



EFSA's activities on Antimicrobial Resistance

CRL-AR, Copenhagen
23 April 2009

- Scientific advices
- Analyses of data on AR submitted by MSs
- EFSA takes an integrated approach:
 - Biological Hazards Panel;
 - Zoonoses Data Collection Unit / ZTF;
 - Feed Additives Panel;
 - GMO Panel.

Opinion on food-borne antimicrobial resistance as a biological hazard

EFSA-Q-2007-089 / BIOHAZ Panel / July 2008

- To identify in terms of qualitative risk, the extent to which food serves as a source for the acquisition, by humans of antimicrobial resistant bacteria or bacteria-borne antimicrobial resistance genes.
- To rank the identified risks.
- To identify potential control options for reducing exposure.

- Food contaminated by bacteria present in live animals
- Fresh produce from land recently irrigated with contaminated water
- Food contaminated during handling and preparation

- Recommendations for preventing and controlling transmission
- Good hygiene practices at all stage of the food chain

http://www.efsa.europa.eu/cs/BlobServer/Scientific_Opinion/biohaz_op_ej765_antimicrobial_resistance_en.pdf?ssbinary=true

“Zoonoses” Directive 2003/99/EC

- ❖ Member States have to submit each year data on antimicrobial resistance in zoonotic agents (*Salmonella* and *Campylobacter*) in animals and food of animal origin
- ❖ Data collected on voluntary basis also of antimicrobial resistance in *E.coli* and *Enterococci* in animals and food
- ❖ Data on antimicrobial resistance in isolates from humans collected by ECDC

Community Summary Report on Zoonoses:

- The antimicrobial resistance data analysed by EFSA and ECDC
- Results published each year in **the Community Summary Report**

Latest one including data on AR:

“Trends and Sources of Zoonoses, Zoonotic Agents, Antimicrobial Resistance and Foodborne Outbreaks in EU in 2006”

http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178671312912.htm

Antimicrobial Resistance, 2006:

- The high level of resistance to fluoroquinolones (**ciprofloxacin**) is of concern in *Campylobacter*

	EU mean	min	max	in MS
Humans	45%			(all MS)
Broiler meat	30%	25%	57%	(4 MS)
Live poultry	32-57%	7%	94%	(10 MS)
Pigs	37%	10%	85%	(7 MS)
Cattle	60%	10%	69%	(3 MS)

Antimicrobial Resistance, 2006:

- The level of resistance to fluoroquinolones (**ciprofloxacin**) in *S. Enteritidis*/*S. Typhimurium*

	EU mean	min	max in MS
Humans	0.6% / 0.7%		(all MS)
Broiler meat	4.6%	0%	48% (8 MS)
Live poultry	0.9%	0%	18% (13 MS)
Pigs	0.6%	0%	3% (7 MS)
Cattle	0.2%	0%	2.5% (7 MS)

- BIOHAZ and AHAW Panels review the Community Summary Reports on Zoonoses;
- Opinions on:

“Review of the Community Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents and Antimicrobial Resistance in the European Union in 2004”.

http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178620775588.htm

“Review of the Community Summary Report on Trends and Sources of Zoonoses, Zoonotic agents and Antimicrobial Resistance in the European Union in 2005.”

http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178672823314.htm

- AR as a public health concern
- Mandatory monitoring of the use of antimicrobials in food producing animals

- Antimicrobial resistance data
 - on *Salmonella*, *Campylobacter*, *E. coli* and *Enterococci* reported under the Directive 2003/99/EC **from 2004 to 2007**
 - reported as part of the completed baseline studies on *Salmonella* in turkeys and slaughter pigs
- Quantitative data
 - Distributions of MIC and mm-values over time
 - For the different animal species and food sources distributions are made for *Salmonella* spp., *S. Typhimurium*, *S. Enteritidis*, *C. jejuni*, *C. coli* and indicator *E. coli*
 - It was decided to focus on critical important antimicrobials: fluoroquinolones, cephalosporin's and macrolides
 - For MIC-distribution both cut-off values and breakpoints will be investigated

