Overview of 2018 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; (ii) by businesses controlling the hazard along the food chain and; (iii) 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 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 published by the European Food Safety Authority and the European Centre for Disease Control and Prevention (EFSA and ECDC, 2019).

The data in the 2018 tables for the results of Irish testing carried out in food, animal and animal feed samples are presented in four categories (routine, census, objective and suspect sampling) depending on the sampling context. Routine sampling is planned sampling but does not involve statistically random sampling. Census sampling is when the totality of a population, on which the data are reported, is controlled. Objective sampling is the planned

selection of a random sample, which is statistically representative of the population to be analysed (EFSA, 2019). 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 (EFSA, 2018). The samples obtained from suspect sampling may have a higher likelihood of having pathogens present.

At the time of publication of this report, the following 2018 data was unavailable.

Human data:

- Creutzfeldt–Jakob disease (CJD) and variant Creutzfeldt–Jakob disease (vCJD) in humans
- Outbreak data for Shiga toxin-producing *Escherichia coli* (STEC) / Verotoxigenic *Escherichia coli* (VTEC)
- Yersinosis in humans

Animal data:

- Listeriosis in animals
- *Campylobacter* in animals
- Toxoplasmosis in animals
- Yersinosis or coxiellosis in animals

Overview of 2018 data

Campylobacteriosis

- *Campylobacter* remained the most common bacterial cause of gastroenteritis in Ireland and in the European Union in 2018 (EFSA and ECDC, 2019). There were 3,032 cases of human campylobacteriosis reported in Ireland in 2018 (HPSC, 2019a; b), corresponding to a crude incidence rate (CIR) of 63.6 cases per 100,000 population. This was an increase on the 2,786 cases (CIR 58.1 per 100,000 population) reported in Ireland in 2017. In Europe, there were 246,571 cases reported in 2018 with a corresponding CIR of 64.1 per 100,000 population.

- A total of 223 routine and 148 suspect food samples were tested for *Campylobacter* spp. in 2018. Campylobacter was detected in one suspect sample in 2018.

Salmonellosis

- In 2018, there were 365 reported cases of salmonellosis in Ireland (CIR 7.6 per 100,000 population) which is a decrease on the previous year (414 reported cases, CIR 8.7 per 100,000 population; HPSC, 2019a; b). The Irish CIR for 2018 were again below the European average CIR of 20.1 per 100,000 population (EFSA and ECDC, 2019). During 2018, two general outbreaks and three family outbreaks of salmonellosis were notified. The largest was an international outbreak of Salmonella monophasic Typhimurium, sequence type 19 identified initially among members of a pilgrimage group returning from Medjugorje, Bosnia and Herzegovina in September 2018. Further cases of salmonellosis

in travellers returning from Medjugorje were also reported from five other Health Service Executive areas, and from another EU Member State, indicating this was a wider event. In total 29 outbreak cases were identified among Irish residents; 18 (62%) of whom were laboratory confirmed. The source was not identified, but a continuing foodborne source was suspected given the distribution of cases over a one-month period

- Of 86 human *Salmonella* isolates reported to be contracted in Ireland referred to the National Salmonella Shigella and Listeria Reference Laboratory (NSSLRL) for typing in 2018, the most common serotypes were *Salmonella* Typhimurium (including monophasic *S.* Typhimurium; 44.2%) and *Salmonella* Enteritidis (20.9%).

- A total of 5,848 food samples were tested for *Salmonella* in 2018.

- A total of 2,590 meat samples were tested. *Salmonella* was detected in 18 (0.7%) of 2,444 routine meat samples tested. Of these, 5 were detected in raw meat and 13 in meat of unspecified RTE status. None of the 146 total suspect meat samples taken for *Salmonella* were positive in 2018.

- A total of 3,285 non-meat foods were tested. *Salmonella* was detected in 197 (6.5%) of 3,029 routine samples tested. Ninety-six of the *Salmonella* positive routine samples were of unspecified RTE status while 32 were of raw and 69 were of RTE status. One suspect sample of unspecified RTE status was positive for *Salmonella* out of 229 non-meat suspect samples taken in 2018.

- *Salmonella* spp. unspecified (99.1%) was the predominant serotypes reported from 216 food isolates in 2018.

- In 2018, 92 of 5,182 (1.8%) breeding, parent, fattening, laying hens and commercial poultry flocks were positive for *Salmonella*. The 92 isolates were detected in census sampled flocks. These included:
    - 32 positives (0.8%) of 4,158 broilers sampled before slaughter
    - 7 (2.1%) of 339 laying hens (*Gallus gallus*)
    - 1 (0.5%) of 182 parents breeding flocks (*Gallus gallus*)
    - 51 (11.8%) of 432 turkey fattening flocks.
    - 1 (25%) of 4 turkey rearing flocks.

- *Salmonella* Derby (42) and *Salmonella* Braenderup (9) were the most common serotypes detected in census flocks.

- Of 3,532 suspect cattle samples tested for *Salmonella* spp. in 2018, 103 (2.9%) were positive. Ninety-one (88.3%) of the 103 isolates were *Salmonella* Dublin and 9 (8.7%) were *Salmonella* Typhimurium. Positive samples included:
    - 20 positives (1.2%) of 1,618 sampled cattle (bovine unspecified)

  - 83 positives (4.3%) of 1,914 sampled cattle (foetus/stillbirth).

- *Salmonella* Typhimurium was detected in 1 (0.2%) of 447 feed material samples analysed in 2018 (all objective sampling). The positive sample was in rape seed in the "oilseeds or fruits" category.

