European Food Safety Authority

ZOONOSES MONITORING

MALTA

The Report referred to in Article 9 of Directive 2003/99/EC

TRENDS AND SOURCES OF ZOONOSES AND ZOONOTIC AGENTS IN HUMANS, FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

including information on foodborne outbreaks, antimicrobial resistance in zoonotic agents and some pathogenic microbiological agents.

IN 2012

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: Malta

Reporting Year: 2012

Laboratory name	Description	Contribution
National Veterinary Laboratory - Agriculture and Fisheries Regulation Division-Ministry for Rural Affairs and the Environment		Infectious disease prevention & control unit

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/ EC*. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in Malta during the year 2012 .

The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given. The information given covers both zoonoses that are important for the public health in the whole European Community as well as zoonoses, which are relevant on the basis of the national epidemiological situation.

The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the Community Legislation, while for the other zoonoses national approaches are applied.

The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.

The information covered by this report is used in the annual Community Summary Report on zoonoses that is published each year by EFSA.

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* Directive 2003/ 99/ EC of the European Parliament and of the Council of 12 December 2003 on the monitoring of zoonoses and zoonotic agents, amending Decision 90/ 424/ EEC and repealing Council Directive 92/ 117/ EEC, OJ L 325, 17.11.2003, p. 31

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1. ANIMAL POPULATIONS

The relevance of the findings on zoonoses and zoonotic agents has to be related to the size and nature of the animal population in the country.

A. Information on susceptible animal population

Sources of information

National Livestock Database, National Veterinary Laboratory of the Agriculture and fisheries Regulation Division (CA)

Dates the figures relate to and the content of the figures

2011

Geographical distribution and size distribution of the herds, flocks and holdings

The data covers both the islands of Malta and Gozo.Malta's location is set in the heart of the Mediterranean Sea, half way between Sicily and North Africa, the Maltese archipelago consists of five islands: Malta, Gozo, Comino and two uninhabited islands, Cominetto and Filfla. The size of Malta is about 27 km long by 14.5 km width.Most of the farms for all species are found mainly on the main island i.e. Malta.

Table Susceptible animal populations

* Only if different than current reporting year

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals	Data	Year*	Data	Year*	Data	Year*	Data	Year*
Cattle (bovine animals)	meat production animals	203				1624		203	
	dairy cows and heifers	44				10705		44	
	calves (under 1 year)	0				0		0	
	mixed herds [1]	77				3299		77	
	- in total	324				15628		324	
Deer	farmed - in total	1		0					
Ducks	meat production flocks [2]								
	parent breeding flocks [3]								
	grandparent breeding flocks [4]								
	elite breeding flocks [5]								
	breeding flocks, unspecified - in total [6]								
	laying ducks [7]								
	mixed flocks/holdings [8]								

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals	Data	Year*	Data	Year*	Data	Year*	Data	Year*
Gallus gallus (fowl)	laying hens	66		0		253273		36	
	broilers	575		2153458		710449		78	
	mixed flocks/holdings	0							
	- in total	641		2153458		963722		114	
Goats	mixed herds	815		1043		4703		815	
	- in total	815		1043		4703		815	
Pigs	mixed herds [9)]			64276		41187		111	
	- in total [10)]			64276		41187		111	
Sheep	mixed herds	1386		3183		11340		1386	
Turkeys	meat production flocks [11)]								
	parent breeding flocks [12)]								
	grandparent breeding flocks [13)]								
	elite breeding flocks [14)]								
	breeding flocks, unspecified - in total [15)]								

Table Susceptible animal populations

		Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
Animal species	Category of animals	Data	Year*	Data	Year*	Data	Year*	Data	Year*
Turkeys	laying hens [16)]								
	mixed flocks/holdings [17)]								
Wild boars	farmed - in total [18)]								

Comments:

[1)] Includes all milk producing units that have more than 3 males over 6 months of age

[2)] No ducks are reared in the Maltese islands

[3)] No ducks are reared in the Maltese islands

[4)] No ducks are reared in the Maltese islands

[5)] No ducks are reared in the Maltese islands

[6)] No ducks are reared in the Maltese islands

[7)] No ducks are reared in the Maltese islands

[8)] No ducks are reared in the Maltese islands

[9)] 111

[10)] 111

[11)] No turkey flocks are reared in the Maltese islands

[12)] No turkey flocks are reared in the Maltese islands

[13)] No turkey flocks are reared in the Maltese islands

[14)] No turkey flocks are reared in the Maltese islands

Table Susceptible animal populations

Comments:

[15)] No turkey flocks are reared in the Maltese islands

[16)] No turkey flocks are reared in the Maltese islands

[17)] No turkey flocks are reared in the Maltese islands

[18)] No wild boars are farmed in Malta

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

Zoonoses are diseases or infections, which are naturally transmissible directly or indirectly between animals and humans. Foodstuffs serve often as vehicles of zoonotic infections. Zoonotic agents cover viruses, bacteria, fungi, parasites or other biological entities that are likely to cause zoonoses.

2.1 SALMONELLOSIS

2.1.1 General evaluation of the national situation

A. General evaluation

History of the disease and/or infection in the country

Salmonella has been on the rise in Malta again since 2008. This follows a trough from 1999 - 2007. Majority of cases are S. Enteritidis and Tymphimurium.

National evaluation of the recent situation, the trends and sources of infection

Most cases of Salmonella originate from households, including outbreaks (30-45 %). the sources are usually eggs and chicken meat.Information about salmonella in pork is not available.

Recent actions taken to control the zoonoses

Control of layers and broilers with culling for positive flocks of S. Enteritidis and S. Typhimurium. Heat treatment of eggs from infected layer flocks is also carried out.

2.1.2 Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

Physician and laboratory surveillance in place.

Case definition

Clinical picture with isolation of Salmonella from clinical specimens.
A probable case has has an epdemiological link with a confirmed case.

