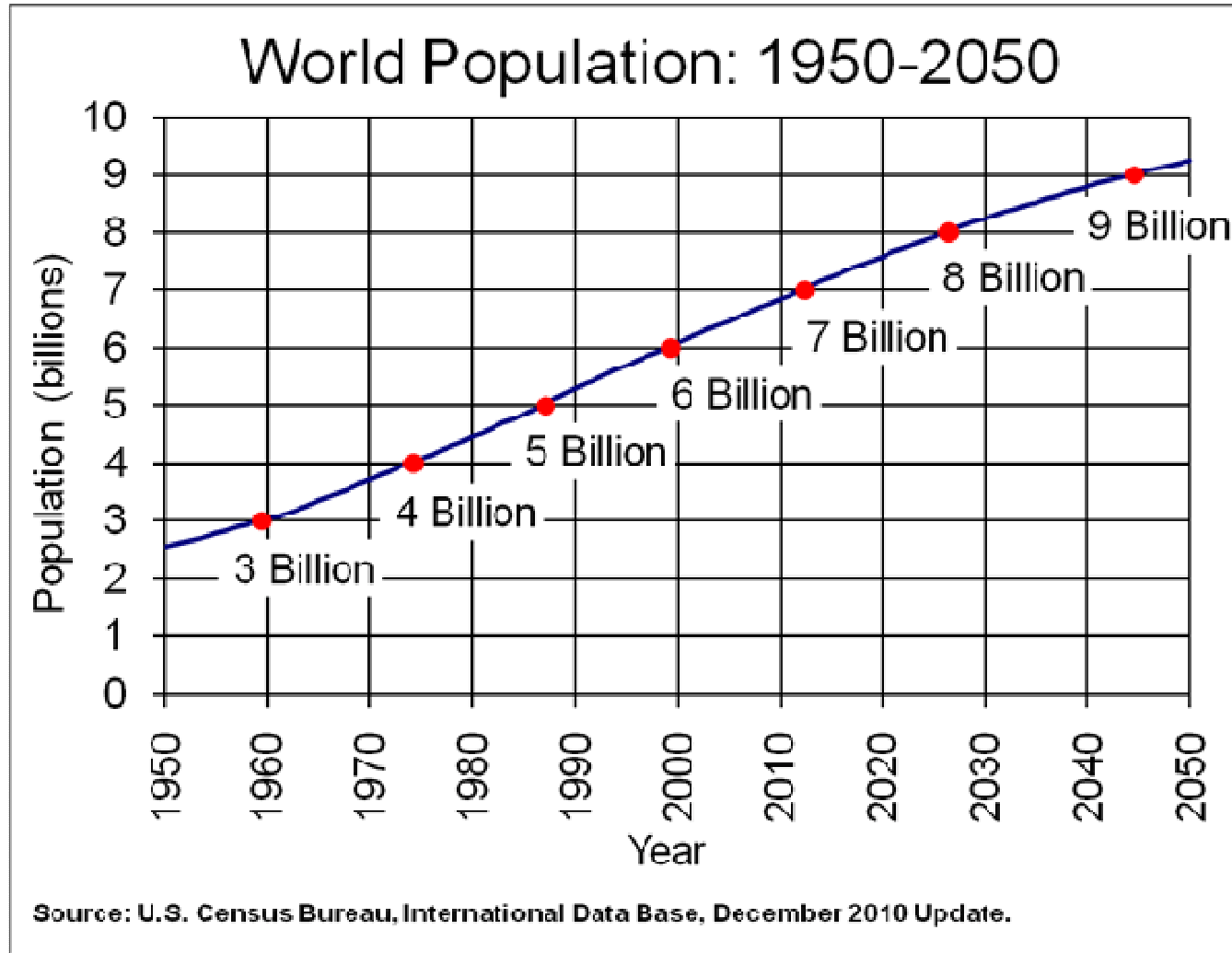
Ongoing Challenges

- New technologies and new products (novel foods)
- New contaminants
- Product piracy and food fraud
- Packaging materials
- New substances, additives, technical aids (pesticides, veterinary drugs, flavour compounds etc.)
- Process contaminants (acrylamide, 3-MCPD, furan, glycidol fatty esters etc.)

