



MALTA

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

TRENDS AND SOURCES OF ZOONOSSES AND ZOO NOTIC AGENTS IN HUMANS, FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

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

IN 2007

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Malta**

Reporting Year: **2007**

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/EC¹. 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 2007. 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.

¹ 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.

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks		Number of slaughtered animals		Livestock numbers (live animals)		Number of holdings	
			Year*		Year*		Year*		Year*
Cattle (bovine animals)	dairy cows and heifers	144		2515		10499		144	
	mixed herds (1)							277	
	meat production animals (2)	277		2532		3460			
	calves (under 1 year)					5424			
	in total	421		5047		19383		421	
Deer	farmed - in total	0							
Ducks	mixed flocks/holdings	0							
	grandparent breeding flocks	0							
	elite breeding flocks	0							
	parent breeding flocks	0							
	meat production flocks	0							
	breeding flocks, unspecified - in total	0							
	in total	0							
Gallus gallus (fowl)	parent breeding flocks for egg production line	0							
	grandparent breeding flocks for egg production line	0							
	breeding flocks, unspecified - in total	0							
	elite breeding flocks, unspecified - in total	0							
	parent breeding flocks, unspecified - in total	0							
	mixed flocks/holdings	0							
	elite breeding flocks for egg production line	0							
	grandparent breeding flocks for meat production line	0							
	parent breeding flocks for meat production line	0							
	breeding flocks for meat production line - in total	0							
	laying hens	64				425000			
	elite breeding flocks for meat production line	0							

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	grandparent breeding flocks, unspecified - in total	0						
	broilers	131	2871352	3400000				
	breeding flocks for egg production line - in total	0						
	in total	195						
Geese	grandparent breeding flocks	0						
	mixed flocks/holdings	0						
	elite breeding flocks	0						
	parent breeding flocks	0						
	meat production flocks	0						
	breeding flocks, unspecified - in total	0						
	in total	0						
Goats	milk goats (3)			1712				
	animals under 1 year	0	1318					
	meat production animals (4)	0						
	animals over 1 year	0	1057	4907				
	mixed herds	1800				1848		
	in total	1800						
Pigs	breeding animals		2302	6884				
	fattening pigs		91987	55000				
	mixed herds	174						
	in total	174	94289	61884		174		
Reindeers	farmed - in total	0						
Sheep	animals over 1 year		3581	9993				
	milk ewes			3488				
	mixed herds (5)	1800				1848		
	animals under 1 year (lambs)		2037	2037				
	in total	1800						
Solipeds, domestic	horses - in total	0						
Turkeys	grandparent breeding flocks	0						
	meat production flocks	1						
	elite breeding flocks	0						
	breeding flocks, unspecified - in total	0						
	parent breeding flocks	0						
	mixed flocks/holdings	0						
	in total (6)	1						
Wild boars	farmed - in total	0						

(1): Bovine farms in Malta consist of dairy breeds the males of which are fattened for slaughter.

(2): These slaughter records include animals under a year.

(3): These farms are mixed farm having both goats and sheep

(4): These farms are mainly dairy farms with a small number of animals slaughtered for meat.

(5): These farms are mixed farm having both goats and sheep. Although these farms are predominantly dairy and cheese producing units they from time

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to time sell some animals for slaughter.

(6): Around 600 day old birds were imported from EU countries and reared in small batches of less than 50 by small producers. Only one large holding reared a batch of 200.

2. INFORMATION ON SPECIFIC ZONOSSES 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

2.1.2. Salmonellosis in humans

A. Salmonellosis in humans

Reporting system in place for the human cases

hospital and private physician and laboratory mandatory notification system

Case definition

Clinical description:

Clinical picture compatible with salmonellosis, e.g. diarrhoea, abdominal pain, nausea and sometimes vomiting.

Laboratory Criteria for Diagnosis:

Isolation of *Salmonella* from a clinical specimen.

Case definition:

Probable: A laboratory confirmed isolate without clinical information or a case with clinical symptoms that has an epidemiological link.

Confirmed case: A clinically compatible case that is laboratory confirmed.

