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 2010

# INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: Malta

Reporting Year:

| Laboratory name | Description | Contribution |
|---|---|---|
| National Veterinary Laboratory - Agriculture and Fisheries Regulation Division-Ministry for Rural Affairs and the Environment | | |

# 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 2010 .

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

2010

### 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 | 333 | | 2393 | | 3397 | | 333 | |
| | mixed herds | 127 | | | | | | 127 | |
| | dairy cows and heifers | 127 | | 3059 | | 9109 | | 127 | |
| | calves (under 1 year) | 358 | | 356 | | 4241 | | 358 | |
| | - in total | 358 | | 5808 | | 14810 | | 358 | |
| Deer | farmed - in total [1] | | | | | | | | |
| Ducks | grandparent breeding flocks [2] | | | | | | | | |
| | mixed flocks/holdings [3] | | | | | | | | |
| | parent breeding flocks [4] | | | | | | | | |
| | meat production flocks [5] | | | | | | | | |
| | breeding flocks, unspecified - in total [6] | | | | | | | | |
| | elite breeding flocks [7] | | | | | | | | |
| | - in total [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) | elite breeding flocks, unspecified - in total [9] | | | | | | | | |
| | mixed flocks/holdings [10] | | | | | | | | |
| | parent breeding flocks, unspecified - in total [11] | | | | | | | | |
| | breeding flocks, unspecified - in total [12] | | | | | | | | |
| | grandparent breeding flocks for egg production line [13] | | | | | | | | |
| | parent breeding flocks for egg production line [14] | | | | | | | | |
| | breeding flocks for egg production line - in total [15] | | | | | | | | |
| | broilers | 798 | 2010 | 2678025 | 2010 | 2932479 | 2010 | 89 | 2010 |
| | grandparent breeding flocks, unspecified - in total [16] | | | | | | | | |
| | elite breeding flocks for meat production line [17] | | | | | | | | |
| | laying hens | 121 | 2010 | | | 382897 | 2010 | 46 | 2010 |
| | breeding flocks for meat production line - in total [18] | | | | | | | | |
| | parent breeding flocks for meat production line [19] | | | | | | | | |

## 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) | grandparent breeding flocks for meat production line [20] | | | | | | | | |
| | elite breeding flocks for egg production line [21] | | | | | | | | |
| Geese | grandparent breeding flocks [22] | | | | | | | | |
| | breeding flocks, unspecified - in total [23] | | | | | | | | |
| | mixed flocks/holdings [24] | | | | | | | | |
| | meat production flocks [25] | | | | | | | | |
| | elite breeding flocks [26] | | | | | | | | |
| | parent breeding flocks [27] | | | | | | | | |
| Goats | mixed herds | | | 763 | 2010 | | | | |
| | meat production animals [28] | 345 | | | | | | | |
| | animals over 1 year | | | 219 | 2010 | | | | |
| | milk goats | 3814 | | | | | | | |
| | animals under 1 year | 757 | | 544 | 2010 | | | | |
| Pigs | breeding animals [29] | 1 | | | | | | | |

## 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* |
| Pigs | fattening pigs [30] | 17 | | 69015 | 2010 | 48586 | | | |
| | mixed herds [31] | 144 | | | | | | | |
| | breeding animals - unspecified - sows and gilts [32] | 3 | | 2215 | 2010 | 5286 | | | |
| | - in total | 165 | | 83795 | 2010 | 53872 | | | |
| Reindeers | farmed - in total [33] | | | | | | | | |
| Sheep | animals over 1 year | | | 2220 | 2010 | | | | |
| | mixed herds | 1395 | | | | | | | |
| | milk ewes | | | 2012 | 2010 | 9077 | | | |
| | meat production animals | | | 805 | 2010 | 450 | | | |
| | animals under 1 year (lambs) | | | 597 | 2010 | 2153 | | | |
| Solipeds, domestic | horses - in total | | | 161 | | | | | |
| Turkeys | parent breeding flocks [34] | | | | | | | | |
| | grandparent breeding flocks [35] | | | | | | | | |
| | breeding flocks, unspecified - in total [36] | | | | | | | | |

## 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 | elite breeding flocks [37)] | | | | | | | | |
| | meat production flocks [38)] | | | | | | | | |
| | mixed flocks/holdings [39)] | | | | | | | | |
| Wild boars | farmed - in total [40)] | | | | | | | | |

Comments:

[1)] No dear are farmed in the Maltese Islands

[2)] No ducks are farmed in the Maltese Islands

[3)] No ducks are farmed in the Maltese Islands Islands

[4)] No ducks are farmed in the Maltese IslandsIslands

[5)] No ducks are farmed in the Maltese Islands

[6)] No ducks are farmed in the Maltese Islands

[7)] No ducks are farmed in the Maltese Islands

[8)] No ducks are farmed

[9)] There are no elite breeding flocks

[10)] There are parent breeding flocks

[11)] There are no parent breeding flocks

[12)] There are no breeding flocks,

[13)] There are no grandparent breeding flocks for egg production line

## Table Susceptible animal populations

Comments:

[14] There are parent breeding flocks for egg production line

[15] There are no breeding flocks for egg production line

[16] There are grandparent breeding flocks,

[17] There are elite breeding flocks for meat production line

[18] There are breeding flocks for meat production line

[19] There are parent breeding flocks for meat production

[20] There are no grandparent breeding flocks for meat production line

[21] There are no elite breeding flocks for egg production line

[22] There are no grandparent breeding flocks

[23] There are no breeding flocks, unspecified

[24] There are no mixed flocks/holdings

[25] There are no meat production flocks

[26] There are no elite breeding flocks

[27] There are no parent breeding flocks

[28] only male animals are represented here

[29] breeding only

[30] fattening only

[31] farrrow to finish

[32] multiplier units

[33] No Reindeers are farmed in Malta

[34] There are no parent breeding flocks in the Maltese Islands

[35] There are no grandparent breeding flocks in the Maltese Islands

## Table Susceptible animal populations

Comments:

[36] There are no breeding flocks, unspecified in the Maltese Islands

[37] There are no inelite breeding flocks the Maltese Islands

[38] There are no meat production flocks

[39] There are no mixed flocks/holdings in the Maltese Islands

[40] There are no wild boars in the Maltese Islands

# 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 | 159 | 38.44 | 159 | 38.44 | 0 | 0 | 0 |
| S. Enteritidis | 72 | 17.43 | 72 | 17.43 | 0 | 0 | 0 |
| S. Typhimurium | 37 | 8.95 | 37 | 8.95 | 0 | 0 | 0 |
| S. Infantis | 4 | 0.96 | 4 | 0.96 | 0 | 0 | 0 |
| S. Bredeney | 1 | 0.24 | 1 | 0.24 | 0 | 0 | 0 |
| S. Haifa | 3 | 0.72 | 3 | 0.72 | 0 | 0 | 0 |
| S. Tumodi | 3 | 0.72 | 3 | 0.72 | 0 | 0 | 0 |
| S. Livingstone | 13 | 3.14 | 13 | 3.14 | 0 | 0 | 0 |
| S. Give | 1 | 0.24 | 1 | 0.24 | 0 | 0 | 0 |
| S. Sandiego | 1 | 0.24 | 1 | 0.24 | 0 | 0 | 0 |
| Salmonella spp. | 12 | 2.9 | 12 | 2.9 | 0 | 0 | 0 |
| S. Paratyphi A | 1 | 0.24 | 1 | 0.24 | 0 | 0 | 0 |
| S. Kentucky | 11 | 2.66 | 11 | 2.66 | 0 | 0 | 0 |

