ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

EPIDEMIOLOGY OF FOODBORNE INFECTIONS GROUP (EFIG)

1. The group met on 3 June 2012 and the following is a combined summary of the animal and human data and other topics that were discussed at the meetings.

Animal data

Animal *Salmonella* data January – December 2012 (provisional data)

2. Key points from the January – December 2012 data were highlighted. The data were provisional figures and relate to numbers of incidents rather than flocks or herds. There was a reduction in reports of *Salmonella* in cattle, sheep, ducks and other bird species not subject to *Salmonella* National Control Plans (NCPs) in 2012 compared to 2011. The number of reports from pigs was roughly comparable to 2011. The annual AHVLA reports on *Salmonella* in livestock provide further details including the reasons for collection of this data. The latest report (2011) is available at http://www.defra.gov.uk/ahvla-en/publication/salm11/**.** Although not presented here some data is available for other foodborne pathogens from confirmed clinical diagnoses of non-statutory zoonoses and infections shared between animals and humans from specimens submitted to VLA and SAC laboratories.

3. An isolation is defined as the report of the first isolate of a given *Salmonella* (defined by serovar, and/or phage type, if available) from the same group of animals on a given occasion. If two submissions from the same group of animals on different dates give the same serovar, this is reported as two isolations. An incident comprises the first isolation and all subsequent isolations of the same serovar or serovar and phage/definitive type combination of a particular *Salmonella* from an animal, group of animals or their environment on a single premises, within a defined time period (usually 30 days).

- Between January and December 2012, there were 1,153 incidents of *Salmonella* from livestock not subject to *Salmonella* NCPs. This is an 8% reduction compared with 2011 (1,251 reports) and a 29% reduction compared with 2010 (1,623 reports). The biggest reduction was in incidents from cattle with 491 in 2012 compared to 715 in 2011.

- The top *Salmonella* serovars in cattle, sheep and pigs were Dublin, 61:k:1,5,(7) and Typhimurium respectively.

- There were 14 reports of *S*. Enteritidis during 2012, compared with 20 reports in 2011 and 16 reports during 2010. Seven of the incidents involved phage type (PT)11, which is usually associated with hedgehogs.

- There were a total of 157 incidents of *S.* Typhimurium in 2012 compared with 194 incidents in 2011 (19% decline) and 251 incidents in 2010 (37% decline). Cattle and pigs were together responsible for the majority of reports for *S*. Typhimurium, *Salmonella* 4,5,12:i:- and *Salmonella* 4,12:i:- during 2012. The most common phage type for all three of these salmonellas was DT193.

- Reports of monophasic *Salmonella* 4,5,12:i:- decreased, with 40 incidents during 2012 compared to 82 in 2011 and 71 during 2010. In contrast, the number of reports of monophasic *Salmonella* 4,12:i:- more than doubled, with 55 incidents during 2012 compared with 24 in 2011 and 23 in 2010.

- There were 98,259 AHVLA/SAC submissions to VIDA between January and December 2012, which is 1% higher than in 2011 (97,479 submissions) but 3% lower than during 2010 (101,768 submissions). Compared with 2011, there were increases in the number of submissions from sheep (18%) and cattle (3%) but decreases in submissions from pigs (39%), birds (8%) and miscellaneous (3%).

Animal *Salmonella* data January to March 2013 (provisional figures)

- Between January – March 2013, there were a total of 298 reports of *Salmonella* from livestock species not subject to *Salmonella* NCPs. This is a 7% increase compared with January – March 2012 (278 reports) and a 5% increase compared to the equivalent period in 2011 (285 reports).

- There was a single report of *S.* Enteritidis during January – March 2013, the phage type was PT8.

- There were also 22 reports of *S.* Typhimurium during January – March 2013 with the most commonly reported phage types DT104, DT193 and U288.

- For monophasic *Salmonella* reports of 4,5,12:i:- increased by 27% from eleven incidents during January – March 2012 to 14 incidents during the same quarter of 2013. In contrast reports of *Salmonella* 4,12:i:- decreased by 33% from nine reports during January – March 2012 to six reports during January – March 2013.

