Possibilities of microbiological criteria for Campylobacter

DG SANCO workshop on the control of Campylobacter in poultry

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Health and Consumers

Control measures at slaughter

- *100% risk reduction by reduction of carcass concentration by > 6 log10 units*
  - Which can be achieved by irradiation/cooking
- *More than 90% risk reduction by reduction of carcass concentrations by > 2 log10 units,*
  - which can be achieved by freezing for 2-3 weeks or reduction of the concentration in intestines at slaughter by > 3 log units;
- *50-90% risk reduction by reduction of carcass concentrations by 1-2 log10 units,*
  - which can be achieved by freezing for 2-3 days, hot water or chemical carcass decontamination with lactic acid, acidified sodium chlorite or trisodium phosphate

European Commission

Risk factors

Positive flock results 30x more probable in a positive carcase

Positive flock results in higher contamination of carcase

Contamination risk differs within MSs and slaughterhouses

European Commission

Food safety criterion

- Purpose: to define the acceptability of a product or a batch of foodstuff applicable to products placed on the market;
- Point in the food chain: e.g. products placed on the market during their shelf-life
- Matrix: e.g. fresh poultry meat

European Commission

Process hygiene criterion

- Purpose: to indicate the acceptable functioning of the production process and to set an indicative contamination value above which corrective actions are required.
- Point in the food chain – e.g. broiler chicken carcasses after chilling
- Matrix: e.g. neck skin (used for *Salmonella)*

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Example of a possible PHC

Food category	*Micro-organisms*	*n*	*c*	*m*	*M*	*Analytical reference method*	*Stage where the criterion applies*	*Action in case of unsatisfactory results*
Poultry carcases of broilers	*Campylobacter*					*ISO/TS 10272-2 (for enumeration)*	*Carcases after chilling*	*Improvements in slaughter hygiene and review of process controls, origin of animals and biosecurity measures in the farms of origin*

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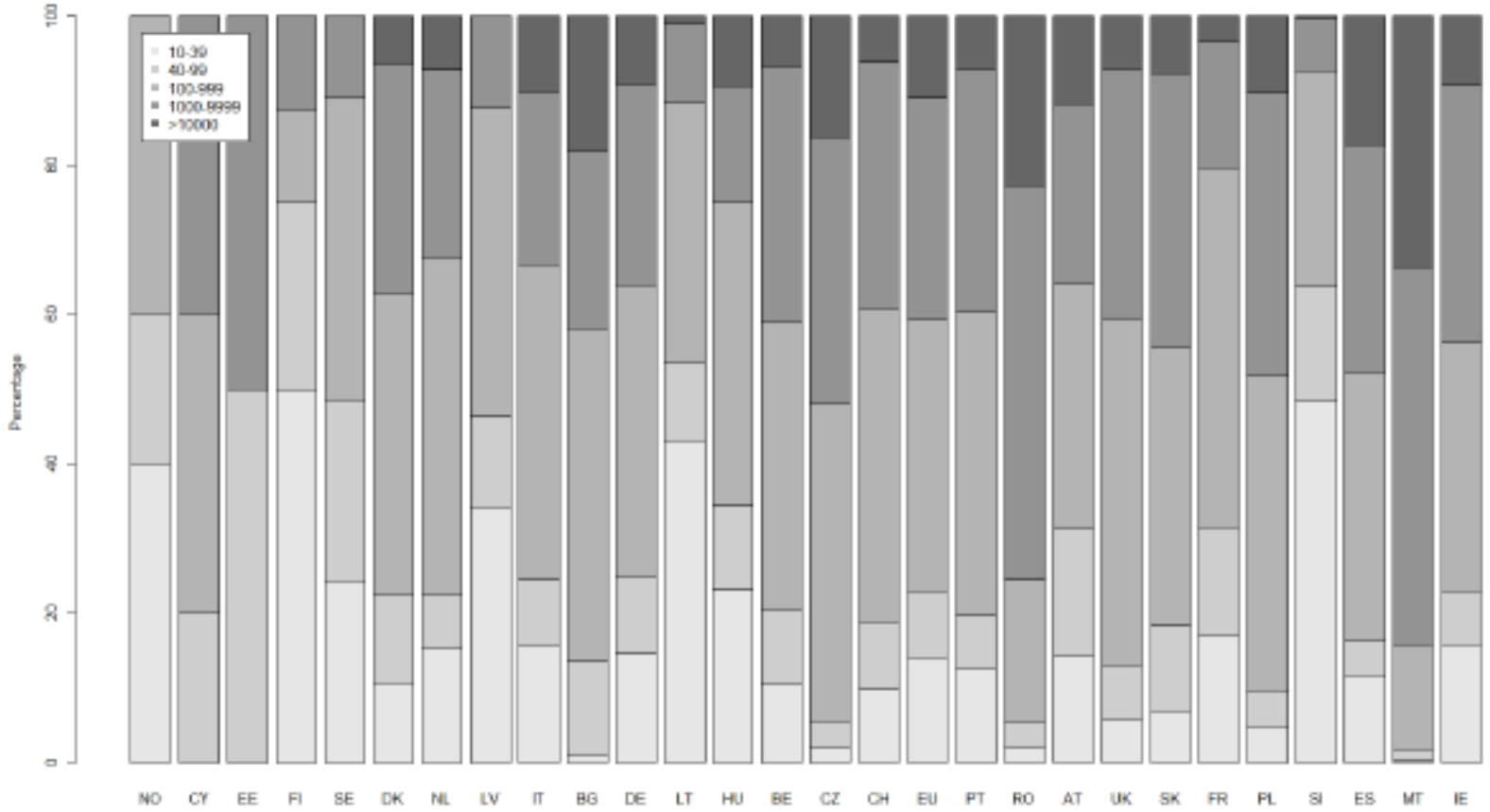
- **Two class sampling plan:**
  - m cfu / g is the critical limit
  - n samples
  - c acceptance number
  - n=5, c=0, m=1 000 means: "we sample each batch, take five samples, none of these may exceed 1 000 cfu/g"
- **Three class sampling plan**
  - M cfu/g is the second critical limit
  - n=5, c=3, M=10 000, m=1 000 means: "we sample each batch, take five samples, none of these may exceed 10 000 cfu/g and up to three may exceed 1 000 cfu/g"