Diagnostic/analytical methods used

Culture methods and serology.

Notification system in place

Statutorily notifiable.

History of the disease and/or infection in the country

Salmonella has been on the rise in Malta again since 2008. This follows a trough from 1999 - 2007.

National evaluation of the recent situation, the trends and sources of infection

Most cases of Salmonella originate from households, including outbreaks (30-45 %). the sources are usually eggs and chicken meat.Information about salmonella in pork is not available.

Table Salmonella in humans - Species/serotype distribution

Species/serotype Distribution	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Salmonella	90	21.82	86	21.82	0	0	0
S. Enteritidis	28	6.8	28	6.8			
S. Typhimurium	11	2.7	11	2.7			
S. Nigeria	1	0.24	1	0.24			
S. Haifa	1	0.24	1	0.24			
S. Give	1	0.24	1	0.24			
S. Gdansk	1	0.24	1	0.24			
S. Kentucky	5	1.21	1	1.21			
S. Kambole	1	0.24	1	0.24			
S. Kedougou	1	0.24	1	0.24			
S. Infantis	10	2.42	10	2.42			
S. Species	20	4.85	20	4.85			
S. Dublin	1	0.24	1	0.24			
S. Agama	1	0.24	1	0.24			
S. Poona	1	0.24	1	0.24			
S. Isangi	1	0.24	1	0.24			
S. Rissen	1	0.24	1	0.24			
S. Bargny	1	0.24	1	0.24			
S. Hillingdon	1	0.24	1	0.24			
S. Livingstone	2	0.48	2	0.48			

Table Salmonella in humans - Species/serotype distribution

Species/serotype Distribution	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Salmonella	90	21.82	86	21.82	0	0	0
S. London	1	0.24	1	0.24			

Table Salmonella in humans - Age distribution

Age distribution	S. Enteritidis			S. Typhimurium			Salmonella spp.			S. Agama			S. Bargny		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
1 to 4 years	8	6	2	3	0	3	3	1	2	0	0	0	0	0	0
5 to 14 years	6	6	0	1	0	1	3	3	0	0	0	0	0	0	0
15 to 24 years	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
25 to 44 years	4	3	1	2	2	0	1	1	0	0	0	0	1	1	0
45 to 64 years	3	1	2	1	0	1	1	1	0	1	0	1	0	0	0
65 years and older	7	3	4	3	2	1	3	2	1	0	0	0	0	0	0
Age unknown	0	0	0	0	0	0	8	3	5	0	0	0	0	0	0
Total :	28	19	9	11	4	7	20	12	8	1	0	1	1	1	0

Age distribution	S. Dublin			S. Gdansk			S. Give			S. Haifa			S. Hillingdon		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5 to 14 years	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
15 to 24 years	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0
25 to 44 years	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
45 to 64 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table Salmonella in humans - Age distribution

Age distribution	S. Dublin			S. Gdansk			S. Give			S. Haifa			S. Hillingdon		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
65 years and older	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Age unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total :	1	0	1	1	1	0	1	0	1	1	0	1	1	0	1

Age distribution	S. Infantis			S. Isangi			S. Kambole			S. Kedougou			S. Kentucky		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 to 14 years	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
15 to 24 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 to 44 years	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0
45 to 64 years	2	1	1	0	0	0	1	1	0	1	1	0	1	1	0
65 years and older	4	1	3	0	0	0	0	0	0	0	0	0	4	1	3
Age unknown	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total :	10	3	7	1	1	0	1	1	0	1	1	0	5	2	3

Table Salmonella in humans - Age distribution

Age distribution	S. Livingstone			S. London			S. Nigeria			S. Poona			S. Rissen		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1
1 to 4 years	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
5 to 14 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 to 24 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 to 44 years	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
45 to 64 years	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0
65 years and older	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Age unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total :	2	2	0	1	0	1	1	1	0	1	1	0	1	0	1

Table Salmonella in humans - Seasonal distribution

Seasonal Distribution / Months	S. Enteritidis	S. Typhimurium	Salmonella spp.	S. Agama	S. Bargny	S. Dublin	S. Gdansk	S. Give	S. Haifa	S. Hillingdon	S. Infantis	S. Isangi	S. Kambole	S. Kedougou	S. Kentucky
	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases
January	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1
February	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
April	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
May	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
June	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
July	2	0	4	0	0	0	0	0	0	1	0	0	0	0	0
August	6	2	4	0	1	0	1	0	1	0	2	0	1	0	1
September	3	3	2	0	0	1	0	0	0	0	3	1	0	0	3
October	2	0	6	0	0	0	0	0	0	0	1	0	0	1	0
November	5	0	2	1	0	0	0	1	0	0	3	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
not known	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total :	28	11	20	1	1	1	1	1	1	1	10	1	1	1	5

Seasonal Distribution / Months	S. Livingstone	S. London	S. Nigeria	S. Poona	S. Rissen
	Cases	Cases	Cases	Cases	Cases
January	0	0	0	0	0

Table Salmonella in humans - Seasonal distribution

Seasonal Distribution / Months	S. Livingstone	S. London	S. Nigeria	S. Poona	S. Rissen
	Cases	Cases	Cases	Cases	Cases
February	0	0	0	0	1
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	1	0
October	1	0	0	0	0
November	1	0	1	0	0
December	0	1	0	0	0
not known	0	0	0	0	0
Total :	2	1	1	1	1

2.1.3 Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Monitoring system

Sampling strategy

there are no egg packing center each farmer packs his own eggs. Eggs were analysed on two occasions as re-confirmatory according to the Commission Regulation 1237/2007.

