# Overview of 2015 Zoonoses Data

## Introduction

Zoonoses are diseases and infections naturally transmissible between animals and humans. Transmission may occur via direct contact with an animal or indirect contact with animal excreta (e.g. faeces) present in contaminated food, water or the environment. Foodborne zoonotic diseases are caused by consuming food or drinking water contaminated by zoonotic pathogenic (disease-causing) microorganisms such as bacteria and their toxins, viruses and parasites. They enter the body through the gastrointestinal tract where the first symptoms often occur. Many of these microorganisms are commonly found in the intestines of healthy food-producing animals. The risks of contamination are present from farm to fork and require prevention and control throughout the food chain. While it is possible for anybody to become infected with a zoonotic pathogen, certain population groups such as the very young, the elderly and immunocompromised are particularly vulnerable and at greater risk of more serious consequences.

The eradication of zoonoses in humans and animals is very challenging. The impact of zoonoses on the health of humans and animals can however be limited, by (i) monitoring the reservoirs of infectious zoonotic pathogens with a view to understanding and controlling their modes of transfer and; (ii) by educating the public about how to avoid or limit the risk of infection.

The Irish zoonoses report is published annually by the FSAI, in collaboration with the Department of Agriculture, Food and the Marine (DAFM), the Health Service Executive (HSE), the Local Authority Veterinary Service (LAVS), the Sea-Fisheries Protection Authority (SFPA) and the Health Protection Surveillance Centre (HPSC). The report brings together the results of thousands of tests carried out on nationwide samples of food and feed, as well as tests on material of animal or human origin, in an effort to determine the pattern and extent of infection by zoonotic pathogens transmitted to humans from animals.

Zoonoses data collected by EU Member States serve as a basis for the EU to set targets for the reduction of these microorganisms in food-producing animals and foodstuffs. The impact of the reduction programmes on the actual prevalence of zoonoses in animals and foods and related human health cases are then monitored and analysed in the annual EU summary reports (EFSA, 2017).

The data in the 2015 tables for the results of Irish testing carried out in food, animal and animal feed samples are presented in two categories (convenience and suspect sampling) depending on the sampling context. Suspect sampling is the unplanned selection of a sample whereby the individual units are selected based on the recent judgement and experience regarding the population, lot or sampling frame, e.g. earlier positive samples. The samples obtained from this procedure are not randomly collected and may have a

higher likelihood of having pathogens present. Convenience sampling is used in exploratory research when the researcher is interested in getting an inexpensive approximation of the truth. The samples are selected because they are convenient and easy to obtain. This non-probability method is often used during preliminary research efforts to get a gross estimate of the results, without incurring the cost or time required to select a random sample. This methodology is potentially subject to serious bias (EFSA, 2016).

## Overview of 2015 data

### Campylobacteriosis

- *Campylobacter* remained the most common bacterial cause of gastroenteritis in Ireland and in the European Union in 2015 (EFSA and ECDC, 2016). There were 2,451 cases of human campylobacteriosis reported in Ireland in 2015, corresponding to a crude incidence rate (CIR) of 53.4 cases per 100,000 population. This was a decrease on the 2,616 cases (CIR 57.0 per 100,000 population) reported in Ireland in 2014. In Europe, there were 229,213 cases reported in 2015 with a corresponding CIR of 65.5 per 100,000 population.

- A total of 742 food samples were tested for *Campylobacter* spp. in 2015 with zero positive food samples detected (0%).

- Out of 2,814 suspect animal samples tested for *Campylobacter*, 227 (8.1%) were positive. *Campylobacter jejuni* was identified from 100% of positive samples (n= 227).

### Salmonellosis

- In 2015, there were 269 reported cases of salmonellosis in Ireland (CIR 5.9 per 100,000 population) which is an increase on the previous year (260 reported cases, CIR 5.7 per 100,000 population). The Irish figures for 2015 were below the European average CIR of 21.2 per 100,000 population (EFSA and ECDC, 2016).

- Of 272 human *Salmonella* isolates referred to the National Salmonella Shigella and Listeria Reference Laboratory (NSSLRL) for typing in 2015, the most common serotypes were *Salmonella* Typhimurium (including monophasic *S.* Typhimurium) (n=94, 34.6%) and *Salmonella* Enteritidis (n=68, 25%).

- A total of 5,956 food samples were tested for *Salmonella* in 2015. *Salmonella* was not detected in any of 847 convenience ready to eat (RTE) meat samples tested. In total 144 suspect RTE meat samples were taken for *Salmonella* in 2015, of these 3 were found to be positive for *Salmonella*. None of 127 convenience raw meat samples or 5 suspect raw meat samples tested positive for *Salmonella*. Seventeen of 665 convenience meat samples of unspecified RTE status were positive for *Salmonella* spp.