Diagnostic/ analytical methods used

Isolation of *Salmonella* from a clinical specimen

Notification system in place

notification system as above

History of the disease and/ or infection in the country

Salmonellosis has been persistently present in Malta for many years.

there has been a persistent decline since 1994 to about 15/ 10,000 population.

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

see above

Relevance as zoonotic disease

Still of relevance as the zoonotic disease causes a considerable amount of human illness

Table Salmonella in humans - Species/ serotype distribution

Salmonella	Cases 100	Cases Inc. 25	Autochthon cases 100	Autochthon Inc. 25	Imported cases 0	Imported Inc. 0	Unknown status 0
S. Birmingham	1	0.25	1	0.25	0	0	0
S. Bredeney	1	0.25	1	0.25	0	0	0
S. Derby	2	0.5	2	0.5	0	0	0
S. Enteritidis	55	13.75	55	13.75	0	0	0
S. Grampian	1	0.25	1	0.25	0	0	0
S. Haifa	1	0.25	1	0.25	0	0	0
S. Heidelberg	1	0.25	1	0.25	0	0	0
S. Indiana	1	0.25	1	0.25	0	0	0
S. Infantis	4	1	4	1	0	0	0
S. Kedougou	3	0.75	3	0.75	0	0	0
S. Kentucky	1	0.25	1	0.25	0	0	0
S. Livingstone	2	0.5	2	0.5	0	0	0
S. Mbandaka	1	0.25	1	0.25	0	0	0
S. Mkamba	1	0.25	1	0.25	0	0	0
S. Sandiego	1	0.25	1	0.25	0	0	0
S. Typhimurium	23	5.75	23	5.75	0	0	0
S. Paratyphi	1	0.25	1	0.25	0	0	0

Table Salmonella in humans - Age distribution (Part A)

Age Distribution	S. Birmingham			S. Bredeney			S. Derby			S. Enteritidis			S. Grampian			S. Haifa		
	All	M	F	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	2	1	1	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	1	0	1	14	6	8	1	1	0	1	1	0
5 to 14 years	0	0	0	0	0	0	1	0	1	20	18	2	1	0	1	0	0	0
15 to 24 years	0	0	0	0	0	0	0	0	0	4	3	1	0	0	0	0	0	0
25 to 44 years	0	0	0	1	0	1	0	0	0	2	1	1	0	0	0	0	0	0
45 to 64 years	1	0	1	0	0	0	0	0	0	5	2	3	0	0	0	0	0	0
65 years and older	0	0	0	0	0	0	0	0	0	6	1	5	0	0	0	0	0	0
Age unknown		0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Total :	1	0	1	1	0	1	2	0	2	54	33	21	2	1	1	1	1	0

Table Salmonella in humans - Age distribution (Part B)

Age Distribution	S. Heidelberg			S. Indiana			S. Infantis			S. Kedougou			S. Kentucky			S. Livingstone		
	All	M	F	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	0	1
1 to 4 years	0	0	0	0	00	0	0	0	0	1	0	1	0	0	0	1	0	1
5 to 14 years	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15 to 24 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 to 44 years	0	0	0	0	0	0	2	1	1	1	0	1	0	0	0	0	0	0
45 to 64 years	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
65 years and older	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0
Age unknown	0	0	0	2	0	2	1	1	0	0	0	0	0	0	0	0	0	0
Total :	1	1	0	2	0	2	4	2	2	3	0	3	2	0	1	2	0	2

Table Salmonella in humans - Age distribution (Part C)

Age Distribution	S. Mbandaka			S. Mkamba			S. Sandiego			S. Typhimurium			Salmonella spp.			S. Paratyphi		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	1	0	1	0	0	0	4	0	4	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0	11	7	4	0	0	0	0	0	0
5 to 14 years	0	0	0	0	0	0	1	1	0	2	1	1	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	0	0	0
25 to 44 years	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0
45 to 64 years	1	0	1	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
65 years and older	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Age unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Total :	1	0	1	1	0	1	1	1	0	23	8	15	0	0	0	1	1	0

Table Salmonella in humans - Seasonal distribution (Part A)

