

ACHIEVING THE AGENCY'S SALMONELLA IN CHICKEN TARGET

Executive Summary

1. This paper introduces a strategy for achieving the Food Standards Agency target of reducing levels of *Salmonella* in UK-produced chickens on retail sale by at least 50% by 2005.
2. The Board is invited to:
 - **note** proposals and timetable for establishing the baseline for this target;
 - **endorse** the strategy; and
 - **request** an update on implementation of the strategy in 12 months time.

Microbiological Safety Division

Contact: Judith Hilton Tel: 020 7276 8983 (GTN 276 8983)
 Jonathan Back Tel: 020 7276 8949 (GTN 276 8949)

ACHIEVING THE AGENCY'S SALMONELLA IN CHICKEN TARGET

Issue

1. To ask the Board to **endorse** a strategy to achieve the Food Standards Agency target of reducing levels of *Salmonella* in UK-produced chickens on retail sale by at least 50% by 2005 and to **note** proposals and timetable for establishing the baseline for measuring achievement of the target.

Background

2. At the launch of the Food Standards Agency on 3rd April 2000, Sir John Krebs made the following statement;

“Furthermore, in relation to consumer protection, we will aim to reduce levels of *Salmonella* in UK-produced chickens on retail sale by at least 50% in the coming five years. In order to do that we will be working with industry to set new and ever higher standards.”

3. It is recognised that there are significant imports of chicken into the UK, both from EU Member States and other countries. Although the Food Standards Agency's chicken target does not specifically include imported chicken, this issue will be swept up as part of the Agency's target to reduce foodborne illness in the UK by 20% within the next five years.
4. It should be noted that the setting of this target comes at a time when the number of laboratory reports of human faecal *Salmonella* isolations is falling significantly. Since 1997, the annual number of UK isolations has fallen from 32,596 reports to just under 15,000 reports in 2000, a decrease of over 54%. However, although the fall in laboratory reports is an encouraging trend, there is no question that *Salmonella* continues to be an important cause of sporadic illness and food poisoning outbreaks. Consequently, there is still work to do to maintain this trend and one obvious area to consider is chicken.

5. There is evidence that *Salmonella* contamination of UK-produced retail chickens has fallen significantly over the past twenty years. In 1979, about 80% of chickens were contaminated and by 1994 this had fallen to about 30%. In 1997 the major supermarket chains reported that levels of contamination in their products were down to about 10-15%, which is approaching the level that the Advisory Committee on the Microbiological Safety of Food thought to be achievable within the industry. The Committee stated in 1996 that it saw no reason in principle why the prevalence of *Salmonella* contamination in the finished raw product should not, within the next few years, be reduced to under 10%.
6. Achieving the target will therefore be a challenge. However, there is a significant body of information available on the control of *Salmonella* in chickens, as well as examples where the industry has achieved dramatic reductions in *Salmonella* contamination in relatively short periods of time. Moreover, the integrated nature of much of the UK chicken industry provides the opportunity for control from 'farm to fork'.

Strategy for achieving the target

7. The strategy is based on a report analysing the various sectors within the chicken industry, concentrating specifically on the measures currently in place to control *Salmonella*, both statutory and voluntary, whether they work, whether they have been adopted by all parts of the industry and whether there are any gaps in our knowledge. The main issues in the report are summarised in Annex A. In producing this report, the Food Standards Agency was helped by a stakeholders workshop that took place in October 2000. The Agency, MAFF, ACMSF, consumers, the farming community, the poultry industry, retailers, the feed industry, the research community and veterinarians were all represented. A summary of the workshop discussions is available on the Agency's website.
8. The main area for the strategy to focus on is the **broiler growing farm** as this sector of the industry plays a pivotal role in preventing *Salmonella* contamination of the final product. If there were no *Salmonella* positive flocks entering the slaughterhouse then there should be no *Salmonella* positive birds leaving the slaughterhouse. Three areas have been identified as requiring immediate attention;
 - improved guidance on **biosecurity** on the broiler farm.

- promoting **testing and scheduling** at all broiler growing farms so that positive flocks are put through the slaughterhouse at the end of the processing day. This needs to be supplemented by guidance on how best to carry out these procedures
 - improving the **washing and disinfection of poultry crates**. A rapid assessment of the systems currently in use is required in order to identify what steps are needed to reduce the potential for recycling of *Salmonella* from one flock to another.
9. It is proposed that these three areas should be the primary focus for the Agency's strategy for achieving its target. A number of other areas have been identified as being important for controlling *Salmonella*. We plan to investigate these further to see whether additional measures can be proposed to supplement the existing strategy. They include:
- the extent to which the available guidance on *Salmonella* control in the **breeding and hatcheries** sector is being used and being adhered to.
 - the extent to which the available guidance on *Salmonella* control in the **feed industry** is being used and being adhered to.
 - identification of best practice for minimising/preventing the spread of *Salmonella* in the **slaughterhouse**.

