Zoonoses in the EU and global context

Conference
"One world – One health. Zoonoses and good practice"

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Health and Food Safety

European Commission

Monitoring of zoonoses in animals, food and feed

Control of food-borne zoonoses
The success story of Salmonella

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Monitoring of zoonoses in animals, food and feed

Directive 2003/99/EC on the monitoring of zoonoses and zoonotic agents

The Directive aims to protect human and animal health collecting data for:

- Evaluation of efficacy of prevention and control of infections
- Trend analysis
- Source evaluation, epidemiological investigation
- Risk assessment

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Monitoring of zoonoses in animals, food and feed

Directive 2003/99/EC on the monitoring of zoonoses and zoonotic agents

The Directive covers:

a) the monitoring of zoonoses and zoonotic agents

b) the monitoring of related antimicrobial resistance

c) the epidemiological investigation of food-borne outbreaks

d) the exchange of information related to zoonoses and zoonotic agents

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Monitoring of zoonoses in animals, food and feed

a) The monitoring of zoonoses and zoonotic agents

WHAT to monitor:

2 lists of zoonoses and zoonotic diseases to be included in monitoring in animals/feed/food:

In all Member States

- Brucellosis
- Campylobacteriosis
- Echinococcosis
- Listeriosis
- Salmonellosis
- Trichinellosis
- Tuberculosis due to *Mycobacterium bovis*
- Verotoxigenic *Escherichia coli*

According to epidemiological situation

- Viral zoonoses (e.g. rabies, influenza)
- Bacterial zoonoses (e.g. botulism)
- Parasitic zoonoses (e.g. toxoplasmosis)
- Other zoonoses

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Monitoring of zoonoses in animals, food and feed

a) The monitoring of zoonoses and zoonotic agents

WHERE / HOW to monitor:

- Primary production, appropriate stages of food chain (incl. feed)
- Legal basis to lay down detailed rules to make data easier to compile and compare: minimum requirements on animal populations, nature and type of data, case definition, sampling schemes, laboratory methods, frequency of reporting

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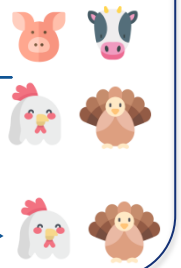
b) The monitoring of related antimicrobial resistance

Having regard to Directive 2003/99/EC, the EC adopted **Commission Implementing Decision 2013/652/EU** on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria

Mandatory

- *Salmonella* spp.
- Indicator commensal *E.coli*
- ESBL- or AmpC- or carbapenemase producing *Salmonella* spp. and *E.coli*
- *Campylobacter jejuni* →



Voluntary

- *Enterobacterium faecalis* and *faecium*
- *Campylobacter coli* →

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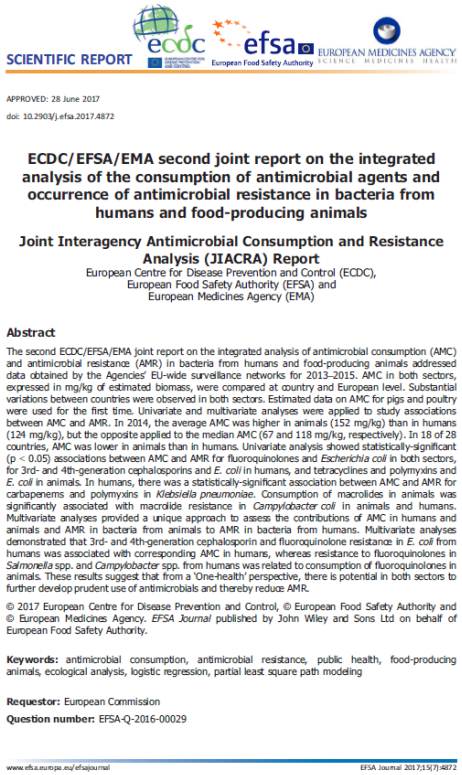
b) The monitoring of related antimicrobial resistance



SCIENTIFIC REPORT

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ECDC/EFSA/EMA second joint report on the integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals

Joint Interagency Antimicrobial Consumption and Resistance Analysis (JIACRA) Report

European Centre for Disease Prevention and Control (ECDC), European Food Safety Authority (EFSA) and European Medicines Agency (EMA)