Month	S. Birmingham		S. Bredeney		S. Derby		S. Enteritidis		S. Grampian		S. Haifa		S. Heidelberg		S. Indiana	
	Cases		Cases		Cases		Cases		Cases		Cases		Cases		Cases	
January	00		0		0		7		0		0		0		0	
February	0		0		0		10		0		0		0		0	
March	0		0		1		3		0		0		0		0	
April	0		0		0		3		0		0		0		0	
May	0		0		1		7		0		0		1		0	
June	0		0		0		5		0		0		0		0	
July	0		0		0		7		0		0		0		0	
August	0		0		0		3		2		0		0		1	
September	1		0		0		4		0		0		0		0	
October	0		0		0		3		0		1		0		0	
November	0		1		0		1		0		0		0		0	
December	0		0		0		2		0		0		0		0	
not known	0		0		0		0		0		0		0		0	
Total :	1		1		2		55		2		1		1		1	

Table Salmonella in humans - Seasonal distribution (Part B)

Month	S. Infantis	S. Kedougou	S. Kentucky	S. Livingstone	S. Mbandaka	S. Mkamba	S. Sandiego	S. Typhimurium
	Cases	Cases	Cases	Cases	Cases	Cases	Cases	Cases
January	0	0	1	0	0	0	0	2
February	1	0	0	1	1	0	0	0
March	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0
May	1	0	0	0	0	0	0	1
June	0	0	0	0	0	0	0	2
July	0	1	00	0	0	0	1	8
August	0	0	0	0	0	1	0	4
September	0	0	0	1	0	0	0	3
October	0	2	0	0	0	0	0	1
November	1	0	0	0	0	0	0	1
December	1	0	1	0	0	0	0	1
not known	0	0	0	0	0	0	0	0
Total :	4	3	2	2	1	1	1	23

Table Salmonella in humans - Seasonal distribution (Part C)

Month	Salmonella spp.	
	Cases	
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		
not known		
Total :		0

2.1.3. Salmonella in foodstuffs

2.1.4. Salmonella in animals

2.1.5. Salmonella in feedingstuffs

2.1.6. Salmonella serovars and phagetype distribution

The methods of collecting, isolating and testing of the Salmonella isolates are described in the chapters above respectively for each animal species, foodstuffs and humans. The serotype and phagetype distributions can be used to investigate the sources of the Salmonella infections in humans. Findings of same serovars and phagetypes in human cases and in foodstuffs or animals may indicate that the food category or animal species in question serves as a source of human infections. However as information is not available from all potential sources of infections, conclusions have to be drawn with caution.

Table Salmonella Enteritidis phagetypes in humans

Phagetype		humans	
Sources of isolates (*)		M	C
Number of isolates in the laboratory	N=	55	55
Number of isolates phagetyped	N=	0	0

Footnote

(*) M : Monitoring, C : Clinical

NO PHAGE TYPING CAPACITY IS AVAILABLE IN MALTA

Table Salmonella Typhimurium phagetypes in humans

Phagetype		humans	
Sources of isolates (*)		M	C
Number of isolates in the laboratory	N=	23	23
Number of isolates phagetyped	N=	0	0

Footnote

(*) M : Monitoring, C : Clinical
no phage typing capacity is available in Malta

2.1.7. Antimicrobial resistance in Salmonella isolates

Antimicrobial resistance is the ability of certain microorganisms to survive or grow in the presence of a given concentration of antimicrobial agent that usually would kill or inhibit the microorganism species in question. Antimicrobial resistant Salmonella strains may be transferred from animals or foodstuffs to humans.

Table Antimicrobial susceptibility testing in S. Birmingham

n = Number of resistant isolates		
S. Birmingham		
humans		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		1
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	1	
Fluoroquinolones		
Ciprofloxacin	1	
Penicillins		

Table Antimicrobial susceptibility testing in S. Bredeney

n = Number of resistant isolates		
S. Bredeney		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	1	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	1	
Fluoroquinolones		
Ciprofloxacin	1	

Table Antimicrobial susceptibility testing in S. Derby

n = Number of resistant isolates		
S. Derby		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	2	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	2	
Fluoroquinolones		
Ciprofloxacin	1	
Penicillins		
Ampicillin	2	

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella Enteritidis

n = Number of resistant isolates		
	S. Enteritidis	
	humans	
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		54
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	51	
Fluoroquinolones		
Ciprofloxacin	51	3
Penicillins		
Ampicillin	51	7

