Modelling the food chain

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Primary production models

To estimate the prevalence of infected herds / flocks at national level

- No. herd / flocks present

- Herd / flock level prevalence
  - Prevalence survey,
  - published data
  - Industry data

- Within herd / flock prevalence
Basic processes occurring during processing and retail

- **Bacterial growth** at each step

- **Inactivation** -→ reductions due to treatment
  - chemical
  - mechanical
  - thermal

- **Cross-contamination** -→ hazard introduction
  - Concentration / dilution?

- **Removal** of units / sub-units from production process,
  eg. by meat inspection, removal of SRM (BSE)
Processing and Retail II

Basic processes occurring during processing and retail **ctd**

- **Mixing** or blending of raw material or ingredients, e.g.
  - a lot of minced meat (trimming of several animals)
  - bulk tank milk
  - broken eggs (combined for pasteurisation)

- **Partitioning:**
  retail packages part of wide blends (s.a.) and further split up into several minor units at one or different steps
Handling in private households I

- Exposure to microorganisms depending on whether
  - Ready-to-eat, or
  - Raw

- Direct contamination:
  - From raw food to food not undergoing subsequent cooking step

- Indirect combination of surfaces

- Cross-contamination in the home
  - „drip fluid“ model
  - „contact transfer“ model
Handling in private households II

- Bacterial Growth
  - Long storage („shelf life“)
  - Wrong storage (temperature)

- Cooking (type….)
  Inactivation during a thermal process uses decimal reduction time $D$ as inactivation parameter
  - Internal temperature approach
  - Protected area approach
  - Heat transfer approach

- Hygiene practices of food preparer
Consumption pattern

- habit and food preferences in populations / sub-populations (→ national food consumption surveys)
- frequency by which different food items are ingested
- quantity of food items ingested
- Preferred preparation styles

- Location for preparation: home, restaurant, canteen
- Person(s) preparing the meal
- Hygiene level during preparation
DATA for Exposure assessment

Data on

- food product
- food chain
- microorganism
- consumer

are needed / collected / retrieved