## Table Salmonella in humans - Age distribution

| Age distribution | S. Enteritidis | | | S. Typhimurium | | | Salmonella spp. | | | S. Bredeney | | | S. Give | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All | M | F | All | M | F | All | M | F | All | M | F | All | M | F |
| <1 year | 2 | 0 | 2 | 4 | 3 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 to 4 years | 30 | 21 | 9 | 15 | 8 | 7 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 to 14 years | 13 | 8 | 4 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 15 to 24 years | 5 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 25 to 44 years | 4 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 to 64 years | 5 | 1 | 4 | 3 | 2 | 1 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 years and older | 10 | 5 | 5 | 8 | 5 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Age unknown | 3 | 3 | 0 | 5 | 3 | 2 | 5 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total : | 72 | 42 | 29 | 37 | 22 | 15 | 15 | 11 | 4 | 1 | 1 | 0 | 1 | 0 | 1 |

| Age distribution | S. Haifa | | | S. Kentucky | | | S. Livingstone | | | S. Paratyphi A | | | S. Sandiego | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All | M | F | All | M | F | All | M | F | All | M | F | All | M | F |
| <1 year | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 to 4 years | 1 | 0 | 1 | 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 | 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 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 to 64 years | 2 | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

## Table Salmonella in humans - Age distribution

| Age distribution | S. Haifa | | | S. Kentucky | | | S. Livingstone | | | S. Paratyphi A | | | S. Sandiego | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All | M | F | All | M | F | All | M | F | All | M | F | All | M | F |
| 65 years and older | 0 | 0 | 0 | 7 | 0 | 7 | 10 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Age unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total : | 3 | 0 | 3 | 11 | 2 | 9 | 13 | 4 | 9 | 1 | 1 | 0 | 1 | 0 | 1 |

| Age distribution | S. Species | | | S. Tumodi | | |
|---|---|---|---|---|---|---|
| | All | M | F | 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 | | | | 3 | 1 | 2 |
| Age unknown | | | | 0 | 0 | 0 |
| Total : | 0 | 0 | 0 | 3 | 1 | 2 |

### 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

| | Number of existing flocks | Source of information | Sampling unit | Units tested | Total units positive for Salmonella | S. Enteritidis | S. Hadar | S. Infantis | S. Typhimurium | S. Virchow | S. 1,4,[5],12:i:- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gallus gallus (fowl) - parent breeding flocks for egg production line - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks for egg production line - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks for egg production line - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - during rearing period | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks for egg production line - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks for egg production line - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - during rearing period | | | --- | | | | | | | | |

## Table Salmonella in breeding flocks of Gallus gallus

| | Number of existing flocks | Source of information | Sampling unit | Units tested | Total units positive for Salmonella | S. Enteritidis | S. Hadar | S. Infantis | S. Typhimurium | S. Virchow | S. 1,4,[5],12:i:- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - during rearing period | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - during rearing period | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks, unspecified - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks, unspecified - during rearing period | | | --- | | | | | | | | |

## Table Salmonella in breeding flocks of Gallus gallus

| | Number of existing flocks | Source of information | Sampling unit | Units tested | Total units positive for Salmonella | S. Enteritidis | S. Hadar | S. Infantis | S. Typhimurium | S. Virchow | S. 1,4,[5],12:i:- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gallus gallus (fowl) - parent breeding flocks, unspecified - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - parent breeding flocks, unspecified - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - during rearing period | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - unspecified | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - day-old chicks | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - during rearing period | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - adult | | | --- | | | | | | | | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - unspecified | | | --- | | | | | | | | |

## Table Salmonella in breeding flocks of Gallus gallus

| | Salmonella spp., unspecified |
|---|---|
| Gallus gallus (fowl) - parent breeding flocks for egg production line - day-old chicks | |
| Gallus gallus (fowl) - parent breeding flocks for egg production line - during rearing period | |
| Gallus gallus (fowl) - parent breeding flocks for egg production line - adult | |
| Gallus gallus (fowl) - parent breeding flocks for egg production line - unspecified | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - day-old chicks | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - during rearing period | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - adult | |
| Gallus gallus (fowl) - grandparent breeding flocks for egg production line - unspecified | |
| Gallus gallus (fowl) - elite breeding flocks for egg production line - adult | |
| Gallus gallus (fowl) - elite breeding flocks for egg production line - unspecified | |
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - day-old chicks | |
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - during rearing period | |

## Table Salmonella in breeding flocks of Gallus gallus

| | Salmonella spp., unspecified |
|---|---|
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult | |
| Gallus gallus (fowl) - parent breeding flocks for broiler production line - unspecified | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - day-old chicks | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - during rearing period | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - adult | |
| Gallus gallus (fowl) - grandparent breeding flocks for broiler production line - unspecified | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - day-old chicks | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - during rearing period | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - adult | |
| Gallus gallus (fowl) - elite breeding flocks for broiler production line - unspecified | |
| Gallus gallus (fowl) - parent breeding flocks, unspecified - day-old chicks | |
| Gallus gallus (fowl) - parent breeding flocks, unspecified - during rearing period | |

## Table Salmonella in breeding flocks of Gallus gallus

| | Salmonella spp., unspecified |
|---|---|
| Gallus gallus (fowl) - parent breeding flocks, unspecified - adult | |
| Gallus gallus (fowl) - parent breeding flocks, unspecified - unspecified | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - day-old chicks | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - during rearing period | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - adult | |
| Gallus gallus (fowl) - grandparent breeding flocks, unspecified - unspecified | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - day-old chicks | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - during rearing period | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - adult | |
| Gallus gallus (fowl) - elite breeding flocks, unspecified - unspecified | |