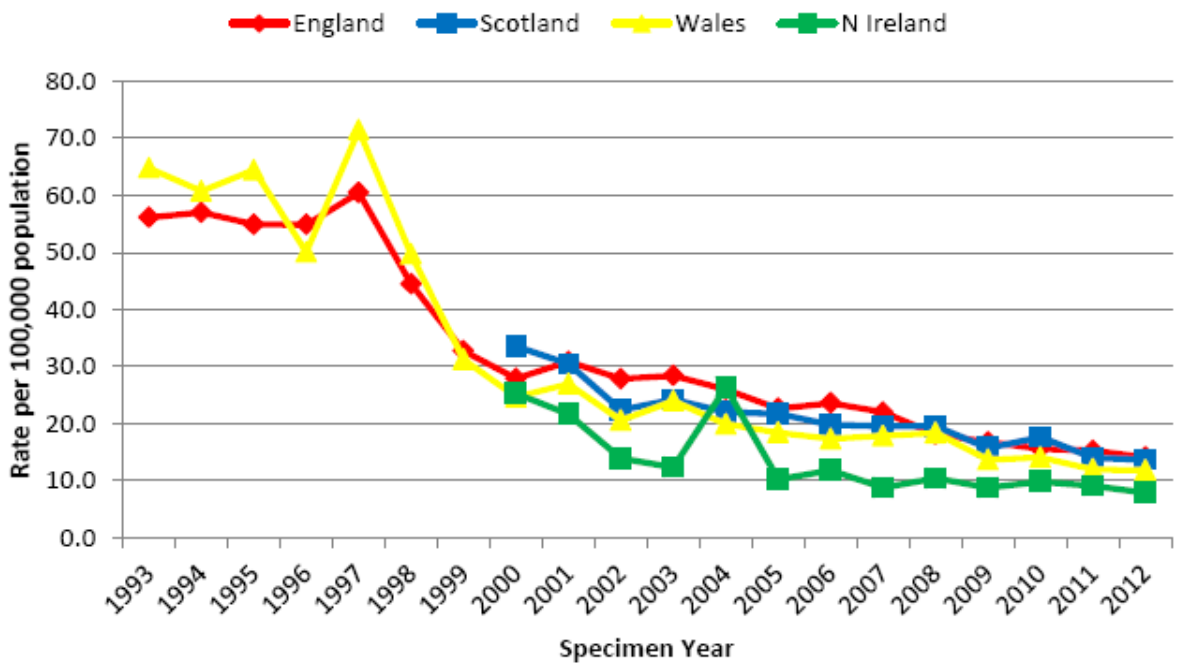
Human data

Trends in laboratory reports

4. The following figures show the trends in laboratory reports for *Salmonella*, *Campylobacter*, *Listeria monocytogenes* and *E.coli* O157 in the UK 1993-

