ACM/611

INFORMATION PAPER

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD (ACMSF)

CURRENT OUTBREAKS OF *SALMONELLA* ENTERITIDIS IN ENGLAND

Background

1. This paper summarises the current state of investigation of a number of outbreaks of *Salmonella* Enteritidis, many of which are associated, or suspected of being associated, with consumption of eggs. These include a large nationwide outbreak of *S.* Enteritidis PT14b, a prolonged hospital outbreak involving both *S.* Enteritidis PT 6a and *S.* Enteritidis PT1, a newly emerging nationwide outbreak of *S.* Enteritidis PT 6d and a number of localised outbreaks, caused by a range of unusual phage types.

2. Testing of eggs from supplies or suppliers associated with some of the outbreaks has identified a number of batches of eggs from Spain showing high levels of contamination with various phage types of *S.* Enteritidis. Three of these (PT14b, PT6a and PT6d) are indistinguishable from outbreak strains in humans. Investigation of premises associated with outbreaks has also shown that existing advice to food businesses on the safe use and handling of raw shell eggs is not always being followed.

3. The Food Standards Agency has reiterated advice to food businesses, including hospital caterers, and has also advised those importing eggs from Spain to make sure that these are sent for commercial heat treatment.

4. Whilst some of the outbreaks have been short-lived and others have been controlled by public health measures, such as advice to stop using raw shell eggs in uncooked products, others still continue despite the measures that have been taken.

5. An update on the current situation and PHLS plans for further studies will be presented at the meeting.

6. Most of the eggs implicated in the current outbreaks are imported for use in catering. However, in at least one outbreak, eggs obtained from a local supermarket, from UK vaccinated flocks, are implicated. The Agency is currently planning a survey of eggs on retail sale to fulfill the recommendation in the ACMSF's Second Report on *Salmonella* in Eggs. The protocol for this survey will be presented to the ACMSF Surveillance Working Group. Since imported eggs will not feature largely on the shop shelves, it is planned to carry out a separate survey of imported eggs subsequently. In the meantime, extensive sampling of eggs from supplies associated with outbreaks will be carried out by the PHLS.

Action required

7. This paper is presented for information.

Secretariat

November 2002

BRIEFING NOTE FOR ACMSF MEMBERS : OUTBREAKS OF *SALMONELLA* ENTERITIDIS ASSOCIATED WITH EGGS

Introduction

1. The purpose of this paper is to brief members about a series of outbreaks of *Salmonella*, which appear to be linked to eggs, and action taken by the Agency to protect public health.

Nationwide outbreak of aerogenic *Salmonella* Enteritidis PT14b

2. In late September, the PHLS identified an increase in laboratory isolates of *Salmonella* Enteritidis phage type (PT) 14b. As at 25 November, 324 cases had been reported and the outbreak appears to be continuing. 13 cases have required admission to hospital. Two deaths have been reported although, on further investigation, one of these did not involve the outbreak strain. Epidemiological investigations of clusters of cases identified bakery items supplied by two businesses, one in Lambeth and the other in Cheshire, as the possible source of infection for some of the cases.

3. Visits to these businesses revealed poor practice in the handling and use of raw shell eggs and suggested that further investigation of the eggs supplied to these businesses was warranted. In one case, this was use of raw shell eggs to make fondant icing that was not subsequently subject to any heat treatment. In the other, a business handling 10,000 raw shell eggs a week, potential for cross contamination was revealed by the detection of two phage types of *S.* Enteritidis (PT1 and PT4) in the sink used to wash the egg sieves. At this stage of the investigation, the Agency reminded food businesses of advice that they should use only pasteurised egg in products that will not be cooked or will be only lightly cooked and that they should take care when handling raw shell eggs to avoid cross contamination.

4. The Cheshire bakery stopped using fondant icing prepared with raw shell eggs and subsequently the cases tailed off in the North West. However, cases of the outbreak strain of PT14b are continuing to occur, scattered over England and Wales.

5. Investigation of the egg supply chain revealed that the two businesses obtained some of their eggs from the same importer. Consequently 3 batches of eggs from this importer, which had come from Spain, albeit at a later date than those associated with outbreak cases, were tested. 120 eggs from each batch of 360 were tested in pools of 6. Two batches were negative but 2/20 pools in the third batch (10%) were found to contain

Salmonella Enteritidis. This was a different type (PT6a) from the outbreak strain.

Nosocomial outbreaks of *Salmonella* Enteritidis PT6a and PT1, with resistance to nalidixic acid and reduced sensitivity to ciprofloxacin

6. Although the strain of *S.* Enteritidis isolated from the first lots of eggs tested did not match the type causing the nationwide outbreak, it did match a strain that had recently been found in increasing numbers in the London area, not only with regard to phage type but also in its antibiotic sensitivity pattern, plasmid profile and pulsed field gel electrophoresis. This strain was also responsible for an emerging hospital-related outbreak.

7. Eggs from hospital kitchens were tested as part of the investigation of the nosocomial outbreak. Three batches of 360 eggs, one batch of 120 eggs plus 101 eggs in an open tray were tested. All were from Spain. A total of 147 pools were tested and 11 of these were positive (7%). The phage types isolated were PT5c, PT6, PT6a, PT13a, PT14b and PT58. Both the 6a and 14b were indistinguishable from the national outbreak strain, using antibiotic sensitivity pattern, plasmid profile and pulsed field gel electrophoresis.

8. The hospitals stopped using raw shell eggs from Spain, and later discontinued all use of raw shell eggs. However, although cases of PT6a declined, a new wave of cases due to PT1, with the same resistance pattern as the PT6a, emerged. A case control study was attempted but there was insufficient data to draw firm conclusions. Despite other measures, including a ban on the handling of raw poultry on site, cases have continued. To date there are at least 60 cases. There have been 7 deaths, six of which are not considered to be associated with *Salmonella* infection. The cause of death remains to be established in the seventh case.