## Table Salmonella in other poultry

| | Number of existing flocks | Source of information | Sampling unit | Units tested | Total units positive for Salmonella | S. Enteritidis | S. Typhimurium | S. 1,4,[5],12:i:- | Salmonella spp., unspecified | S. Bredeney | S. Croft |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gallus gallus (fowl) - laying hens - day-old chicks | 0 | | --- | | | | | | | | |
| Gallus gallus (fowl) - laying hens - during rearing period | 0 | | --- | | | | | | | | |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official and industry sampling [1)] | 121 | National Veterinary Laboratory | Flock | 121 | 80 | 12 | 4 | 0 | 0 | 1 | 6 |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - sampling by industry | | | --- | | | | | | | | |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official sampling - suspect sampling | | | --- | | | | | | | | |
| Gallus gallus (fowl) - broilers - day-old chicks | 0 | | Batch | | | | | | | | |
| Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes - official and industry sampling [2)] | 798 | National Veterinary Laboratory | Flock | 587 | 193 | 21 | 3 | 0 | 0 | 2 | 12 |
| Turkeys - breeding flocks, unspecified - day-old chicks - at farm - Control and eradication programmes - official and industry sampling [3)] | | | | | | | | | | | |
| Turkeys - breeding flocks, unspecified - during rearing period - at farm - Control and eradication programmes - official and industry sampling [4)] | | | | | | | | | | | |
| Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes - official and industry sampling [5)] | | | | | | | | | | | |

## Table Salmonella in other poultry

| | Number of existing flocks | Source of information | Sampling unit | Units tested | Total units positive for Salmonella | S. Enteritidis | S. Typhimurium | S. 1,4,[5],12:i:- | Salmonella spp., unspecified | S. Bredeney | S. Croft |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes - official and industry sampling [6)] | | | | | | | | | | | |
| Ducks - breeding flocks, unspecified [7)] | | | | | | | | | | | |
| Ducks - meat production flocks [8)] | | | | | | | | | | | |
| Geese - breeding flocks, unspecified [9)] | | | | | | | | | | | |
| Geese - meat production flocks [10)] | | | | | | | | | | | |

| | S. Derby | S. Give | S. Goldcoast | S. Hadar | S. Haifa | S. I, monophasic strain | S. Infantis | S. Kedougou | S. Kentucky | S. Leith | S. Lille |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gallus gallus (fowl) - laying hens - day-old chicks | | | | | | | | | | | |
| Gallus gallus (fowl) - laying hens - during rearing period | | | | | | | | | | | |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official and industry sampling [1)] | 1 | 5 | 0 | 0 | 3 | 0 | 3 | 5 | 35 | 0 | 1 |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - sampling by industry | | | | | | | | | | | |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official sampling - suspect sampling | | | | | | | | | | | |

## Table Salmonella in other poultry

| | S. Derby | S. Give | S. Goldcoast | S. Hadar | S. Haifa | S. I, monophasic strain | S. Infantis | S. Kedougou | S. Kentucky | S. Leith | S. Lille |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gallus gallus (fowl) - broilers - day-old chicks | | | | | | | | | | | |
| Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes - official and industry sampling [2)] | 6 | 6 | 7 | 1 | 18 | 2 | 14 | 15 | 79 | 1 | 0 |
| Turkeys - breeding flocks, unspecified - day-old chicks - at farm - Control and eradication programmes - official and industry sampling [3)] | | | | | | | | | | | |
| Turkeys - breeding flocks, unspecified - during rearing period - at farm - Control and eradication programmes - official and industry sampling [4)] | | | | | | | | | | | |
| Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes - official and industry sampling [5)] | | | | | | | | | | | |
| Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes - official and industry sampling [6)] | | | | | | | | | | | |
| Ducks - breeding flocks, unspecified [7)] | | | | | | | | | | | |
| Ducks - meat production flocks [8)] | | | | | | | | | | | |
| Geese - breeding flocks, unspecified [9)] | | | | | | | | | | | |
| Geese - meat production flocks [10)] | | | | | | | | | | | |

## Table Salmonella in other poultry

| | S. Lindenburg | S. Livingstone | S. Mbandaka | S. Meleagridis | S. Poitiers |
|---|---|---|---|---|---|
| Gallus gallus (fowl) - laying hens - day-old chicks | | | | | |
| Gallus gallus (fowl) - laying hens - during rearing period | | | | | |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official and industry sampling [1)] | 0 | 3 | 0 | 0 | 1 |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - sampling by industry | | | | | |
| Gallus gallus (fowl) - laying hens - adult - at farm - Control and eradication programmes - official sampling - suspect sampling | | | | | |
| Gallus gallus (fowl) - broilers - day-old chicks | | | | | |
| Gallus gallus (fowl) - broilers - before slaughter - at farm - Control and eradication programmes - official and industry sampling [2)] | 1 | 1 | 2 | 2 | 0 |
| Turkeys - breeding flocks, unspecified - day-old chicks - at farm - Control and eradication programmes - official and industry sampling [3)] | | | | | |
| Turkeys - breeding flocks, unspecified - during rearing period - at farm - Control and eradication programmes - official and industry sampling [4)] | | | | | |
| Turkeys - breeding flocks, unspecified - adult - at farm - Control and eradication programmes - official and industry sampling [5)] | | | | | |

## Table Salmonella in other poultry

| | S. Lindenburg | S. Livingstone | S. Mbandaka | S. Meleagridis | S. Poitiers |
|---|---|---|---|---|---|
| Turkeys - fattening flocks - before slaughter - at farm - Control and eradication programmes - official and industry sampling [6)] | | | | | |
| Ducks - breeding flocks, unspecified [7)] | | | | | |
| Ducks - meat production flocks [8)] | | | | | |
| Geese - breeding flocks, unspecified [9)] | | | | | |
| Geese - meat production flocks [10)] | | | | | |

Comments:

[1)] The competent authority carries out all the sampling and testing in the salmonella control and eradication programme both official and non official.

[2)] The competent authority carries out all the sampling and testing in the salmonella control and eradication programme both official and non official.