Predictable Trends – Emerging Challenges

- Increasing world population
- Climatic change, global warming
- Globalization in production, trade and consumption
- New markets
- Demographic trend
- New energy policies

Increasing World Population

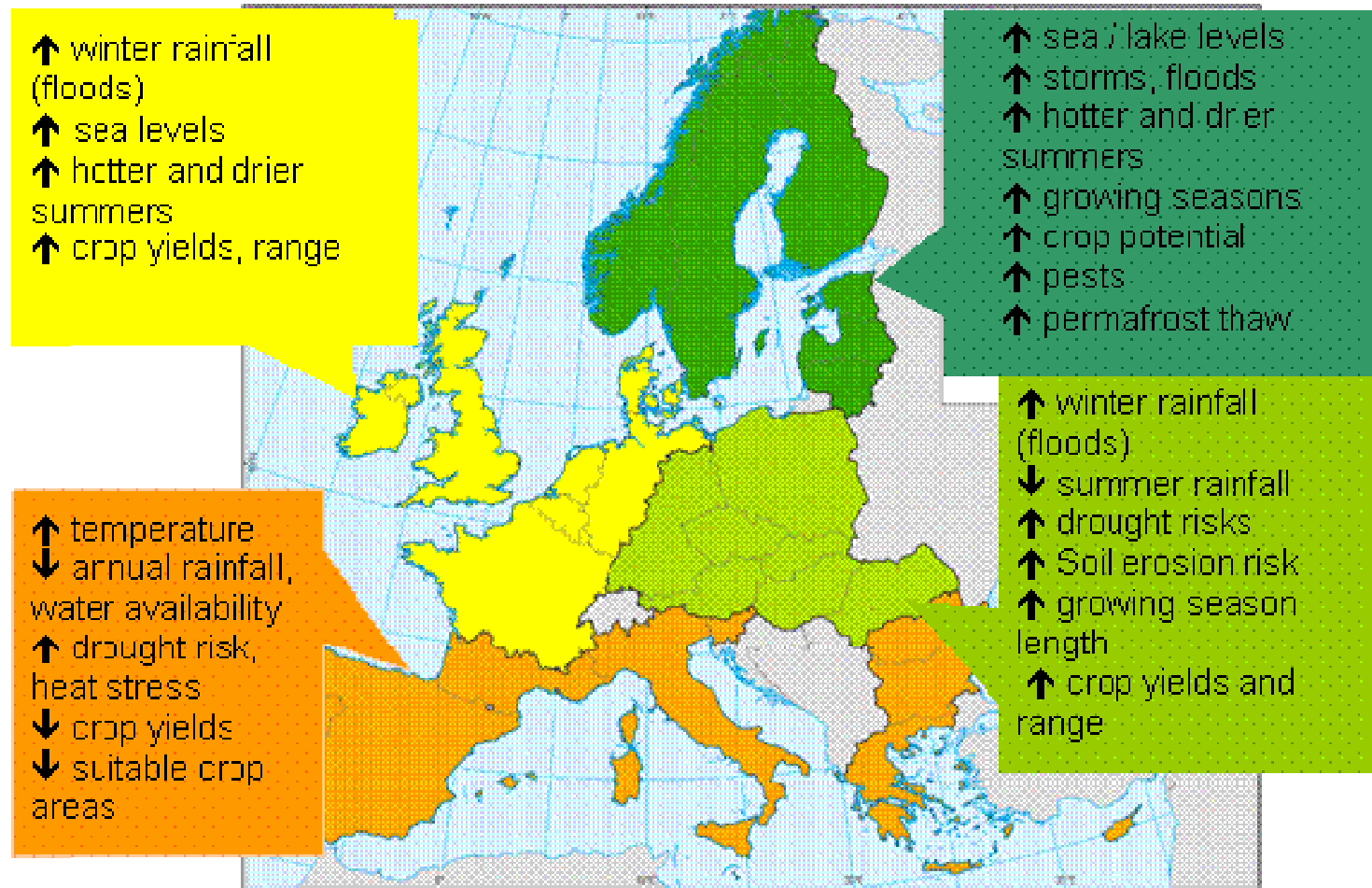


Aquaculture



- Production of fish from aquaculture has exploded in the past 30 years and continues to expand in the world. About 90% are produced in Asia.
- The world aquaculture production is more than 60 million tonnes per year.
- Aquaculture now provides 40% of the world's fish supply for direct human consumption.

