

Overview of 2016 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 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 and ECDC, 2017).

The data in the 2016 tables for the results of Irish testing carried out in food, animal and animal feed samples are presented in three categories (routine, objective and suspect sampling) depending on the sampling context. Routine sampling is planned sampling but does not involve statistically random sampling. Objective sampling is the planned selection of a random sample, which is statistically representative of the population to be analysed (EFSA, 2016). 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, 2016). The samples obtained from suspect sampling may have a higher likelihood of having pathogens present.

Overview of 2016 data

Campylobacteriosis

- *Campylobacter* remained the most common bacterial cause of gastroenteritis in Ireland and in the European Union in 2016 (EFSA and ECDC, 2017). There were 2,513 cases of human campylobacteriosis reported in Ireland in 2016 (HPSC, 2016), corresponding to a crude incidence rate (CIR) of 52.8 cases per 100,000 population. This was an increase on the 2,451 cases (CIR 53.4 per 100,000 population) reported in Ireland in 2015. In Europe, there were 146,307 cases reported in 2016 with a corresponding CIR of 66.3 per 100,000 population.
- A total of 133 routine and 172 suspect food samples were tested for *Campylobacter* spp. in 2016. *Campylobacter* was detected in one of the 133 routine food samples (0.8%), a ready-to-eat (RTE) broiler sample.
- Out of 4,062 suspect animal samples tested for *Campylobacter*, 330 (8.1%) were positive. *Campylobacter jejuni* was identified from 100% of the 330 positive samples.

Salmonellosis

- In 2016, there were 309 reported cases of salmonellosis in Ireland (CIR 6.3 per 100,000 population) which is an increase on the previous year (269 reported cases, CIR 5.9 per 100,000 population; HPSC, 2016). The Irish figures for 2016 were below the European average CIR of 20.4 per 100,000 population (EFSA and ECDC, 2017).
- Of 309 human *Salmonella* isolates referred to the National Salmonella Shigella and Listeria Reference Laboratory (NSSLRL) for typing in 2016, the most common serotypes were *Salmonella* Typhimurium (including monophasic *S.* Typhimurium; 27.5%) and *Salmonella* Enteritidis (26.9%).
- A total of 5,524 food samples were tested for *Salmonella* in 2016.
- A total of 1,703 meat samples were tested. *Salmonella* was detected in two (0.4%) of 531 routine RTE meat samples tested. In total, 155 suspect RTE meat samples were taken for *Salmonella* in 2016, of these 3 (1.9%) were found to be positive for *Salmonella*. Three of 102 (2.9%) routine raw meat samples tested positive for *Salmonella*. In total, 13 (0.8%) routine meat samples and 3 (1.9%) suspect meat samples tested positive for *Salmonella* in meat.

- A total of 3,821 non-meat foods were tested. *Salmonella* was detected in 5 (0.1%) of 3,555 routine and 2 (0.8%) of 266 suspect non-meat samples tested. Four of the *Salmonella* positive routine samples were of unspecified RTE status while 1 was of raw status. Both of the *Salmonella* positive suspect samples were of unspecified RTE status.
- *Salmonella* unspecified (42.9%) and *Salmonella* Brandenburg (21.4%) were the predominant serotypes reported from 14 meat isolates in 2016.
- In 2016, 34 of 1,278 (2.7%) breeding and commercial poultry flocks were positive for *Salmonella*. The 34 isolates were detected in objectively sampled flocks. These included:
 - 22 positives (4.2%) of 520 broilers sampled before slaughter
 - 4 (2.2%) of 182 parents breeding flocks (*Gallus gallus*)
 - 1 (0.3%) of 350 laying hens (*Gallus gallus*)
 - 3 (50%) of 6 turkey breeding flocks and
 - 4 (1.9%) of 210 turkey fattening flocks.
- *Salmonella* unspecified (8), *Salmonella* mikawasima (7), *Salmonella* Derby (6) and *Salmonella* Kentucky (6) were the most common serotypes detected. None of 52 suspect sampled flocks were positive for *Salmonella* in 2016.
- Of the 164 objective fattening pig samples, 90 (64.9%) were positive. Forty three (48.8%) of the 90 isolates were *Salmonella* Typhimurium monophasic and 18 (20%) were *Salmonella* Typhimurium.
- Of 10,683 suspect samples from other animals tested for *Salmonella* spp. in 2016, 227 (2.1%) were positive. Positive samples were from adult cattle (bovine > 2 years) (1.4% of 1,031), calves under 1 years (0.9% of 4,016), cattle (bovine other) (4.2% of 2,730), fattening pigs (14% of 100), goats (78.6% of 28) and sheep (1.1% of 2,524).
- *Salmonella* Lexington was detected in 1 (0.4%) of 246 feed material samples analysed in 2016 (all objective sampling). The positive sample was in the “oilseeds or fruits” category.

Cryptosporidiosis

- In 2016, 561 cases of cryptosporidiosis were notified in Ireland (CIR of 11.8 per 100,000 population) which is an increase on the 439 cases (CIR 9.6 per 100,000 population) reported in 2015 (HPSC, 2016).

Verocytotoxigenic *Escherichia coli* (VTEC)

- In 2016, there were 832 VTEC notifications (CIR 17.6 per 100,000 population) in Ireland, which is an increase from 2015 (730 cases, CIR of 15.9 per 100,000 population; HPSC, 2016). In Europe 6,378 confirmed cases of VTEC were reported in 2016 with a CIR of 1.82

per 100,000 population (EFSA and ECDC, 2017). 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 9 times the EU average in 2016, except in 2011 when Germany reported the highest rate due to a large VTEC O104 outbreak linked to fenugreek seeds.

