

ACM/1040

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

INFORMATION PAPER

UK- WIDE MICROBIOLOGICAL SURVEY OF READY-TO-EAT COOKED SLICED MEATS AND PATE AT RETAIL WITH PARTICULAR REFERENCE TO THE PRESENCE OF LISTERIA MONOCYTOGENES.

On 23 May 2011 the Food Standards Agency published its UK-wide microbiological survey of ready-to-eat cooked sliced meats and pâtés at retail with particular reference to the presence of *Listeria monocytogenes*. Please find attached, for your information, a summary paper for this survey.

The full report can be accessed from the FSA website at:

<http://www.food.gov.uk/science/surveillance/fsisbranch2011/listeria>

**Secretariat
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UK-wide microbiological survey of ready-to-eat cooked sliced meats and pâtés at retail with particular reference to the presence of *Listeria monocytogenes* (FSA project B18024)

1. Between March and September 2007, 1,691 samples of ready-to-eat cooked sliced meat (of which 1,686 samples were acceptable for testing) and 1,651 ready-to-eat pâté products (of which 1,648 were acceptable for testing) were randomly collected from 1,000 retail premises throughout the United Kingdom. The samples were tested for the presence of *Listeria* spp. and *Listeria monocytogenes* and a range of indicator organisms (*Campylobacter* spp., *Salmonella* spp., *E. coli* O157 (cooked sliced meats only), *E. coli*, coagulase positive staphylococci and Enterobacteriaceae.) Physiochemical testing was also carried out to measure pH, salt and water activity.
2. Overall, *Listeria* spp. was detected in 45 cooked sliced meat samples giving a prevalence of 2.82%. *L. monocytogenes* was detected in 21 samples with a prevalence of 1.53%. All positive samples had a level of contamination that was below 100cfu/g and were therefore considered satisfactory according to the Microbiological Criteria Regulations No. 2073/2005. *L. monocytogenes* was found in 1.67% of beef, 1.84% of pork, 0.75% of poultry and 0.87% of mixed meats tested.
3. *Listeria* spp. was detected in 12 out of the 1,648 pâté samples tested giving an overall prevalence of 0.82%. *L. monocytogenes* was detected in 4 samples, giving a prevalence of 0.32%. Contamination levels were below 100cfu/g and therefore considered satisfactory according to the Microbiological Criteria Regulations. *L. monocytogenes* was significantly more prevalent in seafood pâtés (3.66%) than meat (0.06%) and vegetarian (0.00%) pâtés ($p < 0.001$).
4. *Campylobacter* spp., *Salmonella* spp., *E. coli* O157 and *E. coli* were not detected in any of the RTE cooked sliced meat or pâté samples tested. *S. aureus* was only detected in 3 (0.18%) of the 1,686 cooked sliced meat and 2 (0.12%) of the pâté samples tested. Enterobacteriaceae were detected in 178 (11.56%) cooked sliced meat samples, with levels ranging from 10 to 2.9×10^5 cfu/g. Enterobacteriaceae were also detected in 102 (6.12%) pâté samples, with levels ranging from 10 to 1.4×10^5 cfu/g.
5. All RTE cooked sliced meats and pâtés were tested to determine levels of salt, water activity and pH. Physiochemical properties of foodstuffs can affect the ability of bacteria to grow during the course of their shelf-life. There was a slightly greater pH range for cooked sliced meats (pH 4.4 - 8.7) compared to pâtés (pH 4.1 - 7.3). The range for salt concentrations in the pâté (0.3 - 4.1g/100g) was slightly larger than for cooked sliced meats (0.1 - 3.9g/100g). The water activity range for cooked sliced meats (0.88 - 1.00) was slightly larger than that for pâtés (0.91 - 1.00).

6. Statistical analysis indicated that there was no significant association between the physicochemical factors (pH, salt or water activity) and the weighted prevalence of *Listeria* spp. observed in the pâté samples tested. There was also no significant association between the pH and water activity and the weighted prevalence of *Listeria* spp. in the cooked sliced meats. However, the prevalence of *Listeria* spp. in cooked sliced meats was found to be higher in those products with increased salt levels and longer product shelf-lives. Further data analysis demonstrated that the remaining shelf-life of cooked sliced meats was significantly associated with higher salt levels (Spearman's $r=0.17$; $p<0.001$).