Foreseeable impact of climate change in Europe

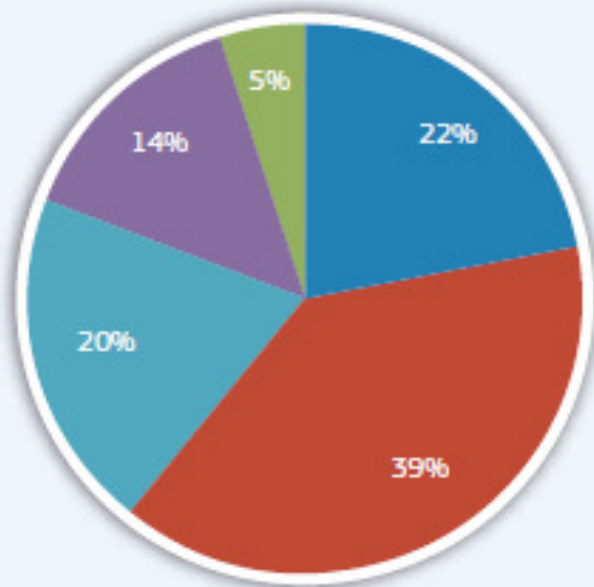


Source: http://ec.europa.eu/agriculture/climate-change/index_de.htm

Energy Mix Challenge

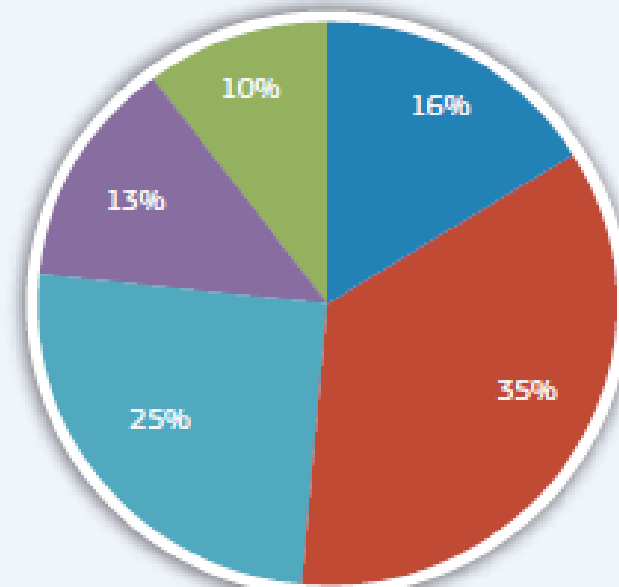
EU-27 Energy Mix in 1995 (%)

EU-27 Gross Inland Consumption: 1 668 Mtoe



EU-27 Energy Mix in 2010 (%)

