

DISCUSSION PAPER

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

ADVICE ON EGG CONSUMPTION AND USE

Attached is a paper looking at the advice given to consumers on the consumption of eggs. The paper asks Members to revisit the advice taking into account the results of the Food Standards Agency's recent surveys on eggs and research into the use and consumption of raw shell eggs.

Members may wish to be aware that the Agency released the report on the UK-wide egg survey on 18 March 2004. The egg research projects under Programme B15 were formally reviewed on 29 June 2004.

The ACMSF is invited to comment:

on the Agency's current advice on egg use and consumption in the light of recent findings; and

on whether the appropriate groups have been identified as targets for this advice.

**Secretariat
November 2004**

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

ADVICE ON EGG CONSUMPTION AND USE

Introduction:

1. Between 1981-1991 the number of cases of salmonellosis in the UK in humans rose by approximately 170%. In March 1991, the Advisory Committee on the Microbiological Safety of Food (ACMSF) set up a working group to consider the extent to which eggs were responsible for this pandemic. The group was re-convened in 1999 to review progress. As a result of this review, the Food Standards Agency (FSA) set in place a UK egg survey to measure whether there had been a 50% reduction in the prevalence of *Salmonella* since 1996. The results of the survey would be used as an indicator for the effectiveness of interventions put in place since the 1995/96 surveys. The reduction of salmonellosis caused by eggs is also linked to FSA's target to reduce foodborne disease by 20%.
2. The results of the 2003 survey were presented to the ACMSF in March 2004. In the light of these results and other information about the epidemiology of *Salmonella* Enteritidis infections, the Agency is reviewing the existing advice on the use of shell eggs and seeks the views of the ACMSF.

Background:

3. Advice on the consumption and use of eggs was first issued in 1988. The Chief Medical Officer advised that "it would be prudent for consumers, particularly those who were more vulnerable, to avoid eating raw eggs or uncooked food made from them" and that caterers should use pasteurised egg for uncooked egg dishes. Later that year, more detailed advice was issued to the effect that it was advisable for vulnerable people to consume only eggs which had been cooked until the white and yolk were solid.
4. A number of measures to control *Salmonella* in poultry and to encourage the safe use and handling of eggs were put in place as a result of the ACMSF's first report on *Salmonella* in eggs when it was published in 1993. However, egg surveys carried out in 1991 and 1995/96 showed no change in the prevalence of *Salmonella* contamination of eggs (around 1% of samples). Moreover, in 1991, 17 of the 7,045 (0.24%) samples were found to have *Salmonella* in both shell and contents. In 1995/96, 6 of the 13,970 (0.043%) samples had *Salmonella* isolated from shell and contents. Over that period of time, there had been little change in the incidence of human infection.
5. The second ACMSF report on *Salmonella* in eggs, published in 2001, found that the incidence of illness had fallen dramatically and that this was likely to be due to the measures taken by industry, including the vaccination of laying flocks. The report recommended a further survey of eggs and research to establish:

- the risk of exposure due to handling;
 - the adherence by caterers to previous advice;
 - the effectiveness of commercial egg washing; and
 - the egg to egg variation of *Salmonella* in egg contents
6. The 2003 survey to establish the prevalence of *Salmonella* contamination in UK produced eggs on retail sale took place over a period of 5 months (Food Standards Agency, 2004). A total of 4753 samples (mostly boxes) of six eggs were sampled during this period. The overall finding was that 9 samples (0.34%) were contaminated with *Salmonella*, which was equivalent to 1 in 290 “boxes” of 6 eggs. All *Salmonella* positive samples were from egg shells only. Comparison with the 1995/96 survey indicated that there had been a threefold reduction in the prevalence of *Salmonella* (from 0.99% to 0.34%). However, the most common *Salmonella* serotype isolated was still *Salmonella* Enteritidis.
 7. A survey of imported shell eggs in 1996/97, carried out by DH, found a *Salmonella* prevalence level of 2.0% in pooled samples of 6 eggs. A previous Public Health Laboratory Service (PHLS) survey, in 1991, found a *Salmonella* prevalence level of 1.6% from eggs that were sampled at the port of entry. This showed that, as with UK eggs, the prevalence of *Salmonella* in non-UK eggs had not significantly changed in over 6 years.
 8. Imported / non-UK eggs are mainly used by the catering industry. There were 239 confirmed outbreaks of *Salmonella* associated with eggs between 1995 and 2004 (statistics from reports by CDSC to GSURV), many of them the last 3 years. This suggests that poor hygiene and handling practices continue within catering establishments.