Key Findings

7. The key findings were:
- In total, 45 (2.82%) cooked sliced meat and 12 (0.82%) pâté samples contained *Listeria* species. The majority of the *Listeria* species detected were *L. monocytogenes*, which was found in 21 (1.53%) cooked sliced meat and four (0.32%) pâté samples, all of these were within legislative limits. In the samples of sliced meats *L. monocytogenes* was found 1.67% of beef, 1.84% of pork, 0.75% in poultry and 0.87% of mixed meats tested.
 - In pâté *L. monocytogenes* was significantly more prevalent in seafood pâté (3.66%) than meat (0.06%) and vegetarian (0.00%) pâté ($p<0.001$).
 - *Campylobacter* spp., *Salmonella* spp., *Escherichia coli* O157 and *Escherichia coli* were not detected in any of the cooked sliced meat and pâté samples tested.
 - *Staphylococcus aureus* was detected in three (0.18%) cooked sliced meat and two (0.12%) pâté samples.
 - Enterobacteriaceae was detected in 178 (11.56%) cooked sliced meat and 102 (6.12%) pâté samples. Levels ranged from 10 to 2.9×10^5 cfu/g in cooked sliced meat and 10 to 1.4×10^5 cfu/g in pâté.

Aims of the survey

8. The aims of the survey were to:
- Establish the prevalence and levels of *Listeria* spp. and *L. monocytogenes* in RTE cooked sliced meats and pâtés sold at UK retail outlets.
 - Measure the incidence of other microbiological organisms in RTE cooked sliced meats and pâtés sold at UK retail outlets, including *Campylobacter*, *Salmonella*, *Escherichia coli* O157 (cooked sliced meats only), *Escherichia coli*, coagulase positive staphylococci and Enterobacteriaceae.
 - Measure physicochemical properties (such as pH, salt content and water activity) of the RTE cooked sliced meat and pâté samples.

Background and approach

9. One of the strategic aims of the Food Standards Agency is to continue to reduce the incidence of foodborne disease in the UK. *Listeria monocytogenes* is one of the 5 key organisms against which the Agency monitors progress towards reducing foodborne disease.
10. Since 2000, the number of cases of *Listeria* in the UK has almost doubled. It is estimated that there were 424 cases in England and Wales in 2009, all of which were thought to have been hospitalised and led to 149 deaths, making it the pathogen responsible for the largest number of deaths due to foodborne illness. Although the numbers of cases are relatively low, the severity of the illness is a cause for concern.
11. The Agency's Advisory Committee on the Microbiological Safety of Food (ACMSF) has investigated the reasons for the increased incidence of listeriosis, particularly in the over 60 age group and produced a report on *Listeria* in September 2009. The report made a number of key conclusions and recommendations for work to reduce the incidence of listeriosis in the over 60s. One of these recommendations was to maintain active surveillance for *Listeria* spp. in a wide range of foods at catering and retail to inform control of this organism.
12. Information for this survey and investigations of RTE foods for *Listeria* contamination will be used to build up a representative picture of the prevalence of *L. monocytogenes* contamination in foods across the UK.
13. ALcontrol laboratories co-ordinated the survey and samples were collected by dedicated samplers from over 1,000 retail premises. Samples were taken according to market share and were representative of the UK market for cooked sliced meats and pâté with retail premises selected at random in England, Scotland, Wales and Northern Ireland. Seasonal effects or prevalence within countries were not investigated in this survey.
14. A range of information concerning the cooked sliced meat and pâté was collected including the type of retail outlet, sampler details, brand/product name, type of cold sliced meat/pâté, production type, country of origin (where possible), identification mark, use by and display until dates, packaging type and temperature at storage at retail premises and on arrival at the laboratory. The methods used were Health Protection Agency national standards or equivalent validated methods.

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