Abstract

The second ECDC/EFSA/EMA joint report on the integrated analysis of antimicrobial consumption (AMC) and antimicrobial resistance (AMR) in bacteria from humans and food-producing animals addressed data obtained by the Agencies' EU-wide surveillance networks for 2013–2015. AMC in both sectors, expressed in mg/kg of estimated biomass, were compared at country and European level. Substantial variations between countries were observed in both sectors. Estimated data on AMC for pigs and poultry were used for the first time. Univariate and multivariate analyses were applied to study associations between AMC and AMR. In 2014, the average AMC was higher in animals (152 mg/kg) than in humans (124 mg/kg), but the opposite applied to the median AMC (67 and 118 mg/kg, respectively). In 18 of 28 countries, AMC was lower in animals than in humans. Univariate analysis showed statistically-significant ($p < 0.05$) associations between AMC and AMR for fluoroquinolones and *Escherichia coli* in both sectors, for 3rd- and 4th-generation cephalosporins and *E. coli* in humans, and tetracyclines and polymyxins and *E. coli* in animals. In humans, there was a statistically-significant association between AMC and AMR for carbapenems and polymyxins in *Klebsiella pneumoniae*. Consumption of macrolides in animals was significantly associated with macrolide resistance in *Campylobacter coli* in animals and humans. Multivariate analyses provided a unique approach to assess the contributions of AMC in humans and animals and AMR in bacteria from animals to AMR in bacteria from humans. Multivariate analyses demonstrated that 3rd- and 4th-generation cephalosporin and fluoroquinolone resistance in *E. coli* from humans was associated with corresponding AMC in humans, whereas resistance to fluoroquinolones in *Salmonella* spp. and *Campylobacter* spp. from humans was related to consumption of fluoroquinolones in animals. These results suggest that from a 'One-health' perspective, there is potential in both sectors to further develop prudent use of antimicrobials and thereby reduce AMR.

Keywords: antimicrobial consumption, antimicrobial resistance, public health, food-producing animals, ecological analysis, logistic regression, partial least square path modeling

Requestor: European Commission

Question number: EFSA-Q-2016-00029

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- Based on a One Health approach combining the data collected by ECDC, EMA and EFSA the **JIACRA reports** are published
- The joint report is an integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals

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Monitoring of zoonoses in animals, food and feed

c) Epidemiological investigation of food-borne outbreaks

- **Food-borne outbreak**: incidence of two or more human cases of the same disease and/or infection and where the cases are linked to the same food source
- The competent authority shall investigate food-borne outbreaks and shall provide data to the EC/EFSA on:
  - the epidemiological profile
  - the foodstuffs potentially implicated
  - the potential causes of the outbreak
  - adequate epidemiological and microbiological studies (if possible)
- Essential to set up priorities and measures

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Example: Number of food-borne outbreaks[1], human cases, hospitalisations and deaths per causative agents in reporting Member States, 2016

	All reported human cases	Food-borne outbreaks			
		Nbr	Human cases	Hospital.	Deaths
Salmonella	94530	1 067	9 061	1 766	10
Bact. toxins	Not reported	848	8 967	401	1
Viruses	Not reported	470	8 847	564	1
Campylobacter	246 307	461	13 085	140	0
Parasites	883[2]	106	489	74	0
STEC[3]	6 378	42	735	125	3
Yersinia	6 861	8	41	3	0
Listeria	2 536	5	25	14	2

