RMT

RÉSEAU MIXTE TECHNOLOGIQUE

QUALIMA

MAÎTRISE DE LA QUALITÉ MICROBIOLOGIQUE DES ALIMENTS

Aérial

ACTIA

ACTALIA

Evaluation des Mesures de Maîtrise : l'Appréciation Quantitative de l'Exposition (AQE), un outil en cours de généralisation

Paris, Maison du Lait, Mardi 2 Juin 2015

*Cette **journée thématique** est l'occasion pour tous les professionnels de l'industrie agroalimentaire, pour les fédérations, les organismes professionnels, les centres techniques, de faire le point des avancées récentes sur l'AQE.*

Les objectifs de cette journée sont :
*-**d'informer les filières sur la méthode** en repositionnant cette démarche dans un **contexte réglementaire et international**,*
*-d'**échanger** à travers des **exemples de cas concrets** issus **de différentes filières** sur les **utilisations possibles de l'AQE** (Appréciation Quantitative de l'Exposition) **ou AQR** (Appréciation Quantitative du Risque).*

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09h45 **Ouverture de la journée et présentation du RMT ACTIA QUALIMA**
(V Stahl - Aérial et C Denis - ACTALIA, Coordinateurs du RMT Qualima)

10h00 **Contexte de la journée**

Contexte réglementaire et AQE

10h10 Validation des mesures de maîtrise : contexte réglementaire (L Montaut - DGAl)

10h40 AQE/AQR : définitions et utilisation (JM Membré – Oniris)

Exemples d'utilisation avec témoignage professionnel

11h15 Impact de la température de transport des carcasses de porc sur leur qualité microbiologique (L Guillier – Anses, B Minvielle - IFIP)

11h55 Appréciation de l'exposition: des modèles évolutifs avec l'avancée des connaissances ; exemple de *L monocytogenes* dans la filière produits de la mer (C Denis - ACTALIA, JC Augustin - ENVA, V Stahl - Aérial)

Exemples d'utilisation avec témoignage professionnel

14h00 Les outils AQR/AQE pour optimiser les mesures de maîtrise des risques : application aux fromages (F Audiat-Perrin - ACTALIA)

14h40 Validation d'un procédé historique par l'AQR dans la filière foie gras : Appréciation Quantitative du Risque botulique dans les conserves de foie gras (S André - CTCPA)

AQE et Contexte international

15h20 Témoignage (M Zwietering - Wageningen University-Laboratory of Food Microbiology)

15h45 **Conclusions**

16h00 **Clôture de la journée**

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Evaluation des Mesures de Maîtrise : l'Appréciation Quantitative de l'Exposition (AQE), un outil en cours de généralisation

The application of the Appropriate Level of Protection (ALOP) and Food Safety Objective (FSO) risk-based metrics in food safety management

Marcel Zwietering, Wageningen University

2 juin 2015

THE APPLICATION OF THE APPROPRIATE LEVEL OF PROTECTION (ALOP) AND FOOD SAFETY OBJECTIVE (FSO) RISK-BASED METRICS IN FOOD SAFETY MANAGEMENT

Marcel Zwietering Laboratory of Food Microbiology
Elissavet Gkogka ARLA Foods Denmark
Leon Gorris Unilever the Netherlands

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Layout of the presentation

1. Introduction
- Role of Codex Alimentarius in food safety management
- Risk Analysis and Risk-based metrics

2. Case studies

A. Salmonella in chicken meat – The Netherlands, EU

B. Listeria monocytogenes in deli meats – The Netherlands
- Risk assessment models
- Results

3. Conclusions

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FAO/ WHO Food Standards

CODEX alimentarius

Global authority for international guidelines, standards, and recommendations on food safety

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CODEX ALIMENTARIUS

- International food standards organization, established in 1963 under auspices of FAO and WHO,
- 186 member States, covering 99% of the world's population

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CODEX ALIMENTARIUS

- Establishes international food safety standards to:
  - protect the health of consumers
  - ensure fair practices in trade
- Issues food safety management "principles" through its standards and guidelines
- National authorities can choose to implement Codex standards and guidelines in their regulation/law

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MODERN FOOD SAFETY MANAGEMENT DEVELOPED BY CODEX

- Developed over the last 50 years – an evolution!
  - Evolving from unique national standards for food to internationally harmonized standards
  - Evolving from "testing for safety" to "safety assurance" following a *systems* approach
  - Evolving away from hazard-based decision-making to more risk-based decision-making