Measuring success

10. In order to set the actual target that needs to be achieved, a large scale survey of chicken on retail sale in the UK is being undertaken. This will include all the various types of chicken on sale in the UK (whole birds, portions, fresh, frozen, home-produced, imported), all of which will be tested for both *Salmonella* and *Campylobacter*. It was hoped that the survey would have been completed by the time this strategy was presented to the Board. However, it has proved to be a complex matter to arrange, not least because of the need to make sure that it was representative of chickens on sale throughout the UK and that both experts and industry were content with the protocol. The survey began in April 2001 and is due to be completed by July 2001.

Next steps

11. We plan to set up a steering group consisting of experts, enforcers, the industry and consumers, chaired by Agency officials, to oversee the drawing up of more detailed plans of action and implementation of the strategy.

12. In developing these more detailed plans, there are a number of general issues to be considered;

- promulgation of best practice from one part of the industry to another (e.g. from large to small companies) should be considered. This could extend as far as education and training.
- the industry does possess a large amount of data and access to this will help to develop the strategy.
- there is already a large amount of information available on Salmonella control and this knowledge base should not be ignored.

Board Action Required

13. The Board is invited to:

- **note** the proposals and timetable for establishing the baseline for this target;
- **endorse** the strategy; and
- **request** an update on implementation of the strategy in 12 months time.

SUMMARY OF REPORT ON ACHIEVING THE FOOD STANDARDS AGENCY CHICKEN TARGET

Legislation/Codes of Practice/Government and Industry Initiatives

1. Relevant Legislation

- The Poultry Breeding Flocks and Hatcheries Order 1993 & Poultry Breeding Flocks and Hatcheries (Northern Ireland) Order 1994
- Zoonoses Order 1989 & Zoonoses Order (Northern Ireland) 1991
- Transport of Animals (Cleansing and Disinfection) (England) (No. 2) Order 2000 & Transport of Animals (Cleansing and Disinfection) (Scotland) Regulations 2000
- The Poultry Meat Regulations, Farmed Game Bird Meat and Rabbit Meat (Hygiene and Inspection) Regulations 1995

2. Relevant Codes of Practice

- MAFF Code of Practice for the Prevention and Control of *Salmonella* in Breeding Flocks and Hatcheries (1993)
- MAFF Code of Practice for the Prevention of Rodent Infestations in Poultry Flocks (1996)
- MAFF Code of Practice for the Control of *Salmonella* During the Storage, Handling and Transport of Raw Materials Intended for Incorporation into, or Direct Use as, Animal Feedingstuffs (1989 – Revised May 1995)
- MAFF Code of Practice for the Control of *Salmonella* in the Production of Final Feed for Livestock in Premises Producing Less than 10,000 Tonnes per Annum (1989 – Revised May 1995)
- MAFF Code of Practice for the Control of *Salmonella* in the Production of Final Feed for Livestock in Premises Producing Over 10,000 Tonnes per Annum (1989 – Revised May 1995)
- MAFF Code of Practice for the Control of *Salmonella* for the UK Fish Meal Industry

3. The Assured Chicken Production (ACP) Scheme is an independently assessed assurance scheme, the aim of which is for the chicken industry to be able to deliver confidence in its products to its customers. It is an industry-wide initiative that addresses all the important issues concerning the production of chicken. Scheme

standards have been written to include best practice in food safety, animal welfare, environmental care and health and safety.

4. The scheme is owned by Assured Chicken Production Ltd., a non-profit making company. The Standards and Scheme Rules are controlled by a Board of Directors, under the guidance of a Technical Advisory Committee comprising of industry representatives and independent technical experts. Assessments are undertaken by UKFQC Ltd, an independent company which is part of a Group which audits a wide range of food and farming products throughout the UK and abroad.

5. The standards in the ACP scheme cover the following elements of the production cycle; breeder layers, breeder replacements, hatcheries, chicken growing, catching/transport and lairage. All stages of the chicken production chain must be included in the Scheme for the chicken to be sold as ACP to the consumer. Chicken produced under the standard will be able to be identified by the British Farm Standards logo (the 'tractor mark'). It is estimated that the ACP scheme will cover about 85% of the more than 15 million UK produced chickens consumed each week.