Diagnostic/analytical methods used

Raw material for egg products (at production plant)

Bacteriological method: ISO 6579:2002

2.1.4 Salmonella in animals

A. Salmonella spp. in Gallus Gallus - breeding flocks

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

There are no breeding flocks in Malta

B. Salmonella spp. in Gallus Gallus - broiler flocks

Monitoring system

Sampling strategy

Broiler flocks

All broiler flocks are sampled irrespective of their capacity. currently the sampling and analysis of both official controls and on behalf of the business operator are being carried out by the Competent Authority; namely the National Veterinary Laboratory

Frequency of the sampling

Broiler flocks: Before slaughter at farm

__2-3__ weeks prior to slaughter

Type of specimen taken

Broiler flocks: Before slaughter at farm

Socks/ boot swabs

Methods of sampling (description of sampling techniques)

Broiler flocks: Before slaughter at farm

The number of boot swabs taken per holding depends on the capacity of the farm.Six pairs of boot swabs are taken if the farms has a capacity of over 50,000. Four boot swabs are taken when there is a capacity between 10,000 - 50,000. Twp pairs of boot swabs are taken when the capacity is less than 10,00. Two pairs of boot swabs are taken from each house sampled.

Case definition

Broiler flocks: Before slaughter at farm

A positive case is when Salmonella enteritidis and Salmonella typhimurium are isolated.

Diagnostic/analytical methods used

Broiler flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Broiler flocks: At slaughter (flock based approach)

Bacteriological method: ISO 6579:2002

Vaccination policy

Broiler flocks

no vaccination for salmonella is carried out in Malta.

Other preventive measures than vaccination in place

Broiler flocks

In accordance to Commission Regulation 1177/2007, no antimicrobial treatment is permitted as a control measure in the case of salmonella infection in poultry flocks.

Control program/mechanisms

The control program/strategies in place

Broiler flocks

Broiler flocks positive to S.typhimurium and S.enteritidis are culled.The A Salmonella National control programme according to Council Regulation 2160/2003 and Commission Regulation 646/2007is being implemented.

Recent actions taken to control the zoonoses

Broiler flocks positive to s.typhimurium and s.enteritidis are destroyed.

Measures in case of the positive findings or single cases

Broiler flocks: Before slaughter at farm

Broiler flocks positive to s.typhimurium and s.enteritidis are destroyed.

Notification system in place

the National Veterinary Laboratory under the competent authority is responsible for notification of results to the Animal Health section and The Food Safety section which fall under the same CA for necessary action.

National evaluation of the recent situation, the trends and sources of infection

The Salmonella control programme has begun to be implemented in mid-2009, therefore it is a bit early to evaluate the situation . On what information is available the prevalence for all types of Salmonella infection is 31%.

C. Salmonella spp. in Gallus Gallus - flocks of laying hens

Monitoring system

Sampling strategy

Laying hens flocks

The competent authority samples all layer flocks irrespectful of the capacity as official controls but also currently those on behalf of the business operators.

Frequency of the sampling

Laying hens: Rearing period

__18__ weeks prior to moving

Laying hens: Production period

Every __15__ weeks

Type of specimen taken

Laying hens: Rearing period

Environmental sample: samples of faeces and dust

Laying hens: Production period

Environmental sample: samples of faeces and dust

Methods of sampling (description of sampling techniques)

Laying hens: Rearing period

Two faecal samples and two dust samples are collected from each house on a holding.Faecal samples are collected from the bottom tiers of the manure belt.

Laying hens: Production period

The same samples are taken as described above.

Diagnostic/analytical methods used

Laying hens: Rearing period

Bacteriological method: ISO 6579:2002

Laying hens: Production period

Bacteriological method: ISO 6579:2002

Vaccination policy

Laying hens flocks

Layers are not vaccinated locally.

Other preventive measures than vaccination in place

Laying hens flocks

No antibiotic treatment is permitted as a means of control in case of salmonella infection in flocks.

Control program/mechanisms

The control program/strategies in place

Laying hens flocks

There is the Salmonella National control Programme that has been drawn up in accordance the Council Regulation 2160/2003 and Commission Regulation 1168/2006 and Control strategies followed are as

commission regulation 1177/2006.

Recent actions taken to control the zoonoses

Salmonella enteritidis and Salmonella typhimurium positive flocks have restriction measures implemented. The eggs are considered not fit for human consumption and are destroyed or heat-treated.

Measures in case of the positive findings or single cases

Laying hens flocks

Salmonella enteritidis and Salmonella typhimurium positive flocks have restriction measures implemented. The eggs are considered not fit for human consumption and are destroyed or heat-treated.

Notification system in place

All samples are brought into the National Veterinary Laboratory which carries out the analyses. Typing of positive isolates is carried out by the National reference laboratory. The National Veterinary Laboratory which falls under the competent authority is then responsible for communicating the information to the animal health section and food safety section which fall under the same authority for any further action if necessary. Action is only taken for Salmonella enteritidis and salmonella typhimurium positive cases.

National evaluation of the recent situation, the trends and sources of infection

The Salmonella Control Programme commenced in mid-2009. Based on the current data 42% of the holdings are positive for all types of Salmonella. it is too early in the programme to evaluate the trend.

Table Salmonella in breeding flocks of Gallus gallus

	No of flocks under control programme	Source of information	Sampling strategy	Sampler	Sample type	Sample origin	Target Verification	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis
Gallus gallus (fowl) - breeding flocks, unspecified - adult - Control and eradication programmes			Census	Official and industry sampling			yes				

	S. Hadar	S. Infantis	S. Typhimurium	S. Virchow	S. 1,4,[5],12:i:-	Salmonella spp., unspecified
Gallus gallus (fowl) - breeding flocks, unspecified - adult - Control and eradication programmes						

Table Salmonella in other poultry

	No of flocks under control programme	Source of information	Sampling strategy	Sampler	Sample type	Sample origin	Target Verification	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes	66		Selective sampling	Official and industry sampling	animal sample > faeces	Domestic	yes	Flock	66	33	4
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	581					Domestic	yes	Flock	581	141	1