Risks from handling

9. Current FSA advice is that careful handling is required when using eggs. A project (B03016- Cross contamination from the external surface of eggs in relation to risk of exposure to *Salmonella*) commissioned by the FSA investigated the risks of contamination due to handling and storage of eggs within the kitchen. Within the kitchen, eggs require adequate cooking, and cross-contamination via hands or the kitchen environment should be prevented. This project revealed that *Salmonella* could be transferred from the eggshell to hands and onto work surfaces, demonstrating a potential for cross-contamination of foods by many routes. Transfer rates were relatively high under moist conditions. On the basis of these findings, *Salmonella* on the eggshell could present a cross contamination risk to consumers if handled incorrectly. The findings of this project demonstrated that precautions were required during all stages after the eggs leave the farm.

10. A study in the Preston area looked at egg use in catering. The project was a pilot study designed to estimate the nature and extent of adherence by the catering industry to Government and ACMSF advice on the safe use of eggs. The ACMSF considered the findings in October 2001. The study was based on the findings from 25 businesses in each of the 4 high-risk areas (nursing homes, restaurants, sandwich operations and functions caterers). Researchers asked questions, observed practices and examined documentation. It emerged that little information on the safe handling of eggs had permeated down to caterers who were questioned.
11. A leaflet on the safe use of eggs was published in December 2002 and distributed to all food businesses on the FSA database. A study, carried out by LACORS/ HPA in 2003, investigated raw shell eggs and their use in catering premises. One part of this study investigated the awareness of Agency advice when storing, preparing and cooking egg dishes. The results revealed that guidance issued by the Agency appeared to be more absorbed by managers of hospitals, schools and residential nursing homes where egg dishes would be served to vulnerable groups. However, premises such as mobile caterers and takeaways appeared not to have absorbed the information and this may be reflected by the high turnover of staff in these businesses.

Risk to consumers

12. Risk groups have been identified as the elderly, babies, toddlers, pregnant women and the immuno-compromised. Salmonellosis is an invasive disease and the risk groups identified may be more susceptible to infection or less able to recover after an infection, or both.

Current advice

13. The current advice is given in Annex A. There are now significantly fewer contaminated eggs on retail sale in the UK than when the advice was first issued. *Salmonella* contamination is likely to be present only on the shell of the egg and, if the consumer takes reasonable precautions, the risk of disease is significantly lower than in the 1990s. Some of the groups identified as vulnerable in the original advice may be less vulnerable than others and therefore, if it remains appropriate to advise thorough cooking of eggs to some of these, does that advice remain applicable to all? The reduced contamination levels in UK-produced eggs needs to be set against recent experience with outbreaks of *Salmonella* Enteritidis related to eggs used in catering and evidence from the research studying the risks of handling eggs.

Recommendation

14. The committee is asked to comment on the Agency's current advice on the use and consumption of eggs :

- a. to vulnerable groups
- b. to the healthy adult population
- c. to catering

References

ACMSF. (1993) Report on *Salmonella* in eggs. Advisory Committee on the Microbiological Safety of Food. HMSO, London.

ACMSF. (2001) Second report on *Salmonella* in eggs. Advisory Committee on the Microbiological Safety of food. HMSO, London.

Adak, G.K., Long, S.M., O'Brien, S.J. (2002) Trends in indigenous foodborne disease and deaths, England and Wales: 1992-2000. *Gut*, 51 (6), 832-841.

Food Standards Agency. (2004) Report of the survey of *Salmonella* contamination of UK produced shell eggs on retail sale. <http://www.food.gov.uk/science/surveillance/fsis2004branch/fsis5004eggs>

Roberts, J.A., Sockett, P.N. (1994) The socio-economic impact of human *Salmonella* enteritidis infection. *International Journal of Food Microbiology*, 21 (1-2) 117-129.