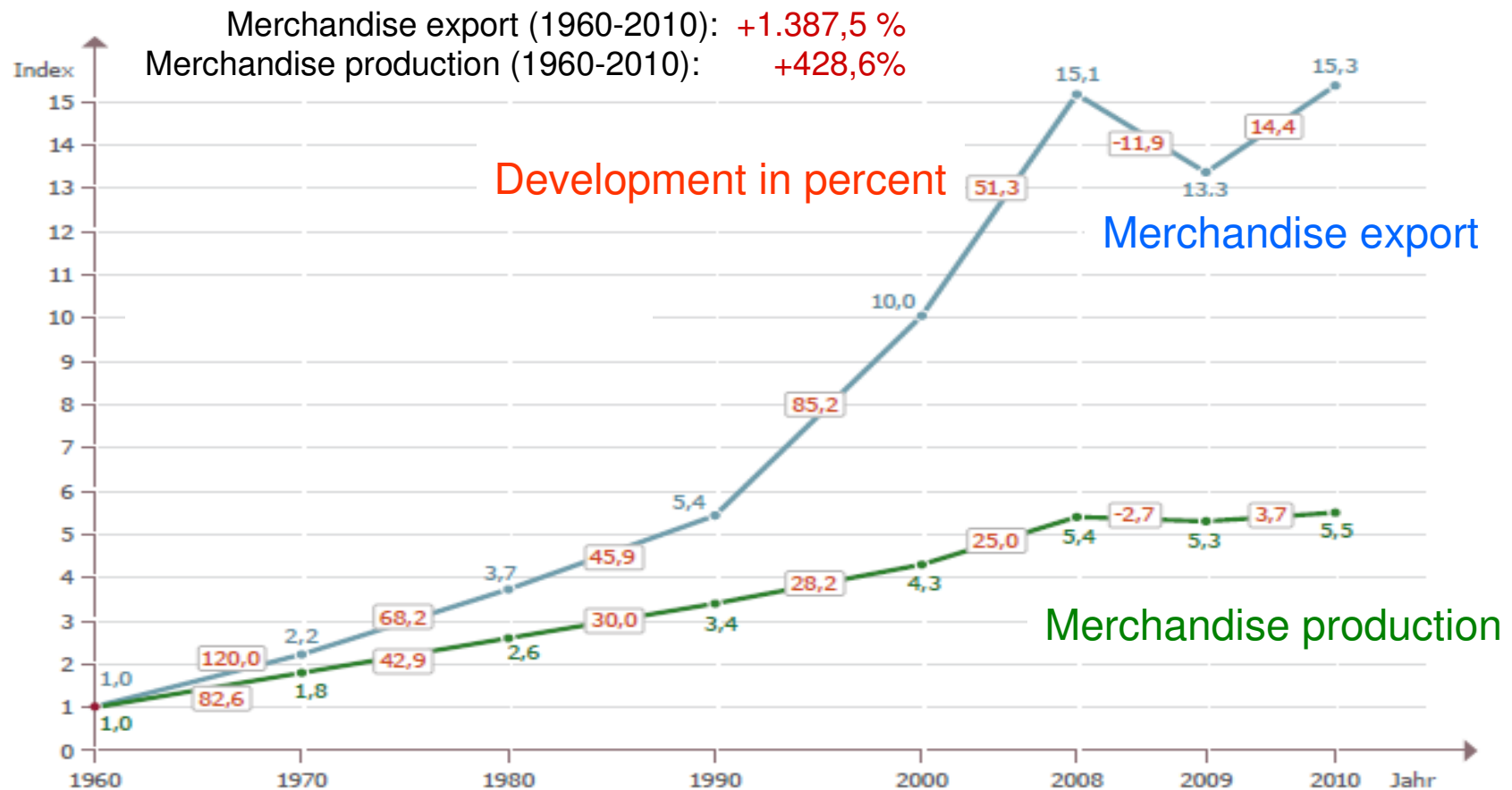
EU-27 Gross Inland Consumption: 1 759 Mtoe



- Coal*
- Oil
- Gas
- Nuclear
- Renewables

© European Union, 2012, Source: Eurostat April 2012

Enhanced cross-border trade (1960 to 2010)



Adopted from World Trade Organization (WTO): International Trade Statistics 2010/2011
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 Bundeszentrale für politische Bildung, 2012, www.bpb.de



Why traceability is necessary ?

- Avoidance of food crises
- Fast reactions in cases of food crises
- Protection of regional markets and producers
- Guarantee of fair trade

Integrated traceability systems are being developed for the food industry that can verify:

- Geographical origin
- Production origin
- Species origin

Real world examples:

EHEC O104:H4 outbreak

HUS incidences by residence (per 100.000 inhabitants) data provided by Robert Koch-Institute

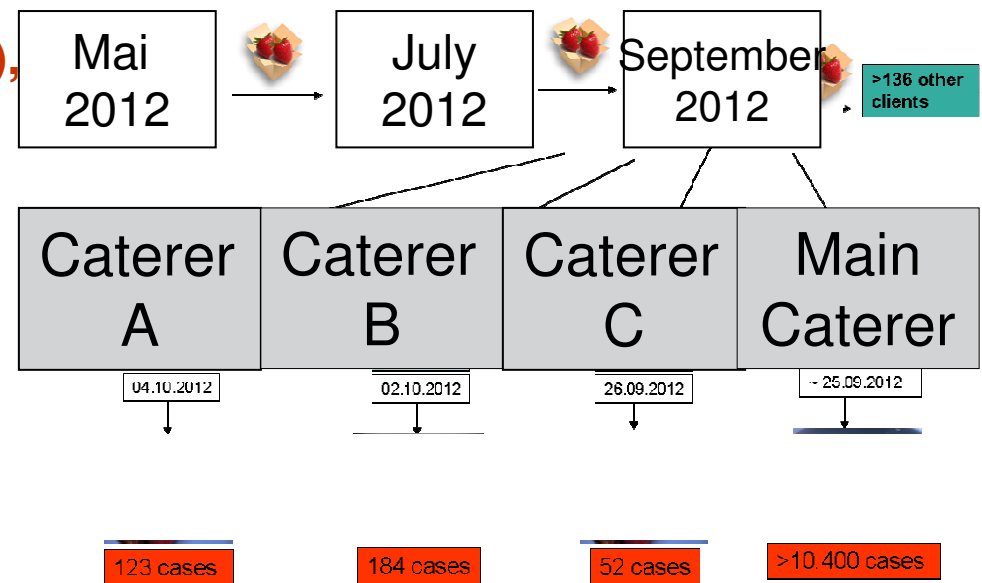
The fatal outbreak from May until July 2011 claimed **53 deaths** and about 4000 seriously ill people in Germany, furthermore 75 cases in 12 EU states and 8 worldwide cases.

