

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

FOOD SAFETY ADVICE ON FLOODING

ISSUE

1. To request the views of the ACMSF on the Agency's advice on the safety of food contaminated with flood water and the use of land contaminated with flood water for growing fresh produce.

SUMMARY

2. A paper was circulated to ACMSF members in August requesting views on the Agency's advice on the safety of fresh produce and agricultural land contaminated by flood water (Annex A). An erratum, also included at Annex B, corrects errors contained in the original paper in respect of the Agency's manures guidance.
3. In particular, members were asked to consider 5 specific questions and to comment on the adequacy of current Agency advice, identifying the need for any revision. These questions were:
 - (i) We are considering whether our advice to discard all produce affected by flood water appropriate, or over-precautionary. Is there an identifiable risk associated with eating crops contaminated with flood water if they are washed, peeled and cooked?
 - (ii) If we were to modify the advice in relation to consumption of foods grown on allotments are there any different considerations we should take into account in relation to commercial crops?
 - (iii) We are considering what advice should be given to allotment holders and commercial growers post flooding in relation to replanting and appropriate harvest intervals. Does the underlying microbiology justify adopting the same precautionary approach as in the case of sewage sludge?
 - (iv) Is there any justification for requiring a delay before replanting crops that are destined to be cooked?
 - (v) With sewage spills, given the high water content and therefore the dilution effect in comparison with the direct application of biosolids, is our advice for sewer bursts on agricultural land over precautionary?
4. A summary of members' initial views was circulated and further comments invited. Six responses were received initially and one received in relation to the summary. An amended summary is attached at Annex C.

5. Responses to question 1 focussed on cooking as the main control. In addition, the Agency needs to consider its advice to consumers in relation to peeled produce that may be eaten raw, without cooking, where cross contamination of the produce during the course of peeling is a further risk.

Members are invited to:

- Consider the revised summary at Annex C and agree a final consensus position.
- Consider whether the advice given in response to question 1 also applies to raw, peeled produce.

**Judith Hilton, Microbiological Safety
September 2007**

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

Food Safety Advice on Flooding (August 2007)

ISSUE

6. To request the views of the ACMSF on the Agency's advice on the safety of food contaminated with flood water and the use of land contaminated with flood water for growing fresh produce.

SUMMARY

7. Following the recent flooding events that have taken place across the UK, there have been a number of questions raised over the safety of consuming fruit and vegetables that have been contaminated with flood water, and also the safety of using agricultural land that has been contaminated with flood water to grow fresh produce.
8. Floodwater may be contaminated with sewage or animal waste containing harmful micro-organisms, such as *Salmonella* or *E. coli* O157. However, in widespread flooding events such contamination is substantially diluted by the large volumes of water involved. Previous experience of flooding and sewage contamination events in the UK shows that the number of reports of gastric or other illness after flooding is usually minimal.
9. The Agency has not previously had specific advice on the safety of fresh produce in relation to flooding and in light of the recent incidents has developed precautionary advice based on existing guidance on the safe use of animal manures and sewage sludge as fertilizers, and advice given in relation to accidental sewage spills.
10. Our current advice is: Don't eat any food that has been touched or covered by floodwater or sewage and Don't eat any food grown on an allotment that has been flooded. We are now reviewing this advice to ensure that it is proportionate.

DETAIL

Consumption of food contaminated with flood water

11. Our advice on the consumption of food contaminated with flood water is based on advice given during sewage spills and is in line with current HPA guidance on flooding. It states that any food that has been touched or covered by flood water or grown on an allotment covered with flood water should not be consumed. This advice applies to both ready-to-eat crops and to those which will be cooked and/or peeled. More detailed information can be found at: <http://www.food.gov.uk/news/newsarchive/2007/jul/flooding>.

