Reducing the risks of Campylobacter – update on UK strategy and how Campylobacter is being addressed by Food Standards Scotland (FSS)

1 Purpose of the paper

1.1 This paper is for **discussion**. The contamination of raw chicken meat with Campylobacter is a significant risk factor for foodborne illness in Scotland, and preventing the transmission of this pathogen in the food chain is a priority for FSS. This paper updates the Board on the current status of the UK strategy and provide details on how FSS aims to support future work on Campylobacter through its own strategy for reducing foodborne illness in Scotland.

2 Key developments since previous board updates

2.1 On 19 April 2016, the Chair wrote jointly with the Chair of the FSA to the nine major UK retailers[1] to seek their commitment to adopt a more transparent approach by taking responsibility for publishing the results of their own Campylobacter testing programmes. Since this letter, FSA has been engaging with each of the retailers to agree on an approved protocol for making their data publically available, which would allow them to be removed from the FSA survey.

2.2 In parallel, the FSA has continued to undertake its own survey, and to publish the prevalence and levels of Campylobacter detected in chickens sampled from each of the nine major UK retailers as well as a combined sample of smaller, independent shops including butchers and convenience stores. The latest results of the FSA's survey were published in June 2017 and showed an overall reduction in the prevalence and levels of Campylobacter detected on fresh chicken on sale in the UK. The results indicated that the significant investment made by the poultry industry to reduce Campylobacter in chicken appears to be having a positive impact, although it is clear that on-going effort will be needed to ensure this is sustained. The survey also showed statistically significantly higher levels of contamination in chickens sampled from smaller retailers and butchers, highlighting the need for focussed intervention to enable the improvements made by the main industry players to be extended across the whole supply chain.

2.3 The observed reduction in Campylobacter on fresh chicken on retail sale has coincided with a decline in the number of cases of human illness across the UK, and in Scotland, the number of reported cases of campylobacteriosis decreased by 15.5% between 2015 and 2016. These findings are encouraging, although it is still too early to establish the extent to which the reduction in human cases can be attributed to lower levels of contamination on chicken.

2.4 In light of the progress made by the major retailers and producers in taking action to reduce Campylobacter in chicken, it has been agreed that the FSA's strategy should now be focussed on targeting areas where effective interventions have yet to be implemented. FSS will continue to support the FSA in promoting on-going action by the poultry industry to address Campylobacter and will work with Scottish partners to reduce the risks of human infection in Scotland.

[1] Aldi, Asda, Co-Op, Lidl, Marks and Spencer, Morrisons, Sainsbury's, Tesco, Waitrose.

3 Strategic Aims

3.1 Campylobacter reduction is a commitment in our Corporate Plan to 2019[2], supporting FSS Strategic Outcome 1 – Food is Safe. The development of interventions for controlling the transmission of Campylobacter has been identified as a priority in our Strategy for Reducing Foodborne Illness in Scotland[3].

4 Identification of risks and issues

4.1 Transferring greater responsibility onto the major retailers for demonstrating their progress with Campylobacter reduction is in line with our wider regulatory approaches, and will provide transparency to consumers as well as a saving for the tax payer. This will enable FSA and FSS to focus effort on areas of the food chain where interventions have not yet been effective and on evaluating the public health impact of Campylobacter. Notwithstanding, it will be necessary to validate and monitor the outputs of self-reporting by retailers to ensure on-going transparency for consumers.

4.2 There is a risk that the implementation in food law, in 2018, of an EU process hygiene criterion for Campylobacter (which falls short of the existing UK target) could adversely impact on the progress that has been made by the UK to address this pathogen. It will therefore be important to continue to engage with the industry to ensure momentum is not lost and they fulfil their commitment to Campylobacter reduction over the long term.

5 The Board is asked to:

- **Agree** that reducing the incidence of foodborne Campylobacter infection in Scotland should continue to be a strategic priority for FSS;
- **Note** the progress being made at a UK level to reduce Campylobacter in the poultry production chain, including plans to reduce Government-led surveillance of fresh chicken at retail in line with the industry's commitment to publish its own data on Campylobacter contamination;
- **Agree** that FSS should continue to work with the FSA to promote Campylobacter reduction in UK produced poultry, and engage with Scottish partners to develop interventions which will help to reduce the public health impact of this pathogen in Scotland.