Table Antimicrobial susceptibility testing in S. Grampian

n = Number of resistant isolates		
S. Grampian		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	2	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	1	
Penicillins		
Ampicillin	1	

Table Antimicrobial susceptibility testing in S. Haifa

n = Number of resistant isolates		
S. Haifa		
humans		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		1
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	1	
Penicillins		

Table Antimicrobial susceptibility testing in S. Heidelberg

n = Number of resistant isolates		
S. Heidelberg		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	1	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	1	
Penicillins		
Ampicillin	1	

Table Antimicrobial susceptibility testing in S. Indiana

n = Number of resistant isolates		
S. Indiana		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	2	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	2	
Penicillins		
Ampicillin	2	

Table Antimicrobial susceptibility testing in *S. Infantis*

n = Number of resistant isolates		
S. Infantis		
	humans	
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		4
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	4	
Penicillins		
Ampicillin	4	1

Table Antimicrobial susceptibility testing in S. Kedougou

n = Number of resistant isolates		
S. Kedougou		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	3	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	3	
Fluoroquinolones		
Ciprofloxacin	3	
Penicillins		

Table Antimicrobial susceptibility testing in S. Kentucky

n = Number of resistant isolates		
S. Kentucky		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	2	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	2	
Fluoroquinolones		
Penicillins		

Table Antimicrobial susceptibility testing in S. Livingstone

n = Number of resistant isolates		
S. Livingstone		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	2	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	2	
Fluoroquinolones		
Ciprofloxacin	2	
Penicillins		
Ampicillin	2	

Table Antimicrobial susceptibility testing in S. Mbandaka

n = Number of resistant isolates		
S. Mbandaka		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	1	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	1	
Fluoroquinolones		
Ciprofloxacin	1	
Penicillins		
Ampicillin	1	

Table Antimicrobial susceptibility testing in S. Mkamba

n = Number of resistant isolates		
S. Mkamba		
	humans	
Isolates out of a monitoring programme	no	
Number of isolates available in the laboratory	1	
Antimicrobials:	N	
Aminoglycosides		
Gentamicin	1	
Fluoroquinolones		
Ciprofloxacin	1	
Penicillins		
Ampicillin	1	

Table Antimicrobial susceptibility testing in S. Sandiego

n = Number of resistant isolates		
S. Sandiego		
humans		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		1
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	1	
Fluoroquinolones		
Ciprofloxacin	1	
Penicillins		
Ampicillin	1	1

Table Antimicrobial susceptibility testing of Salmonella in humans, Salmonella Typhimurium

n = Number of resistant isolates		
S. Typhimurium		
humans		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		23
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	23	1
Fluoroquinolones		
Ciprofloxacin	23	
Penicillins		
Ampicillin	23	4

Table Antimicrobial susceptibility testing in S. Paratyphi

n = Number of resistant isolates		
S. Paratyphi		
humans		
Isolates out of a monitoring programme		no
Number of isolates available in the laboratory		1
Antimicrobials:	N	n
Aminoglycosides		
Gentamicin	1	
Fluoroquinolones		
Ciprofloxacin	1	
Penicillins		
Ampicillin	1	1

Table Breakpoints for antibiotic resistance testing in Humans

Test Method Used

Standards used for testing

NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest		Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol										
Florfenicol										
Tetracyclines										
Tetracyclin										
Fluoroquinolones										
Ciprofloxacin		0.5	4	4						
Enrofloxacin										
Quinolones										
Nalidixic acid										
Trimethoprim										
Sulfonamides										
Sulfonamide										
Aminoglycosides										
Streptomycin										
Gentamicin		0.5		16						
Neomycin										
Kanamycin										
Trimethoprim + sulfonamides		10		320						
Cephalosporins										
3rd generation cephalosporins										
Penicillins										
Ampicillin		.25		32						