	S. Typhimurium	S. 1,4,[5],12:i:-	Salmonella spp., unspecified
Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes	0	0	0
Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes	1	0	0

2.1.5 Antimicrobial resistance in Salmonella isolates

Table Antimicrobial susceptibility testing of Salmonella in humans

Salmonella	S. Enteritidis		S. Typhimurium		Salmonella spp.		S. Agama		S. Bargny		S. Dublin		S. Gdansk		S. Give		S. Haifa		S. Hillingdon		S. Isangi		S. Kambole		S. Kedougou	
Isolates out of a monitoring program (yes/no)	no		no		no																					
Number of isolates available in the laboratory	29		11		19																					
Antimicrobials:	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides - Gentamicin	29	28																								
Fluoroquinolones - Ciprofloxacin	29	3																								
Penicillins - Ampicillin	29	6																								
Trimethoprim	29	13																								
Resistant to 1 antimicrobial	29	15																								
Resistant to 2 antimicrobials	29	10																								
Resistant to 3 antimicrobials	29	1																								
Resistant to 4 antimicrobials	29	4																								

Salmonella	S. Kentucky		S. Livingstone		S. London		S. Nigeria		S. Poona		S. Rissen	
Isolates out of a monitoring program (yes/no)												
Number of isolates available in the laboratory												
Antimicrobials:	N	n	N	n	N	n	N	n	N	n	N	n
Aminoglycosides - Gentamicin												
Fluoroquinolones - Ciprofloxacin												
Penicillins - Ampicillin												
Trimethoprim												

Table Antimicrobial susceptibility testing of Salmonella in humans

Salmonella	S. Kentucky		S. Livingstone		S. London		S. Nigeria		S. Poona		S. Rissen	
Isolates out of a monitoring program (yes/no)												
Number of isolates available in the laboratory												
Antimicrobials:	N	n	N	n	N	n	N	n	N	n	N	n
Resistant to 1 antimicrobial												
Resistant to 2 antimicrobials												
Resistant to 3 antimicrobials												
Resistant to 4 antimicrobials												

Table Cut-off values for antibiotic resistance testing of Salmonella in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		32	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.5	
Fluoroquinolones	Ciprofloxacin		0.06	
Penicillins	Ampicillin		4	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values for antibiotic resistance testing of Salmonella in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		32	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.5	
Fluoroquinolones	Ciprofloxacin		0.06	
Penicillins	Ampicillin		4	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values for antibiotic resistance testing of Salmonella in Food

Test Method Used	Standard methods used for testing

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Aminoglycosides	Gentamicin		2	
	Streptomycin		32	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.5	
Fluoroquinolones	Ciprofloxacin		0.06	
Penicillins	Ampicillin		4	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

2.2 CAMPYLOBACTERIOSIS

2.2.1 General evaluation of the national situation

2.2.2 Campylobacteriosis in humans

A. Thermophilic Campylobacter in humans

Reporting system in place for the human cases

Statutorily notifiable.

Case definition

ECDC definition holds

Diagnostic/analytical methods used

Culture and serology

Notification system in place

Yes. Physician and loboratory surveillance system.

History of the disease and/or infection in the country

The rates of campylobacteriosis have been increasing in the past few years.

National evaluation of the recent situation, the trends and sources of infection

sources of infection are probably poultry meats. National campaigns and food safety weeks being held annually to educate the public.

Relevance as zoonotic disease

A relevant zoonotic disease in veiw of the numbers involved, morbidity, expenses and possible long term complications.

Table Campylobacter in humans - Species/serotype distribution

Species/serotype Distribution	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.	Unknown status
Campylobacter	220	53.39	220	53.39	0	0	0
C. coli	38	9.22	38	9.22	0	0	0
C. jejuni	141	34.22	141	34.22	0	0	0
C. upsaliensis	0	0	0	0	0	0	0
Campylobacter spp., unspecified	41	9.95	41	9.95	0	0	0

Table Campylobacter in humans - Age distribution

Age distribution	C. coli			C. jejuni			Campylobacter spp., unspecified		
	All	M	F	All	M	F	All	M	F
<1 year	3	2	1	15	7	8	5	4	1
1 to 4 years	9	5	4	46	24	22	9	4	5
5 to 14 years	5	4	1	19	14	5	5	3	2
15 to 24 years	3	1	2	14	9	5	7	0	7
25 to 44 years	9	4	5	19	8	11	4	3	1
45 to 64 years	4	4	0	13	9	4	4	4	0
65 years and older	5	1	4	13	6	7	7	3	4
Age unknown	0	0	0	2	1	1	0	0	0
Total :	38	21	17	141	78	63	41	21	20

Table Campylobacter in humans - Seasonal distribution

Seasonal Distribution / Months	C. coli	C. jejuni	C. upsaliensis	Campylobacter spp., unspecified
	Cases	Cases	Cases	Cases
January	4	8	0	1
February	2	10	0	3
March	1	16	0	5
April	3	9	0	2
May	3	17	0	2
June	1	18	0	4
July	2	14	0	3
August	7	14	0	5
September	4	2	0	4
October	6	17	0	5
November	5	15	0	1
December	0	1	0	6
not known	0	0	0	0
Total :	38	141	0	41

2.2.3 Antimicrobial resistance in Campylobacter isolates

Table Antimicrobial susceptibility testing of Campylobacter in humans

Campylobacter	Campylobacter spp., unspecified		C. coli		C. jejuni - C. jejuni subsp. jejuni	
Isolates out of a monitoring program (yes/no)	no		no		no	
Number of isolates available in the laboratory	37		38		141	
Antimicrobials:	N	n	N	n	N	n
Fluoroquinolones - Ciprofloxacin	37	30	38	28	141	101
Macrolides - Erythromycin	37	31	38	5	141	16
Fully sensitive	37	2			141	37
Resistant to 1 antimicrobial	37	1	38	23	141	87
Resistant to 2 antimicrobials	37	30	38	5	141	14

Table Cut-off values used for antimicrobial susceptibility testing of C. coli in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		4	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		16	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of C. coli in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		4	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		16	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of C. coli in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		4	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		16	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of C. jejuni in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		4	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of C. jejuni in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		4	
Tetracyclines	Tetracycline		2	

Table Cut-off values used for antimicrobial susceptibility testing of C. jejuni in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		1	
	Streptomycin		2	
Fluoroquinolones	Ciprofloxacin		1	
Macrolides	Erythromycin		4	
Tetracyclines	Tetracycline		2	

2.3 LISTERIOSIS

2.3.1 General evaluation of the national situation

A. Listeriosis general evaluation

History of the disease and/or infection in the country

No cases of human disease in recent years.

