

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD
EPIDEMIOLOGY OF FOODBORNE INFECTIONS GROUP (EFIG)

1. The group met on 4 November 2010 and the following is a summary of the main areas that were discussed.

Consideration of Feedback from ACMSF

2. The group were informed that ACMSF found the EFIG information about trends useful and if possible future updates should include a short bullet point summary with graphs and tables and if possible denominator data. ACMSF had noted that the Human Animal Infections and Risk Surveillance Group (HAIRS) did have some similarities with EFIG although there was no overlap in their remits, HAIRS focusing more on emerging organisms.
3. EFIG discussed the availability and practicalities of providing denominator data in terms of sampling and populations. This is more straightforward for the human data because numbers of laboratory reports of isolates can be expressed in terms of human population data. The animal data is based on number of reported incidents* or isolations** which have a broader scope than for human isolations. In addition, submissions to veterinary labs depend on a number of factors (especially economic) and samples are submitted from both ill (diagnoses) and healthy (screening) animals. Appropriate denominator data for animal incidents or isolations could be the total number of laboratory submissions or GB population data for each animal species but there are issues with using such data as denominators, see http://www.defra.gov.uk/vla/reports/docs/rep_salm09_chp1.pdf. The National Control Programme (NCP) data for *Salmonella* in chickens and turkeys is a source of reports with denominator data but its availability is likely to lag behind that for other animal data and that for humans. Further consideration would be given to what could be provided in the future and the VLA will be preparing a paper concerning animal denominator data for further consideration by EFIG.

Review of animal data for January – June 2010

4. *Salmonella* in poultry trends over the last few years have been different to previously as there are fewer voluntary surveillance isolates as the majority are now collected under the NCPs. The NCP data for 2009 was not discussed by EFIG and was published in the *Salmonella* in Livestock in GB 2009 report at the end of 2010 see http://www.defra.gov.uk/vla/reports/rep_salm_rep09.htm.
5. During January – June 2010, there were a total of 726 reports of *Salmonella* from voluntary surveillance of livestock. This represents a fall of 10% when compared with the equivalent periods of 2009 and 2008 (806 reports each). The main serovars isolated are shown in the following table.

*An incident comprises all isolations of the same serovar and phage/definitive type of *Salmonella* from an animal, group of animals on the premises, within a defined time period (usually 30 days).

** An isolation is the first isolate of *Salmonella* (serovar and phage type) from a 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.

Top serovars reported from surveillance of livestock in GB January-June 2010

Cattle	Pigs	Sheep	Chickens***	Turkeys***
n=330	n=65	n=129	n=13	n=11
Dublin (69%)	Typhimurium (65%)	61:k:1,5,(7)** (65%)	Typhimurium (15%)	Derby (27%)
Mbandaka (12%)	4,5,12:i:-* (11%)	Montevideo (14%)	-	Bovismorbificans (18%)
Montevideo (6%)	4,12:i:-* (6%)	Dublin (11%)	-	Kedougou (18%) Kottbus (18%)

* These strains are also referred to as monophasic *Salmonella* Typhimurium-like

**All strains likely to be *S. enterica* subspecies *diarizonae* serovar 61:k:1,5,(7)

*** Excludes NCPs

Source: VLA

6. Key points from data for the first 6 months of 2010 are:

- There were 9 incidents of *S. Enteritidis* which remains very low. There was a single report of *S. Enteritidis* (PT4) from chickens during January - June 2010 which was recovered from egg shell at an egg packing station.
- There were 330 reports of *Salmonella* from cattle in January - June 2010, an increase of 23% on reports during January – June 2009.
- Incidents of *S. Typhimurium* are also low, and are reported most frequently from pigs and cattle. The distribution of *S. Typhimurium* phage types is similar to that seen in previous years, DT104 and DT193 in cattle and DT193 and U288 in pigs.
- Monophasic *Salmonella* 4,5,12:i:- continues to be isolated. It was the 5th most common serovar in cattle and the 2nd most common serovar in pigs. There have also been incidents of *S. 4,12:i:-* reported in pigs. It was noted that as the number of incidents of monophasic salmonellas increase in pigs, the number of incidents (and proportion) of *S. Typhimurium* is falling.
- *S. Typhimurium* DT8 is a common duck-associated phage type and has been linked to cases of illness in humans in GB and in Ireland. VLA is carrying out further investigations of DT8 in ducks, and molecular typing of isolates by PFGE and VNTR is underway. Farmers are diversifying from duck breeding flocks to duck egg layer flocks. Unlike chicken flocks, there are no statutory controls for *Salmonella* in duck flocks.

