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Campylobacter Risk Assessment in the EU:

Past, present and future.

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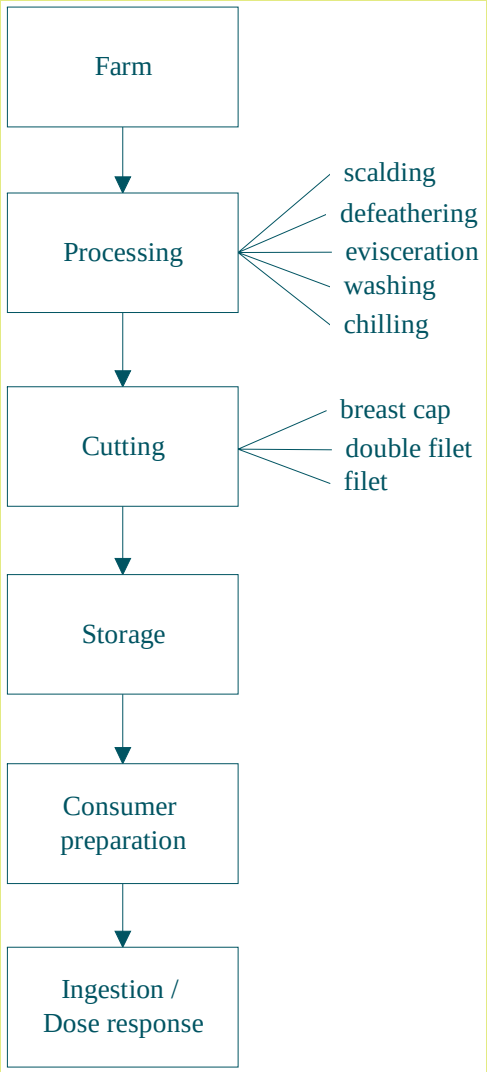
Overview

- Past
  - MedVetNet WP 24: a comparison of "*Campylobacter* in broiler meat risk assessments" in Europe
- Present
  - A consensus framework: CRAF
- Future
  - Challenges of European *Campylobacter* QMRA

Risk assessment: what do I mean?

- Food chain risk assessment
- Model describes transmission and survival of *Campylobacter* in the broiler meat chain: changes in distribution of concentrations
- Exposure assessment

  + Dose response = risk
- Quantitative Microbiological Risk Assessment (QMRA) is still developing!



Why we need risk assessment

- **Relative** risk estimates
  - The effects of control measures
  - Comparison of interventions all over the food chain

- Added value
  - food chain data
  - epidemiology
  - below the detection limit
  - check our understanding

- Indispensable for PO / target setting

Campylobacter in broiler meat risk assessments in Europe

• UK	Hartnett	2001
• Denmark	Rosenquist, Christensen	2003
• Netherlands	Havelaar, Nauta	2005
• Germany	Brynestad	2006
• Belgium	Uyttendaele	2006
	Gellynck, Messens	2008
• Sweden	Lindqvist, Lindblad	2008
• Italy	Calistri, Giovannini	2008

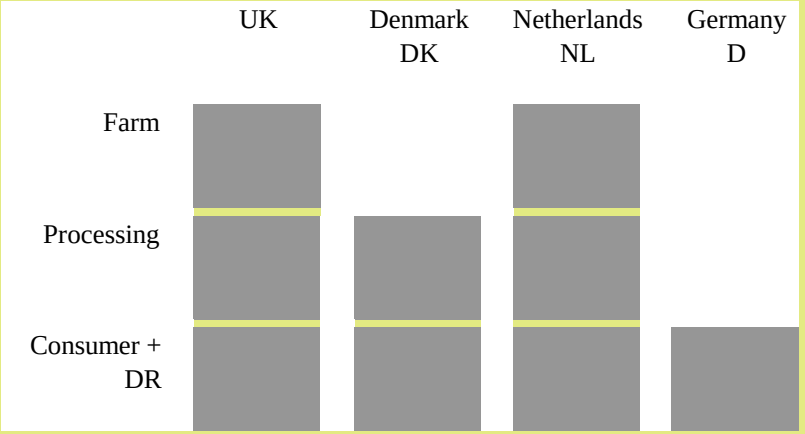
MedVetNet Workpackage 24

March 2006 - June 2009

- Objective: consensus on *Campylobacter* QMRA?