[3)] Not present in Malta

[4)] Not present in Malta

[5)] Not present in Malta

[6)] Not present in Malta

[7)] Not present in Malta

[8)] Not present in Malta

[9)] Not present in Malta

[10)] Not present in Malta

Table Salmonella in other poultry

## 2.1.5 Antimicrobial resistance in Salmonella isolates

### Table Antimicrobial susceptibility testing of Salmonella in humans

| Salmonella | S. Enteritidis | | S. Typhimurium | | Salmonella spp. | | S. Bredeney | | S. Give | | S. Haifa | | S. Infantis | | S. Kentucky | | S. Livingstone | | S. Paratyphi A | | S. Sandiego | | S. Tumodi | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isolates out of a monitoring program (yes/no) | no | | no | | no | | no | | no | | no | | no | | no | | no | | no | | no | | no | |
| Number of isolates available in the laboratory | 72 | | 37 | | 15 | | 1 | | 1 | | 3 | | 3 | | 11 | | 13 | | 1 | | 1 | | 3 | |
| 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 |
| Amphenicols - Chloramphenicol | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Amphenicols - Florfenicol | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Cephalosporins - 3rd generation cephalosporins | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Fluoroquinolones - Ciprofloxacin | 72 | 0 | 37 | 1 | 15 | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 11 | 1 | 13 | 0 | 1 | 1 | 1 | 0 | 3 | 0 |
| Fluoroquinolones - Enrofloxacin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Quinolones - Nalidixic acid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trimethoprim | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sulphonamides - Sulfonamide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aminoglycosides - Streptomycin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aminoglycosides - Gentamicin | 72 | 0 | 37 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 13 | 1 | 1 | 0 | 1 | 0 | 3 | 0 |
| Aminoglycosides - Neomycin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aminoglycosides - Kanamycin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trimethoprim + Sulphonamides | 72 | 1 | 37 | 3 | 15 | 2 | 1 | 0 | | | 3 | 1 | 3 | 0 | 11 | 0 | 13 | 0 | 1 | 0 | 1 | 0 | 3 | 0 |
| Penicillins - Ampicillin | 72 | 1 | 37 | 14 | 15 | 3 | 1 | 0 | 1 | 0 | 3 | 1 | 3 | 0 | 11 | 1 | 13 | 2 | 1 | 0 | 1 | 0 | 3 | 0 |
| Tetracyclines - Tetracycline | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fully sensitive | 72 | 0 | 37 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 3 | 0 | 11 | 1 | 13 | 2 | 1 | 0 | 1 | 0 | 1 | 0 |
| Resistant to 1 antimicrobial | 72 | 3 | 37 | 14 | 15 | 3 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 13 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |

## Table Antimicrobial susceptibility testing of Salmonella in humans

| Salmonella | S. Enteritidis | | S. Typhimurium | | Salmonella spp. | | S. Bredeney | | S. Give | | S. Haifa | | S. Infantis | | S. Kentucky | | S. Livingstone | | S. Paratyphi A | | S. Sandiego | | S. Tumodi | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isolates out of a monitoring program (yes/no) | no | | no | | no | | no | | no | | no | | no | | no | | no | | no | | no | | no | |
| Number of isolates available in the laboratory | 72 | | 37 | | 15 | | 1 | | 1 | | 3 | | 3 | | 11 | | 13 | | 1 | | 1 | | 3 | |
| 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 |
| Resistant to 2 antimicrobials | 72 | 0 | 37 | 2 | 15 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 3 | 0 | 11 | 1 | 13 | 2 | 1 | 0 | 1 | 0 | 1 | 0 |
| Resistant to 3 antimicrobials | 72 | 0 | 37 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 13 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Resistant to 4 antimicrobials | 72 | 0 | 37 | 0 | 15 | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 13 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Resistant to >4 antimicrobials | 72 | 0 | 37 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 13 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Number of multiresistant S. Typhimurium - with penta resistance | | | | | | | 1 | 0 | 1 | 0 | | | | | | | | | | | | | | |

# Table Antimicrobial susceptibility testing of Salmonella in Gallus gallus (fowl) - laying hens

| Salmonella | S. Enteritidis | | S. Typhimurium | | Salmonella spp. | |
|---|---|---|---|---|---|---|
| Isolates out of a monitoring program (yes/no) | yes | | yes | | no | |
| Number of isolates available in the laboratory | 7 | | 16 | | | |
| Antimicrobials: | N | n | N | n | N | n |
| Amphenicols - Chloramphenicol | 7 | 0 | 16 | 11 | | |
| Amphenicols - Florfenicol | 7 | 0 | 16 | 0 | | |
| Fluoroquinolones - Ciprofloxacin | 7 | 2 | 16 | 5 | | |
| Quinolones - Nalidixic acid | 7 | 0 | 16 | 0 | | |
| Trimethoprim | 7 | 7 | 16 | 16 | | |
| Sulphonamides - Sulfonamide | 7 | 0 | 16 | 16 | | |
| Aminoglycosides - Streptomycin | 7 | 0 | 16 | 0 | | |
| Aminoglycosides - Gentamicin | 7 | 6 | 16 | 14 | | |
| Penicillins - Ampicillin | 7 | 0 | 16 | 8 | | |
| Tetracyclines - Tetracycline | 7 | 0 | 16 | 0 | | |
| Fully sensitive | 7 | 0 | 16 | 0 | | |
| Resistant to 1 antimicrobial | 7 | 0 | 16 | 0 | | |
| Resistant to 2 antimicrobials | 7 | 6 | 16 | 1 | | |
| Resistant to 3 antimicrobials | 7 | 1 | 16 | 9 | | |
| Resistant to 4 antimicrobials | 7 | 0 | 16 | 1 | | |
| Resistant to >4 antimicrobials | 7 | 0 | 16 | 5 | | |

# Table Antimicrobial susceptibility testing of Salmonella in Gallus gallus (fowl) - broilers

| Salmonella | S. Enteritidis | | S. Typhimurium | | Salmonella spp. | |
|---|---|---|---|---|---|---|
| Isolates out of a monitoring program (yes/no) | yes | | yes | | no | |
| Number of isolates available in the laboratory | 8 | | 21 | | | |
| Antimicrobials: | N | n | N | n | N | n |
| Amphenicols - Chloramphenicol | 8 | 2 | 21 | 12 | | |
| Amphenicols - Florfenicol | 8 | 0 | 21 | 0 | | |
| Fluoroquinolones - Ciprofloxacin | 8 | 1 | 21 | 7 | | |
| Quinolones - Nalidixic acid | 8 | 0 | 21 | 0 | | |
| Trimethoprim | 8 | 6 | 21 | 21 | | |
| Sulphonamides - Sulfonamide | 8 | 6 | 21 | 0 | | |
| Aminoglycosides - Streptomycin | 8 | 1 | 21 | 0 | | |
| Aminoglycosides - Gentamicin | 8 | 3 | 21 | 17 | | |
| Penicillins - Ampicillin | | | 21 | 15 | | |
| Tetracyclines - Tetracycline | 8 | 1 | 21 | 0 | | |
| Fully sensitive | 8 | 1 | 21 | 0 | | |
| Resistant to 1 antimicrobial | 8 | 0 | 21 | 0 | | |
| Resistant to 2 antimicrobials | 8 | 3 | 21 | 0 | | |
| Resistant to 3 antimicrobials | 8 | 2 | 21 | 13 | | |
| Resistant to 4 antimicrobials | 8 | 2 | 21 | 5 | | |
| Resistant to >4 antimicrobials | 8 | 0 | 21 | 3 | | |

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

| Test Method Used | Standard methods used for testing |
|---|---|
| Broth dilution | NCCLS/CLSI |

| | | | Concentration (microg/ml) | Zone diameter (mm) |
|---|---|---|---|---|
| | | Standard | Resistant > | Resistant <= |
| Amphenicols | Chloramphenicol | | 16 | 13 |
| | Florfenicol | | 16 | 14 |
| Tetracyclines | Tetracycline | | 8 | 13 |
| Fluoroquinolones | Ciprofloxacin | | 0.06 | |
| Quinolones | Nalidixic acid | | 16 | 13 |
| Trimethoprim | Trimethoprim | | 2 | |
| Sulphonamides | Sulfonamide | | 256 | 13 |
| | Sulphonamides | | 256 | |
| Aminoglycosides | Streptomycin | | 32 | 10 |
| | Gentamicin | | 2 | 13 |
| Cephalosporins | Cefotaxim | | 0.5 | |
| Penicillins | Ampicillin | | 4 | |