1 Including waterborne ourtbreaks
2 Only takes into account Echinococcosis and trichinellosis

3 Shiga toxin-producing E.coli

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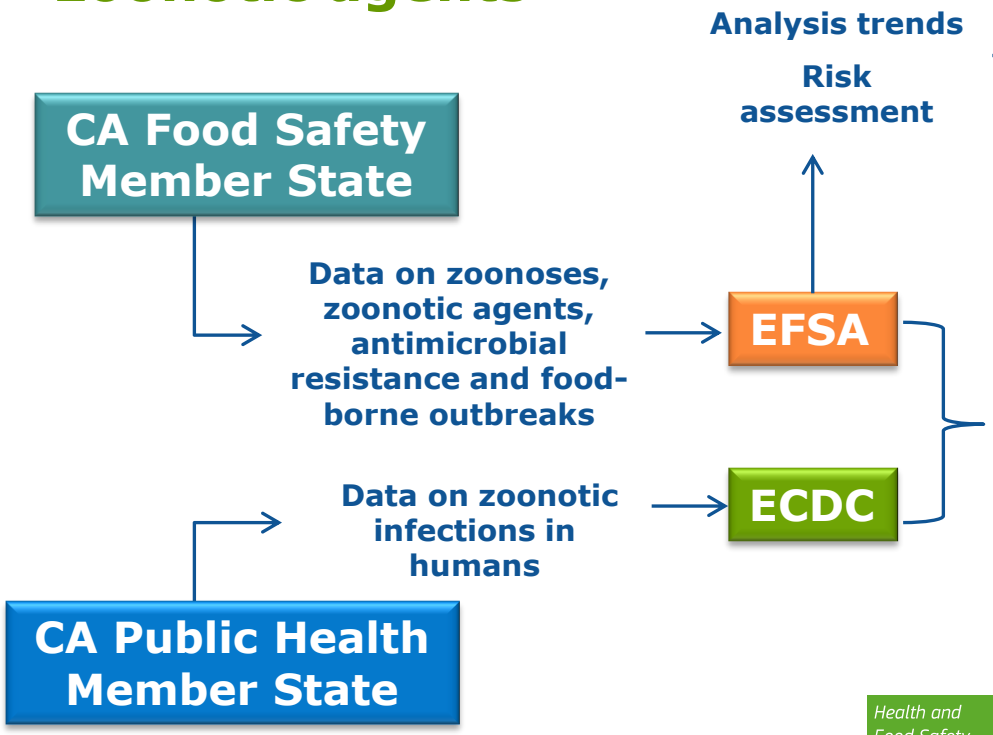
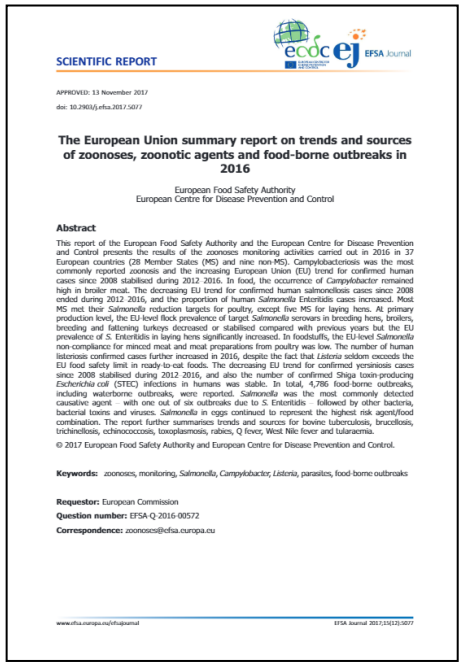
d) The exchange of information related to zoonoses and zoonotic agents





SCIENTIFIC REPORT

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The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2016

European Food Safety Authority
European Centre for Disease Prevention and Control

Abstract

This report of the European Food Safety Authority and the European Centre for Disease Prevention and Control presents the results of the zoonoses monitoring activities carried out in 2016 in 37 European countries (28 Member States (MS) and nine non-MS). Campylobacteriosis was the most commonly reported zoonosis and the increasing European Union (EU) trend for confirmed human cases since 2008 stabilised during 2012–2016. In food, the occurrence of *Campylobacter* remained high in broiler meat. The decreasing EU trend for confirmed human salmonellosis cases since 2008 ended during 2012–2016, and the proportion of human *Salmonella* Enteritidis cases increased. Most MS met their *Salmonella* reduction targets for poultry, except five MS for laying hens. At primary production level, the EU-level flock prevalence of target *Salmonella* serovars in breeding hens, broilers, breeding and fattening turkeys decreased or stabilised compared with previous years but the EU prevalence of *S.* Enteritidis in laying hens significantly increased. In foodstuffs, the EU-level *Salmonella* non-compliance for minced meat and meat preparations from poultry was low. The number of human listeriosis confirmed cases further increased in 2016, despite the fact that *Listeria* seldom exceeds the EU food safety limit in ready-to-eat foods. The decreasing EU trend for confirmed yersiniosis cases since 2008 stabilised during 2012–2016, and also the number of confirmed Shiga toxin-producing *Escherichia coli* (STEC) infections in humans was stable. In total, 4,786 food-borne outbreaks, including waterborne outbreaks, were reported. *Salmonella* was the most commonly detected causative agent – with one out of six outbreaks due to *S.* Enteritidis – followed by other bacteria, bacterial toxins and viruses. *Salmonella* in eggs continued to represent the highest risk agent/food combination. The report further summarises trends and sources for bovine tuberculosis, brucellosis, trichinellosis, echinococcosis, toxoplasmosis, rabies, Q fever, West Nile fever and tularaemia.