Roberts, J.A., Cumberland, P., Sockett, P.N., Wheller, J., Rodrigues, L.C., Sethi, D., Roderick, P.J; Infectious intestinal disease study executive. (2003) The study of infectious intestinal disease in England: socio-economic impact. *Epidemiology and Infection*, 130 (10), 1-11

Annex A: Eggs safety advice

Tuesday, 03 December 2002

Eggs are a good choice as part of a healthy balanced diet, because they are a rich source of protein, and contain vitamins and minerals such as vitamin D, vitamin A, vitamin B2 and iodine.

But some eggs contain salmonella bacteria, which can cause serious illness, especially among elderly people, babies, toddlers, pregnant women and people who are already unwell. So that means you always need to be careful how you use eggs, but particularly when you are preparing food for one of these groups.

There are three main issues you should be aware of:

- avoiding the spread of bacteria
- cooking eggs properly
- storing eggs safely

How can the bacteria spread?

Bacteria can spread very easily from eggs to other foods, hands, worktops etc. Bacteria can be on the shell, as well as inside the egg, so that means you need to be careful how you handle eggs, when they are still in the shell and after you have cracked them. If you touch eggs, or get some egg white or yolk on your hands, you could spread bacteria to anything else you touch, whether it's food or the fridge handle, unless you wash and dry your hands thoroughly.

If a whole egg, egg shell, or drips of white or yolk touch other foods, then bacteria can spread onto those foods. Bacteria can also spread onto worktops, dishes and utensils that are touched by eggs, and then the bacteria can spread to foods that touch the worktops, dishes or utensils.

What can I do to stop bacteria spreading?

- Keep eggs away from other foods, when they are still in the shell and after you have cracked them.
- Be careful not to splash egg onto other foods, worktops or dishes.
- Always wash and dry your hands thoroughly after touching eggs or working with them.
- Clean surfaces, dishes and utensils thoroughly, using warm soapy water, after working with eggs.
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Does cooking kill bacteria?

Yes, if you cook eggs until both the white and yolk are solid this will kill any bacteria. If you are cooking a dish containing eggs, make sure you cook it until the food is piping hot all the way through.

Can I still have my eggs runny?

Lots of people enjoy eating boiled, poached or fried eggs with runny yolks, and this is a

personal choice. But bear in mind that eating runny yolks might cause food poisoning. If you're preparing food for elderly people, babies, toddlers, pregnant women or people who are already unwell, you should avoid giving them any eggs that haven't been cooked until the white and the yolk are solid, or any egg dish that hasn't been thoroughly cooked.

You can reduce the chances of food poisoning by storing eggs correctly. See 'How should I store eggs and egg dishes?' below.

Are there any foods I need to be particularly careful with?

Foods that are made with raw eggs and then not cooked, or only lightly cooked, can cause food poisoning. This is because any bacteria in the eggs won't be killed. For example, home-made mayonnaise, Béarnaise and hollandaise sauces, some salad dressings, ice cream, icing, mousse, tiramisu, and other desserts, might all contain raw eggs.

If you're preparing food for elderly people, babies, toddlers, pregnant women or people who are already unwell, you shouldn't use raw egg in any food that won't be cooked. You could use pasteurised egg instead (available from some supermarkets), because pasteurisation kills bacteria.

What about food that I buy ready-made?

When you're eating out, or buying food that isn't labelled, and you're not sure whether a food contains raw egg, ask the person serving you.

If you buy commercially produced mayonnaise, salad dressings, sauces, ice cream, desserts, or ready-made icing, these will almost always have been made using pasteurised egg. Check the label and if you're not sure ask the retailer or manufacturer.

How should I store eggs and egg dishes?

- Store eggs in a cool, dry place, ideally in the fridge.
- Store eggs apart from other foods. It's a good idea to use your fridge's egg tray, if you have one, because this helps to keep eggs separate.
- Don't use eggs after their 'Best before' date.
- Don't use eggs with damaged shells, because dirt or bacteria might have got inside them.
- Eat dishes containing eggs as soon as possible after you've prepared them, but if you're not planning to eat them straight away, cool them quickly and then keep them in the fridge.

Is the Agency's advice to caterers about eggs different to this advice for the public?