Campylobacter counts on broiler carcasses, BS 2008



Barplot of the distribution of *Campylobacter* counts on broiler carcasses, by country
- excluding counts <10 cfu/g neck and breast skin :
- five categories; 10-39; 40-99; 100-999; 1,000-9,999; >10,000 cfu/g neck and breast skin

European Commission

Impact of microbiological criteria

< 1000 resp. < 500 cfu/g skin

=

>50% resp. >90% risk reduction

EU-wide 15 / 45% of all slaughter batches would not conform (refers to data from baselinestudy)

European Commission

National example

- National evaluation of a PHC with a model
- Prof. Dr. Arie Havelaar (*Microbiological criteria as a decision tool for controlling Campylobacter in the broiler meat chain. RIVM Letter Report 330331008/2013*

Evaluation of PHC with m = 1,000 cfu/g; n=5; c=0

Year	2009	2010	2011	2012
BNMC overall	32%	37%	29%	27%
per plant	10-62%	14-54%	11-52%	3-46%
PF overall	67%	72%	72%	73%
per plant	32-89%	38-90%	29-86%	11-89%

BNMC: Batches Not Meeting the Criterion
PF: Preventable Fraction

Efficiency of a PHC for Campylobacter on Dutch broiler meat

	All human cases	All broiler meat	Dutch broiler meat	Impact of PHC[$]
Fraction	100%	28%	56%	70%
Incidence (2011)	108,000	30,000	17,000	12,000
Disease burden (DALY)*	3,250	910	509	360
Cost-of-illness (M€)^	76	21	12	8.4
Intervention costs (M€)^				1.7
Cost-utility ratio (€ / DALY)				-18,000

* Discounted at 1.5%
^ Discounted at 4%

$ m = 1,000 cfu/g; n=5; c=0

EURL Campylobacter

- EURL Campylobacter at SVA in Uppsala/SE
- Annual proficiency tests on detection and species identification
- Annual proficiency tests on detection and enumeration of Campylobacter
- Annual workshops and specific trainings provided
- NRLs performance improved considerably
- More focus on molecular methods in the future

Thank you very much for your attention!

DG Health & Consumers

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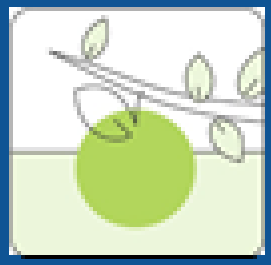
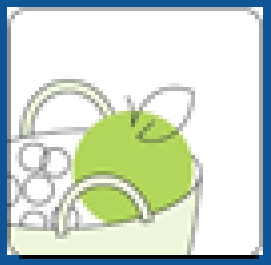
Public Health



Food safety



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