Practical Control of Salmonella in Finnish Production Animals
National and Farm Level

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Finland in numbers

- area 337 000 km²
- 5 million people
  about 15 people / km²
- 0.92 million cattle (2015)
  - 285 000 dairy cows
  - 59 000 suckler cows
  - 574 000 youngstock for dairy and beef
- 7700 dairy farms
  - average dairy herd size 37 cows
- 3700 beef farms
- middle temperature +3 C
The Animal Health ETT ra (www.ett.fi)

- Founded in 1994, just before Finland joined EU.
- Covers 95% of the industry (dairy-, slaughtering-, house- and eggpacking companies)
- 5 veterinarians, 2 register officers, 1 treasurer
- ETT promotes the farm animal health and welfare by:
  - Instructing imports; animals, sperm, embryos, animal feeds
  - Instructing farms to manage diseases and to use preventive measures
The Animal Health ETT ra (www.ett.fi)

- Coordinating the national herd health systems for production animals and maintaining national herd health databases for cattle and pigs (www.naseva.fi) and (www.sikava.fi)

- Co-operating with insurance companies to develop insurance models for animal diseases

- Close co-operation with the veterinary authorities
Finnish Salmonella control

1. The official Finnish Salmonella control program

2. The voluntary measures organized by ETT and its members (dairy-, slaughterhouse- and eggpacking companies)
1. Official Salmonella control program

- The aim of the Finnish Salmonella Control program is to minimize the human exposure to *Salmonella* spp. from production animals and foodstuffs.

- The target of the program is to keep the annual prevalence of *Salmonella* spp. (all serotypes) in each production category below 1 %

- Usually we are far below 1 %; usually we have 10-15 cattle farms found to be positive per year, which is 0.15 % of all cattle farms (dairy and beef production) in Finland
1. Official Salmonella control program

-The control strategy is to prevent, detect and adequately control *Salmonella* spp. at the level of primary production before any threat to human health arises and further spread to other animal populations and environment occur.

-The focus of the risk management is, therefore, mainly the primary production and intermediary products used in the primary production (feed).
1. Official Salmonella control program

- In Finland we follow zero tolerance policy for salmonella
- We consider, that all Salmonella serotypes are of public health significance
- By zero tolerance we mean, that actions are always taken, when salmonella is detected from feed, animals or foodstuffs
- The aim is to find the origin of infection or contamination and to prevent further spread
1. Official Salmonella control program

-In Finland, we have carried out risk assessments showing that our Salmonella control program protects public health effectively.

-We have also carried out cost-benefit analyses showing our program economically efficient.
1. Official Salmonella control program

- Lymph node and swab samples from carcasses at slaughterhouses
- Fecal samples from farms selling bull calves to AI-stations
- Clinical surveillance at vet visits
- Feed samples from imported feeds at risk, especially if imported from outside EU
- Milk samples from dairy farms, especially farms selling unpasteurized milk to consumers
2. Voluntary Salmonella control

Farm level:

- Fecal samples from milk production animals entering dairy farms (terms of insurance)

- Fecal samples from breeding animals to suckler cow farms (terms of insurance)

- Pooled fecal samples from all animals at calf rearing stations at least once a year

- "National level" of Animal Health Service, vet. visits at least once a year, clinical surveillance
2. Voluntary Salmonella control

Farm level:

- All imported animals are examined for salmonella, as part of importation terms set by the ETT for each single individual

- Imported feed must be bought only from companies listed on the ETT’s Positive list (or examined for salmonella) (terms of insurance)

- Protection of feed from birds and rodents

- Tourism guidelines for farmers and their workers
2. Voluntary salmonella control

Positive list:

- A list maintained by ETT of feed companies, that have agreed to minimize the risk of salmonella in feed

- The companies must have a self-control protocol approved by The Finnish Food Safety Authority Evira

- Furthermore they must have quality agreements with their transportation and stocking companies
2. Voluntary salmonella control

Positive list:

-The companies are passive members of ETT and they can be audited by ETT

-The Positive List is published every week in both of the farmer newspapers (in Finnish and in Swedish) and on the website www.ett.fi
2. Voluntary Salmonella control

**Slaughterhouse / dairy level**

- Each unit has a self control program including samples for salmonella from all over the premises.

- If salmonella is increasingly found from the premises, the source of the contamination is traced to the farm level.

- Strict cleaning and disinfection procedures are taken to dispose of the contamination of the premises.
2. Voluntary Salmonella control

**Group insurances for salmonella**

- Most cattle, swine and poultry farms have a group insurance for salmonellosis via slaughterhouse, dairy or egg-packing company.

