Food Safety in EU: "some issues from CZ perspective"

Jiri Ruprich
Faculty of Veterinary Hygiene and Ecology, Veterinary and Pharmaceutical University, Brno & Center for Health, Nutrition and Food in Brno, National Institute of Public Health in Prague

Palackeho 3a, Brno, CZ, Email: jruprich@chpr.szu.cz
Safety policy / programme in EU: shared responsibility for all stakeholders

- “European food safety system should be proactive, dynamic, coherent and fully comprehensive instrument to ensure”

  high level of human, animal, plant health

  and

  environment protection
Content

1. Part 1 - Basic food safety principles

2. Part 2 – Practical examples
Part 1: Basic food safety principles
1. Basic food safety principles
2. Regulatory aspects – general principles
3. Terminology – what is a safe food
4. Risk based approach
5. Role of EFSA
6. The EU food safety management system: DG SANTE
7. Food and Veterinary Office and system RASFF
8 basic food safety principles in EU

1. Comprehensive and integrated approach
2. Responsibility of all stakeholders
3. Traceability
4. Coherent, effective and dynamic
5. Transparent
6. Risk analysis based
7. Precautionary principle
8. Other legitimate factors
Regulatory aspects

- **European food law**
    - directly applicable in all MSs

- **General Objectives**

  1. .....integrated "farm to fork" approach is considered as a general principle for EU food safety policy
  2. .....rights of consumers to safe food and to accurate and honest information.
  3. .....harmonize existing national requirements in order to ensure the free movement of food and feed in the EU.
  4. .....commitment to its international obligations, except where this might undermine the high level of consumer protection targeted by the EU.
Terminology: often not fully understood

- „Safe“ food – theoretically 3 intrinsic attributes

  1. Safe – socially acceptable health risk
  2. Wholesome – fit for human consumption
  3. Sound – nutritional/biological value

Covered by „EU food law“ : Regulation No.178/2002
Is this food still safe and wholesome?
Is this food safe, wholesome and sound?

Bottled water = food >>> deionized water criticism - a serious conflict in CZ

Product Information
Activate Drinks Deionized Water 20oz (24)

Through our deionization filtering process, we remove minerals that contain impurities. Activate Deionized Water. Pure Water. Nothing More.

Nutrients deteriorate sitting in water. So we don't add any. In fact, we go further-by removing minerals that contain impurities through our unique deionization and reverse osmosis purification process.
Risk based approach

- *The Regulation No 178/2002 establishes the principles of risk analysis*

- .... food safety must be underpinned by **strong science**
  - .....not all in food law has a scientific basis, consumer information or the prevention of misleading practices does not need a scientific foundation

- .....scientific assessment of risk must be **independent, objective and transparent**

- .....**risk management is the process of weighing policy alternatives** in the light of a risk assessment results
Independence of risk assessment and risk management

- Separation of risk assessment and risk management bodies to prevent influence of policy makers on independent scientific work

- Recommended also for national authorities
Role of European Food Safety Authority

What is EFSA?

- European
- Food
- Safety
- Authority

- The European reference body
- Covers the entire food chain
- Assess, advise, communicate
- Independent, trusted, based on sound science

New EFSA’s seat, Parma, IT
Role of European Commission (EC): DG SANTE
The mission of the Food and Veterinary Office is, through its audits, inspections and related activities, to:

1. **check on compliance** with the requirements of EU food safety and quality, ......
2. **contribute to the development** of European Community policy in the food safety ..... 
3. **contribute to the implementation** of effective control systems in the food safety ...... 
4. **inform stakeholders** of the outcome of its audits and inspections.....
EC: Rapid Alert System for Food and Feed

- was put in place to provide food and feed control authorities with an effective tool to exchange information about measures taken responding to serious risks detected in relation to food or feed.