Review of human data for January – September 2010

7. The following table shows UK incidence rates for selected bacterial pathogens for the first nine months of 2003 to 2010. Incidence rates are per 100,000 population apart from *L.monocytogenes* which is per 1,000,000 population.

	2003	2004	2005	2006	2007	2008	2009	2010*
<i>Salmonella</i>	28.5	26.9	21.8	21.5	21.3	18.8	16.3	14.3
<i>S.Enteritidis</i>	18.4	16.9	12.3	11.7	11.2	8.0	6.7	4.2
<i>Campylobacter</i>	91.1	87.2	89.0	88.9	97.2	93.6	106.6	115
<i>E.coli</i> O157	1.67	1.69	1.85	2.28	1.93	2.27	2.16	1.86
<i>Listeria monocytogenes</i>	4.27	3.87	3.52	3.25	4.47	3.37	3.67	1.68

*Provisional data

Data provided by HPA

8. Key points from data for the first 9 months of 2010 are:

- Laboratory reports of *Salmonella* infections including *S.Enteritidis* continue to decline which is a trend seen over the last few years.
- Reports for non-typhoidal salmonellas were down across the UK with the exception of Scotland where a large proportion of cases were from an outbreak of *S.Typhimurium* PT191A associated with handling of snakes. *S.Typhimurium* PT8 was associated with duck eggs and PT193 variant with the ASSuT anti-microbial resistance marker has doubled in England & Wales in 2010 compared with 2009.
- In 2009 the rate for *Campylobacter* infections showed an increase in all four countries and the rise has continued in the first nine months of 2010.
- Rates for *E.coli* O157 and *L.monocytogenes* were lower in the first 9 months of 2010 than for the same period in 2009.
- Microbiological foodborne general outbreak numbers have been falling in recent years although there has been an increase in *Campylobacter* outbreaks associated with chicken liver pate in both 2009 and 2010 and norovirus outbreaks associated with oysters over the winter season 2009/10. It should also be noted that there has been a move to electronic reporting but the surveillance system remains the same.

Other items of interest to the Committee

Food Surveillance Studies

9. EFIG received an update on the work of the HPA's Food, Water and Environmental Microbiology Laboratories and an outline of the programme of national microbiological studies that the HPA and the Local Government Regulation undertake each year. In terms of recent studies, one concerned hygiene practices in catering premises at large scale events in the UK with a

focus on identifying risks for the Olympics 2012. The study was carried out because of the known increased risk of infectious disease outbreaks at mass gatherings, particularly due to the frequent use of mobile caterers which in previous studies have been associated with poor food hygiene practices. The study was carried out between July and September 2009 and the reports can be accessed at <http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/FoodSampling/HPALGRegulationReports/>

10. The second study concerned hygiene standards in butchers' shops based on a LACORS/HPA study of butchers' shops undertaken between April to June 2009 focussing on the microbiological safety of Ready To Eat (RTE) meat products in response to the Pennington Report on the *E.coli* O157 outbreak in South Wales in 2005. Members will be provided with a link to the report when this becomes available.

Tackling *Campylobacter* in Chicken – progress update

11. Tackling *Campylobacter* in chicken is a priority for the FSA as set out in its strategic plan for 2010 -2015 published in early 2010. The FSA is working in partnership with the British Poultry Council, the British Retail Consortium and Defra through a joint industry/Government Working Group to reduce *Campylobacter* in chicken. This joint working group are also considering the outcome of the FSA's international meeting on *Campylobacter* control in chicken held in March 2010 and exploring a range of interventions/recommendations. EFIG was also informed that an FSA call for research proposals arising from the Agency's 2010-2015 strategy was published in July 2010 as well as a joint FSA/BBSRC/Defra call for research.