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

## 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 <= |
| Amphenicols | Chloramphenicol | | 16 | |
| Tetracyclines | Tetracycline | | 8 | |
| Fluoroquinolones | Ciprofloxacin | | 0.06 | |
| Quinolones | Nalidixic acid | | 16 | |
| Trimethoprim | Trimethoprim | | 2 | |
| Sulphonamides | Sulphonamides | | 256 | |
| Aminoglycosides | Streptomycin | | 32 | |
| | Gentamicin | | 2 | |
| Cephalosporins | Cefotaxim | | 0.5 | |
| Penicillins | Ampicillin | | 4 | |

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

| Test Method Used | Standard methods used for testing |
|---|---|
| | |

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

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

| Test Method Used | Standard methods used for testing |
|---|---|
| | EUCAST |

| | | | Concentration (microg/ml) | Zone diameter (mm) |
|---|---|---|---|---|
| | | Standard | Resistant > | Resistant <= |
| Tetracyclines | Tetracycline | | 4 | |
| Fluoroquinolones | Ciprofloxacin | | 0.5 | |
| Aminoglycosides | Gentamicin | | 2 | |
| Trimethoprim + Sulphonamides | Trimethoprim + Sulphonamides | | 40 | |
| Penicillins | Ampicillin | | 8 | |

Footnote:

Test used is Biomerieux Vitek II Card (AST-GN27)

# 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 | 204 | 49.4 | 203 | 49.1 | 1 | .2 | 0 |
| C. coli | 19 | 4.6 | 19 | 4.6 | 0 | 0 | 0 |
| C. jejuni | 132 | 32 | 131 | 31.7 | 1 | 0.2 | 0 |
| C. upsaliensis | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Campylobacter spp., unspecified | 53 | 12.8 | 53 | 12.8 | 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 | 0 | 0 | 0 | 9 | 5 | 4 | 5 | 2 | 3 |
| 1 to 4 years | 5 | 2 | 3 | 34 | 17 | 17 | 14 | 8 | 6 |
| 5 to 14 years | 2 | 2 | 0 | 19 | 12 | 7 | 7 | 1 | 6 |
| 15 to 24 years | 2 | 1 | 1 | 12 | 4 | 8 | 2 | 0 | 2 |
| 25 to 44 years | 5 | 1 | 4 | 8 | 3 | 5 | 9 | 7 | 2 |
| 45 to 64 years | 3 | 2 | 1 | 25 | 12 | 13 | 7 | 4 | 3 |
| 65 years and older | 2 | 1 | 1 | 25 | 15 | 10 | 9 | 0 | 9 |
| Age unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total : | 19 | 9 | 10 | 132 | 68 | 64 | 53 | 22 | 31 |

## 2.2.3 Antimicrobial resistance in Campylobacter isolates

Table Antimicrobial susceptibility testing of Campylobacter in humans

| Campylobacter | Campylobacter spp., unspecified | |
|---|---|---|
| Isolates out of a monitoring program (yes/no) | no | |
| Number of isolates available in the laboratory | 204 | |
| Antimicrobials: | N | n |
| Fluoroquinolones - Ciprofloxacin | 175 | 124 |
| Quinolones - Nalidixic acid | 0 | 0 |
| Aminoglycosides - Gentamicin | 0 | 0 |
| Macrolides - Erythromycin | 175 | 15 |
| Penicillins - Ampicillin | 0 | 0 |
| Tetracyclines - Tetracycline | 0 | 0 |
| Fully sensitive | 175 | 175 |
| Resistant to 1 antimicrobial | 175 | 115 |
| Resistant to 2 antimicrobials | 175 | 12 |
| Resistant to 3 antimicrobials | 0 | 0 |
| Resistant to 4 antimicrobials | 0 | 0 |
| Resistant to >4 antimicrobials | 0 | 0 |

## Table Cut-off values used for antimicrobial susceptibility testing of Campylobacter in Humans

| Test Method Used |
| --- |
| E-test |

| Standard methods used for testing |
| --- |
| EUCAST |

| | | | Concentration (microg/ml) | Zone diameter (mm) |
| --- | --- | --- | --- | --- |
| | | Standard | Resistant > | Resistant <= |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Macrolides | Erythromycin | | 4 | |

## 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 <= |
| Tetracyclines | Tetracycline | | 2 | |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Aminoglycosides | Gentamicin | | 2 | |
| | Streptomycin | | 4 | |
| Macrolides | Erythromycin | | 16 | |

## 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 <= |
| Tetracyclines | Tetracycline | | 2 | |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Aminoglycosides | Gentamicin | | 2 | |
| | Streptomycin | | 4 | |
| Macrolides | Erythromycin | | 16 | |

## 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 <= |
| Tetracyclines | Tetracycline | | 2 | |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Aminoglycosides | Gentamicin | | 2 | |
| | Streptomycin | | 4 | |
| Macrolides | Erythromycin | | 16 | |

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

| Test Method Used |
| --- |
| E-test |

| Standard methods used for testing |
| --- |
| EUCAST |

| | | | Concentration (microg/ml) | Zone diameter (mm) |
| --- | --- | --- | --- | --- |
| | | Standard | Resistant > | Resistant <= |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Macrolides | Erythromycin | | 4 | |

## 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 <= |
| Tetracyclines | Tetracycline | | 2 | |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Aminoglycosides | Gentamicin | | 1 | |
| | Streptomycin | | 2 | |
| Macrolides | Erythromycin | | 4 | |

## 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 <= |
| Tetracyclines | Tetracycline | | 2 | |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Aminoglycosides | Gentamicin | | 1 | |
| | Streptomycin | | 2 | |
| Macrolides | Erythromycin | | 4 | |

## 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 <= |
| Tetracyclines | Tetracycline | | 2 | |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Aminoglycosides | Gentamicin | | 1 | |
| | Streptomycin | | 2 | |
| Macrolides | Erythromycin | | 4 | |

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

| Test Method Used |
| --- |
| E-test |

| Standard methods used for testing |
| --- |
| EUCAST |

| | | | Concentration (microg/ml) | Zone diameter (mm) |
| --- | --- | --- | --- | --- |
| | | Standard | Resistant > | Resistant <= |
| Fluoroquinolones | Ciprofloxacin | | 1 | |
| Macrolides | Erythromycin | | 4 | |

# 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 | 1 | .2 |
| Listeria spp., unspecified | 0 | 0 |
| L. monocytogenes - L. monocytogenes, unspecified | 1 | 0.2 |
| 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 |
| <1 year | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 to 4 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 to 14 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 to 24 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 to 44 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 to 64 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 years and older | 1 | 1 | 0 | 0 | 0 | 0 |
| Age unknown | 0 | 0 | 0 | 0 | 0 | 0 |
| Total : | 1 | 1 | 0 | 0 | 0 | 0 |