The advice for caterers is very similar, but the Agency advises caterers to use pasteurised egg for all foods that won't be cooked or will be only lightly cooked. And we recommend that the safest option for caterers preparing food for more vulnerable people is to use pasteurised egg for all foods, even those that are cooked.

The Agency advises caterers who handle large numbers of eggs to do all their work with raw eggs at one time, to help prevent bacteria from spreading.

Annex B: Egg safety advice to caterers <http://www.food.gov.uk/safereating/foodadvice/eggs2002advice>



How can I reduce the dangers if I use large numbers of eggs?

If you use lots of eggs, you should be especially careful to avoid cross-contamination.

Ideally, you should do all your work with raw eggs at one time. Remember that drips of egg and broken shells could spread bacteria. So you should dispose of the shells carefully, and thoroughly clean surfaces, sinks, dishes and utensils before starting a different type of work. All staff should wash their hands with warm water and soap, and dry them thoroughly, after working with eggs.

Where can I get more information?

Visit the Food Standards Agency's website at www.food.gov.uk

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Eggs – what caterers need to know

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Eggs

Some eggs can contain salmonella bacteria inside or on their shells, so it's important to be careful how you handle them and how you use them. This is because salmonella can cause very serious illness, especially among more vulnerable people. Occasionally it can even cause death.

Remember

- Keep eggs away from other foods, when they are still in the shell and when you have cracked them open.
- Don't use damaged or dirty eggs.
- Be careful not to splash raw egg onto other foods, surfaces or dishes.
- Cook eggs and foods containing eggs thoroughly.
- Use pasteurised egg for raw or lightly cooked foods.
- Always wash and dry your hands thoroughly after touching eggs or working with them.
- Clean food areas, dishes and utensils thoroughly, using warm soapy water, after working with eggs.
- Serve egg dishes straight away, or cool them quickly and keep chilled.

What are the dangers?

There are two main things you need to avoid:

- bacteria spreading from eggs onto other foods, hands, work surfaces or utensils (cross-contamination)
- bacteria surviving because eggs aren't properly cooked

Remember, salmonella bacteria can be on the shell as well as inside the egg so, to help stop bacteria spreading, you need to be very careful how you handle eggs, both when they are still in the shell and after you have cracked them open.

Keep eggs away from other foods. And always wash and dry your hands, and clean surfaces, sinks, dishes and utensils thoroughly, after working with eggs.

Cooking eggs properly kills bacteria, but bacteria will survive in foods that aren't cooked thoroughly. This is why you shouldn't use raw eggs in food that won't be cooked – use pasteurised egg instead.

Which foods should I use pasteurised egg for?

You should use pasteurised egg in any food that won't be cooked (or will be only lightly cooked), for example home-made mayonnaise, Béarnaise and hollandaise sauces, some salad dressings, ice cream, icing, mousse, tiramisu and other desserts containing eggs. Pasteurised egg can be bought frozen, or in liquid or powder form.

If you buy commercially produced mayonnaise or sauces in jars, or ready-made icing, these will almost always have been made using pasteurised egg. Check the label and if you're not sure, ask the retailer or manufacturer.

Who is most vulnerable?

Elderly people, babies, toddlers, pregnant women and people who are already unwell are most likely to become seriously ill from food poisoning.

If you are catering for any of the people mentioned above, it's especially important to use pasteurised egg for foods that won't be cooked (or will be only lightly cooked). And the safest option is to use pasteurised egg for all dishes, even those that are cooked.

If you do use raw eggs, use them only in dishes that are thoroughly cooked, or cook them until the white and the yolk are solid. This means you should avoid serving eggs with runny yolks to these people.

Can I be sure that an egg is salmonella-free?

It isn't possible to guarantee that any egg will be free from salmonella, whatever the source or brand. So you need to be careful how you handle all eggs. There is a smaller chance that eggs from vaccinated flocks will contain salmonella, but you should still take care. Remember, it's always better to buy your eggs from a reputable supplier.

How should I store eggs?

- Store eggs in a cool, dry place, ideally in the fridge.
- Keep eggs apart from other foods.
- Clean the storage area regularly.
- Don't use eggs after the 'Best before' date.