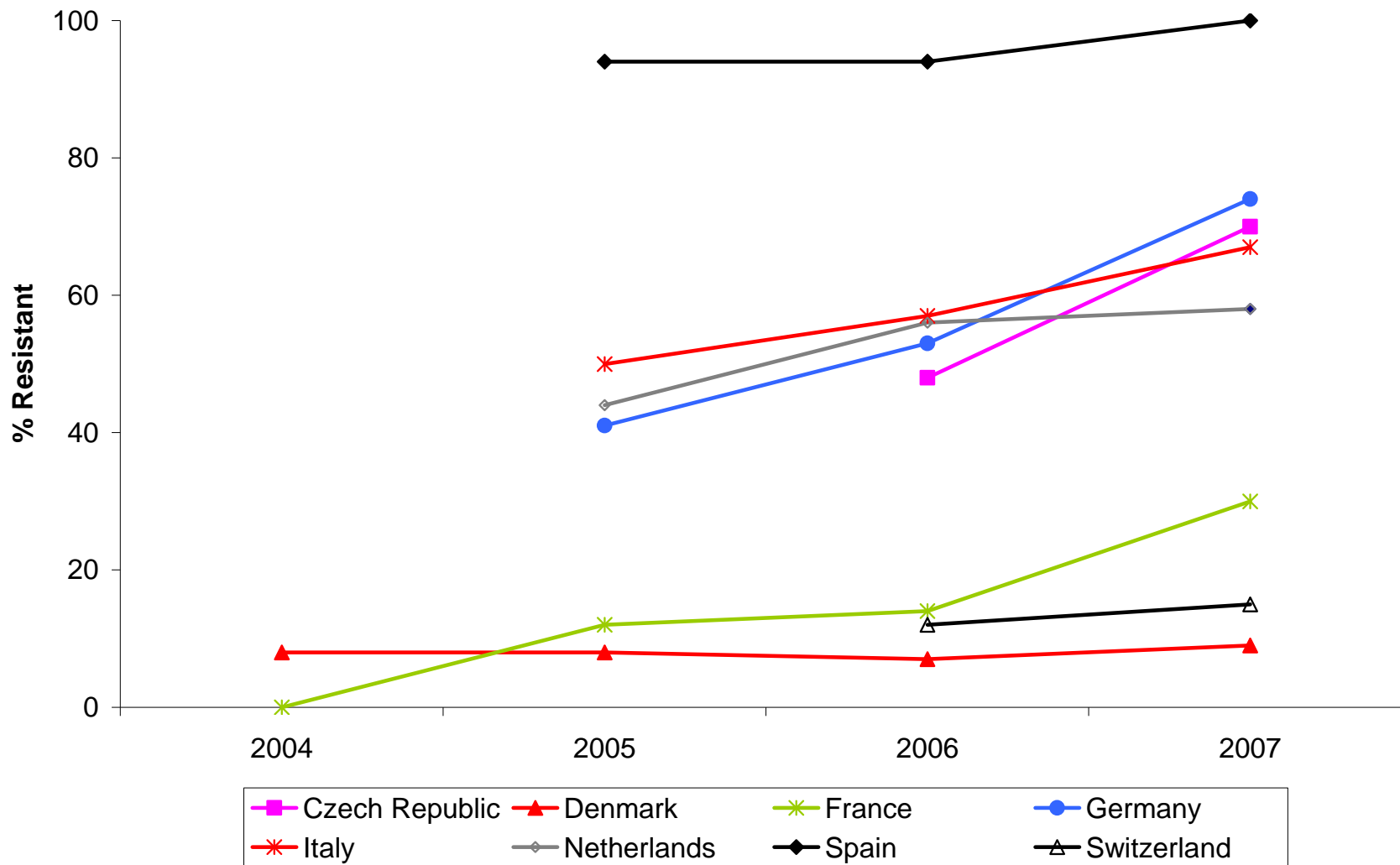
C. jejuni from Gallus gallus

Ciprofloxacin MIC distribution

Country	Year	N	% Resistant	Distribution (%) of MICs														
				0.03	0.06	0.125	0.25	0.5	1	2	4	8	16	32	64	128	256	512
Czech Republic	2006	50	48.0			6.0	32.0	8.0	6.0				2.0	30.0	4.0	12.0		
	2007	53	69.8		1.9	13.2	7.5	5.7	1.9	1.9	5.7	7.5	24.5	20.8	9.4			
Denmark	2004	77	7.8		2.6	32.5	50.6	5.2	1.3	2.6				1.3	3.9			
	2005	77	7.8	5.2	31.2	44.2	9.1	1.3	1.3			7.8						
	2006	75	6.7		13.3	53.3	25.3	1.3			1.3	5.3						
	2007	94	8.5	11.7	55.3	22.3	2.1					8.5						
Finland	2007	94	0		1.1	12.8	59.6	26.6										
France	2005	32	12.5	15.6	9.4	6.3	15.6	15.6	25.0	3.1			6.3	3.1				
	2006	49	14.3	20.4	14.3	18.4	6.1	20.4	6.1	6.1			2.0	6.1				
	2007	56	30.4		19.6	26.8	16.1	7.1		1.8		3.6	25.0					
Germany	2005	49	40.8			2.0	24.5	30.6	2.0				4.1	18.4	10.2	8.2		
	2006	95	52.6		1.1	8.4	18.9	12.6	6.3		1.1		12.6	18.9	20.0			
	2007	100	74.0					10.0	16.0	8.0	2.0	1.0	63.0					
Italy	2005	24	50.0			20.8	25.0	4.2				12.5	37.5					
	2006	108	57.4		13.0	21.3	4.6	1.9	1.9		2.8	11.1	25.0	16.7	0.9	0.9		
	2007	48	66.7		16.7	12.5	2.1	2.1				25.0	20.8	18.8	2.1			
Netherlands	2005	78	43.6			38.5	7.7	7.7	2.6			10.3	14.1	19.2				
	2006	16	56.2			18.8	12.5	12.5			6.3		25.0	25.0				
	2007	45	57.8			31.1	8.9	2.2				20.0	22.2	15.6				
Spain	2005	16	93.8		6.3						6.3	31.3	18.8	31.3	6.3			
	2006	17	94.1			5.9						17.6	35.3	35.3	5.9			
	2007	19	100								5.3	57.9	31.6		5.3			
Norway	2007	98	1.0		3.1	32.7	59.2	3.1	1.0				1.0					
Switzerland	2006	77	11.7		27.3	50.6	10.4					1.3	10.4					
	2007	122	14.8	0.8	29.5	45.9	4.9	1.6	2.5			4.9	7.4	2.5				

C. jejuni from *Gallus gallus*