- UK, DK, GE, NL models compared
  - Input from New Zealand and FAO/WHO risk assessment

- Differences
  - objectives
  - approach
  - models
  - results



- Similar conclusions

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Different objectives

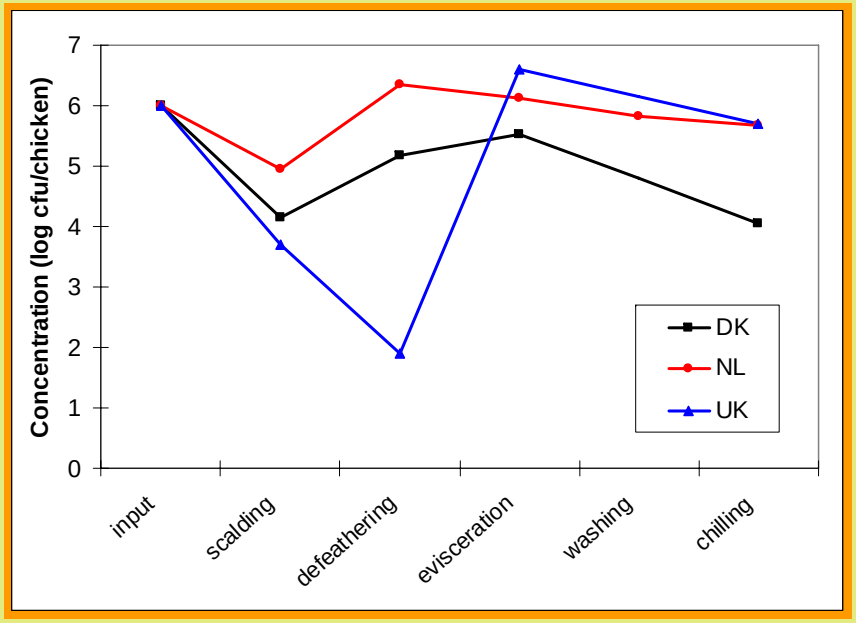
- Gain risk assessment modelling experience
- Human incidence estimation
- Evaluation of risk reduction after intervention and control
  - general
  - specific interventions
  - incl. economic analysis
- Interaction with risk management

Differences between models

- objectives
- expertise of modellers
- national differences
- data and/or expert opinion
- statistical description and/or dynamic model
- details included in the models
- channel assignment
- end product
  - whole carcass
  - specific product
  - side dish
- but all use quantitative risk assessment
  - probabilistic models

Differences between model results

example



Three chicken processing models with the same input

- different dynamics
- similar end results
- similar effects of interventions (?)

Different end results ?

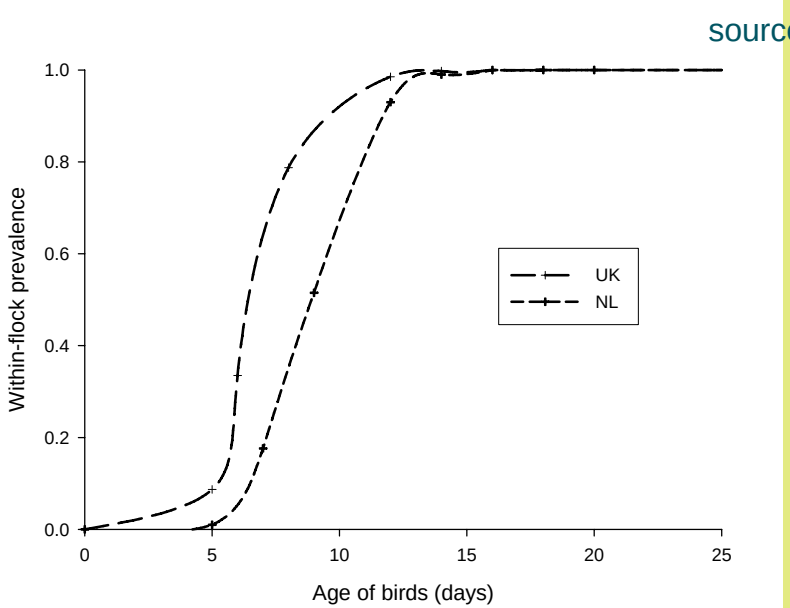
- Varying human incidence estimates
  - Differences in models, (national) data and assumptions
  - Risk estimates are uncertain
  - Not easy to decide what is the "main cause" of differences in results