The use of agricultural land post-flooding

12. Existing precedents for the reuse of land following a flooding incident, largely relate to the use of agricultural land to which biosolids have been applied or that have been contaminated by burst sewers. Our current precautionary advice on flooding and sewage spills (Annex 1) is based on the lay-off periods described in the Application of Sewage Sludge to Industrial Crops (http://www.adas.co.uk/media_files/Publications/ASSIC.pdf).
13. **Application of sewage sludge to agricultural land:** Current advice is based on research carried out by WRc on behalf of Water UK and DETR, which resulted in the Guidelines for the Application of Sewage Sludge to Industrial Crops. ACMSF commented on the reports of this research. The guidance recommends harvest intervals of up to 48 months after the application of untreated sludge to land (see link above). The harvest intervals for conventionally treated and enhanced treated sludges provided in the Safe Sludge Matrix are shorter, up to 30 months (http://www.adas.co.uk/media_files/Publications/SSM.pdf). This guidance was agreed by Water UK, the British Retail Consortium, Defra's predecessor department, the Food Standards Agency, the Environment Agency and the Food and Drink Federation and reflect the agreed consensus on best practice.
14. **Sewer bursts/Sewage spills:** Although the water content of raw domestic sewage is higher than sludge, it is considered that sewage has the potential to contain the same pathogenic organisms; therefore, the Guidelines for the Application of Sewage Sludge to Industrial Crops have been used as the basis for advising commercial growers on harvesting intervals following sewer bursts, i.e. up to 48 months for ready-to-eat crops.
15. **Application of manures/animal waste to agricultural land:** The Agency commissioned investigations into pathogen survival in livestock manures and other animal waste. The research showed that, for spiked faecal wastes applied to grass pasture, spiked organisms were generally no longer detectable by 64 days. The exception was *Listeria monocytogenes*, where up to 128 days was required for the complete decline in some waste types. When naturally-contaminated livestock faeces were deposited directly onto pasture, *E. coli* was able to survive for up to 6 months. Further information on the studies is summarised in the B17 research programme review (<http://www.food.gov.uk/multimedia/pdfs/b17progreview>).
16. This has formed the basis for guidance on managing farm manures, which has been consulted on and is now being completed for publication (Annex 2). Our advice is that:
 - manure should not be applied to ready to eat crops during the growing season;

- there should be a 6 month gap between application of fresh manure to land and the harvesting of ready to eat crops: and
- There should be a 12 month gap between livestock last grazing in the field and harvesting of a ready-to-eat crop.

17. **Flooding:** We do not currently hold any data on the microbiological quality of flood water, or the survival of micro-organisms in flood water or saturated soil. However, we would assume that the potential pollutants will be more dilute than from a sewer burst and the risk of contaminating land would be lower; therefore, shorter harvesting intervals may be appropriate.

Questions

1. We are considering whether our advice to discard all produce affected by flood water appropriate, or over-precautionary. Is there an identifiable risk associated with eating crops contaminated with flood water if they are washed, peeled and cooked?
2. If we were to modify the advice in relation to consumption of foods grown on allotments are there any different considerations we should take into account in relation to commercial crops?
3. We are considering what advice should be given to allotment holders and commercial growers post flooding in relation to replanting and appropriate harvest intervals. Does the underlying microbiology justify adopting the same precautionary approach as in the case of sewage sludge?
4. Is there any justification for requiring a delay before replanting crops that are destined to be cooked?
5. With sewage spills, given the high water content and therefore the dilution effect in comparison with the direct application of biosolids, is our advice for sewer bursts on agricultural land over precautionary?

Members are invited to:

- Provide their views on the proportionality of our advice,
- Provide their expert opinions on the questions raised above so that the Agency can develop its policy in relation to food safety and flooding.

Judith Hilton, Microbiological Safety
August 2007

SEWAGE SPILLAGES

1. Sewage spillages into waterways

Where sewage spills into a waterway, MSD should ask the Incidents Branch to obtain the following information;

- 1) Are there any shellfish beds in the affected stretch of water? If so, are they intended to be harvested in the near future and will the shellfish be depurated?
- 2) Are there any fish in the affected waterway that may be harvested for human consumption either commercially or by anglers?
- 3) Do any grazing animals have access to the affected waterway for drinking?
- 4) Is any water abstracted from the affected waterway for irrigation purposes?

If shellfish are present in the affected waterway then PPD3 will also play a role in the incident.

If fish that may be caught by anglers for human consumption are present in the affected waterway, MSD could advise that EA display signs suggesting that fish from the waterway should not be consumed.

2. Sewages spillages onto agricultural land

Where spillages of untreated sewage occur onto agricultural land, any crops contaminated by the untreated sewage should not enter the food chain.

The DEFRA Code of Practice accompanying the Sludge Use In Agriculture Regulations states the following:

Where non-food crops are used in rotation with food crops on agricultural land, the following minimum harvest intervals apply between the application of untreated sewage sludge (or septic tank waste) to a non-food crop and the harvest or grazing of the next food crop.

- 18 months for combinable crops and animal feed crops
- 30 months for vegetable, grass and maize crops
- 48 months for salad, horticultural and fruit crops

The same intervals should be applied if untreated sewage sludge has contaminated food crops.