[2] http://www.foodstandards.gov.scot/publications-and-research/shaping-scotlands-food-future-our-strategy-to-2021-1
[3] http://www.foodstandards.gov.scot/downloads/A_Strategy_for_reducing_foodborne_illnesses.pdf

6 Background

Profile of Campylobacter infection in Scotland

6.1 Campylobacter continues to be the most important cause of food poisoning in Scotland, and controlling the transmission of this pathogen in the food chain is a priority for FSS's Strategy for Reducing Foodborne Illness in Scotland[4]. There is unequivocal evidence that chicken is the most important source of Campylobacter infection. Previous research funded by FSS has shown that approximately 55-75% of human cases reported in Scotland could be attributed to a chicken source; a figure which is comparable to other European countries[5].

6.2 Between 2010 and 2015, between 6163 and 6629 cases of human Campylobacter infection were reported annually in Scotland. In 2016, Health Protection Scotland (HPS) reported 5296 cases, which represented a decrease of 15.5% compared to 2015, and the lowest number of reported cases in Scotland since 2009 (Figure 1). The reason for this decrease is currently unclear, and it is too early to ascertain to what extent the UK strategy for reducing Campylobacter in chicken has translated to public health outcomes in Scotland.

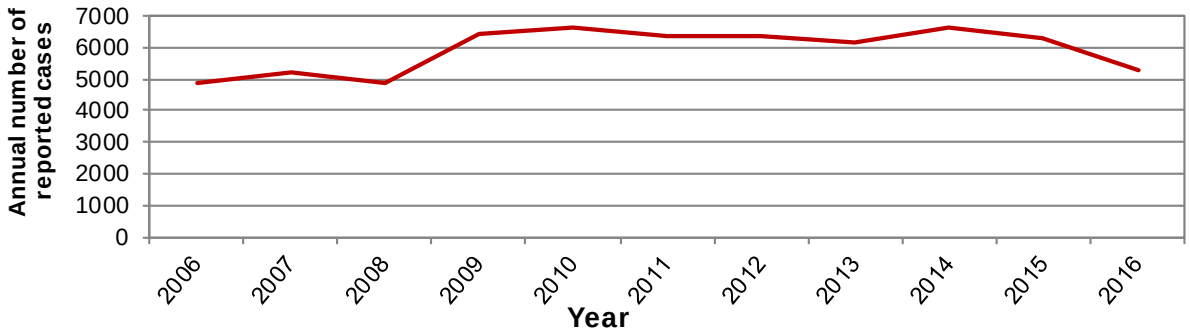

Figure 1. Annual number of clinical cases of Campylobacter infection reported in Scotland between 2006 and 2016. Health Protection Scotland (http://www.hps.scot.nhs.uk/giz/annualdatatables.aspx).

6.3 Since 2005, the FSS (and previously FSA in Scotland; FSAS) research programme has examined the attribution of Campylobacter infection in Scotland by comparing the whole genome sequences of strains isolated from human cases with those identified in chicken and other known sources of the pathogen (cattle, sheep, pigs and wild birds). The latest tranche of this research (due to be published in September 2017 subject to peer review) showed that, up to December 2016, 52-68% of human Campylobacter infection in Scotland could be attributed to a chicken source. These findings represent a small decrease, although not statistically significant compared to the figures previously reported[6].

6.4 Previous research undertaken by FSAS showed that there are differences in the profile of Campylobacter infection in different population groups in Scotland[7]. An association was identified between human campylobacteriosis and households which have a private drinking water supply[8], and infection in young children living in rural areas was found to be more

[4] http://www.foodstandards.gov.scot/sites/default/files/65726_SCT0217241290_pm_online.pdf

[5] http://www.foodstandards.gov.scot/sites/default/files/Board%20meeting%20-%202015%20June%2015%20-%20paper%20150604%20-%20Campylobacter_0.pdf

[6] http://www.foodstandards.gov.scot/consumers/food-safety/foodborne-illness

[7] http://www.foodstandards.gov.scot/factors-associated-geographic-and-temporal-variation-campylobacteriosis-humans

[8] http://www.foodstandards.gov.scot/private-water-supplies-risk-factor-campylobacter-infection-aberdeen-city-and-aberdeenshire

commonly attributed to cattle and sheep faeces than chicken sources. These findings suggest that environmental sources play a role in infection for individuals living in the countryside, which contrasts with urban populations of Scotland, where infection is most commonly associated with chicken. Our work also identified that fewer cases of Campylobacter infection are reported in deprived areas of Scotland compared with more affluent post code sectors, a finding which we are investigating further through our current research programme.