Footnote

DISC METHOD IS NOT USED

2.2. CAMPYLOBACTERIOSIS

2.2.1. General evaluation of the national situation

2.2.2. Campylobacteriosis in humans

Table Campylobacter in humans - Species/ serotype distribution

Campylobacter	Cases	Cases Inc. 23.25	Autochthon cases	Autochthon Inc. 23.25	Imported cases	Imported Inc.	Unknown status
C. coli	12	3	12	3	0	0	0
C. jejuni	64	16	64	16	0	0	0
C. lari	1	0.25	1	0.25	0	0	0
C. upsaliensis	0	0	0	0	0	0	0
Campylobacter spp., unspecified	16	4	16	4	0	0	0

Table Campylobacter in humans - Age distribution

Age Distribution	C. coli			C. jejuni			C. lari			Campylobacter spp., unspecified			
	All	M	F	All	M	F	All	M	F	All	M	F	
<1 year 1 to 4 years 5 to 14 years 15 to 24 years 25 to 44 years 45 to 64 years 65 years and older Age unknown	1	1	0	7	4	3				0	0	0	
	0	0	0	19	8	11				4	3	1	
	4	2	2	12	6	6	1	1	0	3	3	0	
	0	0	0	6	2	4	0	0	0	2	1	1	
	4	1	3	13	5	8	0	0	0	1	0	1	
	0	0	0	1	1	0	0	0	0	1	0	1	
	2	0	2	6	4	2	0	0	0	4	1	3	
	1	0	1	0	0	0	0	0	0	1	1	0	
Total :	12	4	8	64	30	34	1	1	0	16	9	7	

Table Campylobacter in humans - Seasonal distribution

Month	C. coli		C. jejuni		C. lari		C. upsaliensis		Campylobacter spp., unspecified	
	Cases		Cases		Cases		Cases		Cases	
January	0		4		1		0		5	
February	2		3		0		0		2	
March	0		3		0		0		0	
April	1		1		0		0		1	
May	1		10		0		0		4	
June	3		11		0		0		0	
July	1		11		0		0		0	
August	2		9		0		0		2	
September	0		3		0		0		0	
October	0		5		0		0		1	
November	0		1		0		0		0	
December	2		3		0		0		1	
not known	0		0		0		0		0	
Total :	12		64		1		0		16	

2.2.3. Campylobacter in foodstuffs

2.2.4. Campylobacter in animals

2.2.5. Antimicrobial resistance in Campylobacter isolates

Table Antimicrobial susceptibility testing of Campylobacter in humans

n = Number of resistant isolates		
	Campylobacter spp., unspecified	
	humans	
Isolates out of a monitoring programme		
Number of isolates available in the laboratory	93	
Antimicrobials:	N	n
Fully sensitive	71	
Macrolides		
Ervthromycin	71	0

Table Breakpoints used for antimicrobial susceptibility testing in Humans

Test Method Used

E-test

Standards used for testing

NCCLS

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content microg	Breakpoint Zone diameter (mm)		
		Susceptible ≤	Intermediate	Resistant >	lowest	highest		Susceptible ≥	Intermediate	Resistant ≤
Tetracyclines										
Tetracyclin										
Fluoroquinolones										
Ciprofloxacin										
Quinolones										
Nalidixic acid										
Aminoglycosides										
Gentamicin										
Macrolides										
Erythromycin		4		4	0.16	256				
Penicillins										
Ampicillin										

Footnote

A number of campylobacter did not grow on sub cultures and therefore sensitivity testing was not possible. Disc content method is not used.

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

Listeriosis is poorly recorded in Malta and poorly sought.

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

No notified cases

Suggestions to the Community for the actions to be taken

greater awareness is necessary amongst physicians and population.

2.3.2. Listeriosis in humans

2.3.3. Listeria in foodstuffs

2.3.4. Listeria in animals

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 - Age distribution**

Escherichia coli, pathogenic	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
HUS	0	0	0	0	0	0
- clinical cases	0	0	0	0	0	0
- lab. confirmed cases	0	0	0	0	0	0
- caused by O157 (VT+)	0	0	0	0	0	0
- caused by other VTEC	0	0	0	0	0	0
E.coli infect. (except HUS)	10	2.5	10	2.5	0	0
- clinical cases	10	2.5	10	2.5	0	0
- laboratory confirmed	10	2.5	10	2.5	0	0
- caused by O157 (VT+)	6	1.5	6	1.5	0	0
- caused by other VTEC	4	1	4	1	0	0