3. Sewages spillages onto personal allotments

There is no set advice on action to be taken following the flooding of personal allotments. However, the Agency has previously recommended that there should be a 6 month period after the spillage where extra precautions should be taken to minimize the potential risk;

- Hands should be washed after handling crops from affected land.
- Ready to eat crops such as radishes and lettuce should not be grown. However, if they are grown they should be washed and/or peeled thoroughly before consumption.
- Root vegetables and over the ground plants such as gooseberries should be safe to grow. However, they should be washed thoroughly before consumption.
- Crops currently in the ground and which have come into contact with the sewage spillage should not be consumed as a precaution.

MANAGING FARM MANURES FOR FOOD SAFETY

Guidelines for Growers to Reduce the Risks of Microbiological Contamination of Ready to Eat Crops

This guidance provides practical guidance on ways of reducing the risks of food borne illness resulting from the microbiological contamination by farm manures of ready to eat crops. These crops provide the highest potential risk to food safety from manure use. The guidelines are based on recent research, largely funded by the Food Standards Agency, on pathogen occurrence and survival in farm manures both during storage and following land spreading. The guidance is equally applicable to both conventional and organic growers.



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ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

Food Safety Advice on Flooding (August 2007)

ERRATUM

The Agency's guidance on managing farm manures (for ready to eat crops) was quoted incorrectly in paragraph 11 of this paper. The correct guidance is as follows:

- Batch stored or treated manures may be applied at any time up to drilling/planting of a ready to eat crop but not during the growing season;
- Fresh solid manure or slurry should not be applied within 12 months of harvesting a ready to eat crop, including a minimum period of 6 months before drilling/planting; and
- There should be a 12 month gap between livestock last grazing in the field and harvesting of a ready-to-eat crop, including a minimum period of 6 months between last grazing and drilling/planting.

**Judith Hilton, Microbiological Safety
August 2007**

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

Food Safety Advice on Flooding (August 2007) – Summary of Members' Views

General:

The risks of microbiological contamination from flooding are lower than those associated with sewage spills or the direct application on animal manures to land, largely due to the dilution effect, therefore any pathogens present would be at much lower levels. However, it is possible that flood waters could contain raw sewage or run-off from agricultural land which may contain harmful pathogens. There is little data available on the type, levels or survivability of pathogens/indicator organisms in flood waters. Advice is based on what is known about these organisms in biosolids and sewage.

Q1. Is FSA advice to discard all produce affected by the flood water appropriate or over precautionary?

There is an identifiable risk from produce affected by flood waters although discarding all crops on this basis may be over precautionary recognising the limited data available. The greatest risk will be from RTE produce. Support current advice to discard RTE crops grown above ground affected by flood water noting it is probable that such crops would be destroyed during flooding anyway.

For produce that will be further processed (cooked) there is a risk of cross-contamination in the processing environment. Such produce need not be discarded providing this risk can be communicated and managed effectively. Any pathogens that are potentially present are likely to be the same as those found on raw meat. Advice should take into account the local situation (for example factors likely to increase the risk of microbiological contamination at a particular location such as proximity to sources of animal wastes or severity of flooding etc.) and emphasise general food hygiene messages that are given to avoid cross-contamination.

Q2. Considerations re: advice for allotment vs commercial crops

There were mixed views on this issue. Some members considered that advice to discard allotment grown produce is over-precautionary if general hygiene measures to avoid cross contamination are observed. Members considered that advice given by commercial companies would have to ensure that consumers were informed that crops that can be eaten either cooked or raw/peeled are not RTE and must be cooked before consumption.

Q3. Replanting and harvest intervals

Given the lack of data on quality of microbiological contamination and likely survival in flood waters the advice given on sewage sludge may be appropriate where sewage contamination is known to be high. In general pathogens have been reported to survive in soil and water for up to 4-6 months and 7 months respectively. Considering this and the dilution effect of

flood water, a harvest interval between 4-12 months would be reasonable, although local conditions should be taken into consideration. Members indicated that the Agency should make an informed judgement and set a specific harvest interval rather than quote a range.

Q4. Delay before replanting crops to be cooked

There is no justification for delaying replanting of crops that will be cooked, as long as cooking is assured and potential cross-contamination can be mitigated. Food businesses should assess the risk on an individual basis, with particular attention to the risk of cross-contamination in the home or processing environment.

Q5. Over precautionary advice re: sewer bursting on agricultural land?

There were mixed views. Differences in pathogen survival in sewage have been shown compared to that seen in manures and water, although once pathogens were spread over plants/soil survival should be similar (particularly for more liquid matrices). Some members expressed concerns about relaxing the existing advice on sewage spills without further evidence/data. Others considered 48 months to be unrealistic and questioned the justification. It was suggested that shorter intervals of between 4-12 months should still be appropriate, as although pathogen levels are likely to be higher than in flood water and the associated risks greater, survival data on crops and in the environment should still apply.