Suspected causative vehicle: fenugreek sprouts from imported seeds from Egypt.

Real world examples:

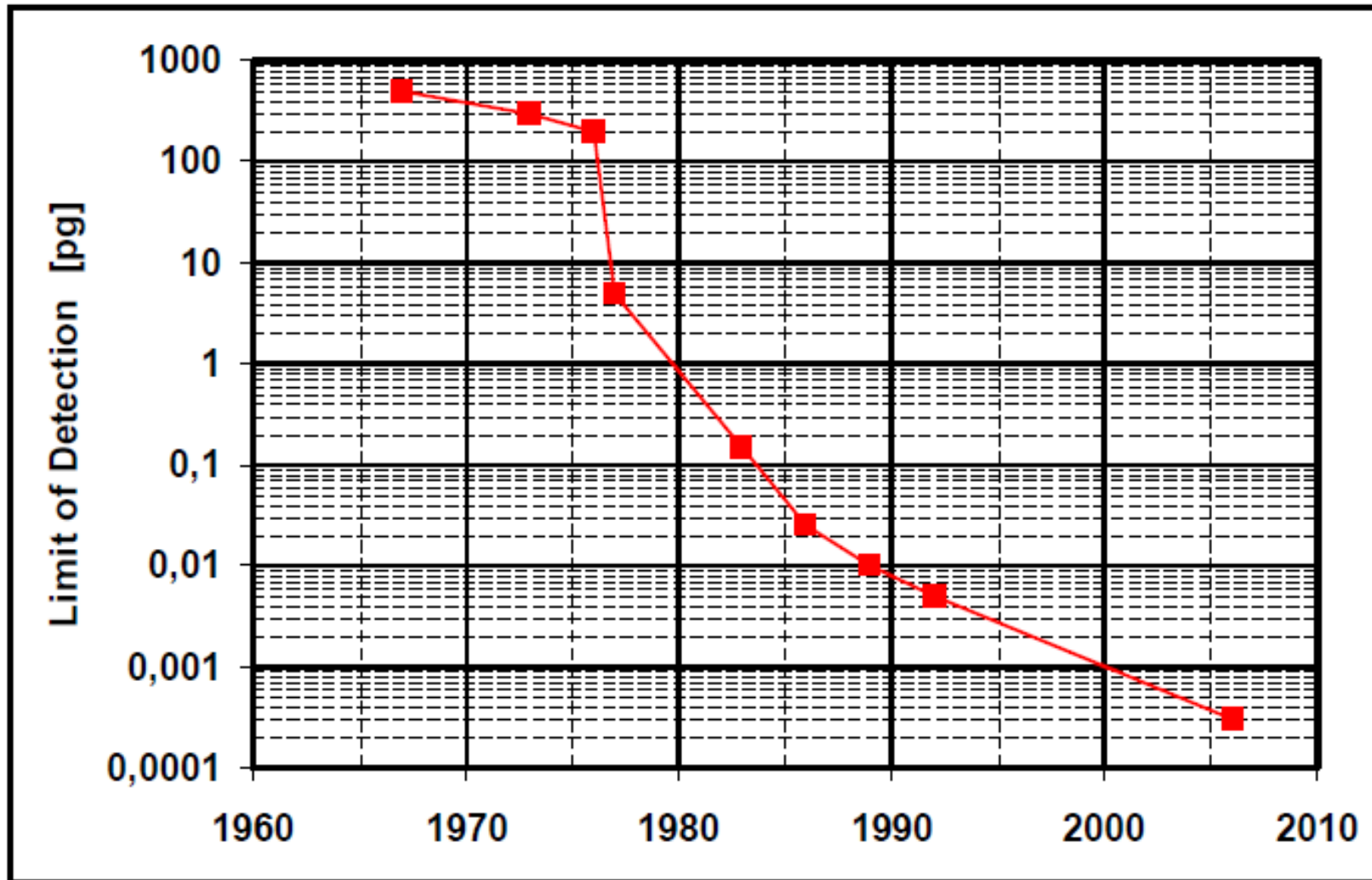
Norovirus outbreak 2012

- A total of **10.950 cases**, averagely 10 years old
- At least **390 affected facilities (cluster)**, almost exclusively schools and kindergartens
- Associated to one main catering company and some minor ones