Keywords: zoonoses, monitoring, *Salmonella*, *Campylobacter*, *Listeria*, parasites, food-borne outbreaks

Requestor: European Commission
Question number: EFSA-Q-2016-00572
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The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks

Example: Top 5 combinations (agent/food vehicle) causing the highest number of food-borne outbreaks, reporting Member States, 2016

Table 46: Top-5 combinations (agent/food vehicle) causing the highest number of strong-evidence food-borne outbreaks (including waterborne outbreaks), reporting Member States, 2016

Causative agent	Food vehicle	2016							2010–2015		
		Rank	Number of outbreaks	Cases			Outbreak reporting rate per 100,000	Reporting Member State	Rank	Number of outbreaks (mean)	Outbreak reporting rate per 100,000 (mean)
				Number	Hospitalised	Deaths					
Salmonella	Eggs and egg products	1	67	1,099	222	4	0.014	17	1	89.0	0.022
Calicivirus including norovirus	Crustaceans, shellfish, molluscs and their products	2	36	436	6	0	0.008	9	7	18.8	0.005
Salmonella	Bakery products	3	28	290	80	0	0.006	5	6	20.2	0.004
Bacterial toxins other than *C. botulinum*	Mixed food	4	26	697	27	0	0.006	8	3	31.8	0.015
Bacterial toxins other than *C. botulinum*	Poultry meat	5	25	813	6	0	0.005	4	30	4.7	0.004

Bacterial toxins other than *C. botulinum* include toxins produced by *Bacillus*, *Clostridium* other than *Clostridium botulinum* and *Staphylococcus* and other unspecified bacterial toxins.

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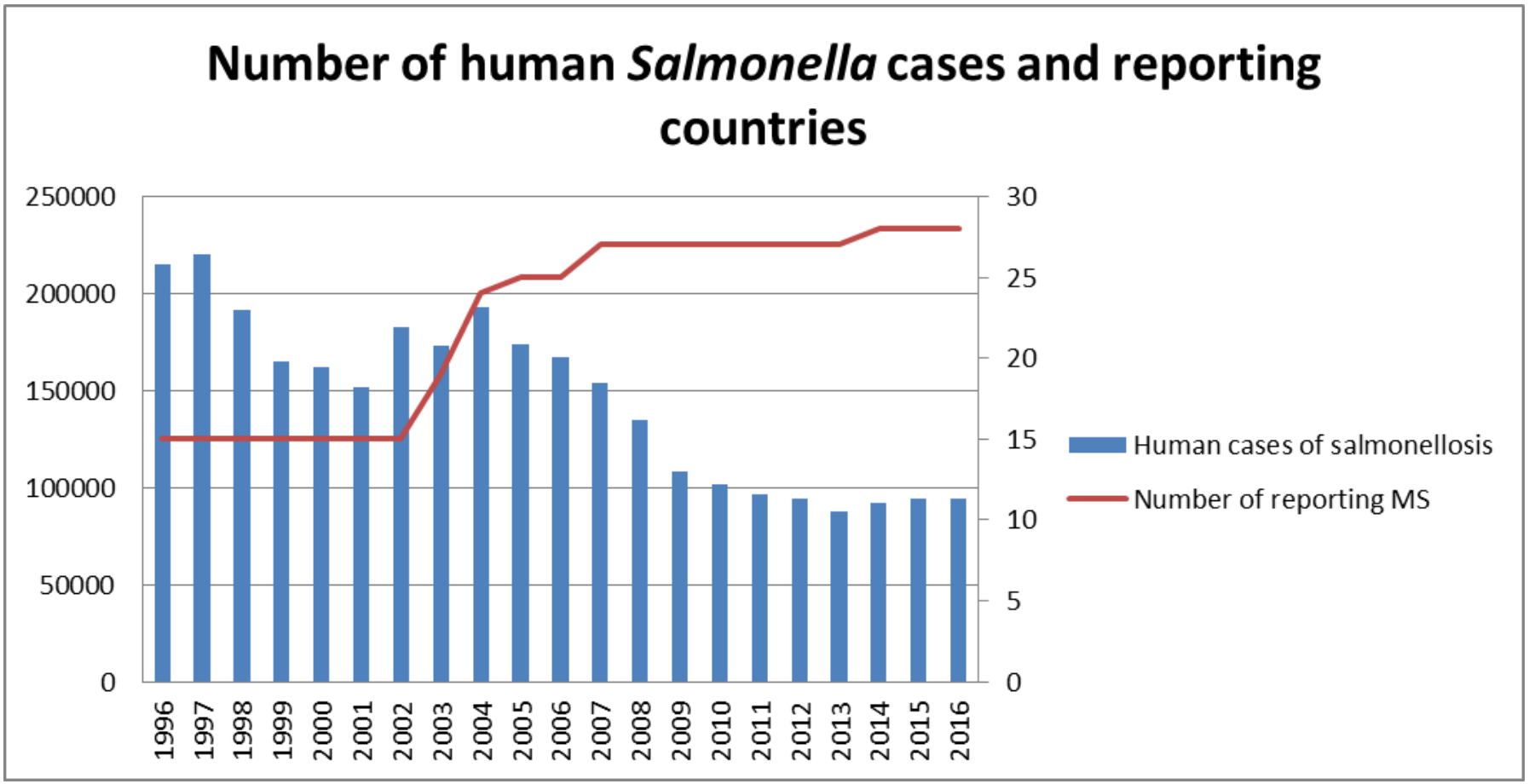
Control of food-borne zoonoses
The success story of Salmonella