6. The Government/Industry Working Group on Meat Hygiene published its Forward Programme for the Poultry Industry in 1997. The Group agreed the forward programme for the Poultry Meat Industry with the aim of ensuring consistently high hygiene standards. The programme notes that in modern poultry production, the health of the flock as a whole, rather than that of an individual bird, is of paramount significance for public health and appropriate measures should be in place on farm to achieve this objective. Where production records or any other evidence indicate that there may be a risk of pathogenic bacteria being introduced by a flock, operators should put in place additional systems at the slaughterhouse to minimise cross-contamination.

7. The Group also recommended that all premises slaughtering birds for the production of poultry and game meat should adopt a full HACCP plan on a voluntary basis. Within the forward work programme a framework is suggested as a starting point for the implementation of HACCP in poultry slaughterhouses.

8. The Group endorsed the ACMSF recommendation that industry should arrange for broiler flocks to be tested for *Salmonella* within 2-3 weeks prior to slaughter so that those identified as positive can be handled and processed with special care to avoid cross-contamination.

9. The Group also commented that there should be sufficient flexibility in the legislation to provide for the use of other treatments or processes to reduce contamination of the final product (although it was emphasised that these should not be used as an alternative to good hygiene practice). Endorsement was also given to a series of principles and targets for training of the poultry industry and recommended that their implementation should be pursued as a matter of priority.

10. It was also agreed that the Meat Hygiene Service should provide an overall record of the number of plants which are operating a HACCP plan and an aggregated record should be published annually. The Meat Training Council should also monitor take-up of the training schemes and publish this information annually.

The Breeding Sector and Hatcheries

11. In their 1996 Report on Poultry Meat, the ACMSF noted that 'At the primary breeding stage, the industry is in the hands of a very small number of companies who are able to exercise very tight controls on the product they produce. This has had tangible beneficial effects. The evidence presented to us strongly suggests that primary broiler breeding flocks are free from *Salmonella* infection. It also appears to us that *Salmonella* infection in broiler breeding flocks is primarily acquired via horizontal, not vertical transmission'.

12. The Poultry Breeding Flocks and Hatcheries Order 1993 ensures that the broiler breeder sector is closely monitored, with frequent testing for *Salmonella* laid down in legislation. It is also understood that the major poultry breeders carry out additional monitoring to that required by legislation.

13. In addition to legislation, the MAFF Code of Practice for the Prevention and Control of *Salmonella* in Breeding Flocks and Hatcheries provides detailed guidance. This deals with a variety of issues, including building design, biosecurity and cleaning and disinfection. Similar requirements, in slightly more detail, are laid out in the relevant sections of the Assured Chicken Production Scheme. If the legislation, MAFF Code and the ACP scheme are followed then it would appear that the likelihood of *Salmonella* infection in both breeding flocks and hatcheries should be considerably reduced.

14. The one area which was identified as definitely being worthy of further investigation was vaccination. This is currently being applied to about 75% of the UK

breeding flock and has been shown to be beneficial in preventing *Salmonella* infections. Whilst it is not known whether the other 25% of the breeding flock present a specific problem with respect to *Salmonella* infection, promotion of vaccination for all breeding flocks may be a useful additional control measure. It should be noted that compulsory vaccination is being considered as part of the ACP scheme.

15. It has been argued that in view of the controls already in place in this sector there is nothing further that needs to be done in relation to control of *Salmonella*. However, whilst the mandatory and voluntary controls introduce a strong element of monitoring at breeder farms and hatcheries (with appropriate action should *Salmonella* be found), this does not mean that the whole of the broiler breeder and hatchery sectors are clear of *Salmonella*. Incidents of *Salmonella enteritidis* and *Salmonella typhimurium* in breeding flocks are collated by MAFF and still occur.

16. In summary, whilst recognising the efforts that have been put in place by the Government and the industry to control *Salmonella* in the breeding and hatchery sectors, it would be inappropriate to state that there is nothing else that needs to be done. As a first step it would seem appropriate to gather information on;

- the extent to which Codes of Practice and other initiatives are being used and are being adhered to.
- the extent to which lessons can be learnt from incidents of *Salmonella* contamination in the breeding sector and hatcheries.
- the benefits of vaccination in the breeding sector and whether this should be promoted as best practice.

Broiler Growing (Rearing) Farms

17. It is clear that the rearing farm plays a pivotal role in minimising *Salmonella* contamination of the final product. Should all flocks being sent to the slaughterhouse be free of *Salmonella*, then so should all of the birds coming out the other end. This was recognised by the ACMSF in its 1996 Report and was a strong message coming out of the Poultry Target Workshop. Control measures at this stage of the poultry production process are vital and it is important that the industry take steps to minimise/eliminate *Salmonella*.