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

Age Distribution	Verotoxigenic E. coli (VTEC)			VTEC O157:H7			VTEC non-O157		
	All	M	F	All	M	F	All	M	F
<1 year	1	1	0	0	0	0	1	1	0
1 to 4 years	3	1	2	1	1	0	2	0	2
5 to 14 years	0	0	0	0	0	0	0	0	0
15 to 24 years	0	0	0	0	0	0	0	0	0
25 to 44 years	0	0		0	0	0	0	0	0
45 to 64 years	2	0	2	2	0	2	0	0	0
65 years and older	0	0	0	0	0	0	0	0	0
Age unknown	4	2	1	3	2	1	0	0	0
Total :	10	4	5	6	3	3	3	1	2

2.4.3. Escherichia coli, pathogenic in foodstuffs

2.4.4. Escherichia coli, pathogenic in animals

2.5. TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1. General evaluation of the national situation

2.5.2. Tuberculosis, Mycobacterial Diseases in humans

Table Mycobacterium in humans - Species/ serotype distribution

Mycobacterium	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
M. bovis	36	9	14	3.5	22	5.5
M. tuberculosis	0	0	0	0	0	0
Reactivation of previous cases	36	9	14	3.5	22	5.5

Table Mycobacterium in humans - Age distribution

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

2.5.3. Mycobacterium in animals

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified
Goats		single	287	0	0	0	0

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

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 examinations	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	421	19383	421	100	0	0					
Total	421	19383	421	100	0	0		0	0	0	0

(*) Legend:

In column "Interval between routine tuberculin tests" use the following numeric codes: (0) no routine tests; (1) tests once a year; (2) tests each two years; (3) tests each three years concerning 24 month-old animals; (4) tests each 4 years; (5) others (please give details).

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

2.6.2. Brucellosis in humans

A. Brucellosis in humans

Reporting system in place for the human cases

No human cases of brucellosis last year and for a number of years now.

Case definition

Clinical picture compatible with brucellosis, e.g. acute or insidious onset of fever, night sweats, undue fatigue, anorexia, weight loss, headache and arthralgia.

Laboratory Criteria for diagnosis:

Demonstration of a specific antibody response.

denonstration by immunoflorescence of Brucella species in a clinical specimen.

Isolation of Brucella species from a clonical specimen.

Probable case:

A clinically compatible case with an epidemiological link, or a case with an isolated high titre.

Confirmed:

A clinically compatible case that is laboratory confirmed.

Diagnostic/ analytical methods used

antibody titres.

Immunoflorescence

cultures of Brucella

Notification system in place

Hospital and private physician/ laboratory mandatory notification system

History of the disease and/ or infection in the country

Brucellosis was very common after WW2 from fresh goat milk.

Brucella Melitensis was dicovered in Malta.

Last outbreak occurred in 1995.

Since 1996 ther has been no cases reported to us.

Relevance as zoonotic disease

SURVEILLANCE from the veterinary end of lambs, goats and cows.

Table Brucella in humans - Species/ serotype distribution

Brucella	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
B. abortus	0	0	0	0	0	0
B. melitensis	0	0	0	0	0	0
B. suis	0	0	0	0	0	0
Occupational cases	0	0	0	0	0	0

Table Brucella in humans - Age distribution

Age Distribution	B. abortus			B. melitensis			Brucella spp.		
	All	M	F	All	M	F	All	M	F
<1 year	0	0	0	0	0	0	0	0	0
1 to 4 years	0	0	0	0	0	0	0	0	0
5 to 14 years	0	0	0	0	0	0	0	0	0
15 to 24 years	0	0	0	0	0	0	0	0	0
25 to 44 years	0	0	0	0	0	0	0	0	0
45 to 64 years	0	0	0	0	0	0	0	0	0
65 years and older	0	0	0	0	0	0	0	0	0
Age unknown	0	0	0	0	0	0	0	0	0
Total :	0	0	0	0	0	0	0	0	0