2.3.2 Listeriosis in humans

A. Listeriosis in humans

Reporting system in place for the human cases

A notifiable disease.

Case definition

ECDC definition holds.

Diagnostic/analytical methods used

Culture

Notification system in place

Yes

History of the disease and/or infection in the country

No notified cases of listeriosis in recent years.

Table Listeria in humans - Species/serotype distribution

Species/serotype Distribution	Cases	Cases Inc.
Listeria	0	0
Listeria spp., unspecified	0	0
Congenital cases	0	0
Number of deaths	0	0

Table Listeria in humans - Age distribution

Age distribution	L. monocytogenes			Listeria spp., unspecified		
	All	M	F	All	M	F
25 to 44 years	1	0	1			
Total :	1	0	1	0	0	0

2.4 E. COLI INFECTIONS

2.4.1 General evaluation of the national situation

2.4.2 E. coli infections in humans

Table Escherichia coli, pathogenic in humans - Species/serotype distribution

Species/serotype Distribution	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Escherichia coli, pathogenic						
E.coli infect. (except HUS)	1	0.24	1	0.24	0	0
- clinical cases	1	0.24	1	0.24	0	0
- laboratory confirmed	1	0.24	1	0.24	0	0
- caused by 0157 (VT+)	1	0.24	1	0.24	0	0
- caused by other VTEC	0	0	0	0	0	0

Table Escherichia coli, pathogenic in humans - Age distribution

Age distribution	Verotoxigenic E. coli (VTEC)			Verotoxigenic E. coli (VTEC) - VTEC O157:H7			Verotoxigenic E. coli (VTEC) - VTEC non-O157		
	All	M	F	All	M	F	All	F	M
<1 year				0	0	0			
1 to 4 years				0	0	0			
5 to 14 years				1	0	1			
15 to 24 years				0	0	0			
25 to 44 years				0	0	0			
45 to 64 years				0	0	0			
65 years and older				0	0	0			
Age unknown				0	0	0			
Total :	0	0	0	1	0	1	0	0	0

2.5 TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1 General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/or infection in the country

In a recent study (1995-2005) the elderly group of locally born persons are mostly affected with an incidence of 10.6/100,000 persons-years. Since 2003 we have seen a rise in TB corresponding to a wave of illegal immigrants from the sub-sahharin regions of Africa.

National evaluation of the recent situation, the trends and sources of infection

The trends of TB in immigrants has been steady with a number of active and latent cases being treated.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Immigrant cases are mostly imported ones. Few might be locally acquired possibly because of close proximity of living quarters in detention centers

Recent actions taken to control the zoonoses

routine screening of all immigrants and DOTS treatment.

2.5.2 Tuberculosis, mycobacterial diseases in humans

A. Tuberculosis due to Mycobacterium bovis in humans

Reporting system in place for the human cases

Statutory Notification from Laboratories, Physicians.

Diagnostic/analytical methods used

Culture

Notification system in place

Statutory Notification from Laboratories, Physicians.

History of the disease and/or infection in the country

very rare in humans

National evaluation of the recent situation, the trends and sources of infection

Last human case in 2006. Case acquired from contact with cattle. No further cases since.

Table Mycobacterium in humans - Species/serotype distribution

Species/serotype Distribution	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Mycobacterium	16	0	0	0	16	0
M. bovis	0	0	0	0	0	0
M. tuberculosis	16		0	0	16	
Reactivation of previous cases	1		0	0	1	

Footnote:

No Mycobacterium Bovis have been reported in Malta in 2012.

The migrant population denominator is not available. Incidence cannot, therefore be calculated.

Table Mycobacterium in humans - Age distribution

Age distribution	M. bovis		
	All	M	F
<1 year	0	0	0
1 to 4 years	0	0	0
5 to 14 years	0	0	0
15 to 24 years	0	0	0
25 to 44 years	0	0	0
45 to 64 years	0	0	0
65 years and older	0	0	0
Age unknown	0	0	0
Total :	0	0	0

2.5.3 Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Status as officially free of bovine tuberculosis during the reporting year

Additional information

The last confirmed positive case was in 2001.

Monitoring system

Diagnostic/analytical methods used

On farm skin test carried out twice yearly according to standard protocols.

Measures in case of the positive findings or single cases

The positive animal is slaughtered and tissue samples taken for microbiology tests. If microbiology is negative the farm is considered as negative.

Notification system in place

The Veterinary officer in charge of animal health is responsible of informing the farmer. The farmer is then advised to make arrangements for the slaughter of the animal and sampling for Microbiology is carried out.

Table Tuberculosis in other animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample origin	Sampling unit	Units tested	Total units positive for Mycobacterium	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified
Goats [1)]		Selective sampling	Official sampling	animal sample	Domestic	Animal	642	0	0	0	0

Comments:

[1)] Skin test are carried out on the farm where bovine animals are present.

Table Bovine tuberculosis in countries and regions that do not receive Community co-financing for eradication programmes

If present, the row "Total -1" refers to analogous data of the previous year.