Identification of causative foodstuff succeeded by joined application of analytical and / or epidemiological analysis methods

Limit of detection for dioxins



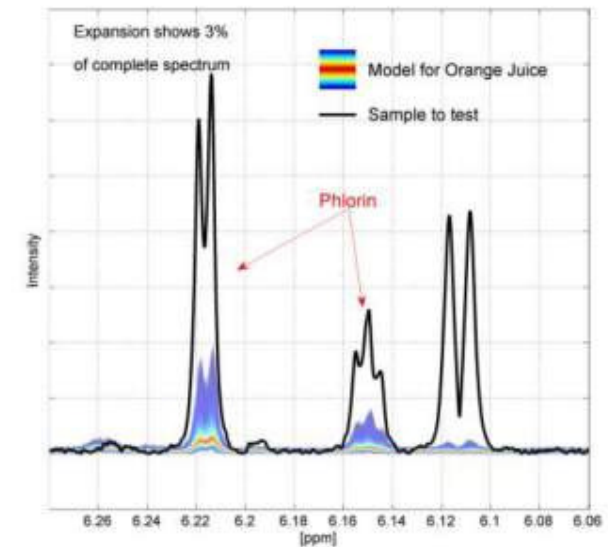
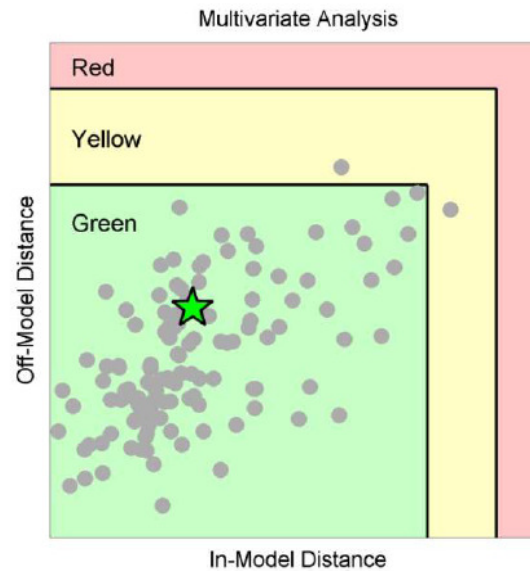
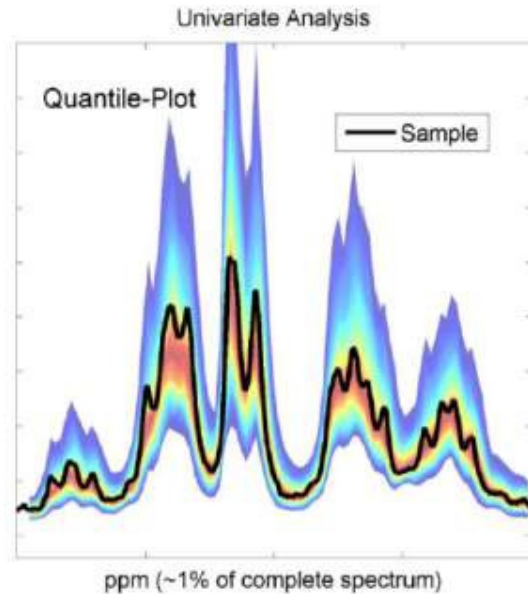
Quelle: nach: Handbook of GC/MS, Hübschmann, 2009

<http://www.bwkbund.de/fileadmin/Dokumente/Veranstaltungen/Kongresse/2010/13-Pinnekamp-Verfahrenstechniken.pdf>
Vortrag J. Pinnekamp, RWTH Aachen

Fingerprinting/Profiling Analysis

Detection of “”