## 2.3.3 Listeria in foodstuffs

Table Listeria monocytogenes in milk and dairy products

| | Source of information | Sampling unit | Sample weight | Units tested | Total units positive for L. monocytogenes | Units tested with detection method | Listeria monocytogenes presence in x g | Units tested with enumeration method | > detection limit but <= 100 cfu/g | L. monocytogenes > 100 cfu/g |
|---|---|---|---|---|---|---|---|---|---|---|
| Cheeses made from cows' milk - hard - made from pasteurised milk - at processing plant | | --- | | | | | | | | |
| Cheeses made from cows' milk - hard - made from pasteurised milk - at retail | | --- | | | | | | | | |
| Cheeses made from cows' milk - hard - made from raw or low heat-treated milk - at processing plant | | --- | | | | | | | | |
| Cheeses made from cows' milk - hard - made from raw or low heat-treated milk - at retail | | --- | | | | | | | | |

## Table Listeria monocytogenes in other foods

| | Source of information | Sampling unit | Sample weight | Units tested | Total units positive for L. monocytogenes | Units tested with detection method | Listeria monocytogenes presence in x g | Units tested with enumeration method | > detection limit but <= 100 cfu/g | L. monocytogenes > 100 cfu/g |
|---|---|---|---|---|---|---|---|---|---|---|
| Fish - smoked - at retail | PHL | Single | 300g | 24 | 0 | 24 | 0 | 24 | 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 | 4 | .8 | 4 | .8 | 0 | 0 |
| 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) | 1 | 0.2 | 1 | 0.2 | 0 | 0 |
| - clinical cases | 1 | 0.2 | 1 | 0.2 | 0 | 0 |
| - laboratory confirmed | 1 | 0.2 | 1 | 0.2 | 0 | 0 |
| - caused by 0157 (VT+) | 1 | 0.2 | 1 | 0.2 | 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 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 to 4 years | 0 | 0 | 0 | 1 | 1 | 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 | 1 | 1 | 0 | 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 | 3.88 | 3 | .72 | 13 | 3.14 |
| M. bovis | 0 | 0 | 0 | 0 | 0 | 0 |
| M. tuberculosis | 14 | 3.4 | 3 | 0.72 | 11 | 2.66 |
| Reactivation of previous cases | 2 | 0.48 | 0 | 0 | 2 | 0.48 |

## Table Mycobacterium in humans - Age distribution

| Age distribution | M. bovis | | | M. tuberculosis | | |
|---|---|---|---|---|---|---|
| | All | M | F | All | M | F |
| <1 year | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 to 4 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 to 14 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 to 24 years | 0 | 0 | 0 | 3 | 2 | 1 |
| 25 to 44 years | 0 | 0 | 0 | 9 | 6 | 3 |
| 45 to 64 years | 0 | 0 | 0 | 1 | 1 | 0 |
| 65 years and older | 0 | 0 | 0 | 3 | 2 | 1 |
| Age unknown | 0 | 0 | 0 | 0 | 0 | 0 |
| Total : | 0 | 0 | 0 | 16 | 11 | 5 |

## 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 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 [1)] | 358 | 16291 | 148 | 41.34 | 0 | 0 | every six months | 13653 | 0 | 0 | 0 |
| Total : [2)] | 358 | 16291 | 148 | 41.34 | 0 | 0 | N.A. | 13653 | 0 | 0 | 0 |

Comments:

[1)] The animals tested in the 148 herds are dairy animals, the remaining holdings do not rear animals for milk production

[2)] 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**

N human cases since 1998.

**Relevance as zoonotic disease**

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

## Table Brucella in humans - Species/serotype distribution

| Species/serotype Distribution | Cases | Cases Inc. | Autochthon cases | Autochthon Inc. | Imported cases | Imported Inc. |
|---|---|---|---|---|---|---|
| Brucella | 0 | 0 | 0 | 0 | 0 | 0 |
| 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., unspecified | | |
|---|---|---|---|---|---|---|---|---|---|
| | 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 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 Bovine brucellosis - data on herds - Community co-financed eradication programmes

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

| Region | Total number of herds | Total number of herds under the programme | Number of herds checked | Number of positive herds | Number of new positive herds | Number of herds depopulated | % positive herds depopulated | Indicators | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | % herd coverage | % positive herds Period herd prevalence | % new positive herds Herd Incidence |
| Malta | 358 | 358 | 210 | 0 | 0 | 0 | N.A. | 58.66 | 0 | 0 |
| Total : [1)] | 358 | 358 | 210 | 0 | 0 | 0 | N.A. | 58.66 | 0 | 0 |
| Total - 1 | 352 | 352 | 352 | 3 | 0 | 0 | 0 | 100 | .85 | 0 |

Comments:

[1)] 0

## Table Bovine brucellosis - data on animals - Community co-financed eradication programmes

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

| Region | Total number of animals | Number of animals to be tested under the programme | Number of animals tested | Number of animals tested individually | Number of positive animals | Slaughtering | | Indicators | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Number of animals with positive result slaughtered or culled | Total number of animals slaughtered | % coverage at animal level | % positive animals - animal prevalence |
| Malta | 16291 | 16291 | 15577 | 15577 | 0 | 0 | 0 | 95.62 | 0 |
| Total : [1)] | 16291 | 16291 | 15577 | 15577 | 0 | 0 | 0 | 95.62 | 0 |
| Total - 1 | 15941 | 11309 | 11074 | 11074 | 1 | 1 | 4 | 97.92 | .01 |

Comments:

[1)] N.A.

## Table Bovine brucellosis - data on status of herds at the end of the period - Community co-financed eradication programmes

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

| | Status of herds and animals under the programme | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total number of herds and animals under the programme | | Unknown | | Not free or not officially free | | | | Free or officially free suspended | | Free | | Officially free | |
| | | | | | Last check positive | | Last check negative | | | | | | | |
| Region | Herds | Animals | Herds | Animals | Herds | Animals | Herds | Animals | Herds | Animals | Herds | Animals | Herds | Animals |
| Malta | 358 | 16291 | 148 | 714 | 0 | 0 | 210 | 15577 | 0 | 0 | 210 | 15577 | 210 | 15577 |
| Total : [1)] | 358 | 16291 | 148 | 714 | 0 | 0 | 210 | 15577 | 0 | 0 | 210 | 15577 | 210 | 15577 |

Comments:

[1)] N.A.

## 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 [1)] | 1389 | 11666 | 1389 | 100 | 0 | 0 | 1387 | 15504 | 0 | 15504 | 0 | 0 | 0 | 0 |
| Total : [2)] | 1389 | 11666 | 1389 | 100 | 0 | 0 | 1387 | 15504 | 0 | 15504 | 0 | 0 | 0 | 0 |

Comments:

[1)] 2010

[2)] 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.