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
Malta	121	14005	121	100	0	0	6mths	13678	0	0	0
Total : [1)]	121	14005	121	100	0	0	N.A.	13678	0	0	0

Comments:

[1)] N.A.

2.6 BRUCELLOSIS

2.6.1 General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/or infection in the country

The last case of brucellosis in Malta occurred in 1998. This followed a short epidemic related to goat's milk in 1995.

National evaluation of the recent situation, the trends and sources of infection

Strict control of animal herds have eliminated human cases since 1998.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

n reported findings in foodstuffs.

Recent actions taken to control the zoonoses

Routine surveillance from the veterinary end.

2.6.2 Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

Statutory notification obliging laboratories and physicians to notify cases.

Case definition

Clinical picture with demonstration of specific antibody response, demonstration by immunoflorescense of Isolation of Brucella.

Diagnostic/analytical methods used

Serology, Immunoflorescence and isolation from clinical specimens.

Notification system in place

Statutory notification by labs and physicians.

History of the disease and/or infection in the country

As above.

National evaluation of the recent situation, the trends and sources of infection

N0 human cases since 1998.

Relevance as zoonotic disease

There is the hope that in the future Malta might be declared Brucella free

2.6.3 Brucella in animals

A. Brucella abortus in bovine animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

Brucella abortus has never been recorded in bovines in Malta. The last case confirmed in Bovines was B.melitensis in 1996.

Monitoring system

Sampling strategy

All animals over 6 mouths

Frequency of the sampling

Blood twice Yearly, Milk bulk tank 3 times a year.

Type of specimen taken

Other: blood, milk or tissue

Methods of sampling (description of sampling techniques)

Blood sampling on farms is carried out twice yearly for screening with RBT/ELISA. Bulk milk tank samples are taken 3 times a year to screen by MRT.

Diagnostic/analytical methods used

Rose Bengal Test, ELISA, Milk Ring Test, Complement Fixation Test, Microbiological analysis of lymph node samples from CFT positive animals.

Vaccination policy

No vaccination for brucellosis is carried out in Malta.

Other preventive measures than vaccination in place

Animal movement is controlled and only authorized by the CA and based on the Health Status of the farm.

Control program/mechanisms

The control program/strategies in place

Animals that test positive to a complement fixation test are slaughtered and tissue samples lifted. These samples are then subject to microbiological analysis.

Measures in case of the positive findings or single cases

The positive animal is slaughtered and tissue samples lifted. These samples are then sent for microbiology. All the animals on the farmare retested at an interval of 1 month from the slaughter of the CFT positive animal and again after 2 months. If the microbiology test is negative the farm is considered negative.

Notification system in place

The National Veterinary Laboratory sends the results of screening to the National Livestock database. In the case of a positive screening result the Veterinary officer responsible for Animal Health is informed by email of the positive result. Farmers are sent a copy of both the negative and positive result (RBT,MRT,ELISA,Microbiology). If the microbiology test is negative the farm is considered negative.

B. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

Brucella abortus has never been recorded in caprines . The last case confirmed was B.melitensis in 1996.

Monitoring system

Sampling strategy

All animals over 6 months are tested twice yearly.

Frequency of the sampling

All animals over 6 months are tested twice yearly.

Type of specimen taken

Blood

Methods of sampling (description of sampling techniques)

Blood samples are taken from all animals over 6 months.

Diagnostic/analytical methods used

Rose Bengal Test, Complement Fixation Test, ELISA and Microbiology

Vaccination policy

No Vaccination is practiced in the Maltese Islands

Other preventive measures than vaccination in place

Strict control of animal movment

Measures in case of the positive findings or single cases

Any animal positive for RBT is then re tested using CFT and ELISA. Positive CFT/ELISA animals are slaughtered and organs are submitted for Microbiological investigation.

Table Ovine or Caprine Brucellosis in countries and regions that do not receive Community co-financing for eradication programme

If present, the row "Total -1" refers to analogous data of the previous year.

Region	Total number of existing		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of herds	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbio logically	Number of animals positive microbio logically	Number of suspended herds
Malta	1568	16043	1568	100	0	0	1568	17160	0	0	0	0	0	0
Total : [1)]	1568	16043	1568	100	0	0	1568	17160	0	0	0	0	0	0

Comments:

[1)] N.A.

Table Bovine brucellosis in countries and regions that do not receive Community co-financing for eradication programme

If present, the row "Total -1" refers to analogous data of the previous year.

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk			Information about			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals		Number of animals examined microbio logically	Number of animals positive microbio logically
																		Sero logically	BST		
Malta	191	15400	191	100	0	0	191	15429	0	121	358	0	0	0	0	0	0	0	0	0	0
Total : [1)]	191	15400	191	100	0	0	191	15429	0	121	358	0	0	0	0	0	0	0	0	0	0

Comments:

[1)] N.A.

2.7 YERSINIOSIS

2.7.1 General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

History of the disease and/or infection in the country

No cases in recent years.

2.7.2 Yersiniosis in humans

A. Yersinosis in humans

Reporting system in place for the human cases

Statutorily notifiable infection.

Case definition

Clinical criteria and Isolation of pthogenic bacteria in a clinical specimen.

Diagnostic/analytical methods used

Testing in accredited to foreign labs.

Notification system in place

Yes

History of the disease and/or infection in the country

No recent history of disease locally.

2.8 TRICHINELLOSIS

2.8.1 General evaluation of the national situation

A. Trichinellosis general evaluation

History of the disease and/or infection in the country

There are no recorded human or animal cases.

National evaluation of the recent situation, the trends and sources of infection

The possibility of swine being infected with trichinella are very remote. There are no wild animals in Malta that may support the cycle in wildlife. All Pigs are reared indoors.There are no backyard farms and no freerange pigs

Recent actions taken to control the zoonoses

There is no wildlife on Malta. Trichinella testing in the past was carried out using the trichinoscope menthod. End of 2009 the digestive method was being adopted. Full analysis of all horse/swine slaughtered commenced beginning 2010.