- this exchange of information helps Member States to act more rapidly and in a coordinated manner in response to a health threat caused by food or feed.
Part 2: Practical examples
Content – part 2

1. Actuality 1 – food fraud
2. Actuality 2 – missing limits for foods / practices
3. Actuality 3 – mechanically separated meat
4. Actuality 4 – food enzymes
5. Actuality 5 – cumulative exposure
6. Actuality 6 – novel food
Paramount troubles with food fraud / safety

Horse meat scandal

So that's where horse DNA comes from!
EU consumer’s trust to the system is in a risk

- Scandal with horse meat opened long known problems with food fraud;

- EU made tens of thousands of analyses, costs are huge, the health risk from the content of phenylbutazone is minimal (see the EFSA evaluation/EMA);

- Catering/restaurants are suitable destinations for the deception of the consumer - who is responsible for this part of food control?
Nutritional composition of horse meat

- Horse meat is nutritionally better than beef – but some people have ethical problems to eat it
- Around 400 horses are slaughtered in the Czech Republic per one year,
- There is evidence of BUTE contamination

<table>
<thead>
<tr>
<th>Nutritional values for beef and horse meat (100g)</th>
<th>nutrient</th>
<th>beef</th>
<th>horse meat</th>
</tr>
</thead>
<tbody>
<tr>
<td>energy (kJ)</td>
<td>905</td>
<td>493</td>
<td></td>
</tr>
<tr>
<td>water (g)</td>
<td>63,42</td>
<td>73,77</td>
<td></td>
</tr>
<tr>
<td>protein (g)</td>
<td>16,73</td>
<td>21,45</td>
<td></td>
</tr>
<tr>
<td>fat (g)</td>
<td>16,41</td>
<td>3,55</td>
<td></td>
</tr>
<tr>
<td>SFA (g)</td>
<td>6,67</td>
<td>1,104</td>
<td></td>
</tr>
<tr>
<td>MUFA (g)</td>
<td>7,42</td>
<td>1,19</td>
<td></td>
</tr>
<tr>
<td>PUFA (g)</td>
<td>0,73</td>
<td>0,62</td>
<td></td>
</tr>
<tr>
<td>cholesterol (g)</td>
<td>0,068</td>
<td>0,064</td>
<td></td>
</tr>
<tr>
<td>saccharides (g)</td>
<td>0,35</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>sodium (mg)</td>
<td>76,7</td>
<td>49,5</td>
<td></td>
</tr>
<tr>
<td>magnesium (mg)</td>
<td>23,8</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>phosphorus (mg)</td>
<td>193,9</td>
<td>210,5</td>
<td></td>
</tr>
<tr>
<td>chlorides (mg)</td>
<td>64,5</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>potassium (mg)</td>
<td>314,5</td>
<td>352,5</td>
<td></td>
</tr>
<tr>
<td>calcium (mg)</td>
<td>9</td>
<td>10,5</td>
<td></td>
</tr>
<tr>
<td>iron (mg)</td>
<td>2,87</td>
<td>3,66</td>
<td></td>
</tr>
<tr>
<td>zinc (mg)</td>
<td>3,74</td>
<td>2,8</td>
<td></td>
</tr>
<tr>
<td>iodine (mg)</td>
<td>0,006</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>vitamin A (mg)</td>
<td>0,016</td>
<td>0,03</td>
<td></td>
</tr>
<tr>
<td>vitamin D (mg)</td>
<td>0,0007</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>vitamin E (mg)</td>
<td>0,62</td>
<td>0,52</td>
<td></td>
</tr>
<tr>
<td>vitamin B1 (mg)</td>
<td>0,142</td>
<td>0,135</td>
<td></td>
</tr>
<tr>
<td>vitamin B2 (mg)</td>
<td>0,206</td>
<td>0,185</td>
<td></td>
</tr>
<tr>
<td>vitamin C (mg)</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Source: compiled FCD of the NIPH
Targets for food control system

- all cases, where meat is minced, hidden in meal or industrially processed – for example, detection of beef kebab
- horse meat is more expensive than beef – there is no reason for food fraud
Is there something even more fraudulent?