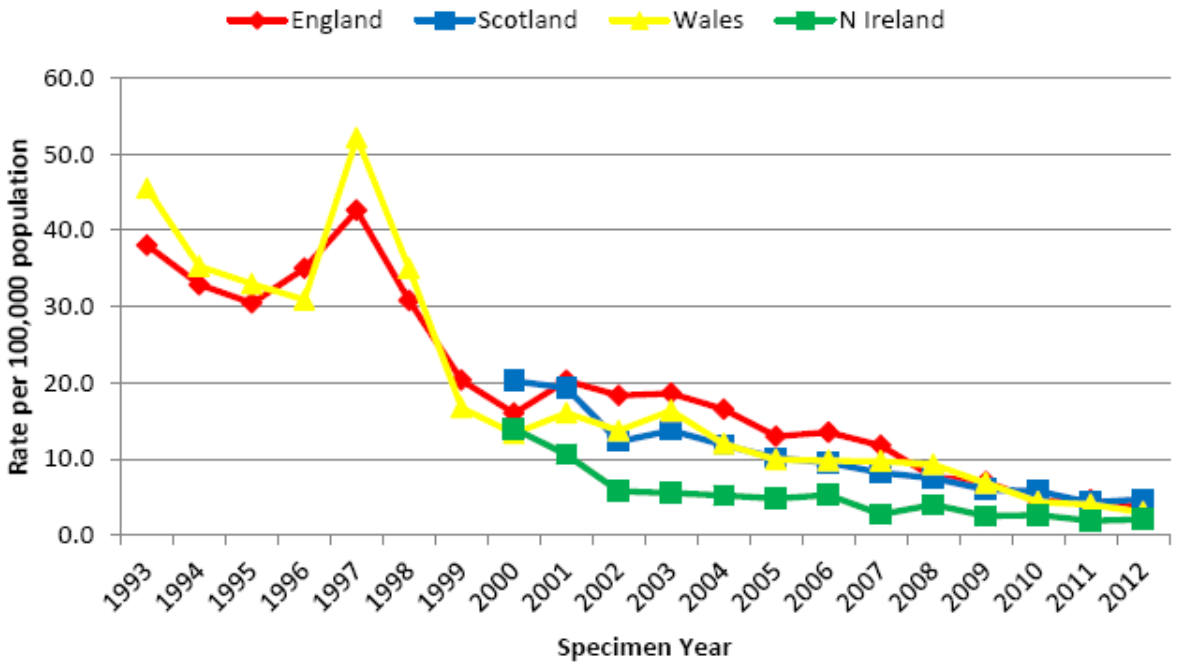
2012. The data for Salmonella Typhimurium phage types in Figure 4 relates to England and Wales 2000-2012.