Cryptosporidiosis

- In 2018, 629 cases of cryptosporidiosis were notified in Ireland (CIR of 13.2 per 100,000 population) which is an increase on the 589 cases (CIR 12.4 per 100,000 population) reported in 2017 (HPSC, 2019a; b). In 2017, the most recent data available from the European Centre for Disease Prevention and Control (ECDC) reported an overall notification rate of 3.2 per 100,000 populations in the European Union. Among the countries reporting on cryptosporidiosis in 2017, Ireland has the highest rate (10.1/100,000) followed by Sweden (8.2/100,000) and the United Kingdom (7.6/100,000) (ECDC, 2017).

Shiga toxin-producing *Escherichia coli* (STEC) also known as Verocytotoxigenic *Escherichia coli* (VTEC)

- In 2018, there were 1,121 VTEC notifications (CIR 20 per 100,000 population) in Ireland, which is an increase from 2017 (923 cases, CIR of 19.4 per 100,000 population; HPSC, 2019a; b). This was the first year more than 1,000 cases have been reported in Ireland. In Europe 8,314 confirmed cases of VTEC were reported in 2018 with a CIR of 2.28 per 100,000 population (EFSA and ECDC, 2019). 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 8 times the EU average in 2018, except in 2011 when Germany reported the highest rate due to a large VTEC O104 outbreak linked to fenugreek seeds.

- No published VTEC outbreak data for 2018 was available at the time of publication of this report.

- Of 857 food samples tested for VTEC in 2018, 7 of the 804 suspect samples were positive. None of the 53 routine samples tested were positive.

Listeriosis

- Twenty-two cases of listeriosis were notified in Ireland in 2018 (CIR of 0.46 per 100,000 population; HPSC, 2019a; b). This is higher than reported in 2017 (14 cases, CIR of 0.29 per 100,000 population). Listeriosis in Ireland is close to the 2018 European average CIR of 0.47 per 100,000 population (EFSA and ECDC, 2019).

- Of 2,451 detection tests (detected or not detected in 25 grams) carried out on food samples, 261 (10.6%) were positive for *Listeria monocytogenes*. Of these, 245 (10%) positives were detected in routine food samples (RTE (127), raw (31), cooked (2) and unspecified RTE status (85)). A further sixteen (0.7%) positives were detected in suspect samples, three in RTE food and thirteen in food of unspecified RTE status.

- Of 5,528 enumeration tests (number of colony forming units per gram), *L. monocytogenes* was present in 1 (0.02%) of routine samples at >100 cfu/g. The microbiological criteria for *L. monocytogenes* in Commission Regulation (EC) 2073/2005, as amended, sets a legislative limit of 100 cfu/g for certain categories of RTE food products during their shelf-life when they are placed on the market. The positive routine sample with enumerated levels of *L. monocytogenes* >100 cfu/g was a RTE food.

- No published data was available from DAFM for *Listeria* in Irish animals in 2018 at the time of publication of this report.

Tuberculosis (TB)

- In 2018, 325 cases of TB were notified in Ireland (CIR of 6.7 per 100,000 population), which is a minor increase in the number of cases on the previous year (321 cases, CIR of 6.7 per 100,000 population). *Mycobacterium tuberculosis* was identified in 210 (95.9%) of the 219 culture confirmed cases for 2018. Seven cases of *Mycobacterium bovis*-associated TB were reported in 2018, which is an increase on the two cases reported in Ireland in 2017. 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 2018, 3.5% of bovine herds were positive for TB, the same rate reported in 2017.

- Of 672 suspect samples from animals other than bovine tested for *Mycobacterium* in 2018, 30.7% (n=206) tested positive. Positive suspect samples were detected in badgers (173 of 514), birds (3 of 6), cats (1 of 2), deer unspecified (25 of 138), goats (2 of 4) and zoo animals (2 of 4).

Brucellosis

- No cases of brucellosis were reported in humans in 2018.

- Of the 404 ovine or caprine herds suspect samples tested in 2018, none were positive for *Brucella*.

- Of the 26,256 bovine herds objective samples tested in 2018, none were positive for *Brucella*.

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

- In 2018, no positive BSE cases were identified. The number of BSE cases peaked in 2002 (333 cases), but since then a steady decline in incidence has been observed. This is mainly attributed to older animals in the national herd being replaced by younger animals that have not been exposed to contaminated feed. Since 2008, no BSE incidents have been detected in cattle younger than 60 months of age.

- No data on new notifications for vCJD cases was available for 2018 at the time of publication of this report. The last case of vCJD was notified in 2006.

- No data on new notifications for CJD cases was available for 2018 at the time of publication of this report .

- In 2018, eight cases of atypical scrapie and 1 case of classic scrapie were reported.

Toxoplasmosis

- There were 32 toxoplasmosis notifications in humans in 2018 (CIR of 0.7 per 100,000 population), compared with 20 notifications reported in 2017 (CIR of 0.4 per 100,000 population).

- No published data was available from DAFM for toxoplasmosis in Irish animals in 2018 at the time of publication of this report.

Leptospirosis

- There were 19 cases of leptospirosis notified in humans in 2018, (CIR of 0.4 per 100,000 population) which is one less than in 2017, in which 20 cases were notified (CIR of 0.4 per 100,000 population).

Other Zoonoses

- No data on the incidence of yersinosis was available in humans or animals for 2018 at the time of publication of this report.

- No human cases of trichinellosis were notified in Ireland in 2018. There were 3,518 tests carried out for *Trichinella* in pigs, solipeds, sows and boars with no positive samples

detected (objective samples). Of 161,088 census samples taken in pigs, solipeds, sows and boars in 2018, none were positive for *Trichinella*.

- No new cases of Q fever were reported in Ireland in 2018. No published data was available on *Coxiella* in Irish animals in 2018 at the time of publication of this report.

- Two cases of echinococcosis were notified in 2018.

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