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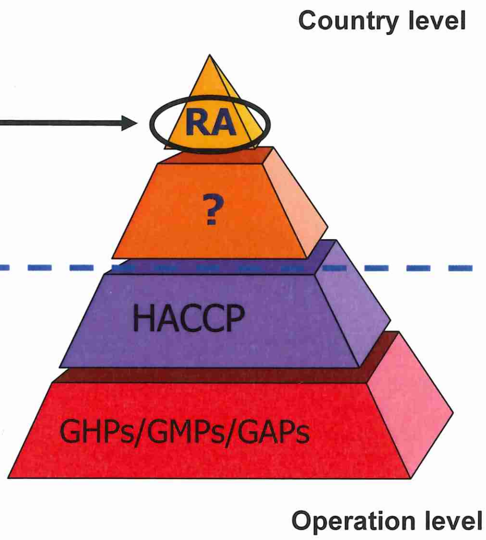
RISK ANALYSIS: THE FRAMEWORK

- **Risk Analysis**:
  - Risk Management
  - Risk Assessment
  - Risk Communication

– Local, specific management



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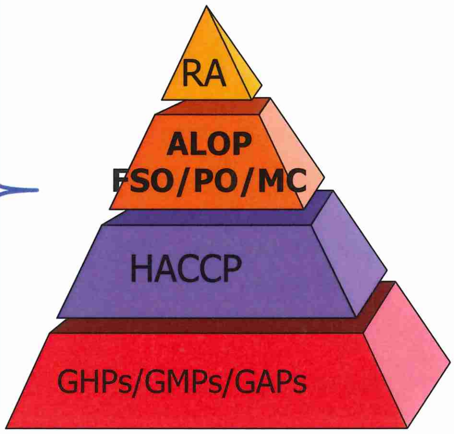
RISK-BASED METRICS HIERARCHY

Appropriate Level of Protection

Food Safety Objective (FSO), and
Performance Objective (PO)

Microbiological criterion (MC)



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RISK BASED METRICS HIERARCHY

Appropriate Level of Protection
- WTO term (SPS, **1995**)
- Benchmark for acceptable risk at country level
- To facilitate trade (discussions)

Food Safety Objective (FSO), and
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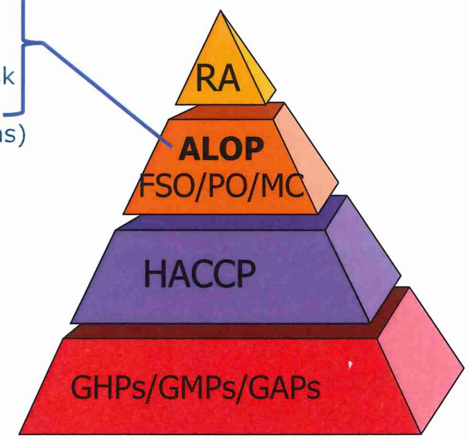
Microbiological criterion (MC)



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RISK BASED METRICS HIERARCHY

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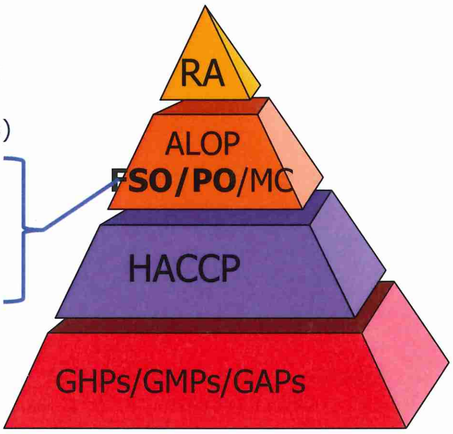
Food Safety Objective (FSO), and **Performance Objective** (PO)
- Codex terms (CAC, **2004**)
- Benchmarks for acceptable risk at end or in, resp., a value chain

Microbiological criterion (MC)



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RISK BASED METRICS HIERARCHY