% Ciprofloxacin resistance (2004 - 2007)



- Percentage resistance over time will be plotted for each antimicrobial separately
- Development in resistance over time will also be plotted using maps where the unit is no. of resistant isolates/number of tested isolates
 - Analysed to see if there is any spatial clustering between countries

- **Baseline survey on the prevalence of MRSA in breeding pigs**
 - **To undertake a common survey at EC level**, in particular to understand and quantify the spread of MRSA in some farm animals throughout the EU as well as the relevance of different strains.
 - The survey will focus on **breeding pigs**
 - Harmonised technical specifications for the MRSA survey including the sampling techniques and analytical methods.
 - From January to December 2008.
 - Reports: November 2009 / March 2010

Assessment of the public health significance of meticillin resistant *Staphylococcus aureus* (MRSA) in animals and foods (EFSA-Q-2008-300)

The Biohaz Panel will assess (self-mandate):

- The risk to human health posed by MRSA associated with food-producing animals.
- The importance of food, food-producing animals, and companion animals in the risk of human infection and/or food-borne disease caused by MRSA in both the community and hospital settings.
- Which animal species (and if appropriate, foods derived there from) represent the highest risk to humans.
- Which methods are best suited for the isolation and molecular typing of MRSA of animal origin.
- What control options (pre- and post-harvest) can be considered to minimize the risk of transfer of food-producing animal-associated MRSA to humans.