- A total of 4,104 non-meat foods were tested for *Salmonella* in 2015. *Salmonella* was detected in 2 (0.2%) of 1,322 convenience and 6 of 152 (3.9%) of suspect RTE non-meat samples tested. *Salmonella* was also detected in 4 (0.2%) out of 1,787 convenience non-meat samples of unspecified RTE status.

- *Salmonella* spp. (37.5%) and *Salmonella Brandenburg* (18.75%) and *Salmonella Enteritidis* (9.34%) were the predominant serotypes recovered from meat in 2015.

- In 2015, 7 of 563 (1.2%) of breeding and commercial flocks were positive for *Salmonella*. The seven isolates was detected in broiler (suspect samples) and serotyped as *S.* Enteritidis.

- Of 11,104 suspect samples from other animals tested for *Salmonella* spp. in 2015, 2.9% (n=324) were positive. Positive samples were from Adult cattle (bovine > 2 years) (n=35), Calves under 1 years (n=79), Cattle (bovine other) (n=121), fattening pigs (n=75) and sheep (n=14).

- *Salmonella* spp. was not detected in any of 303 feed material samples analysed in 2015 (all convenience sampling).

- In 2015, 0% (n=0 of 1 tested), 0% (n=0 of 15 tested), 100% (n= 35 of 35 tested) of *S.* Typhimurium poultry, bovine and porcine isolates, respectively, tested against a panel of 15 antimicrobial agents were resistant to at least one antimicrobial.

## Cryptosporidiosis

- In 2015, 439 cases of cryptosporidiosis were notified in Ireland (CIR of 9.6 per 100,000 population) which is an increase on the 394 cases (CIR 8.6 per 100,000 population) reported in 2014.

## Verocytotoxigenic *Escherichia coli* (VTEC)

- In 2015, there were 730 VTEC notifications (CIR 15.9 per 100,000 population) in Ireland, which is a slight increase from 2014 (707 cases, CIR of 15.4 per 100,000 population). The European CIR for VTEC infections in 2015 was 1.52 per 100,000 population (5,901 confirmed cases of VTEC were reported in the EU in 2015; EFSA and ECDC, 2016). The reported VTEC incidence rate in Ireland is generally high relative to other European countries. For many years, Ireland has reported the highest VTEC incidence rate of any Member State in the EU, reporting over 7 times the EU average in 2015, except in 2011 when Germany reported the highest rate due to a large VTEC O104 outbreak linked to fenugreek seeds.

- In 2015, there were 91 VTEC outbreaks which involved 232 cases of illness. One outbreak (family outbreak, 2 persons ill) was reported as being suspected to be

foodborne (unpasteurised cheese). Another outbreak involving a family of 3 was suspected to be food or waterborne where the family had been exposed to unpasteurised milk and a private water well supply. A lower number of outbreaks were reported in 2014 (83 outbreaks) but the reported cases of illness were higher (n = 275). The dominant transmission routes reported for VTEC infection in Ireland have been person-to-person spread, especially in childcare facilities and among families with young children, and waterborne transmission associated with exposure to water from untreated or poorly private water sources. Person-to-person was suspected to have played a role in 51 (56%) VTEC outbreaks in 2015 in which 114 persons were reported ill. Waterborne transmission was reported to have contributed to 19 outbreaks (21%) with 82 persons ill.

- Of 1,201 food samples tested for VTEC in 2015, 37 (3.1%) were positive. The VTEC isolates (serotype unspecified) were detected in convenience samples of raw beef (n=28) and in suspect samples of raw cow's milk (n = 6) and raw goat's milk (n = 3) at processing level.

## Listeriosis

- Nineteen cases of listeriosis were notified in Ireland in 2015 (CIR of 0.41 per 100,000 population). This is higher than reported in 2014 (Fifteen cases, CIR of 0.3 per 100,000 population). Listeriosis in Ireland is below the 2015 European average CIR of 0.48 per 100,000 population (EFSA and ECDC, 2016).

- Of 3,445 detection tests (presence or absence) carried out on foods for *Listeria*, 125 (3.6%) were positive for *Listeria monocytogenes*. Of these, 4 positives were detected in convenience samples of meat (two of which were RTE foods, one was cooked and one was of unspecified RTE status). A further four positives were detected in suspect samples, three of which were in RTE meat and one was of unspecified RTE status. The remaining positives were detected in other foods, with 66 positives detected in convenience samples (13 RTE foods, 2 cooked and 51 of unspecified RTE status) and 51 detected in suspect samples (22 RTE foods and 29 of unspecified RTE status).

- Of 8,199 enumeration tests (number of colony forming units per gram) carried out on foods for *Listeria*, *L. monocytogenes* was detected in 5 samples at >100 cfu/g. Of these, three were detected in convenience RTE meat samples and two in convenience RTE other foods.