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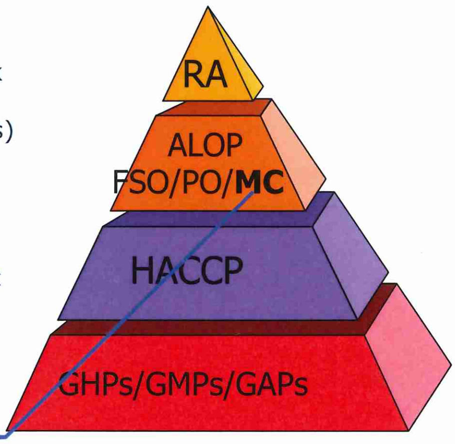
Food Safety Objective (FSO), and **Performance Objective** (PO)
- Codex terms (CAC, **2004**)
- Benchmarks for acceptable risk at end or in, resp., a value chain

Microbiological criterion (MC)
- Codex term (CAC, **1997**)
- Test criterion to evaluate meeting a benchmark operationally, i.e. in practice



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RISK ANALYSIS: ADOPTED BY MANY GOVERNMENTS

- To estimate the level of risk in a (sub-)population due to a **specific** hazard associated to a **particular** food on the market, produced by (many) businesses
- To decide on the acceptability of an estimated risk
- To evaluate interventions that may eliminate the estimated risk or reduce it to an acceptable level

RISK-BASED METRICS: CHALLENGES EXIST

- To follow the "Codex process" **top down**:
  - For competent authorities to establish an ALOP value for a pathogen
  - To relate an ALOP values to a formal FSO value that industry can benchmark its food safety management systems (GHP/HACCP) to (same for *default* POs)
- To use the principles, but not the process, and move **bottom up**:
  - Following a "status quo" approach, starting with current FSM benchmarks (e.g. Micro Criteria; process criteria; epi data) to relate PO or FSO values to

Case study I:
Salmonella in chicken meat

Gkogka, E., M.W. Reij, L.G.M. Gorris, and M.H. Zwietering (2013a). Risk assessment strategies as a tool in the application of the Appropriate Level of Protection (ALOP) and Food Safety Objective (FSO) by risk managers. International Journal of Food Microbiology, 167, 8-28.

Case study II:
Listeria in deli meat

Gkogka, E., M.W. Reij, L.G.M. Gorris, M.H. Zwietering (2013b). The Application of the Appropriate Level of Protection (ALOP) and Food Safety Objective (FSO) concepts in food safety management, using *Listeria monocytogenes* in deli meats as a case study. Food Control, 29, 382-393.

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Case study I - Aims

- *Salmonella* in chicken meat
- The Netherlands
- 2 risk assessment approaches

- Compare outcomes
- Investigate potential for international comparisons
- Issues with implementation
- Data gaps

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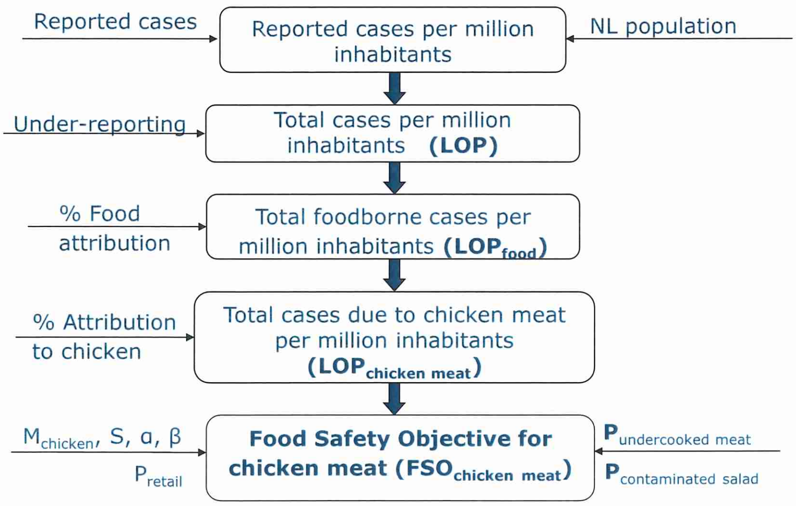
Case study I - Top-down model