Figure 1. Non Typhoidal Salmonellas



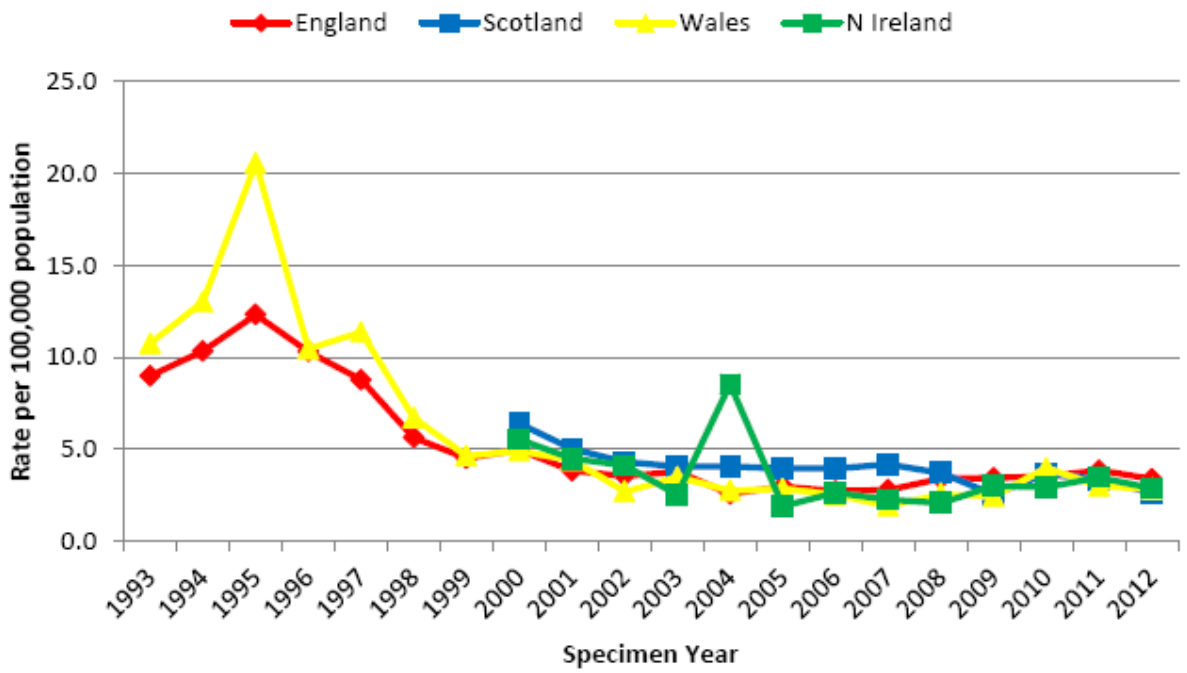
Source: PHE

Figure 2. *Salmonella* Enteritidis



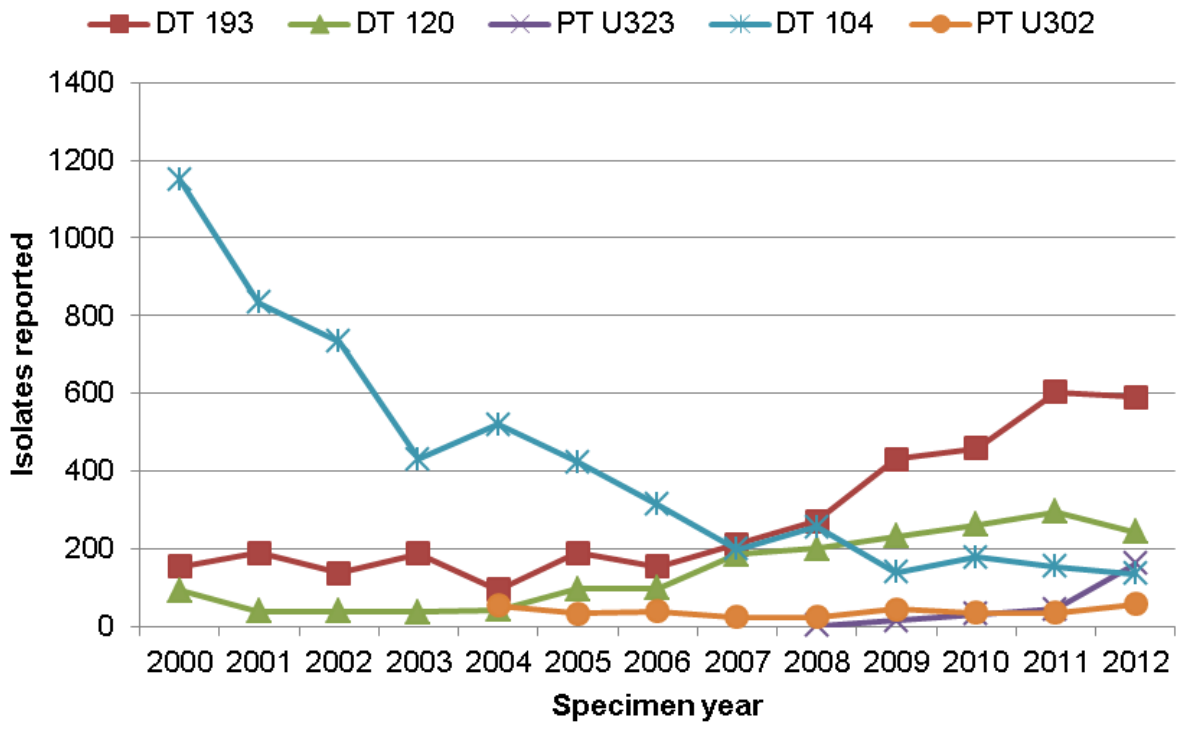
Source: PHE