9. The *S.* Enteritidis PT1 isolated from hospital cases is indistinguishable by antibiotic sensitivity, plasmid profile and pulsed field gel electrophoresis from a strain isolated from an outbreak associated with a sandwich bar in Liverpool (see table below). Mayonnaise used in egg sandwiches was made with raw shell eggs. The company supplying eggs to the sandwich bar also supplied eggs to the Cheshire bakery involved in the 14b outbreak. The company supplies both UK-produced and imported eggs, including eggs from Spain. The exact source of the eggs supplied to the sandwich shop has not been established,

Agency action

10. As a result of the implication of eggs from Spain in at least two outbreaks, the Food Standards Agency advised all egg importers and wholesalers that they should send all eggs from Spain for commercial heat treatment.

11. The Agency informed the European Commission and the Spanish Food Safety Authority of the details of the outbreaks and the eggs that have tested positive. Two packing stations were inspected. At one of these, no testing of eggs was considered necessary, although monitoring of the establishment was intensified. At the other, distribution was suspended pending the testing of eggs. No *Salmonella* were isolated, although only 20 eggs were tested, 5 each from 4 batches. Distribution was therefore allowed to resume. Subsequently, we have been informed of the isolation of *Salmonella* Braenderup and *Salmonella* Infantis from eggs from that packer.

12. The Agency also issued advice to Chief Executives of NHS Trusts and, subsequently, to Medical Directors, reminding them of existing advice on the cooking and use of raw shell eggs when catering for vulnerable groups.

Other outbreaks of *Salmonella* Enteritidis

13. A review of recent local outbreaks of *Salmonella* Enteritidis has identified a further 14 outbreaks. In some of these, an association with eggs has been demonstrated, whilst others are still under investigation. Of interest is the recently-described outbreak of *S.* Enteritidis PT6d, where cases are scattered in the South West, South East, West Midlands and Wales. Descriptive epidemiology showed an association with consumption of runny eggs, mainly out of the home. An isolate of this phage type, indistinguishable from the outbreak strain by antibiotic sensitivity, plasmid profile and pulsed field gel electophoresis has been found in eggs imported from Spain that were tested by the Wessex Environmental Microbiology Service.

14. A summary of these outbreaks is given below.

Location	**Phage type**	**Cases**	**Possible food vehicle/source of eggs**
Liverpool	1	51 (85 ill)	Egg mayonnaise. Eggs from supplier to the Cheshire bakery - possibly Spanish. Isolate indistinguishable from the hospital outbreak strain.
Woodbridge, Suffolk	4	21	Eggs (Lion brand) in chocolate parfait. PT4 isolated from bowl used to prepare the dish (subsequently used for fruit salad)
Brantham, Suffolk	4	19 (24 ill)	Eggs (Spanish) in egg fried rice

Location	Phage type	Cases	Possible food vehicle/source of eggs
Caernarfon	21	24 (58 ill)	Chocolate terrine made with raw shell eggs (said to be UK - not Lion stamped - but possibly not)
Cornwall	6	18 (>25 ill)	
Suffolk nursing homes	4	7 (13+ ill)	Queen's pudding made with raw shell eggs (not Lion stamped)
Nationwide	6d	27	Trawling interviews suggest high exposure to eggs with runny yolks, eaten outside the home or bought from local butchers', greengrocers' or car boot sale!
Nursing home, Southport	8	2 (8 ill)	Mode of transmission not yet established
Plymouth	3	9	Associated with Chinese restaurants - duck & eggs being investigated as possible source
Norfolk	4	3 (5 ill)	Dessert (left on dessert trolley for 8 days and only refrigerated at night). Eggs bought from local supermarket Lion brand)
Essex	3	19 (30 ill)	Chinese restaurant
Sussex wedding reception	6	10 (53 ill)	Not yet known - shell eggs used for some items
Southampton	21	48 (53 ill)	Some cases linked to local bakery but no discrete point source
National	56	42	Not yet known

15. Whilst only Spanish eggs have been sampled in the course of the investigations to date, the rate of positivity (7-10% of pooled samples) is much higher than the level found in surveys of UK -produced and imported eggs in the mid 90s (1-2% of pooled samples).

Further actions to protect public health

16. The Agency is planning a survey of eggs on retail sale, based on the recommendation in the ACMSF's Second Report on *Salmonella* in Eggs. This survey was recommended principally to examine the current rate of contamination of UK-produced eggs to see whether the control programmes put in place by the industry had reduced the levels of contamination in comparison with those found in previous surveys. We hope to carry out this survey early in the New Year.

17. We will consider testing of eggs imported from other countries to check that levels of contamination are not comparable with the levels found in Spanish eggs. However, a very large number of eggs will need to be tested to be sure of detecting even the relatively high level of contamination found in eggs implicated in the outbreaks (about 120 eggs from each batch of 360).

18. In the meantime, where eggs are implicated in outbreaks, intensive sampling will be carried out and, as far as is possible, the eggs will be traced back to source.

19. Eggs are a raw product and cannot be guaranteed to be *Salmonella* free. At present, it is not illegal to supply eggs contaminated with *Salmonella*. Therefore proper cooking and handling of raw shell eggs is very important. However, there is a commitment across EU member states to reduce S*almonella* in eggs to the lowest possible levels by controlling infection in laying flocks. If current proposals for a new EU Zoonoses Directive and Regulation are agreed, table eggs will eventually have to come from flocks that are certified as being salmonella-free.

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