- Evaluation of risk reduction after intervention
  - In general similar, despite quantitative differences
  - Relative risk estimates are less uncertain

Similar conclusions (1)

- Farm models predict many low prevalent flocks at the farm that may not be detected

source: Nauta *et al* IJFM in press



- False negative flocks occur frequently

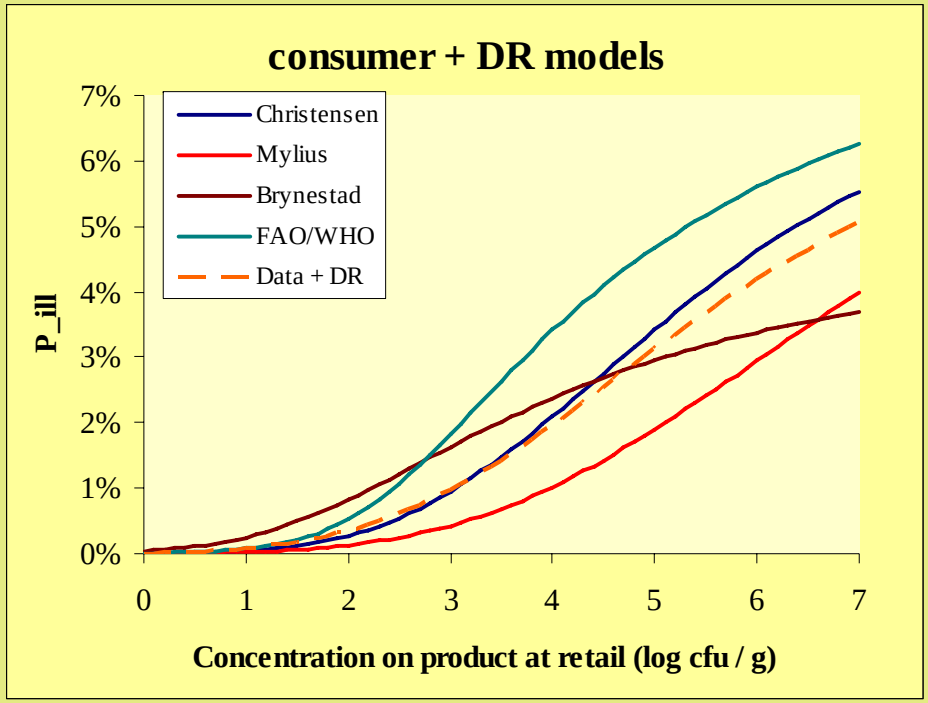
Similar conclusions (2)

- "Logistic slaughter" has little effect
  - No growth of *Campylobacter* in processing environment
  - Each model MUST predict that concentrations on carcasses of cross contaminated flocks are lower

- Data:
  - Typing shows *Campylobacters* are transmitted from one flock to the other (e.g. Miwa et *al.* 2003)
  - Transferred quantities are small (Johannessen et *al*. 2007)

Similar conclusions (3)

- High concentrations pose the largest risks



Nauta *et al*, unpublished results

- targetting high concentrations is an effective intervention
- get data on *distributions* of concentrations, not just *means*
- confirmed by Callicott et *al*. (2008)

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Conclusions from WP 24

- QMRA model must be fit for purpose
  - *different purposes require different models*
  - *balance between simple and complex*
- Many modelling methods explored
  - *try to combine the good qualities of different models*
- Similar conclusions !
  - *useful insights for risk managers*
- No consensus European Risk assessment Model
  - *no single purpose, many national differences*
- Towards a consensus Approach
  - *development of Campylobacter Risk Assessment Framework (CRAF)*

Campylobacter Risk Assessment Framework CRAF

- Software tool for risk assessors
- Structured information on five Campy QMRAs
- Compare and link models for modules
- An aid to make your own *Campylobacter* QMRA