Figure 3. *Salmonella* Typhimurium



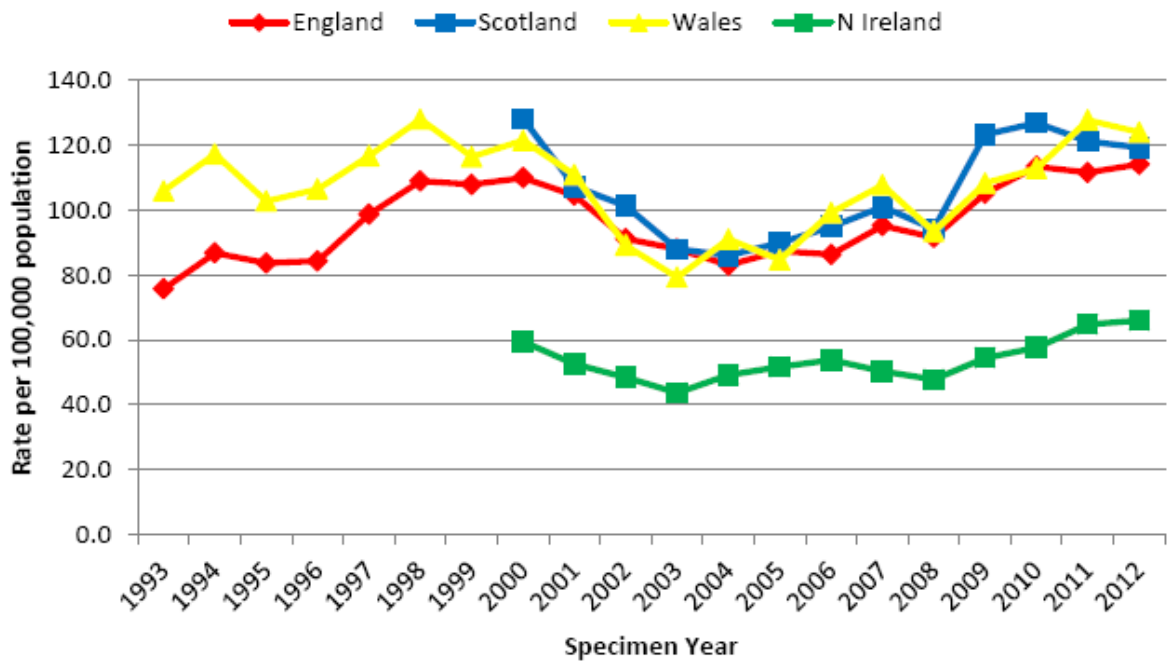
Source: PHE

Figure 4. *Salmonella* Typhimurium – tope 5 phage types in England and Wales – change in trend 2000-2012