CC398 has emerged in food-producing animals: asymptomatic carriage in intensively reared animals

When MRSA prevalence high: people in contact with live animals (farmers, veterinarians and families) more at risk than the general population

Food may be contaminated with CC398, it has not been associated with foodborne intoxications and there is currently no evidence for increased risk of infection following contact or consumption

Systematic surveillance and monitoring of MRSA in intensively reared animals

Summary paper of scientific reports of the Panel on Biological Hazards (EFSA) on “Assessment of the Public Health significance of meticillin resistant *Staphylococcus aureus* (MRSA) in animals and foods” and of the Scientific Committee in Medicinal Products for Veterinary Use (EMA), on “MRSA in companion and food producing animals in the European Union: Epidemiology and control options for human and animal health”

European Centre for Disease Prevention and Control (<http://ecdc.europa.eu>)



European Food Authority (<http://www.efsa.europa.eu>)



European Medicines Agency (<http://www.emea.europa.eu/>)



The EMEA, and the EFSA, following concerns on the increase of MRSA in livestock and companion animals independently decided to undertake self-tasking mandates and to produce scientific outputs to address the issue. ECDC was represented in this exercise through membership of the EFSA expert working group. The European Commission (DG SANCO) formally requested from EFSA, EMEA and ECDC the production of a single document that would summarise the main outcomes of the independent assessments.

EC joint mandate: “Short report on antimicrobial resistance (AMR) focused on zoonotic infections based on the information currently available”

(EFSA-Q-2008-781). In Progress.

EMEA / EFSA / ECDC + SCENIHR collaboration

Joint AFC/BIOHAZ guidance document on the submission of data for the evaluation of the safety and the efficacy of substances for the removal of microbial surface contamination of foods of animal origin

http://www.efsa.europa.eu/etc/medialib/efsa/science/biohaz/biohaz_guidance/guidance_ej388.Par.0001.File.dat/biohaz_op_ej388_decontam_guidance_en.pdf

Opinion of the Scientific Panel on Biological Hazards (BIOHAZ) on the Assessment of the possible effect of the four antimicrobial treatment substances on the emergence of antimicrobial resistance.

http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178697425124.htm

There are no published data indicating that the 4 substances will lead to increased bacterial tolerance to the specific substances or to increased resistance to therapeutic antibiotics and other antimicrobial agents

BIOHAZ Panel working closely with CRL-AR will update its guidance including for monitoring and collecting data on antimicrobial resistance linked to decontamination treatments

- **Reg (EC) No 1831/2003 on additives for use in animal nutrition** foresees the use of micro-organisms as feed additives
- **EC Guidelines for the assessment of additives in feedingstuffs, Part II: Enzymes and Micro-organisms,** and the recently adopted
- **CR regarding the preparation and the presentation of applications and the assessment and the authorisation of feed additives:**
 - stress the fact that micro-organisms used as additives or as a production strain shall be free of antibiotic activity; and
 - establish that all strains of bacteria should be tested for resistance to antibiotics in use in human and veterinary medicine.

- In 2001, **SCAN** adopted an opinion (revised in 2003) on the criteria for assessing the safety of micro-organisms resistant to antibiotics of human clinical and veterinary importance.
- In 2005, the FEEDAP Panel adopted an **opinion on the update of the criteria used in the assessment of bacteria for resistance to antibiotics of human or veterinary importance.**
- Both opinions included a table laying down appropriate breakpoint values for 13 antibiotics that allows to distinguish strains harboring acquired antimicrobial resistance from susceptible strains.

- Opinion of the **GMO Panel**: Guidance doc on the use of AMR marker genes in GM plants (EFSA-Q-2003-109) EFSA journal 48: 1-18
- Statement on the safe use of an antibiotic resistance marker gene (nptII) on genetically modified plants,(2007):

http://www.efsa.europa.eu/EFSA/Statement/gmo_statement_nptII .pdf

Consolidated Opinion on the use of antibiotic resistance genes as marker genes in genetically modified plants (EFSA-Q-2008-411). In Progress. GMO/BIOHAZ collaboration

1. To prepare a consolidated scientific opinion taking into account previous EFSA GMO opinions and statements on the use of antibiotic resistance marker genes in GM plants intended or already authorized to be placed on the market and their possible uses as food and feed, for import and processing and for cultivation.
 - This opinion should explain the rationale leading to the conclusion of whether the use of each particular antibiotic resistance marker gene is likely or not to have adverse effects on human health and the environment and outline the reasoning leading to each conclusion.
 - The opinion should also serve as a basis for the case-by-case safety assessment of each GMO and its processed products.
2. To indicate the possible consequences of this new opinion on the previous EFSA assessments on individual GMOs containing antibiotic resistance marker genes.

Thank you for your attention!