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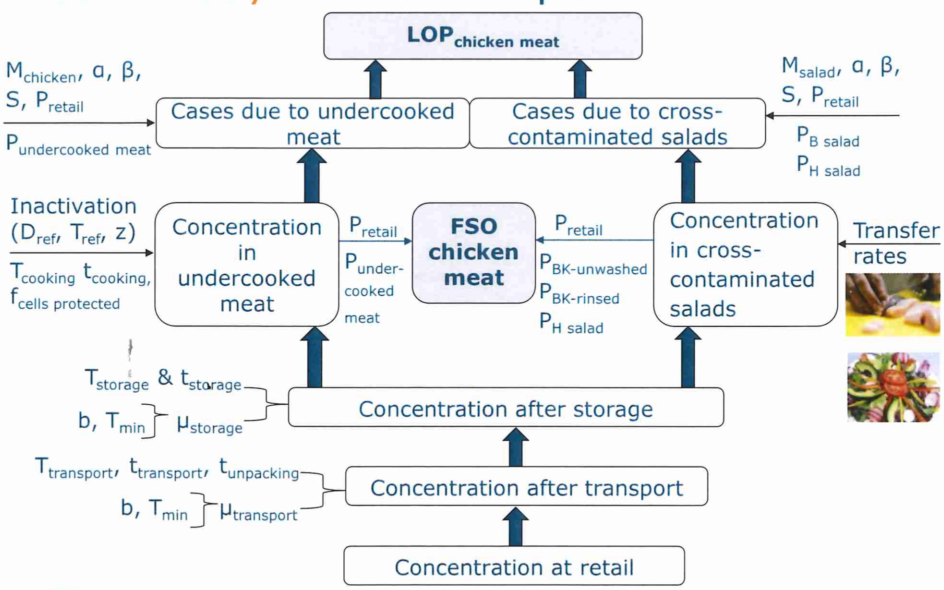
Case study I - Bottom-up model



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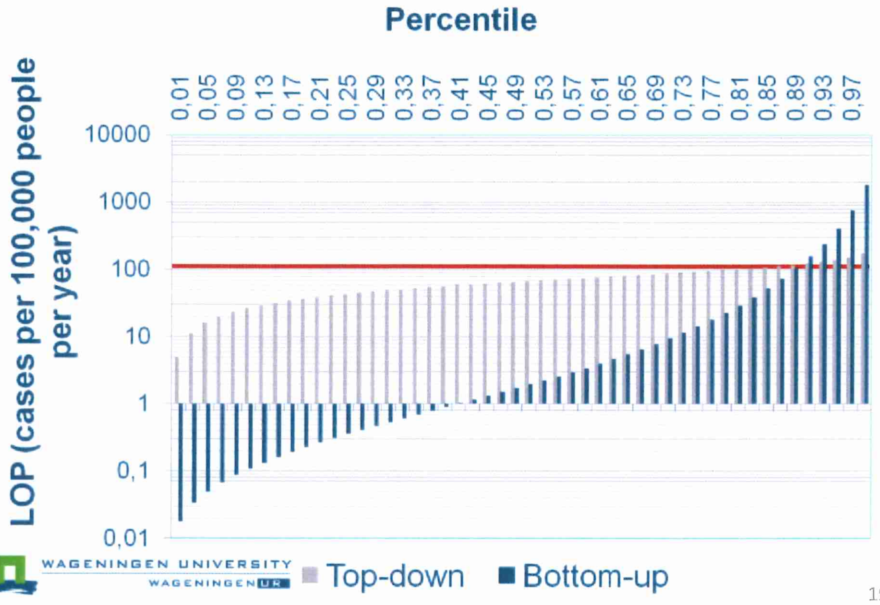
Case study I - Results - LOP



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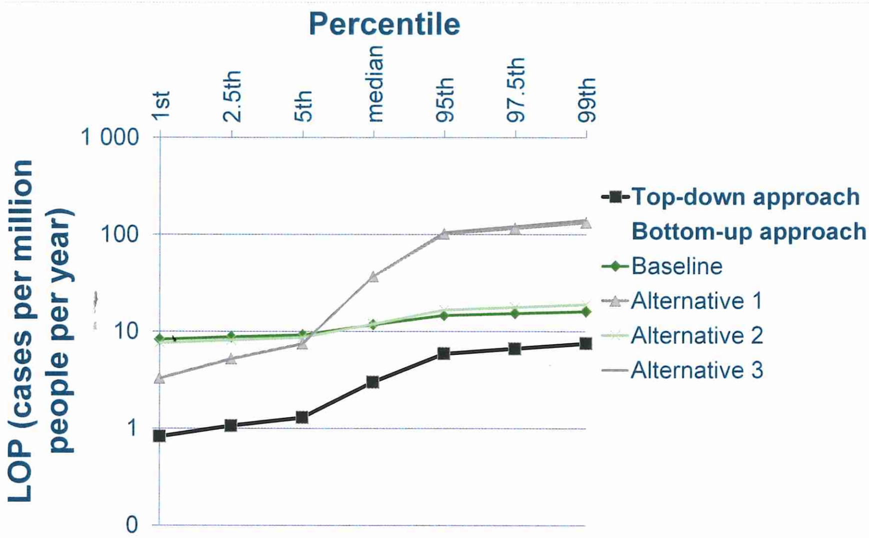
Case study II – Results - LOP