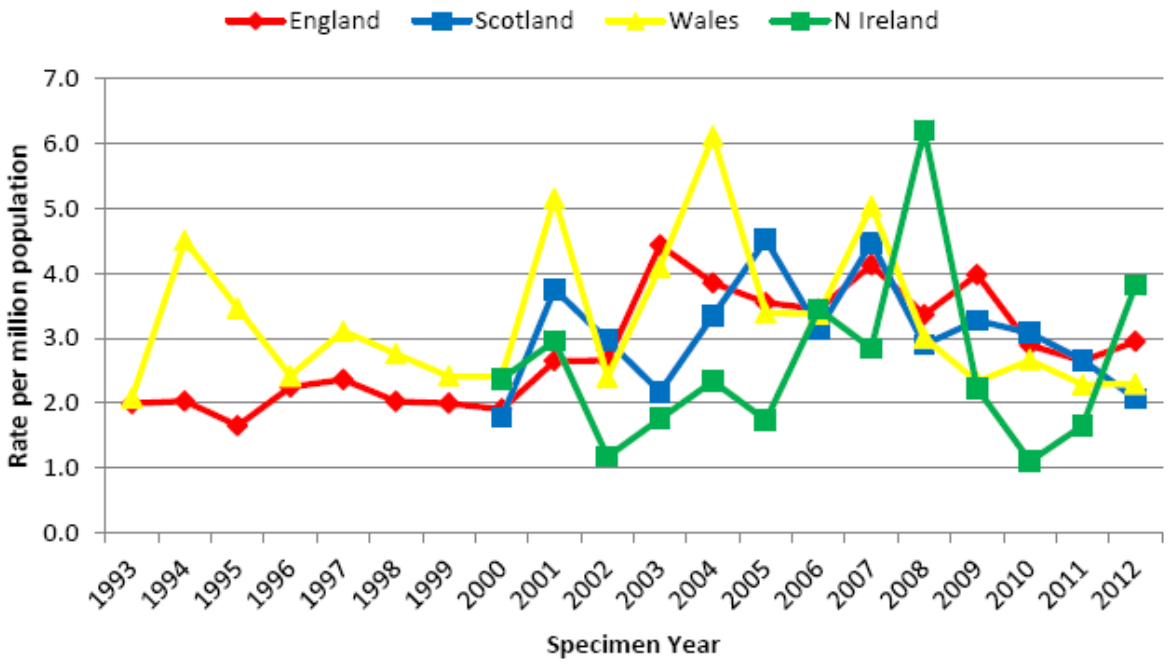
Source: PHE

Figure 5. ***Campylobacter***



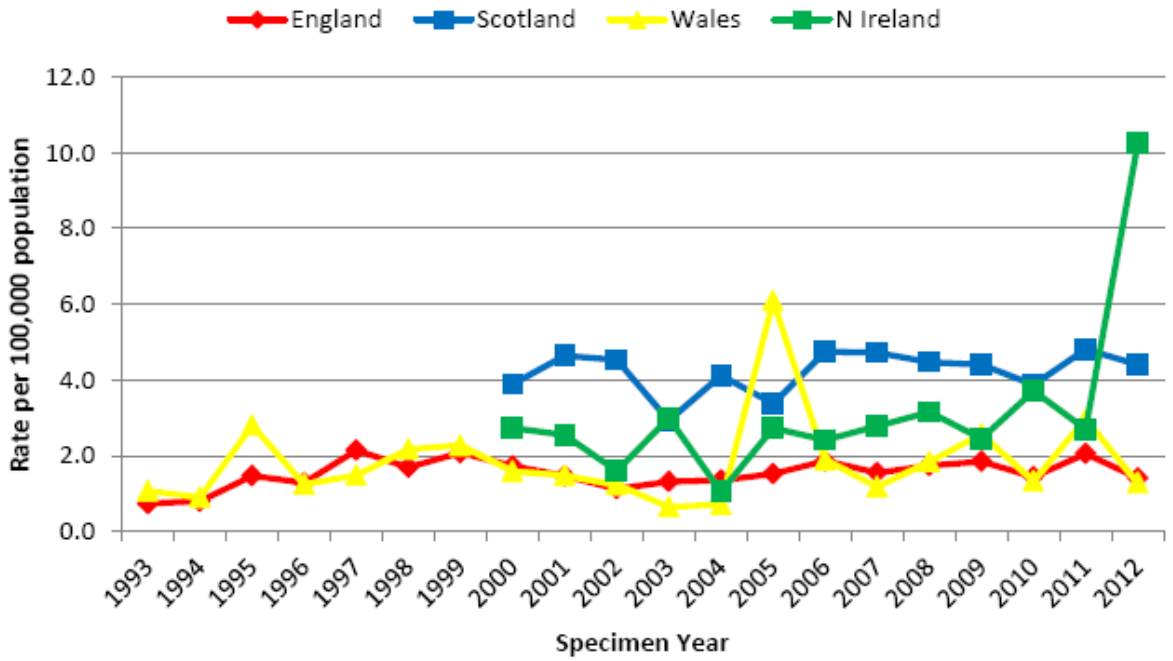
Source: PHE

Figure 6. ***Listeria monocytogenes***



Source: PHE

Figure 7. *E.coli* O157



Source: PHE

Review of trends in human data

Laboratory reports

- The decline in non-typhoidal *Salmonella* infections has continued, with the numbers of cases and rates of infection in decline for the past 10 years in UK (Figure 1). The top 3 serovars in England and Wales in 2012 were Enteritidis, Typhimurium and Infantis.

- The decline in *S.* Enteritidis has continued in all countries (Figure 2), and this is presumed to be as a result of a decline in PT4 strains following interventions in the poultry meat and egg industries. The top 3 phage types of Enteritidis in 2012 were PT8, 1 and 4.