## Table Yersinia in humans - Species/serotype distribution

| Species/serotype Distribution | Cases | Cases Inc. | Autochthon cases | Autochthon Inc. | Imported cases | Imported Inc. |
|---|---|---|---|---|---|---|
| Yersinia | 1 | .2 | 1 | .2 | 0 | 0 |
| Y. enterocolitica | 1 | 0.2 | 1 | 0.2 | 0 | 0 |
| Y. enterocolitica - O:3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Y. enterocolitica - O:9 | 0 | 0 | 0 | 0 | 0 | 0 |

## Table Yersinia in humans - Age distribution

| Age distribution | Y. enterocolitica | | | Yersinia spp., unspecified | | |
|---|---|---|---|---|---|---|
| | All | M | F | All | M | F |
| <1 year | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 to 4 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 to 14 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 to 24 years | 1 | 1 | 0 | 0 | 0 | 0 |
| 25 to 44 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 to 64 years | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 years and older | 0 | 0 | 0 | 0 | 0 | 0 |
| Age unknown | 0 | 0 | 0 | 0 | 0 | 0 |
| Total : | 1 | 1 | 0 | 0 | 0 | 0 |

# 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.

## Table Trichinella in humans - Species/serotype distribution

| Species/serotype Distribution | Cases | Cases Inc. | Autochthon cases | Autochthon Inc. | Imported cases | Imported Inc. |
|---|---|---|---|---|---|---|
| Trichinella | 0 | 0 | 0 | 0 | 0 | 0 |
| Trichinella spp., unspecified | 0 | 0 | 0 | 0 | 0 | 0 |

## Table Trichinella in humans - Age distribution

| Age distribution | Trichinella spp., unspecified | | |
|---|---|---|---|
| | 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 |

## 2.8.3 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 unit | Units tested | Total units positive for Trichinella | T. spiralis | Trichinella spp., unspecified |
|---|---|---|---|---|---|---|
| Bears [1)] | | --- | | | | |
| Foxes [2)] | | --- | | | | |
| Pigs | | --- | | | | |
| Pigs - breeding animals - unspecified - sows and boars | | Slaughter batch | 2215 | 0 | 0 | 0 |
| Pigs - fattening pigs - not raised under controlled housing conditions [3)] | | --- | | | | |
| Pigs - fattening pigs - raised under controlled housing conditions | | Slaughter batch | 69015 | 0 | 0 | 0 |
| Rats | | --- | | | | |
| Rodents | | --- | | | | |
| Solipeds, domestic | | --- | | | | |
| Solipeds, domestic - horses | | Single | 161 | 0 | 0 | 0 |
| Wild boars - farmed [4)] | | --- | | | | |
| Wild boars - wild [5)] | | --- | | | | |

Comments:

[1)] There are no Bears in the Maltese Islands

[2)] There are no Foxes in the Maltese Islands

[3)] All pigs are housed under controlled housing conditions

Table Trichinella in animals

Comments:

[4] No wild Boars are farmed in Malta

[5] There are no wild boars in Malta

# 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

# 2.10 TOXOPLASMOSIS

## 2.10.1 General evaluation of the national situation

### A. Toxoplasmosis general evaluation

History of the disease and/or infection in the country

No reported cases.

## 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.

## Table Toxoplasma in humans - Species/serotype distribution

| Species/serotype Distribution | Cases | Cases Inc. |
|---|---|---|
| Toxoplasma | 0 | 0 |
| Toxoplasma spp., unspecified | 0 | 0 |
| Congenital cases | 0 | 0 |

## Table Toxoplasma in humans - Age distribution

| Age distribution | Toxoplasma spp., unspecified | | |
|---|---|---|---|
| | 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 |

# 2.11 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 rerported rabies case at the beginning of the 20th century!

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.

## 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.

# 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 <= |
| Amphenicols | Chloramphenicol | | 16 | |
| Tetracyclines | Tetracycline | | 8 | |
| Fluoroquinolones | Ciprofloxacin | | 0.03 | |
| Quinolones | Nalidixic acid | | 16 | |
| Trimethoprim | Trimethoprim | | 2 | |
| Sulphonamides | Sulphonamides | | 256 | |
| Aminoglycosides | Streptomycin | | 16 | |
| | Gentamicin | | 2 | |
| Cephalosporins | Cefotaxim | | 0.25 | |
| Penicillins | Ampicillin | | 8 | |

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 <= |
| Amphenicols | Chloramphenicol | | 16 | |
| Tetracyclines | Tetracycline | | 8 | |
| Fluoroquinolones | Ciprofloxacin | | 0.03 | |
| Quinolones | Nalidixic acid | | 16 | |
| Trimethoprim | Trimethoprim | | 2 | |
| Sulphonamides | Sulphonamides | | 256 | |
| Aminoglycosides | Streptomycin | | 16 | |
| | Gentamicin | | 2 | |
| Cephalosporins | Cefotaxim | | 0.25 | |
| Penicillins | Ampicillin | | 8 | |

## 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 <= |
| Amphenicols | Chloramphenicol | | 16 | |
| Tetracyclines | Tetracycline | | 8 | |
| Fluoroquinolones | Ciprofloxacin | | 0.03 | |
| Quinolones | Nalidixic acid | | 16 | |
| Trimethoprim | Trimethoprim | | 2 | |
| Sulphonamides | Sulphonamides | | 256 | |
| Aminoglycosides | Streptomycin | | 16 | |
| | Gentamicin | | 2 | |
| Cephalosporins | Cefotaxim | | 0.25 | |
| Penicillins | Ampicillin | | 8 | |

# 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 | Streptomycin | | 512 | |
| | Gentamicin | | 32 | |
| Amphenicols | Chloramphenicol | | 32 | |
| Penicillins | Ampicillin | | 4 | |
| Glycopeptides (Cyclic peptides, Polypeptides) | Vancomycin | | 4 | |
| Macrolides | Erythromycin | | 4 | |
| Streptogramins | Quinupristin/Dalfopristin | | 32 | |
| Tetracyclines | Tetracycline | | 2 | |

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

| | | | Concentration (microg/ml) | Zone diameter (mm) |
|---|---|---|---|---|
| | | Standard | Resistant > | Resistant <= |
| Oxazolidines | Linezolid | | 4 | |

## 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 | Streptomycin | | 512 | |
| | Gentamicin | | 32 | |
| Amphenicols | Chloramphenicol | | 32 | |
| Penicillins | Ampicillin | | 4 | |
| Glycopeptides (Cyclic peptides, Polypeptides) | Vancomycin | | 4 | |
| Macrolides | Erythromycin | | 4 | |
| Streptogramins | Quinupristin/Dalfopristin | | 32 | |
| Tetracyclines | Tetracycline | | 2 | |
| Oxazolidines | Linezolid | | 4 | |