- In 2016, there were 98 VTEC outbreaks reported which involved 250 cases of illness. Three outbreaks (3.1%) were suspected to be foodborne involving 31 cases of illness from 2 family outbreaks and 1 general outbreak in a restaurant. In the restaurant outbreak epidemiological, environmental and microbiological evidence pointed to the serving of undercooked burgers as the likely cause. A lower number of outbreaks (91) and cases of illness (232) were reported in 2015. 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 maintained private water sources. Person-to-person was suspected to have played a role in 33 (33.67%) VTEC outbreaks in 2016 in which 80 persons were reported ill. Waterborne transmission was reported to have contributed to 11 outbreaks (11.22%) with 29 persons ill whilst animal or environmental contact was reported to have contributed to 13 outbreaks with 26 persons ill.
- Of 217 food samples tested for VTEC in 2016, 8 (3.7%) were positive. VTEC isolates (serotype unspecified) were detected in 6 routine samples of raw beef at both catering (3 out of 4; 75%) and processing level (3 out of 3; 100%) and in 2 (66.6% of 3) suspect samples of fresh beef at catering level.

Listeriosis

- Thirteen cases of listeriosis were notified in Ireland in 2016 (CIR of 0.27 per 100,000 population; HPSC, 2016). This is lower than reported in 2015 (19 cases, CIR of 0.41 per 100,000 population). Listeriosis in Ireland is below the 2016 European average CIR of 0.47 per 100,000 population (EFSA and ECDC, 2017).
- Of 2,372 detection tests (presence or absence in 25 grams) carried out on food samples, 29 (1.2%) were positive for *Listeria monocytogenes*. Of these, 23 positives were detected in routine food samples (seven of which were RTE foods, 2 were cooked, four were raw and ten was of unspecified RTE status). A further six positives were detected in suspect samples, one of which was in RTE foods, two in raw foods and three were of unspecified RTE status.
- Of 5,804 enumeration tests (number of colony forming units per gram), *L. monocytogenes* was not present in any of the samples at >100 cfu/g. However, three suspect samples of 'Foodstuffs intended for special nutritional uses' sampled at retail level had *Listeria monocytogenes* present at ≤100cfu/g .

- In 2016, *Listeria* was detected in 40 of 9,925 (0.4%) animal samples from cattle-bovine not specified (32 of 5644; 0.6%) and sheep (8 of 2898; 0.3%). Of these, 92.5% (37 of 40) were serotyped as *L. monocytogenes*.

Tuberculosis (TB)

- In 2016, 319 cases of TB were notified in Ireland (CIR of 7.0 per 100,000 population), which is an increase on the previous year (303 cases, CIR of 6.6 per 100,000 population). *Mycobacterium tuberculosis* was identified in 229 (97.86%) of the 234 culture confirmed cases for 2016. Three cases of *Mycobacterium bovis*-associated TB were reported in 2016, which is a decrease on the four cases reported in Ireland in 2015. 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 2016, 3.2% of bovine herds were positive for TB compared with 3.3% in 2015.
- Of 1,832 objective and 52 suspect samples from animals other than bovine tested for *Mycobacterium* in 2016, 20.9% and 23.1% were positive respectively. Positive objective samples were detected in badgers (21% of 1794) and wild deer (13.5% of 37), while positive suspect samples were detected in pigs (20.7% of 29), goats (50% of 6), zoo animals (25% of 4), wild birds (33.3% of 3) and sheep (16.6% of 6).

Brucellosis

- There were two cases of brucellosis reported in humans in 2016, compared to no reported cases in 2015.
- Of the 2,820 suspect (bovine, sheep, antelopes, monkeys, solipeds) samples tested in 2016, 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 2016. The last case of vCJD was notified in 2006.
- There was 1 new case of BSE reported in cattle in 2016.

- In 2016, 20,000 sheep and 130 goats were tested for scrapie. Of these, one flock was positive for classical scrapie and one was positive for atypical scrapie.

Toxoplasmosis

- There were 24 toxoplasmosis notifications in humans in 2016 (CIR of 0.50 per 100,000 population), compared with 26 notifications reported in 2015 (CIR of 0.56 per 100,000 population).
- *Toxoplasma gondii* was detected in 8.3% (147 of 1,772) of sheep tested in 2016 (suspect samples).

Leptospirosis

- There were 26 cases of leptospirosis notified in humans in 2016, (CIR of 0.54 per 100,000 population) which is higher than 2015 in which 16 cases were notified (CIR of 0.33 per 100,000 population).

Other Zoonoses

- There were three reported cases of yersinosis (CIR of 0.06 per 100,000 population). This was a decrease on the previous year (13 cases; CIR=0.28). Of 10,342 suspect animal samples tested for *Yersinia*, 2 (0.02%) were positive.
- No human cases of trichinellosis were notified in Ireland in 2016. There were 3,525 tests carried out for *Trichinella* in animals with no positive samples detected (objective samples).
- Six cases of Q fever were reported in Ireland in 2016. Five cases were male, with a median age of 51.5 years. *Coxiella* was detected in 2.8% (16 of 572) of suspect animal samples tested in 2016. Eleven positives were from cattle (11.3% of 97) and five positives were from sheep (1.1% of 475). All positives were identified as *Coxiella burnetii*.
- There were two cases of echinococcosis notified in 2016. These were the first cases of echinococcosis since 2007.

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