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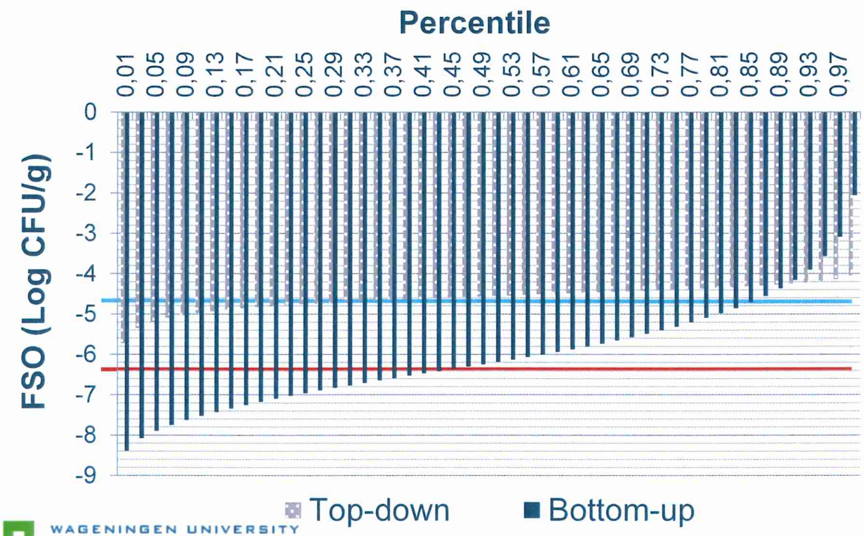
Case study I - Results - FSO



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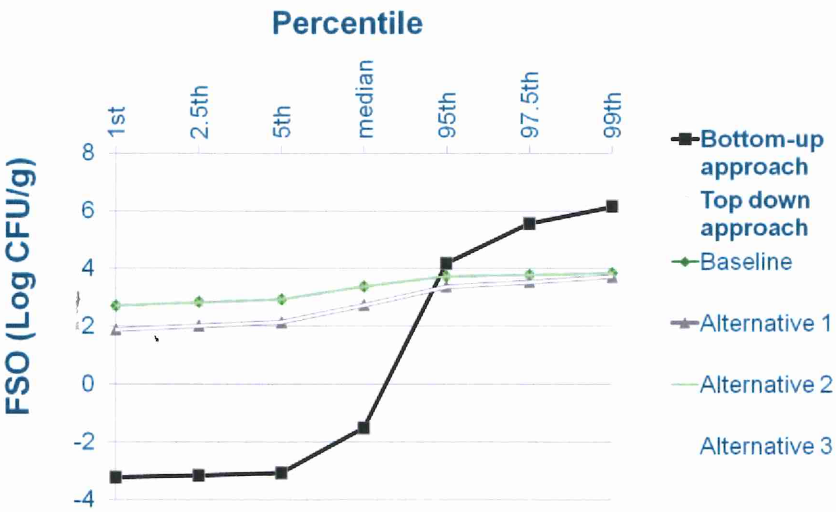
Case study II – Results - FSO