- Venison – in restaurants (?%) – goulash, minced meat
- Fish – species? Some kinds (Atlantic cod) more expensive – therefore replaced by cheaper fish

![Diagram of fish mislabeling](image)

snapper = chňapal
Conclusions – food fraud challenges

- There are many challenges for food control organizations – web?
- How to organize quality/safety control in catering/restaurants?
- How to organize harmonized food control among EU member states?
High content of lead in venison „bloody cut“

Bloody cut from hunted game – not obligatory confiscated – used into meat products?

<table>
<thead>
<tr>
<th>Meat area</th>
<th>ug Pb/kg meat (example, N=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullet hole (1cm)</td>
<td>40059 – 1279666</td>
</tr>
<tr>
<td>Surrounding (1-3cm)</td>
<td>8046 - 115647</td>
</tr>
<tr>
<td>Surrounding (3-5cm)</td>
<td>12 - 4684</td>
</tr>
<tr>
<td>Control (&gt;10 cm)</td>
<td>7 - 346</td>
</tr>
</tbody>
</table>

CZ national action limit = 100 ug Pb / kg

There is no safe limit for Pb in food !!
Discussion about MSM

Consumers dislike consumption of MSM

Media often classify MSM as „food wastes“ – questionable from safety and quality point of view

EFSA opinion 2013 (pork and chicken MSM):

- Microbiological risk comparable with minced meat, depends on the separation pressure
- Chemical detection is possible according to Ca and possibly also cholesterol contents
- Regulation EC No. 2074/2005 - max content of Ca in MSM/MOM 0,1% = 100mg/100 g fresh product)

Often questioned:
Example of discussion about MSM

- **Ms. Kateřina question:** What is composition of your chicken nuggets?
- **McD answer - May 18, 2013 11:06**
  - „….Chicken McNuggets have about 50% of chicken meat (specifically roughly minced breast), rest is marinade and coating (flour, dough, crumbs). ([http://www.narovinu.mcdonalds.cz/](http://www.narovinu.mcdonalds.cz/))

- **Test of NIPH(5/2013 „Nutrimon“):**
  - 9 – 12 mg Ca per 100 g strips: 12% of max Ca limit for MSM, and 80% NUTR Ca value
  - 18 – 20 mg Ca per 100 g nuggets: 20% of max Ca limit for MSM, and 133% NUTR Ca value

Other ingredients ???
Usage of trans-glutaminases
(enzymatic meat glue)
(covalent bounds among amines)

Public question: how is possible that minced meat in nuggets stick together?

Our answer: we do not know, we asked McDonald

Hypothetically: due to trans-glutaminase, no information about „marinade“

Regulation EPC No. 1332/2008 – register of food enzymes should be established (but still not on a table). Labeling?

<table>
<thead>
<tr>
<th>US FDA GRAS certificate 1999 - trans-glutaminase</th>
<th>USAGE LEVEL [PPM]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food category</td>
<td></td>
</tr>
<tr>
<td>Processed Cheeses</td>
<td>250</td>
</tr>
<tr>
<td>All Natural Hard Cheeses (Domestic)</td>
<td>100</td>
</tr>
<tr>
<td>Cream Cheese</td>
<td>70</td>
</tr>
<tr>
<td>Refrigerated Yogurt</td>
<td>30</td>
</tr>
<tr>
<td>Frozen Desserts</td>
<td>20</td>
</tr>
<tr>
<td>Vegetable Protein DishesNegeburgers</td>
<td>25</td>
</tr>
<tr>
<td>Meat Substitutes</td>
<td>25</td>
</tr>
</tbody>
</table>

Traditional use: some fish products
Cumulative and aggregated exposure assessment and risk characterization
Pesticides: typical example for cumulative and aggregated exposure (exposure to mixtures)

- **Cumulative exposure** = exposure via one way from various sources (e.g. from various foods)

- **Aggregated exposure** = exposure via various ways – p.o. + p.c. + inh.

