Meat contamination by *Salmonella*, *Campylobacter*, *Yersinia enterocolitica* and EHEC O157 in Belgium

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Introduction

- **What is a zoonosis?**
  - Any disease and/or infection which is likely to be naturally transmitted from animals to man

- **Which are the recent evolutions?**
  - 10 years ago, zoonosis often = animal disease
    » tuberculosis, anthrax, brucellosis
  - Now, zoonosis often ≠ animal disease
    » salmonellosis, yersiniosis, haemolytic uremic syndrome
Introduction

Which are the recent evolutions?

- The concept of sectors and the responsabilisation of producers

Types of zoonotic agents

- Worms
- Protozoa
- Bacteria
- Viruses
- Mycotoxins and marine biotoxins
- Non conventional transmissible agents
Regulations

- Zoonosis directive 92 / 117 / CEE

- Directives about food hygiene
  - Vertical directives
  - Horizontal directive 93/43/CEE

Surveillance plans of IEV

- Any fresh meat from the slaughterhouse to the distribution
- Random sampling plans representative of the production from the slaughterhouse to the distribution
- Micro-organisms: Salmonella, verocytotoxigenic E. coli, Yersinia enterocolitica, Campylobacter, Listeria monocytogenes, indicators of faecal contamination
- Since 1996, > 25,000 analysis with standardised protocols for sampling and analysis
- Strain typing, MIC and result working
Surveillance plans of IEV

- **Pork** (carcasses, livers, cuts, ground meat)
- **Beef** (carcasses, livers, cuts, ground meat)
- **Veal** (carcasses, livers, ground meat)
- **Broiler** (carcasses, livers, cuts)
- **Layer** (carcasses)
- **Turkey** (carcasses)
- **Rabbit** (carcasses)
- **Fresh water fish**

Some results

- **Salmonella**
- **Campylobacter**
- **Yersinia enterocolitica**
- **Enterohaemorrhagic E. coli O157**
Salmonella

Salmonella prevalence (origin IEV)
Contamination level by *Salmonella* (origin IEV)

Salmonella serotypes (origin ISP, CERVA, IEV)
**Salmonella**
Prevention strategy

- Breeding (germ-free sectors)
- Transformation and distribution industry
  - Lower faecal contamination at slaughterhouse
  - Lower cross contamination along the sector
- Consumer
  - Avoid cross contamination from poultry raw meat
  - Watch over the cold chain
  - Good cooking of poultry meat

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**Campylobacter**
Campylobacter prevalence (origin IEV)

Contamination level by Campylobacter (origin IEV)
Campylobacter species (origin ISP, IEV)

Thermophilic Campylobacter
Prevention strategy

- Breeding (poultry and offal sectors)
- Transformation and distribution industry
  - Lower faecal contamination at slaughterhouse
  - Lower cross contamination along the sector
- Consumer
  - Avoid cross contamination from poultry raw meat
  - Good cooking of poultry meat
Yersinia enterocolitica O:3

Enteropathogenic Yersinia enterocolitica in man (origin ISP)
Meat and *Yersinia enterocolitica O:3* (origin IEV)

**Prevention strategy**

- **Transformation and distribution industry**
  - Meat sector: lower cross contamination and reduce BBD

- **Consumer**
  - Avoid cross contamination from raw meat, offal
  - Good cooking of meat
  - Do not conserve a long time under cold conditions
**Enterohaemorrhagic E. coli O157**

**Situation in Belgium**

*(origin ULg, RUG, VUB and IEV)*

- **1996-97:** beef ground meat (25 g): 0 EHEC O157 isolate from 624 samples
- **1998:** beef carcasses (400 cm²): 9 (0,15 %) EHEC O157 isolates from 6,010 carcasses
- **1998:** meats from several origins (poultry, pork, rabbit) (25 g): 0 EHEC O157 isolate from 1,000 samples
- **1999:** beef carcasses (1,600 cm²): 16 (1 %) EHEC O157 isolates from 1,620 carcasses
- **1999:** beef ground meat (25 g): 1 (0,1 %) EHEC O157 isolate from 900 samples
Enterohaemorrhagic \textit{E. coli} O157
Prevention

- **Cattle breeding**
  - Detection et elimination of the carrier breeding

- **Transformation and distribution industry**
  - Hygiene at the slaughterhouse and respect of the cold chain
  - Avoid meat mixing

- **Consumer**
  - Do not give raw meat at children
  - Good cooking of ground or tenderised beef meat
Perspectives

- Sanitary surveillance systems of IEV

  - Result fiches for each industry (control of auto-control)
  
  - Computerised data base available for at a distance consultation:

    - Web site: mda04.fmv.ulg.ac.be

Discussion

- Need of national co-ordination (animals, food, man)

  - Working group « Food-borne diseases»
  - Institute of veterinary expertise (IVE), Veterinary and agrochemical research centre (VAR) and Federal agency for security of the food chain (AFSCA)
  - Scientific institute of public health - Louis Pasteur, epidemiological section (Communities)
Conclusions

- Need of a **consciousness** of ministers, administrations, scientists, agriculturists, industrials et consumers about importance of food transmissible zoonosis

- Need of a **co-ordination** of search, surveillance and prevention programmes, of AFSCA (animals and food) and of Communities (man)