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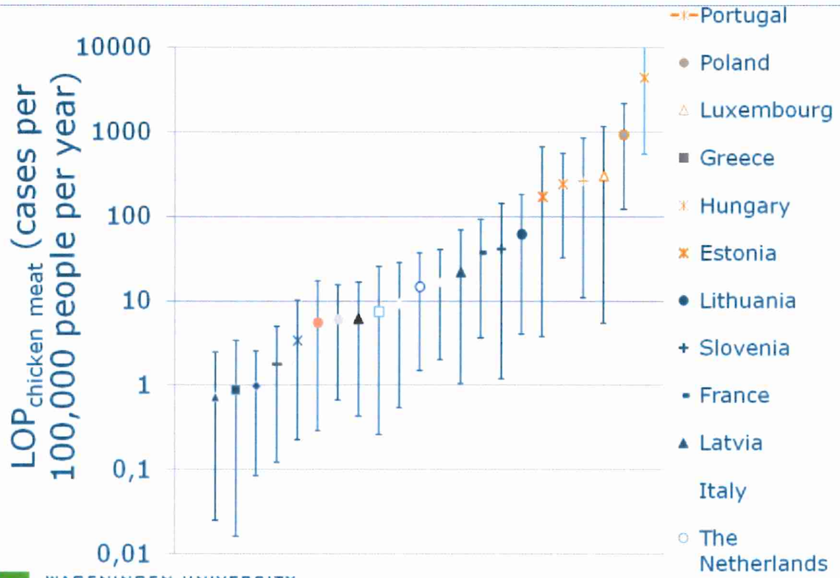
Case study I - Results – International LOPs



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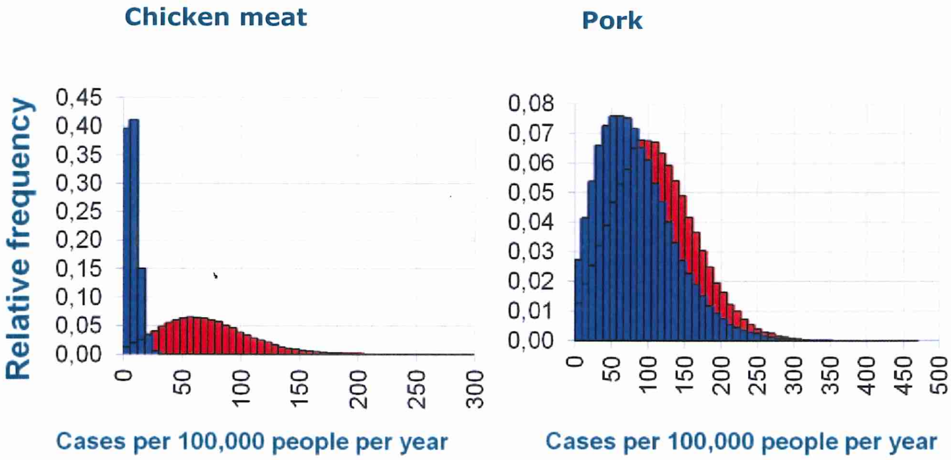
Case study I - Results – Comparisons between national and international data



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US estimates microbiological food borne illnesses per year (Scallan et al. 2011)

ORGANISMS responsible for illness, the sum of the column is 100%

	ill%	hosp%	death%
Bacillus cereus	0.68	0.036	0
Brucella	0.0089	0.098	0.074
Campylobacter	9.0	15.1	5.6
Clostridium botulinum	0.00059	0.075	0.67
Clostridium perfringens	10.3	0.78	1.9
E. coli	2.2	4.3	1.5
Listeria monocytogenes	0.017	2.6	18.9
Salmonella nontyphoidal	10.9	34.5	28.0
Shigella	1.4	2.6	0.74
Staphylococcus	2.6	1.9	0.44
Streptococcus	0.12	0.0018	0
Vibrio	0.56	0.50	3.6
Yersinia enterolitica	1.0	0.95	2.1
Cryptosporidium parvum	0.61	0.38	0.30
Cyclospora cayetanensis	0.12	0.020	0
Giardia intestinalis	0.82	0.46	0.15
Toxoplasma gondii	0.92	7.9	24.2
Trichinella spiralis	0.0017	0.011	0
Norovirus	58.2	26.2	11.0
Rotavirus	0.16	0.62	0
Astrovirus	0.16	0.16	0
Hepatitus A	0.017	0.18	0.52

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DALY: Disability Adjusted Life Year

DALY = years of life lost (YLL) + years lived with disability (YLD)

No deaths x yrs lost against standard

Incidence x duration x DW

High number deaths
Young adult deaths
High LE assumed

High incidence
Sequelae +++
High DW
Long duration

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Conclusions

- Current data allow the setting of benchmarks
- Decisions need to be made in face of complexity
- Parallel use of both approaches recommended
- Top-down approach shows promise for international comparisons
- Significant differences can be observed between national and international datasets for the same country
- DALY to combine different health outcomes

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Contact information for presenters

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Thank you