- Why it is important?
  - Endocrine disruption, non-monotonous dose-response relationship

- In reality – we are exposed to mixtures
Consumer concerns regarding pesticide residues on Fruit & Vegetable

Source: Eurobarometer on food-related risks 2010
Example – fruit and vegetable on the CZ market

- CZ national monitoring 2009/10

Cabbage
Potato
Pepper
Tomato
Apple
Carrot
Pear
Lettuce
Cucumber
Wine Grapes
Celery
Lemon
Orange
Peach
Banana
Mandarin

No residues
1 residue
2 residues
3 residues
4 residues
5 and more residues
Retailers - private standards

**Max. 70% MRL**

**Max 80% ARfd**

**Max. 80% MRL (sum)**

**Max. 80% ARfD (sum)**

**Max. 3-5 AS depending crop**

**Max 70% MRL**

**Max. 100% ARfD**

**No max number AS**

**Max 70% MRL**

**Max 50% MRL for EDEKA brand**

**Max. 100% ARfD**

**No max number AS**

**Max. 70% MRL**

**Max. 70% ARfD**

**Max. 70% MRL**

**Max 50% MRL for REWE brand**

**Max. 70% ARfD**

**Red list  AS**

**Cumulated MRM : 150%**

**Cumulated Arfd : 100%**
Retailers - private standards

**Carrefour**
- Max. 50% MRL

**Auchan**
- Max. 50% MRL

**Kaufland**
- Max. 33,3% MRL
- Max. 70% ARfD
- Max 100% ARfD (sum)
- No max nb AS
- No cumaltion MRL
- If former German MRL lower than EU harmonized those apply

**Lidl**
- Max. 33,3% MRL
- Max 100% ARfD (sum)
- No max nb AS
- No cumaltion MRL

**Billa**
- Follow Pesticide reduction programme of Global 2000 Austria –based on most vulnerable consumers
- Cumulated PRP reidues limit apply

**Norma**
- Max. 80% MRL (sum)
- Max. 80% ARfD (sum)
- Max 5 AS

Provided kindly by FRESHFEL EUROPE, 2013
Retailers - private standards

- Max. 70% MRL
- Max. 70% ARfD
- Max AS (> 0,01 ppm) from 3-5 depending of crop

- Max. 70% MRL
- Max. 70% ARfD
- Max AS 4 (not including post harvest)
- No cumulative charge

- Product specific grading for multiples residue with financial sanction for exceeding legal limits or max nb AS

Provided kindly by FRESHFEL EUROPE, 2013
Conclusions: recommendations for pesticides

- **Food control system**
  - Time-seasonally based sampling plan

- **Retail system**
  - Private standards – limited number of used pesticides

- **Consumers**
  - Peel citruses and banana (usual practice)
  - Peel cucumbers
  - Wash fruit and vegetable thoroughly by warm water (wine grapes, peach).
We know more than 1100 species of edible insects. Insect is not characterized as a whole animal – therefore it is not covered by Regulation No. 258/1997 on novel foods – no regulation now
Insect as a dish

Insect can be a good source of proteins and omega-3 FA
Insect as an ingredient in bread
### Cases „Insect as a food“ pending application for authorization EC CAFAB (2007-2013)

<table>
<thead>
<tr>
<th>Case</th>
<th>Latin name</th>
<th>Request from</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brood (honeybee larva and honey)</td>
<td><em>Apis mellifera</em> L.</td>
<td>F</td>
<td>7. 5. 2007</td>
</tr>
<tr>
<td>3. Frozen fried grasshoppers</td>
<td><em>Patanga succincta</em> L.</td>
<td>DK</td>
<td>23. 10. 2007</td>
</tr>
</tbody>
</table>
Conclusions - insect as a food

- Need of **Revised Novel Food Regulation**
  - Insect should be a novel food
  - Approach - case by case assessment / authorization
  - Public perception / communication will be essential
Food fraud – a new challenge for food safety / quality systems / programs in EU
International cooperation – only way forward
Complexity of approaches - pressure on communication quality
Conflict of interest - issue for organization of food safety systems
Food safety - closely connected also with food security and nutritional adequacy in societies