6.5 In the majority of cases, Campylobacter infection results in an acute, self-limiting gastroenteritis characterised by diarrhoea, abdominal pain and fever, and, in some cases, nausea and vomiting. The illness usually develops a few days after ingesting the bacteria and lasts around one week, however infection can lead to more serious health complications. FSS has recently undertaken a project in collaboration with HPS to estimate the burden of Campylobacter infection through the linkage of human case data collected from 2011 to 2015, with patient records relating to hospitalisations, deaths and medical prescriptions over same period. The research found that:

- Approximately 0.04% of the 30986 Campylobacter cases studied went on to report Guillan Barré syndrome, and 0.08% of cases developed reactive arthritis following infection (although it was not possible to establish whether this resulted from the infection);
- Approximately 11% of cases resulted in hospitalisation, with a higher proportion of cases being hospitalised in urban areas compared to rural areas;
- The mortality rate for confirmed cases was 0.05%, comprising 9 cases for which Campylobacter was cited as the cause of death, and a further 8 cases where death was due to a recognised complication of Campylobacter infection. An additional 55 cases died within 30 days of their infection, although it was not possible to determine whether these deaths were attributed to Campylobacter infection itself or other unrelated conditions;
- Hospitalisation and medical complications attributed to Campylobacter infection were found to be associated with increased deprivation;
- Hospitalisation and mortality were more common in cases over 65 years.

6.6 The findings of FSS's research on the profile and burden of Campylobacter infection in Scotland will be used to identify the population groups which are at greatest risk of illness and to estimate the costs of foodborne campylobacteriosis to the Scottish economy. This will help FSS and HPS to develop appropriate public health interventions for addressing this pathogen in Scotland and ensure they are effectively targeted to the population groups which are most affected.

UK Campylobacter Reduction Strategy – Background and progress to date

6.7 It is well established that Campylobacter grows to high levels in the gut of infected chickens and can contaminate the skin and meat of birds during slaughter and processing. This puts consumers at risk of exposure to the pathogen through cross contamination from raw meat and the consumption of undercooked chicken. Evidence suggests that chicken with high levels of Campylobacter - exceeding 1000 colony forming units per gram (cfu/g) - presents the greatest risk to consumers[9], and reducing contamination levels below this threshold is therefore considered to be important in the prevention of foodborne illness[10].

[9] EFSA 2009, Scientific Colloquium Summary Report 12, 4-5 December 2008, Rome, Italy
[10] https://www.food.gov.uk/sites/default/files/multimedia/pdfs/campytarget.pdf

6.8 Internationally, public health strategies for Campylobacter control have been based on reducing the levels of contamination on fresh chicken, and improving consumer awareness of the risks and how to avoid them. In the UK, this has been delivered, since 2009, in partnership with the poultry industry, through the FSA's UK Campylobacter reduction strategy. A key milestone for the UK strategy was agreement, with the industry, to a voluntary target aimed at reducing the percentage of the most heavily contaminated chickens (with greater than 1000 colony forming units of Campylobacter per gram of chicken (cfu/g)), that are placed on the market.

6.9 Through the strategy, the major poultry producers and retailers have committed to address Campylobacter through improved food safety management and the implementation of targeted intervention approaches at farming, processing and retail. A wide range of interventions have been trialled to date, with the following control measures found to have the greatest impact on Campylobacter reduction:

At the farm level improvements to biosecurity coupled with increased sampling of poultry houses to prevent transmission and identify when flock colonisation has occurred. Certain producers have also removed the thinning stage (when a portion of the flock is removed prior to depopulation to satisfy market demand for smaller chickens) from the growing process to reduce the risks of Campylobacter contamination in the finished flock.