Fast Screening Techniques: e.g. NMR, FT-IR, High-Resolution MS



Taken from: Bruker Juice Screener®

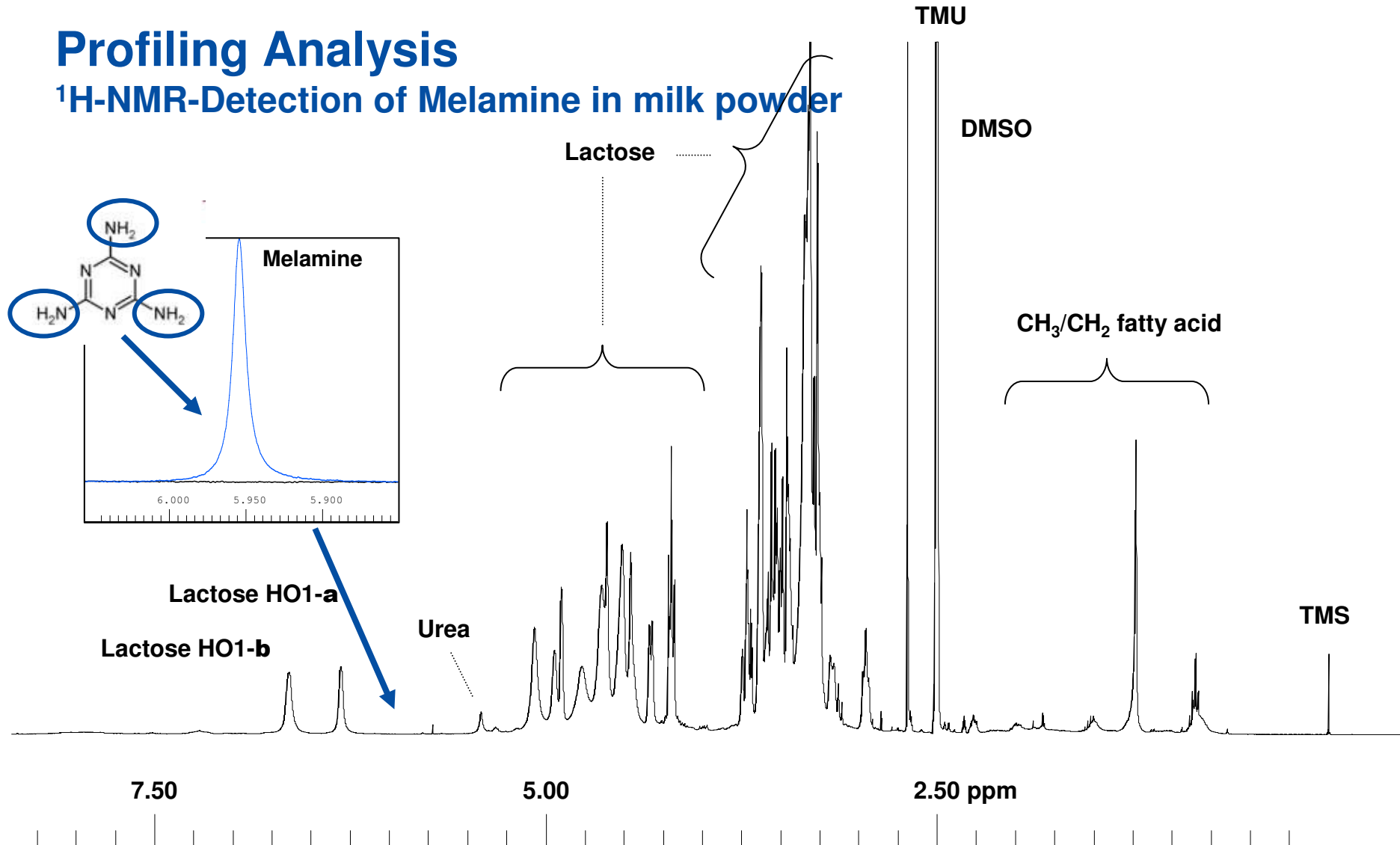
- Applicable with no sample preparation
- Detection of known adulterants
- Detection of “**abnormalities**”



Further deeper evaluation
Stable isotopes etc.

Profiling Analysis

¹H-NMR-Detection of Melamine in milk powder



Black: d6-DMSO extract milk powder

Blue: d6-DMSO extract milk powder spiked with melamine

Global Conclusions

- New analytical strategies
- Global harmonization of standards, methods, and data interpretation
- Global quality assurance systems
- Joint risk assessment with acceptance in Europe and further countries
- Establishment of global community resources (e.g. software, models, data)
- New communication tools



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**Thank you for your
attention**

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