- In 2015, *Listeria* was detected in 107 of 9,944 (1.1%) animal samples from cattle-bovine not specified (n=93) and sheep (n=14). Of these, 76.6% (82/107) were serotyped as *L.* monocytogenes.

## Tuberculosis (TB)

- In 2015, 303 cases of TB were notified in Ireland (CIR of 6.6 per 100,000 population), which is a decrease on the previous year (318 cases, CIR of 6.9 per 100,000 population). *Mycobacterium tuberculosis* was identified in 186 (93.9%) of the 198 culture confirmed cases for 2015.

- Four cases of *Mycobacterium bovis*-associated TB were reported in 2015, which is an increase on the two cases reported in Ireland in 2014. Globally, most cases of zoonotic TB are caused by *M. bovis*, and cattle are the major reservoir. Zoonotic transmission of *M. bovis* occurs primarily through close contact with infected cattle or consumption of contaminated animal products such as unpasteurized milk. Bovine TB is a notifiable disease in Ireland and an ongoing national eradication program means that all herds are subject to test and control measures. Currently, in high-income countries, bovine TB is well controlled or eliminated in most areas, and cases of zoonotic TB are rarely seen. However, reservoirs of TB in wildlife populations have been linked to the persistence or increase of the incidence of bovine TB in some countries (Müller et al, 2013).

- In 2015, 3.3% of bovine herds were positive for TB which is slightly less than the 3.6% reported in 2014.

- Of 1,860 convenience and 28 suspect animals other than bovine tested for *Mycobacterium* in 2015, 21.4% and 32.1% were positive respectively. Positive convenience samples were detected in badgers (n=365), deer (n=31) and birds (n=2), while positive suspect samples were detected in pigs (n=7), goats (n=1) and sheep (n=1).

## Brucellosis

- There were no cases of brucellosis reported in humans in 2015, compared to three reported case in 2014.

- Of the 344 convenience (ovine, caprine) and 2,514 suspect (bovine, sheep, solipeds) samples tested in 2015, none were positive for *Brucella*.

## Variant Creutzfeldt-Jakob disease (vCJD), Bovine Spongiform Encephalopathy (BSE) and Transmissible Spongiform Encephalopathy (TSE)

- No new vCJD cases were notified in 2015. The last case of vCJD was notified in 2006.

- There was 1 new case of BSE in cattle was reported in 2015 compared to no cases reported in 2014.

- In 2015, 8 flocks out of 22,179 sheep tested were positive for scrapie.

## Toxoplasmosis

- There were 26 toxoplasmosis notifications in humans in 2015 (CIR of 0.56 per 100,000 population), a decrease to the previous year in which 20 notifications were reported (CIR of 0.4 per 100,000 population).

- *Toxoplasma gondii* was detected in 8.8% (69 of 780) of sheep and 41.2% (7 of 17) goats tested (suspect samples).

## Leptospirosis

- There were 16 cases of leptospirosis notified in humans in 2015, (CIR of 0.3 per 100,000 population) which is lower than 2014 in which 23 cases were notified (CIR of 0.5 per 100,000 population).

## Others

- No human cases of trichinellosis, echinococcosis or Q fever were notified in Ireland in 2015. There were thirteen reported cases of yersinosis (CIR of 0.28 per 100,000 population). This was a sharp increase on the previous year (n = 5; CIR = 0.1).

- Of 10,131 animals tested for *Yersinia*, 4 (0.03%) were positive.

- There were 3,234,286 tests carried out for *Trichinella* in animals with no positive samples detected.

- *Coxiella* was detected in 4.6% (27 of 593) of animals tested in 2015. All 27 positives were from cattle and identified as *Coxiella burnetii*.

## References

European Food Safety Authority (EFSA), 2016b. Manual for reporting on zoonoses and zoonotic agents, within the framework of Directive 2003/99/EC, and on some other pathogenic microbiological agents for information derived from the year 2015. EFSA supporting publication 2016:EN-991. 96pp. http://onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2016.EN-991/pdf

European Food Safety Authority (EFSA), 2017. Monitoring and analysis of food-borne diseases. https://www.efsa.europa.eu/en/topics/topic/monitoringandanalysisoffood-bornediseases (Website accessed 17.10.2017)

European Food Safety Authority (EFSA) and European Centre for Disease Prevention and Control (ECDC), 2016. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2015. EFSA Journal 2016;14(12):4634, 231 pp. http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2016.4634/epdf

Müller, B., Dürr, S., Alonso, S., Hattendorf, J., Laisse, C. J. M., Parsons, S. D. C., van Helden, P.D. and Zinsstag, J. (2013). Zoonotic *Mycobacterium bovis*–induced Tuberculosis in Humans. *Emerging Infectious Diseases*, *19*(6), 899–908. http://doi.org/10.3201/eid1906.120543