At processing secondary scalding (where birds are immersed in hot water following the de-feathering stage, in addition to the initial scald which acts to soften feathers for removal) has proven to be particularly effective in reducing Campylobacter contamination on carcasses, and has now been implemented by many of the major processors. Additional end of line treatments based on steaming, chilling or washing are also being trialled and implemented by some companies to effect further reductions in Campylobacter levels.

At retail a number of interventions have been taken forward including leak proof packaging, labelling to advise consumers not to wash raw chicken, and cook in the bag products to minimise handling and cross contamination risk in the domestic kitchen.

6.10 The impact of these interventions is being assessed by the industry against the voluntary target, and progress is currently being monitored through FSA surveillance of fresh chickens sampled at the end of slaughter and at retail sale.

6.11 The most recent FSA retail survey results (published in June 2017)[11] were based on tests of 1,051 whole fresh chickens sampled during January to March 2017. The results showed that 48.8% of chickens tested positive for Campylobacter (compared to 50.0% during January to March 2016), and that the overall industry average of chickens testing positive for Campylobacter within the highest band of contamination (more than 1,000 colony forming units per gram (cfu/g)) was 6.5%, which was a statistically significant reduction from the 9.3% recorded for the same period last year.

6.12 Looking at the nine retailers with the highest market share, an average of 5.0% of chickens in this group tested positive for Campylobacter within the highest band of contamination. This contrasted with the 'others' category consisting of smaller retailers and butchers, where the

[11] http://www.foodstandards.gov.scot/news/survey-indicates-levels-campylobacter-uk-produced-chicken-continue-decrease

average percentage of chickens found to be contaminated with levels exceeding 1,000 cfu/g was statistically significantly higher at 16.9%.

6.13 A comparison of survey results over time has shown that, overall, for the first five months of the current retail survey (covering August-December 2016), 7% of chickens tested positive for the highest level of contamination, which was down from 12% for the same period in 2015 and 20% in 2014. These results demonstrate on-going improvement, although it will be necessary to continue to monitor progress to take account of the seasonality of Campylobacter, which is known to peak during the summer months. The survey results also demonstrate the need for on-going action by the industry, particularly the smaller producers, to ensure these improvements are sustained.

6.14 It is encouraging that the observed reductions in Campylobacter contamination in retail chicken have occurred in parallel with a decline in the number of human cases. Although no direct causal link has yet been established, FSA has estimated, taking account of under-reporting, that the number of Campylobacter cases reported in the UK in 2016 was equivalent to an overall reduction of 100,000 actual cases compared to a baseline figure calculated using data from 2009-2013[12].

Future approach to Campylobacter reduction in the UK

6.15 The UK Campylobacter reduction strategy has involved significant public investment in research, stakeholder engagement and communications over a period of almost 20 years. Whilst it is not possible to measure the true impact of this investment on public health, it is clear that the strategy has been effective in promoting action by the industry in efforts to improve food safety. In light of evidence for the success of the strategy, and recognising the need to adopt a more sustainable approach to Campylobacter reduction going forward, the FSA has proposed to focus effort to the areas where it can make the greatest further impact, with objectives managed under 'business as usual' programmes of work.

6.16 With regard to surveillance of Campylobacter in chicken, it has been agreed that individual retailers will be removed from the FSA retail survey once they have demonstrated a commitment to publishing their own testing results, in accordance with an FSA-approved, standardised protocol. At the time of this paper, 8 of the 9 major UK retailers have agreed, in principle, to self-reporting of their own testing data, although written confirmation of their agreement to the schedule and format in which data will be published is still awaited.

6.17 Once the required criteria for self-reporting are met by each retailer, they will no longer be included as part of the FSA survey, although FSA and FSS will retain the ability to issue comment on their published data sets. The expectation is for individual retailers to publish a summary of their own Campylobacter testing results on the consumer facing pages of their websites, and make their raw data sets publically available on an anonymised basis. The agreed protocol would also enable FSA and FSS to review the raw data for individual retailers, but not for publication purposes. The timetable for retailers to self-report their own Campylobacter testing data is yet to be finalised, although it is expected to commence towards the end of 2017.