Regulation (EC) No 2160/2003 on the control of *Salmonella* and other specified food-borne zoonotic agents

Objective of the Regulation:

Ensure that proper and effective measures are taken to detect and to control *Salmonella* and other zoonotic agents at all relevant stages of production, processing and distribution, particularly at the level of primary production, including in feed, in order to reduce their prevalence and the risk they pose to public health.


Number of human *Salmonella* cases and reporting countries
250000
200000
150000
100000
50000
0
30
25
20
15
10
5
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Human cases of salmonellosis
Number of reporting MS

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The success story of Salmonella

Regulation (EC) No 2160/2003 on the control of *Salmonella* and other specified food-borne zoonotic agents

The Regulation covers:

a) the adoption of targets for the reduction of the prevalence of specified zoonoses in animal populations;
b) the approval of specific control programmes established by Member States and food and feed business operators;
c) the adoption of specific rules concerning certain control methods applied in the reduction of the prevalence of zoonoses and zoonotic agents;
d) the adoption of rules concerning intra-Community trade and imports from third countries of certain animals and products thereof.

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Control of food-borne zoonoses
The success story of Salmonella

a) The adoption of Union targets

Baseline study (1 year)

Prevalence in all MS

Setting of target for reduction

Establishment of national control programmes taking into account minimum EU requirements

Approval national control programmes

Start National control programmes

Achieving /maintaining target, harmonised monitoring

Trade restrictions

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Control of food-borne zoonoses
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a) The adoption of Union targets


For the reduction of the prevalence of certain types of Salmonella in:

- Final target set for reduction in flocks **breeding hens** of Gallus gallus → Commission Regulation (EU) No 200/2010
- Final target set for reduction in flocks of **laying hens** of Gallus gallus → Commission Regulation (EU) No 517/2011
- Final target set for reduction in **flocks of broilers** → Commission Regulation (EU) No 200/2012
- Final target set for reduction in **flocks of turkeys** → Commission Regulation (EU) No 1190/2012

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The success story of Salmonella

b) Specific control programmes established by MSs

- In the case of *Salmonella*, a series of requirements are set out for the coordinated monitoring programmes at Member State level

- There are EU co-financed national programmes for the eradication and monitoring of other animal diseases, of certain TSEs, and for the prevention of zoonoses. They are adopted yearly and can be consulted here: *https://ec.europa.eu/food/funding/animal-health/national-veterinary-programmes_en*

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c-d) Specific rules, measures and imports

Specific measures:

- Requirements for use of **antimicrobials and vaccines** in control programmes for poultry → Commission Regulation (EU) No 1177/2006
- Restriction on import of **live poultry and eggs** → Commission Regulation (EC) No 798/2008

Special guarantees

- When the prevalence of Salmonella in certain animal populations or food is very low and strict national control programmes apply (e.g. Finland and Sweden)

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Thank you

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