- Infections with *S.* Typhimurium overall are only slightly lower than ten years ago (Figure 3), but would be lower still, were it not for the rise in *S.* Typhimurium Definitive Type 193 (DT 193) that has been seen in all countries in recent years. Data for the top 5 phage types of S.Typhimurium in England and Wales is shown in Figure 4. Preliminary data for 2012 indicate that 50% of *S.*Typhimurium isolates tested were monophasic, with the majority represented by DT 193 (86%), DT 120 (68%) and PT U323 (97%).

- The rise in *Campylobacter* cases has continued in 2012, reaching the highest ever levels in England, but levelling off in Scotland, Wales and Northern

Ireland (Figure 5). Northern Ireland continue to report rates of infection approximately half that of other UK countries though following the same annual trends as other countries in the UK. PHE was tasked with leading a cross-government piece of work for EFIG looking at the possible reasons for why *Campylobacter* rates in Northern Ireland and the Republic of Ireland are consistently lower than in England, Wales or Scotland.

- *Listeria monocytogenes* remains lower than in most recent years, though with small reported numbers the data remain particularly stochastic, with the overall rate of infection in the UK fluctuating from 1.9 cases per million population to 4.1 per million in the past 12 years (Figure 6). *Listeria monocytogenes* has seen a decline in cases in recent years except in Northern Ireland.

- The rates of verocytotoxin-producing *Escherichia coli* (VTEC) O157 infection in Scotland and Northern Ireland remain higher than in other UK countries, the latter following a large outbreak in the final quarter of 2012. In England and Wales phage types PT21/28 and PT8 remain the commonest phage types reported as in previous years.

Outbreak data

- The number of outbreaks reported in 2012 declined by 35% in 2012 (58) compared to 2011 (89). *Salmonella* infections caused the largest number of reported outbreaks (14) most being due to *S*.Typhimurium. The largest outbreak reported was for *Cryptosporidium* infection associated with consumption of fresh salads leaves.

Listeriosis in England and Wales

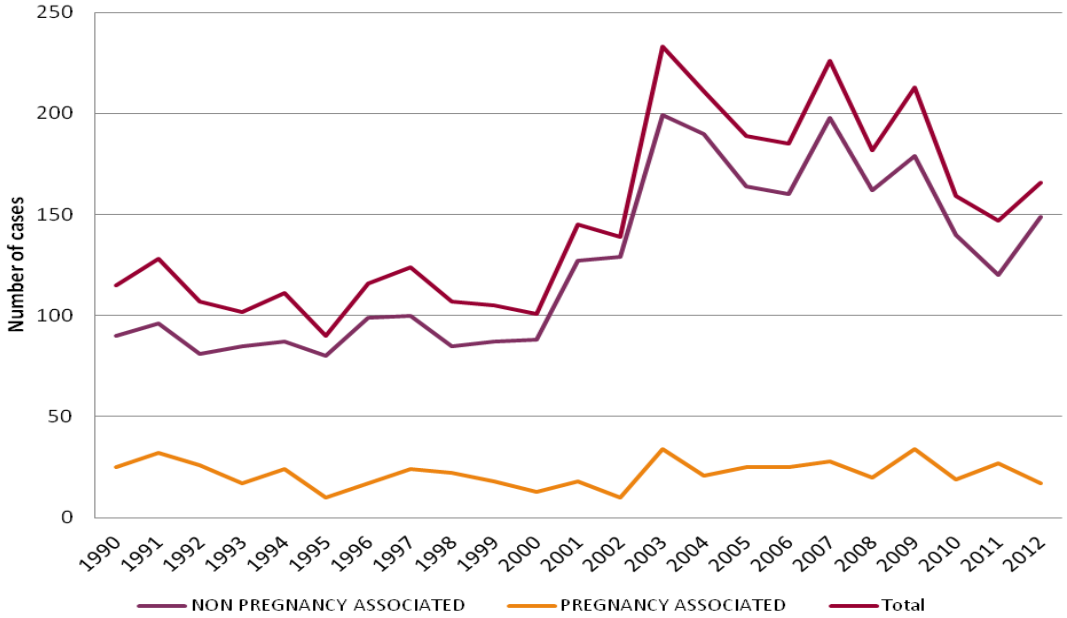
5. PHE updated EFIG on enhanced surveillance data for listeriosis in England and Wales between 1990 and 2012. During the surveillance period (1990 – 2012), a total of 3401 cases of listeriosis were reported to the *Listeria* enhanced surveillance system in England and Wales. In the 1990s, an average of 110.5 cases were reported annually, and this increased to 180.2 cases annually post 2000 (Figure 8). Between 2003 and 2009, the number of cases nearly doubled to about 205 cases per year. This however declined in 2010 and 2011 with 159 and 148 cases respectively. In 2012, the number of cases increased again to 165; however the number of pregnancy associated cases reduced. This is in contrast to the picture in 2011 where the number of pregnancy related cases increased despite a decrease in the total number of cases.