2.6.3. Brucella in foodstuffs

2.6.4. Brucella in animals

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

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases											
							Serological tests			Examination of bulk milk samples			Information about abortions		Epidemiological investigation						
															Number of abortions due to Brucella abortus		Number of animals tested with serological blood tests		Number of suspended herds		Number of positive animals
Herds	Animals	Number of herds	%	Number of herds	%	Number of infected herds tested	Number of animals tested	Number of infected animals or pools tested	Number of bovine herds tested	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	Serologically	I&T	Number of animals examined logically	Number of animals positive microbiologically	Number of animals positive logically	
MALTA	421	19383	421	100	1	0.238	7907	1	114	0	0	0	0	1	0	1			0	0	
	421	19383	421	100	1	0.238	7907	1	114	0	0	0	0	1	0	1	0	0	0	0	
Total																					

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

Region	Total number of existing ovine / caprine		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 examined serologically	Number of animals examined microscopically	Number of animals positive serologically	Number of animals positive microscopically	Number of suspected herds
MALTA	2146	15660	2146	100	0	0			0	1647		0	0	0
	2146	15660	2146	100	0	0	0	1647	0	1647		0	0	0
Total														

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

2.7.2. Yersiniosis in humans

2.7.3. Yersinia in foodstuffs

2.7.4. Yersinia in animals

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

trichinellosis not reported in Malta

2.8.2. Trichinellosis in humans

Table Trichinella in humans - Species/ serotype distribution

Trichinella	Cases	Cases Inc.	Autochthon cases	Autochthon Inc.	Imported cases	Imported Inc.
Trichinella spp.	0	0	0	0	0	0

Table Trichinella in humans - Age distribution

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

2.8.3. Trichinella in animals

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified
Pigs						
fattening pigs						
raised under controlled housing conditions in integrated production system	National Veterinary Laboratory	animal	6162	0	0	0
Solipeds, domestic						
horses	National Veterinary Laboratory	animal	111	0	0	0

2.9. ECHINOCOCCOSIS

2.9.1. General evaluation of the national situation

2.9.2. Echinococcosis in humans

A. Echinococcus spp. in humans

Reporting system in place for the human cases

No Echinococcosis is recorded in Malta

2.9.3. Echinococcus in animals

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

2.10.2. Toxoplasmosis in humans

2.10.3. Toxoplasma in animals

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

MALTA has no rabies in humans or animals

2.11.2. Rabies in humans

A. Rabies in humans

History of the disease and/ or infection in the country

malta has no human or animal rabies.

2.11.3. Lyssavirus (rabies) in animals

2.12. Q-FEVER

2.12.1. General evaluation of the national situation

2.12.2. Coxiella (Q-fever) in animals

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. ENTEROCOCCUS, NON-PATHOGENIC

3.1.1. General evaluation of the national situation

3.1.2. Antimicrobial resistance in Enterococcus, non-pathogenic isolates

3.2. *ESCHERICHIA COLI, NON-PATHOGENIC*

3.2.1. General evaluation of the national situation

3.2.2. Antimicrobial resistance in *Escherichia coli*, non-pathogenic isolates

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1. HISTAMINE

4.1.1. General evaluation of the national situation

4.1.2. Histamine in foodstuffs

Table Histamine in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units in non- conformity	≤ 100 mg/ kg	>100 - ≤ 200 mg/ kg	>200 - ≤ 400 mg/ kg	> 400 mg/ kg
Fish									
Fishery products from fish species associated with a high amount of histidine - not enzyme matured		single	200g	5	0	5	0	0	0

4.2. *ENTEROBACTER SAKAZAKII*

4.2.1. General evaluation of the national situation

4.2.2. Enterobacter sakazakii in foodstuffs

4.3. STAPHYLOCOCCAL ENTEROTOXINS

4.3.1. General evaluation of the national situation

4.3.2. Staphylococcal enterotoxins in foodstuffs

5. FOODBORNE OUTBREAKS

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.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Number of possible outbreaks	Number of verified outbreaks
Bacillus	1	1	0
Campylobacter	6	6	0
Clostridium	0	0	0
Escherichia coli, pathogenic	2	2	0
Foodborne viruses	2	2	0
Listeria	0	0	0
Other agents	0	0	0
Parasites	0	0	0
Salmonella	6	6	0
Staphylococcus	1	1	0
Unknown	39	39	0
Yersinia	0	0	0