[12] https://www.food.gov.uk/news-updates/news/2017/16052/latest-figures-reveal-decline-in-cases-of-campylobacter

6.18 Focus for FSA and FSS will now move to encouraging and working with smaller processors who generally have not had the same levels of improvements made to their processing lines. Although these plants account for a significantly smaller share of the market, many supply product into catering and local retailers. Therefore interventions targeted to these food chains will be important in ensuring public health improvement is sustained in to the future. It is proposed that this will be taken forward through operations staff working with these businesses to develop action plans for controlling cross contamination, and a pilot initiative is currently underway to inform how this work will be implemented going forward.

6.19 It is worth noting that the first statutory regulatory intervention for Campylobacter has recently been agreed which is intended to place greater emphasis on hygiene controls applied to the processing of chicken across the EU. On 30th March 2017, the Commission gained a qualified majority vote on implementing a Process Hygiene Criterion (PHC) for Campylobacter on broiler carcasses. This states that from January 2018, up to 40% of poultry carcasses tested for Campylobacter can exceed 1000 cfu/g, from 2020 up to 30% of carcasses tested can exceed 1000 cfu/g and from 2025, up to 20% of carcasses tested can exceed 1000 cfu/g. The UK abstained from the vote as it was felt that the levels would not achieve adequate reductions in human cases of Campylobacter infection, and did not take account of the progress already made by a number of Member States, including the UK. Whilst it is unlikely that the major UK producers would seek to apply this criterion at the expense of the more robust Campylobacter target they have been working towards over the past 8 years, an advantage of these legal limits will be to re-enforce measures for improving controls in smaller plants. Notwithstanding, and taking account of consumer preference for more stringent targets relating to Campylobacter control[13], it will be important to ensure that this legislative change is monitored to ensure there is no impact on our aim for continual improvement.

How Campylobacter will be addressed through FSS Strategy

6.20 Previous updates to the Board outlined FSS's contribution to the UK strategy and how we were working with HPS and other partners to reduce Campylobacter infection in Scotland. Given its on-going significance as a cause of foodborne illness in Scotland it will be important for FSS to continue to prioritise this issue; supporting FSA in keeping the pressure on industry to reduce Campylobacter in UK produced chicken, and developing interventions which address the risks associated with the Scottish food chain and ensure consumers are protected from this pathogen.

6.21 Our future work on Campylobacter will be refreshed through the FSS Strategy for Reducing Foodborne Illness in Scotland[14]. This will build on our existing collaborative current research and communications activities focussing on the following areas:

- **Continuing to promote on-going action by the poultry industry to reduce Campylobacter** by working with FSA to monitor progress and engaging with the major retailers and poultry producers in our own right to ensure Campylobacter control remains a priority in the interests of public health in Scotland;
- **Developing action plans for improving Campylobacter controls at smaller poultry plants and retailers across Scotland** employing our operational field staff to promote hygiene improvements and implement monitoring programmes at the 2 smaller poultry

[13] https://www.food.gov.uk/sites/default/files/campylobacterconsumersurvey2016_0.pdf
[14] http://www.foodstandards.gov.scot/downloads/A_Strategy_for_reducing_foodborne_illnesses.pdf

processing plants which operate in Scotland. We will also work with Scottish Local Authorities to develop interventions to support butchers and smaller retailers in controlling Campylobacter risks;

- **Working with scientists and the public health community across Scotland to direct research and surveillance programmes** aimed at understanding of the sources of Campylobacter in Scotland and how the illness it causes affects the Scottish population;
- **Ensuring our consumer advice and communications activities are effectively targeted** based on evidence for the trends in Campylobacter infection and the population groups which are most affected.

7 Conclusion/Recommendations

The Board is asked to:

- **Agree** that reducing the incidence of foodborne Campylobacter infection in Scotland should continue to be a strategic priority for FSS;
- **Note** the progress being made at a UK level to reduce Campylobacter in the poultry production chain, including plans to reduce Government-led surveillance of fresh chicken at retail in line with the industry's commitment to publish its own data on Campylobacter contamination;
- **Agree** that FSS should continue to work with the FSA to promote Campylobacter reduction in UK produced poultry, and engage with Scottish partners to develop interventions which will help to reduce the public health impact of this pathogen in Scotland.

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