ACM/866

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

SURVEY OF *SALMONELLA* CONTAMINATION OF RAW SHELL EGGS USED IN CATERING PREMISES IN THE UK

Attached is a summary sheet and the final report for the Food Standards Agency's UK wide survey of *Salmonella* contamination in eggs used in catering premises. Chun-Han Chan will be presenting the main results from this catering egg survey report which was published on 13 September 2007.

The full report can be found on the Food Standards Agency website at the following address:

http://www.food.gov.uk/science/surveillance/fsisbranch2007/eggsurvey

Secretariat
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SURVEY OF *SALMONELLA* CONTAMINATION OF RAW SHELL EGGS USED IN CATERING PREMISES IN THE UK

Summary

1. Between November 2005 and January 2007, eggs purchased from 1,567 catering premises in the UK were tested for *Salmonella* contamination. Eggs from eight different countries were tested. Most of the eggs originated from the UK (89.0%).

2. *Salmonella* was found on the shells of 6 samples, of which one was also contents positive, giving a prevalence of 0.38%. Five of the positive samples were from the UK and one was produced in Germany. *Salmonella* Enteritidis was the most common serotype (0.31%) with phage type (PT) 4 being the most common phage type (0.19%).

3. The survey showed evidence of poor egg storage and handling practices in catering premises in that half (55%) did not store their eggs under refrigerated conditions, a fifth (20.7%) of egg samples had expired best before dates or were in use after three weeks of lay indicating poor stock rotation, and 37.1% mixed and pooled eggs for use during the day.

4. Key Facts

- Groups of 6 eggs were collected from 1,567 catering premises in the UK
- Eggs were tested in groups of six.
- Six examples of *Salmonella* contamination were found.
- Most of the *Salmonella* found were of the serotype Enteritidis, normally associated with eggs, which were further characterised as phage types PT4 (including the isolate from the eggs), PT12 and PT8. *Salmonella* Mbandaka was also isolated.
- Most of the *Salmonella* were found on eggs originating from the UK with one from Germany. However this may reflect the large number of UK eggs (89.0%) which were tested.
- High risk practices such as mixing and pooling shelled eggs for use during the day occurred in 37.1% of catering premises.
- Pooling eggs and storage at ambient temperatures was also shown to be significantly associated with those premises serving Chinese cuisines (77.8% pooled eggs, 40.7% stored pooled eggs at ambient temperature).

Aims of survey

5. The aims of the survey were to:

- Establish the current prevalence of *Salmonella* in raw shell eggs used in catering premises across the UK;
- Identify the *Salmonella* sero- and phage-types present in raw shell eggs used in catering premises and determine the susceptibility of the *Salmonella* isolates to antimicrobial drugs;
- Establish any association between country of origin of eggs and presence of particular sero / phage types of *Salmonella*;
- Provide information on egg storage and handling practices in catering premises

Background and approach

6. *Salmonella* infection remains an important public health problem in the UK. During the period from 1981 to 1991 the number of cases of salmonellosis in the UK in humans rose by approximately 170%. Subsequent investigations have shown that eggs caused a significant number of these outbreaks. Surveys and investigations of eggs for *Salmonella* contamination have played an important role in understanding the extent and pattern of contamination. Outbreaks caused by *Salmonella* have been linked to a great variety of foods, and have been closely associated with egg and egg products but it is the way in which eggs are used in catering establishments that have given particular cause for concern. Since 2002, the emergence of egg associated *S*. Enteritidis strains other than the strain PT4 has increased with three quarters of these outbreaks occurring in commercial catering premises.

7. As a substantial number of outbreaks of *S*. Enteritidis infection described above have occurred in catering premises in England and Wales, information on the incidence of high-risk egg preparation methods that allow the growth or survival of *S*. Enteritidis in eggs in these premises was needed.

8. The Agency set up a series of raw shell egg surveys: this survey of eggs at the catering level, and previously one of non-UK eggs at the retail level. The results from these surveys will contribute to providing an indication of where particular contamination problems are occurring and hence where interventions to reduce *Salmonella* contamination might best be focused.

9. Seasonal effects or prevalence within countries were not investigated in this survey. Samples were taken at random from catering premises in England, Scotland, Wales and Northern Ireland.

10. The Health Protection Agency coordinated the survey and samples were collected by experienced staff from 238 Environmental Health Departments. Eggs were identified by the stamp marking on the egg shells and samples were collected from the shelves at random. A range of information concerning the eggs was collected including

details of the type of caterer and type of cuisine, sampler details, storage temperature of eggs, size of eggs, pooling of shelled eggs, packing station number, country of origin, production types, sell by date, best before date, vaccination scheme and brand name. All the methods used are HPA Standard Operating Procedures.

11. Any catering premises could be included in the survey provided they obtained their eggs from wholesale suppliers and not retail outlets. Catering premises were selected in a manner designed to minimise bias towards particular premises types. The proportion of premises of each category within the list of those sampled was intended to reflect the proportion within the local authority's area. Within each premises category in the local authority's database of food businesses, individual premises were selected without bias by either using a random number generator or selecting every 10^{th} entry.

12. In terms of egg sampling, the number to be tested to achieve this objective depended on the estimated previous level of contamination and allowing for any change that may have taken place. It was estimated that a sample size of approximately 1,600 eggs in groups of six in the course of a year would be needed to measure an estimated prevalence of around 1%.