- The insurance covers the eradication costs for salmonellosis; extra work, disinfectants, control samples, veterinary costs, killed animals etc.) usually for half a year.

- The group insurance makes it possible to carry out the eradication procedures properly, the state does not pay the costs.
Cattle, poultry and swine farms under restrictions for Salmonella 01.01.- 31.12.2015

**Cattle farms**
- S. Coelns 1
- S. Enteritidis 1
- S. Konstanz 1
- S. Typhimurium FT 1 2
- S. Typhimurium FT 41 2
- S. Typhimurium FT U 302 1
- S. Typhimurium U 277 5
- S. Typhimurium (eli tyypitetty) 1

- One farm both S. Typhimurium U 277 and S. Konstanz

**Poultry farms**
- S. Cerro 1
- S. Enteritidis 1
- S. Livingstone 1

**Swine farms**
- S. Derby 1
- S. Typhimurium NST 3 (belong to the same case)
Cattle, poultry and swine farms under restrictions for Salmonella 01.01.- 09.10.2016

Cattle farms
- S. Coelns 1
- S. Typhimurium 2
- S. Typhimurium FT 1 1
- S. Typhimurium FT 135 1
- S. Hassarek 1

Poultry farms
- S. Enteritidis 1
- S. Tennessee 1
- S. Typhimurium 2
- S. Typhimurium FT 41 2
- S. Poona 1

Sikatilat:
- S. Derby 1
- S. Typhimurium NST 1
- S. Mbandaka 1
Salmonella on cattle farms

- During the last years 10-15 farms/year under restrictions and eradication procedure, mostly *S. Typhimurium* (different subtypes) and some other serotypes.

- The most common sources of infection are feed stores and drinking basins contaminated by feces from birds and rodents.

- In calf rearing stations Salmonella usually originates from one of the dairy farms selling calves to it; the critical point in beef production chain.
Salmonella on cattle farms

-A farm found to be positive for salmonella is put under restrictions by the authorities:

- No selling of live animals to other farms
- Selling uninfected animals for slaughter is possible if the slaughterhouse company accepts them (rarely)
- Milk is taken to the dairy under special measures, it must be pasteurized before consuming
- No unnecessary visitors to the farm, especially not to the production facilities
Salmonella eradication, cattle farm

- Fecal and environmental sampling to survey the situation on the farm
- Feed, feed stores and feeding equipment must be clean:
  - Feed and feed environmental sampling
  - Decontamination or destruction of contaminated feed
  - Cleaning and disinfection of feed stores and feeding equipment
- Documented eradication plan (requirement of the insurance): cleaning and disinfection of the premises, manure handling and decontamination etc.
Salmonella eradication, cattle farm

-The infection chain from feces to feed and drinking water must be cut off:
  - Clean feed and drinking water => the animals get rid of salmonella within 3 – 4 months

-Monitoring by fecal samples at 2 -4 weeks interval

-More environmental samples if needed

-Chronically infected animals must not be left in the herd, they may cause a new outbreak.

-Large farms and complicated production chains may cause problems for salmonella eradication.
A drying grain silo (150 tn barley and oats) on a milk farm contaminated with *S. Typhimurium FT 1*: bird droppings in the open inlet pit during harvest-time.
A dairy farm for 300 cows: eradication procedure for S. Typhimurium DT 104 within 6 months
Salmonella eradication on swine farms

- In principle the same procedure as on cattle farms: fecal, environmental and feed samples, clean feed and drinking water.

- The production cycle on swine farms is quick, and usually there is not enough time to wait for the animals to get rid of salmonella => part of the animals must usually be killed and sent for destruction to avoid animal welfare problems.

- On problem farms: stamping out, cleaning and disinfecting the facilities.
A grain dryer used as storage for commercial feed, contaminated with *S. Tennessee*
Environmental sampling on a large swine farm (1000 sows)
Lifting restrictions for salmonella at cattle and swine farms

- Fecal samples taken of all animals must be negative for salmonella twice for the restrictions to be lifted off.

- Clean environmental samples are also required.

- These samples are taken by the veterinary authorities, when the eradication procedure has been carried out, and the farm is supposed to be free from salmonella.
Salmonella eradication on poultry farms

- The animals are always killed and sent for destruction, the facilities are cleaned and disinfected.

- Environmental samples after cleaning and disinfection; based on legislation => must be negative for the restrictions to be lift off.
Feed and feed environmental sampling at a large poultry farm (150,000 laying hens, 70,000 broilers)
Large production units and chained production require good knowledge of the production systems to manage exceptional situations and disease outbreaks.
“CRITICAL CONTROL POINT”