Possible reasons for the rise in *Campylobacter* cases

12. At the previous meeting EFIG had discussed the recent increase in reports of *Campylobacter* infections in humans in the UK and a paper was developed to examine the possible reasons for the observed increase and the means by which it could be investigated further. Whilst in theory changes to sampling and reporting systems could have changed, there was no indication that this had occurred in Scotland or elsewhere in the UK and the conclusion was that the increase was likely to be a real one. At this stage it was not possible to say whether there had been any increase in other European countries. EFIG considered ways to investigate the issue further including looking at whether there has been any shift in MLST types, looking at *Campylobacter* bacteraemias and hospital admissions which are less prone to artefact or sentinel surveillance building on existing networks. FSA would consider options for taking this forward.

Monophasic *Salmonella*

13. EFIG was updated on monophasic *Salmonella* strains which have now been identified in many countries. Monophasic strains have been involved in European human outbreaks and these strains appear to be becoming more common (Mossong *et al.*, 2007; Bone *et al.*, 2010; Hopkins *et al.*, 2010) and have often associated with pork or pork products.

14. A scientific opinion on monophasic *Salmonella* Typhimurium was published by EFSA in September 2010 (<http://www.efsa.europa.eu/en/scdocs/scdoc/1826.htm>) The opinion considered the public health risk posed by emerging strains with the antigenic formula 1,4,[5],12:i:- to be comparable to that of other epidemic *S. Typhimurium* strains. However, serovars other than named target serovars of public health significance (*Enteritidis*, *Typhimurium*, *Virchow*, *Hadar* and *Infantis*) are currently not included in the *Salmonella* National Control Programmes (NCPs), as they were not considered to be of major zoonotic importance at the time the legislation was put in place.
15. The EFSA opinion recommends the use of phage typing and DNA analysis methods (e.g. PCR or PFGE) to provide definitive confirmation of these monophasic strains as being variants of *S. Typhimurium*. Monophasic strains will be included within the statutory requirements of the NCPs in poultry and pigs in 2011.
16. The EFSA opinion further recommends that, in order to ensure consistency of reporting and to monitor trends in the occurrence of monophasic strains, all isolates of putative *Salmonella* should ideally be fully serotyped in accordance with the White-Kauffman-Le Minor scheme, and the full antigenic formula reported in as much detail as possible. If the full antigenic formula is not available but a phage type that is consistent with *S. Typhimurium* has been confirmed, with the lack of the second phase flagella antigen verified by PCR, then the term 'monophasic *S. Typhimurium*' is recommended for reporting purposes.
17. The Veterinary Laboratories Agency (VLA) is developing PCRs to confirm monophasic strains through detecting lack of flagella genes and looking for the presence of a genomic island characteristic of epidemic monophasic *S. Typhimurium* strains.

Action

18. ACMSF Members are invited to comment on the recent trends in animal and human data and other subjects discussed by EFIG.

Secretariat
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References

Bone A, Noel H, Le Hello S, Pihier N, Danan C, Raguenaud ME, Salah S, Bellali H, Vaillant V, Weill FX, Jourdan-da Silva N. Nationwide outbreak of *Salmonella enterica* serotype 4,12:i:- infections in France, linked to dried pork sausage, March-May 2010. *Euro Surveill.* 2010;15(24):pii=19592.

Hopkins KL, Kirchner M, Guerra B, Granier SA, Lucarelli C, Porrero MC, Jakubczak A, Threlfall EJ, Mevius DJ. Multiresistant *Salmonella enterica* serovar 4,[5],12:i:- in Europe: a new pandemic strain?. *Euro Surveill.* 2010;15(22):pii=19580. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19580>

Mossong J, Marques P, Ragimbeau C, Huberty-Krau P, Losch S, Meyer G, Moris G, Strottner C, Rabsch W, Schneider F. Outbreaks of monophasic *Salmonella enterica* serovar 4,[5],12:i:- in Luxembourg, 2006. *Euro Surveill.* 2007;12(6):pii=719. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=719>.