19 February 2009 :

The Final General Meeting of MedVetNet Workpackage 24

INVITATION

20 February 2009 :

Campylobacter Risk Assessment Framework (CRAF) Training Course

hosted by BfR in Berlin

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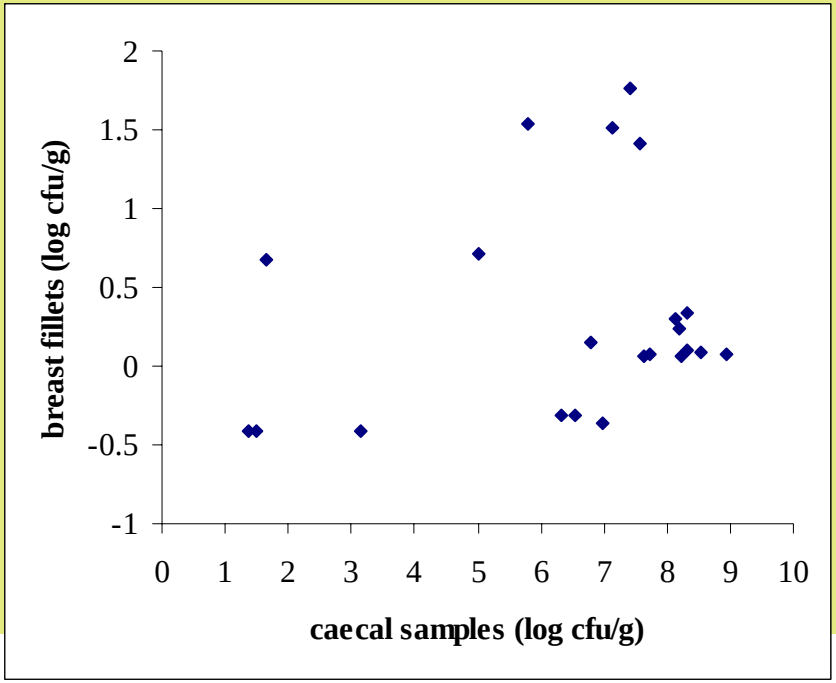
New *Campylobacter* QMRA in Europe (1)

- Baseline data from caeca and neck skins
- Challenge: how to relate those data to risks?
  - QMRA models don't have either of them as inputs
  - Data don't always show a good link caecal samples - meat products; why not?

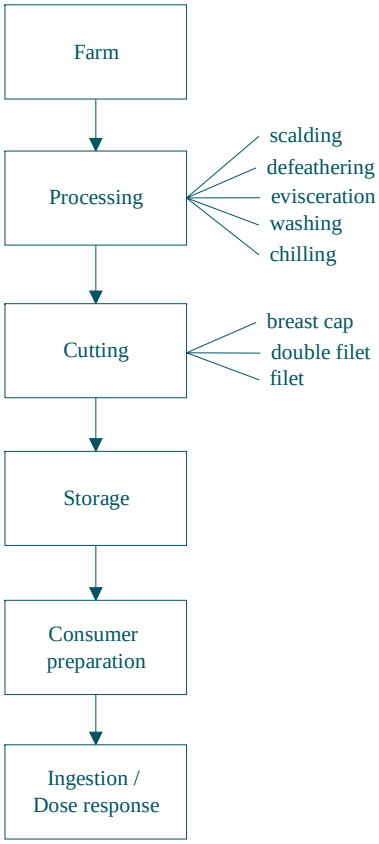
		caeca		
		-	+	tot
product	-	17	19	36
	+	4	22	26
	tot	21	41	62

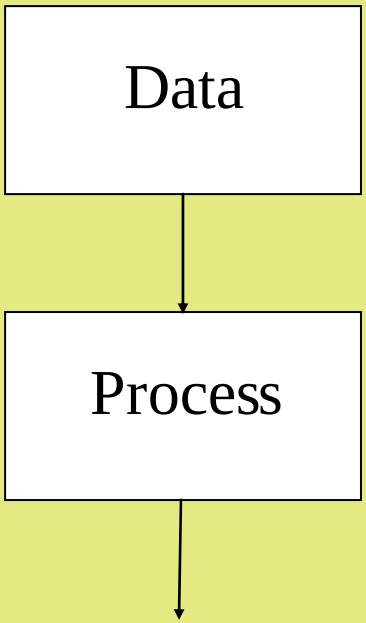


source: Nauta, Bolder *et al*, in prep.

New Campylobacter QMRA in Europe (2)

- Target setting: link with human health risks





Quantitative distribution

Differences between member states

Challenge: How to model the differences for each MS? How important are those?

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Take away messages

- Much *Campylobacter* QMRA experience in Europe,

but

  - different objectives and approaches
  - different results

still

  - similar and useful conclusions

- European Campylobacter QMRA needs
  - a clear objective
  - further development of QMRA modelling
    - integration of good ideas
    - balance between complexity and simplicity
    - incorporation of differences between MS