6. From 2010, laboratories have been legally obliged to report *Listeria* isolates under the Health Protection Regulations 2010, however this regulation has not resulted in an increase in the number of cases reported. For the duration of the surveillance period, serotype 4 has consistently been the dominant serotype. Results for molecular subtyping (AFLP) became available from 2004. Since then, subtype 4I has been the most common subtype with the exception of year 2010 where most cases were subtype 4V. Of the 141

isolates (85% of all reported cases in 2012) available for typing in 2012, serotype 4 accounted for nearly 60%, of which subtype 4I was the most common.

7. In the first ten years of surveillance (1990 – 2000), the case fatality rate (CFR) was over 30%, however, when the number of cases increased in the second decade (2001 – 2011), the overall trend of the CFR declined to about 27%. This means that the increase in the number of cases reported is not matched by a proportional increase in the number of deaths observed, so even though more cases are being reported, they result in fewer deaths when compared to the earlier years. A possible explanation is that most cases presenting since 2001 were individuals presenting with bacteraemia rather than CNS involvement and therefore presenting with a less severe form of listeriosis.

Figure 8. Number of *Listeria monocytogenes* cases by patient type in England and Wales; 1990 - 2012



Source: PHE

Other items of interest to the Committee

Recent workshops

8. The FSA held a research workshop on foodborne viruses in January 2013 and the report of the meeting has been published on the FSA website. http://food.gov.uk/multimedia/pdfs/publication/foodborne-virus-2013.pdf
A joint FSA/Defra/BBSRC workshop on *Campylobacter* was held in March 2013 and a report of the meeting was currently in preparation. Areas for research identified by the delegates for closer attention in the future included comparing different practices on-farm and in-factory on *Campylobacter* contamination of poultry, potential interventions in poultry transport/slaughter house/factory practices, high quality baseline data and regular monitoring of

poultry, understanding how *Campylobacter* survives in the food supply chain. In addition research on human behaviour throughout the food chain was also considered important; what prevents and what motivates behavioural change: educating and motivating farmers; consumer awareness and education; and development of improved training methods.

Food surveillance

9. PHE provided an update on their UK co-ordinated food surveillance studies. An evaluation of hygiene practices in catering premises at large scale events in the United Kingdom with a focus on identifying risks for the Olympics 2012 and a follow-up study of hygiene practices in catering premises at large scale events in the United Kingdom have been published on the HPA website.
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1287144844852
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138362820
In terms of new work, study 50 is looking at plain soda water from soda guns or fixed dispensing points in bars, restaurants, cafés and other premises serving carbonated drinks and study 51 will be looking at pre-packed sandwiches from unregistered premises and small and medium enterprises and will focus on *Listeria monocytogenes.*

Action

10. ACMSF Members are invited to comment on the recent trends in animal and human data and other subjects discussed by EFIG at the June 2013 meeting.

Secretariat
June 2013