## 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 | Streptomycin | | 512 | |
| | Gentamicin | | 32 | |
| Amphenicols | Chloramphenicol | | 32 | |
| Penicillins | Ampicillin | | 4 | |
| Glycopeptides (Cyclic peptides, Polypeptides) | Vancomycin | | 4 | |
| Macrolides | Erythromycin | | 4 | |
| Streptogramins | Quinupristin/Dalfopristin | | 32 | |
| Tetracyclines | Tetracycline | | 2 | |
| Oxazolidines | Linezolid | | 4 | |

## 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 | Streptomycin | | 128 | |
| | Gentamicin | | 32 | |
| Amphenicols | Chloramphenicol | | 32 | |
| Penicillins | Ampicillin | | 4 | |
| Glycopeptides (Cyclic peptides, Polypeptides) | Vancomycin | | 4 | |
| Macrolides | Erythromycin | | 4 | |
| Streptogramins | Quinupristin/Dalfopristin | | 1 | |
| Tetracyclines | Tetracycline | | 2 | |
| Oxazolidines | Linezolid | | 4 | |

## 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 | Streptomycin | | 128 | |
| | Gentamicin | | 32 | |
| Amphenicols | Chloramphenicol | | 32 | |
| Penicillins | Ampicillin | | 4 | |
| Glycopeptides (Cyclic peptides, Polypeptides) | Vancomycin | | 4 | |
| Macrolides | Erythromycin | | 4 | |
| Streptogramins | Quinupristin/Dalfopristin | | 1 | |
| Tetracyclines | Tetracycline | | 2 | |
| Oxazolidines | Linezolid | | 4 | |

## 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 | Streptomycin | | 128 | |
| | Gentamicin | | 32 | |
| Amphenicols | Chloramphenicol | | 32 | |
| Penicillins | Ampicillin | | 4 | |
| Glycopeptides (Cyclic peptides, Polypeptides) | Vancomycin | | 4 | |
| Macrolides | Erythromycin | | 4 | |
| Streptogramins | Quinupristin/Dalfopristin | | 1 | |
| Tetracyclines | Tetracycline | | 2 | |
| Oxazolidines | Linezolid | | 4 | |

# 4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

# 4.1 ENTEROBACTER SAKAZAKII

## 4.1.1 General evaluation of the national situation

### A. Enterobacter sakazakii 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 Community for the actions to be taken

None so far

### 4.1.2 Enterobacter sakazakii in foodstuffs

#### A. Enterobacter sakazakii 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.

## Table Enterobacter sakazakii in food

| | Source of information | Sampling unit | Sample weight | Units tested | Total units positive for Enterobacter sakazakii | E. sakazakii |
|---|---|---|---|---|---|---|
| Foodstuffs intended for special nutritional uses - dried dietary foods for special medical purposes intended for infants below 6 months | | --- | | | | |
| Infant formula - dried | PHL | Batch | 10g | 30 | 0 | |

# 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.

## 4.2.2 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 maturated | PHL | Single | >200G | 34 | 1 | 33 | 0 | 0 | 1 |
| Fish - Fishery products which have undergone enzyme maturation treatment in brine | PHL | --- | | | | | | | |

# 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.

## 4.3.2 Staphylococcal enterotoxins in foodstuffs

Table Staphylococcal enterotoxins in food

| | Source of information | Sampling unit | Sample weight | Units tested | Total units positive for Staphylococcal enterotoxins |
|---|---|---|---|---|---|
| Cheeses made from cows' milk | | --- | | | |
| Cheeses made from cows' milk - hard | | --- | | | |
| Cheeses made from cows' milk - hard - made from pasteurised milk | PHL | Single | 200g | 3 | 0 |
| Cheeses made from cows' milk - hard - made from raw or low heat-treated milk | | --- | | | |
| Cheeses made from cows' milk - soft and semi-soft | | --- | | | |
| Cheeses made from cows' milk - soft and semi-soft - made from pasteurised milk | PHL | Single | 200G | 3 | 0 |
| Cheeses made from cows' milk - soft and semi-soft - made from raw or low heat-treated milk | | --- | | | |
| Cheeses made from goats' milk | | --- | | | |

Footnote:

Cheeses made from cow's milk soft and semisoft - made from pasteurised milk = rikotta

# 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

| | Number of outbreaks | Human cases | Hospitalized | Deaths | Strong evidence Number of Outbreaks | Total number of outbreaks |
|---|---|---|---|---|---|---|
| Salmonella - S. Typhimurium | 1 | 3 | 0 | 0 | 0 | 1 |
| Salmonella - S. Enteritidis | 3 | 9 | 3 | 0 | 0 | 3 |
| Salmonella - Other serovars | 2 | 26 | 0 | 0 | 0 | 2 |
| Campylobacter | 19 | 48 | unknown | 0 | 0 | 19 |
| Listeria - Listeria monocytogenes | 0 | 0 | 0 | 0 | 0 | 0 |
| Listeria - Other Listeria | 0 | 0 | 0 | 0 | 0 | 0 |
| Yersinia | 0 | 0 | 0 | 0 | 0 | 0 |
| Escherichia coli, pathogenic - | 0 | 0 | 0 | 0 | 0 | 0 |
| Bacillus - B. cereus | 0 | 0 | 0 | 0 | 0 | 0 |
| Bacillus - Other Bacillus | 0 | 0 | 0 | 0 | 0 | 0 |
| Staphylococcal enterotoxins | 2 | 7 | 0 | 0 | 0 | 2 |
| Clostridium - Cl. botulinum | 0 | 0 | 0 | 0 | 0 | 0 |
| Clostridium - Cl. perfringens | 0 | 0 | 0 | 0 | 0 | 0 |
| Clostridium - Other Clostridia | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Bacterial agents - Brucella | 0 | 0 | 0 | 0 | 0 | 0 |

| | Number of outbreaks | Human cases | Hospitalized | Deaths | Strong evidence Number of Outbreaks | Total number of outbreaks |
|---|---|---|---|---|---|---|
| Other Bacterial agents - Shigella | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Bacterial agents - Other Bacterial | 0 | 0 | 0 | 0 | 0 | 0 |
| Parasites - Trichinella | 0 | 0 | 0 | 0 | 0 | 0 |
| Parasites - Giardia | 0 | 0 | 0 | 0 | 0 | 0 |
| Parasites - Cryptosporidium | 0 | 0 | 0 | 0 | 0 | 0 |
| Parasites - Anisakis | 0 | 0 | 0 | 0 | 0 | 0 |
| Parasites - Other Parasites | 0 | 0 | 0 | 0 | 0 | 0 |
| Viruses - Norovirus | 0 | unknown | unknown | unknown | 0 | 0 |
| Viruses - Hepatitis viruses | 0 | 0 | 0 | 0 | 0 | 0 |
| Viruses - Other Viruses | 0 | 0 | 0 | 0 | 0 | 0 |
| Other agents - Histamine | 2 | 4 | 0 | 0 | 0 | 2 |
| Other agents - Marine biotoxins | 0 | 0 | 0 | 0 | 0 | 0 |
| Other agents - Other Agents | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown agent | 21 | 69 | unknown | 0 | 0 | 21 |