2.8.2 Trichinellosis in humans

A. Trichinellosis in humans

Reporting system in place for the human cases

Statutorily notifiable disease.

Case definition

EDC definition holds.

Diagnostic/analytical methods used

Bopsy of skeletal muscle and serological testing.

Notification system in place

From physicians and laboratories.

History of the disease and/or infection in the country

No recorded human cases.

2.8.3 Trichinella in animals

A. Trichinella in horses

Monitoring system

Sampling strategy

All Horses slaughtered for human consumption are sampled

Frequency of the sampling

All Horses slaughtered for human consumption are sampled

Type of specimen taken

Muscle

Diagnostic/analytical methods used

Digestive Method as per council regulation 2075/2005

Table Trichinella in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample origin	Sampling unit	Units tested	Total units positive for Trichinella	T. spiralis	Trichinella spp., unspecified
Pigs - fattening pigs		Selective sampling	Official sampling	animal sample	Domestic	Animal	67050	0	0	0
Pigs - breeding animals		Selective sampling	Official sampling	animal sample	Domestic	Animal	1564	0	0	0
Solipeds, domestic - horses - at slaughterhouse - Surveillance		Selective sampling	Official sampling	animal sample	Domestic	Animal	18	0	0	0

2.9 ECHINOCOCCOSIS

2.9.1 General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/or infection in the country

No notified cases in the past few years

2.9.2 Echinococcosis in humans

A. Echinococcus spp. in humans

Reporting system in place for the human cases

Statutorily notifiable disease.

Case definition

ECDC definition holds

Notification system in place

Routine surveillance

Additional information

No cases have been reported.

2.9.3 Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling strategy	Sampler	Sample type	Sample origin	Sampling unit	Region	Units tested	Total units positive for Echinococcus	E. granulosus	E. multilocularis
Dogs		Selective sampling	Official sampling	animal sample > faeces	Domestic	Animal	Malta	294	0		0

	Echinococcus spp., unspecified
Dogs	

2.10 TOXOPLASMOSIS

2.10.1 General evaluation of the national situation

2.10.2 Toxoplasmosis in humans

A. Toxoplasmosis in humans

Reporting system in place for the human cases

Statutorily notifiable disease.

Case definition

ECDC definition holds.

Diagnostic/analytical methods used

Serological methods.

Notification system in place

Yes

History of the disease and/or infection in the country

No notified cases.

2.11 RABIES

2.11.1 General evaluation of the national situation

A. Rabies general evaluation

History of the disease and/or infection in the country

Last reported rabies case at the beginning of the 20th century!

A notifiable infection

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

No known animal cases.

2.11.2 Rabies in humans

A. Rabies in humans

Reporting system in place for the human cases

Rabies is still a notifiable disease in Malta.

Case definition

ECDC definition holds.

Notification system in place

Yes

Additional information

No cases of Rabies have been recorded in Malta for many years.

2.12 STAPHYLOCOCCUS INFECTION

2.12.1 General evaluation of the national situation

2.13 Q-FEVER

2.13.1 General evaluation of the national situation

A. Coxiella burnetii (Q-fever) general evaluation

History of the disease and/or infection in the country

No reported cases in recent years.

2.14 WEST NILE VIRUS INFECTIONS

2.14.1 General evaluation of the national situation

2.14.2 West Nile Virus Infections in humans

A. West Nile Virus in Humans

Reporting system in place for the human cases

Yes

Case definition

ECDC definition holds

Diagnostic/analytical methods used

PCR

Notification system in place

Yes

History of the disease and/or infection in the country

No cases diagnosed in recent years.

Results of the investigation

All cases that were tested were negative.

Relevance as zoonotic disease

No autochtonous cases have been reported but disease is under surveillance as vector is present in Malta.

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1 ESCHERICHIA COLI, NON-PATHOGENIC

3.1.1 General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/or infection in the country

E. coli O157 disease is not common with a handful of cases each year.

National evaluation of the recent situation, the trends and sources of infection

No recent trends noticed.

Recent actions taken to control the zoonoses

Educational campiagns, stricter control at food production premises.

3.1.2 Antimicrobial resistance in Escherichia coli, non-pathogenic

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		16	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.25	
Fluoroquinolones	Ciprofloxacin		0.03	
Penicillins	Ampicillin		8	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Animals

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		16	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.25	
Fluoroquinolones	Ciprofloxacin		0.03	
Penicillins	Ampicillin		8	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

Table Cut-off values used for antimicrobial susceptibility testing of Escherichia coli, non-pathogenic in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		2	
	Streptomycin		16	
Amphenicols	Chloramphenicol		16	
Cephalosporins	Cefotaxime		0.25	
Fluoroquinolones	Ciprofloxacin		0.03	
Penicillins	Ampicillin		8	
Quinolones	Nalidixic acid		16	
Sulfonamides	Sulfonamides		256	
Tetracyclines	Tetracycline		8	
Trimethoprim	Trimethoprim		2	

3.2 ENTEROCOCCUS, NON-PATHOGENIC

3.2.1 General evaluation of the national situation

3.2.2 Antimicrobial resistance in Enterococcus, non-pathogenic isolates

Table Cut-off values for antibiotic resistance of E. faecalis in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		512	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		32	

Table Cut-off values for antibiotic resistance of E. faecalis in Animals

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of E. faecalis in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		512	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of E. faecalis in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		512	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		32	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of E. faecium in Animals

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		128	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		1	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of E. faecium in Feed

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		128	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		1	
Tetracyclines	Tetracycline		2	

Table Cut-off values for antibiotic resistance of E. faecium in Food

Test Method Used	Standard methods used for testing

			Concentration (microg/ml)	Zone diameter (mm)
		Standard	Resistant >	Resistant <=
Aminoglycosides	Gentamicin		32	
	Streptomycin		128	
Amphenicols	Chloramphenicol		32	
Glycopeptides (Cyclic peptides, Polypeptides)	Vancomycin		4	
Macrolides	Erythromycin		4	
Oxazolidines	Linezolid		4	
Penicillins	Ampicillin		4	
Streptogramins	Quinupristin/Dalfopristin		1	
Tetracyclines	Tetracycline		2	

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1 ENTEROBACTER SAKAZAKII

4.1.1 General evaluation of the national situation

A. Cronobacter general evaluation

History of the disease and/or infection in the country

No known history of cases in Malta.

National evaluation of the recent situation, the trends and sources of infection

No cases of disease identified in Malta

Recent actions taken to control the hazard

Surveillance being done on infant milk formulations at the laboratory end.

Suggestions to the European Union for the actions to be taken

None so far

4.1.2 Cronobacter in foodstuffs

A. Cronobacter in foodstuffs

Monitoring system

Type of specimen taken

Milk

Methods of sampling (description of sampling techniques)

EC regulation 2073/2005 on microbiological criteria on food stuffs where in 30 samples of 10 grms all samples must be negative.

Definition of positive finding

Detection of Enterobacter sakazakii in any of the samples.

Diagnostic/analytical methods used

ISO/ts: 22964 /2006

Preventive measures in place

Monitoring programme.

4.2 HISTAMINE

4.2.1 General evaluation of the national situation

A. Histamine General evaluation

History of the disease and/or infection in the country

Malta has few reported cases of histame poisoning in humans every year. It may be under reported.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Most cases occur via canned tuna or from locally caught dolphin fish which were temperature mis-treated at some stage of food preparation.

4.3 STAPHYLOCOCCAL ENTEROTOXINS

4.3.1 General evaluation of the national situation

A. Staphylococcal enterotoxins general evaluation

History of the disease and/or infection in the country

Not common.

National evaluation of the recent situation, the trends and sources of infection

There are no particular trends being observed

Recent actions taken to control the hazard

Educational campaigns on food safety and hygiene undergoing.

5. FOODBORNE

Foodborne outbreaks are incidences of two or more human cases of the same disease or infection where the cases are linked or are probably linked to the same food source. Situation, in which the observed human cases exceed the expected number of cases and where a same food source is suspected, is also indicative of a foodborne outbreak.

A. Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of foodborne outbreaks

Statutory notification system involving all physicians and laboratories. Epidemiological investigation done by epidemiologists at the Health promotion and Disease Prevention Directorate, with field investigations performed by the Environmental Health Directorate of the Regulatory directorate of the Health Department.

Description of the types of outbreaks covered by the reporting:

All suspected types of food-borne outbreaks reported, however not all outbreaks are reported. All notified outbreaks are classified according to origin.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

There has been no major trend over the last decade in the number of outbreaks. Minor changes from year to year reflect random variability as the country is small.

Relevance of the different type of places of food production and preparation in outbreaks

All types of food-borne outbreaks are more common in households (30-45%).The next most common source are restaurants.

Evaluation of the severity and clinical picture of the human cases

No specific trends have been noticed.

Table Foodborne Outbreaks: summarised data

	Weak evidence or no vehicle outbreaks					
	Number of outbreaks	Human cases	Hospitalized	Deaths	Strong evidence Number of Outbreaks	Total number of outbreaks
Salmonella - S. Typhimurium	2	4	0	0	0	2
Salmonella - S. Enteritidis	3	7	2	0	0	3
Salmonella - Other serovars	3	8	0	0	0	3
Campylobacter	16	39	14	0	0	16
Listeria - Listeria monocytogenes	0	unknown	unknown	unknown	0	0
Listeria - Other Listeria	0	unknown	unknown	unknown	0	0
Yersinia	0	unknown	unknown	unknown	0	0
Escherichia coli, pathogenic - Verotoxigenic E. coli (VTEC)	0	unknown	unknown	unknown	0	0
Bacillus - B. cereus	0	unknown	unknown	unknown	0	0
Bacillus - Other Bacillus	0	unknown	unknown	unknown	0	0
Staphylococcal enterotoxins	0	unknown	unknown	unknown	0	0
Clostridium - Cl. botulinum	0	unknown	unknown	unknown	0	0
Clostridium - Cl. perfringens	0	unknown	unknown	unknown	0	0

	Weak evidence or no vehicle outbreaks					
	Number of outbreaks	Human cases	Hospitalized	Deaths	Strong evidence Number of Outbreaks	Total number of outbreaks
Clostridium - Other Clostridia	0	unknown	unknown	unknown	0	0
Other Bacterial agents - Brucella	0	unknown	unknown	unknown	0	0
Other Bacterial agents - Shigella	0	unknown	unknown	unknown	0	0
Other Bacterial agents - Other Bacterial agents	0	unknown	unknown	unknown	0	0
Parasites - Trichinella	0	unknown	unknown	unknown	0	0
Parasites - Giardia	0	unknown	unknown	unknown	0	0
Parasites - Cryptosporidium	0	unknown	unknown	unknown	0	0
Parasites - Anisakis	0	unknown	unknown	unknown	0	0
Parasites - Other Parasites	0	unknown	unknown	unknown	0	0
Viruses - Norovirus	1	19	0	0	0	1
Viruses - Hepatitis viruses	0	unknown	unknown	unknown	0	0
Viruses - Other Viruses	1	4	0	0	0	1
Other agents - Histamine	2	8	0	0	0	2
Other agents - Marine biotoxins	0	unknown	unknown	unknown	0	0
Other agents - Other Agents	0	unknown	unknown	unknown	0	0

	Weak evidence or no vehicle outbreaks					
	Number of outbreaks	Human cases	Hospitalized	Deaths	Strong evidence Number of Outbreaks	Total number of outbreaks
Unknown agent	7	114	4	0	0	7