18. In view of the above, a lot of effort has been devoted to this area. Much has been directed towards biosecurity issues and the need to prevent horizontal transmission of

Salmonella. Areas receiving attention including poultry shed design, the cleansing and disinfection of sheds, poultry feed, access to sheds, protection against rodents, etc.

19. It is apparent that the issue of guidance to promote best practice on biosecurity on broiler farms needs to be assessed. In particular, there is a need to ensure that any guidance that is provided is applicable to the whole of the poultry industry. For example, it would need to take account of the fact that many 'old' sheds are still being used. At the Poultry Target Workshop it was identified that these could still be adequately cleaned and disinfected, although more effort and attention to detail may be needed when compared to 'new' sheds.

20. The other major issue in relation to the broiler farm is the testing of flocks for *Salmonella* prior to slaughter. The intention being that positive flocks can be scheduled for slaughter at the end of the processing day to avoid contaminating *Salmonella* free flocks going through the slaughterhouse. This was recommended by both the ACMSF and the Government/Industry Working Group and is a requirement of the Assured Chicken Production Scheme.

21. There is a view that testing and scheduling is the single most important control measure to minimise *Salmonella* contamination in the final product. Indeed at the Poultry Target Workshop the view was expressed that if you do not do this, then as a company you cannot be serious about *Salmonella* control. This is not to say that there are not issues to be addressed about testing and scheduling. This was discussed at the Poultry Target Workshop and it was noted that the production of a standard protocol for carrying out mid-crop testing would be useful.

22. Testing and scheduling is compulsory under the ACP scheme and hence should be carried out for around 85% of the birds going for slaughter in the UK. Details as to whether testing and scheduling is carried out on the other 15% of birds is not known, but would be useful to obtain a view of the importance attached to undertaking these actions.

23. In relation to scheduling and testing, it is also known that some companies make use of bacterial typing in order to try and identify the source of any *Salmonella* found in flocks. Such typing can show whether there is a long term problem on a farm with a particular *Salmonella* serotype. It can even, making use of other historical data, identify where the problem originated.

24. In view of the fact the testing and scheduling is compulsory under the ACP scheme, it is apparent that the industry will be collecting a significant amount of data on flock contamination. It would be useful if this could be collated as it may help to identify the long-term trends on *Salmonella* contamination at the broiler farm.

25. In summary, there would appear to be two main issues relating to the broiler farm. Biosecurity to prevent *Salmonella* getting into broiler sheds is vital and encompasses a number of different areas (essentially control can be exerted by having a clean chick, clean feed and a clean site). Whilst there is some guidance available, this could be expanded to promote best practice. Especially as there is plenty of background information available on how to ensure biosecurity on farms. A proposed MAFF Code of Practice for Prevention and Control of *Salmonella* in Broiler Flocks may deal with this issue.

26. Despite the best efforts in biosecurity, it appears that there will always be some occasions when flocks become *Salmonella* positive. This brings in the other important issue at the broiler farm which is testing and scheduling. As there is general agreement that this is a very important control measure for *Salmonella*, there would be benefits if this could be used throughout the industry. In promoting this view, it would be useful to find out how common these procedures are in non ACP companies. In addition, consideration could be given to enhanced guidance on how to carry out the mid-crop testing that is required for scheduling. Collation of information on positive flocks could also be useful as a way of monitoring trends.

27. There are other issues for consideration although some, such as potential problems with thinning, are really linked to biosecurity. One area which may merit further attention is the benefit of typing *Salmonella* isolates on the broiler farm and seeing whether the results can help to identify the source. Another is investigating actions that can be taken when flocks do become *Salmonella* positive. For example what are the benefits of using competitive exclusion or acidified feed.

Feed

28. The ACMSF made a number of conclusions and recommendations in their 1996 report. These can be summarised in the following statement contained in the report:

'We firmly believe that it is technologically possible and economically feasible for the feed industry to produce *Salmonella*-free poultry feed. Not only is this desirable; it is something which the poultry industry should be insisting upon.'

29. The ACMSF views, and those that came out of the Poultry Target Workshop, illustrate that all involved recognise the importance of ensuring *Salmonella* free feed. Especially as it must be noted that feed is used in the breeding sector as well as at the broiler farm. It is also apparent that there is a lot of information on prevention of *Salmonella* contamination of feed and that this has been used in the guidance that has been put in place by both the industry and the Government.

30. The MAFF Codes of Practice for the Control of *Salmonella* in Animal Feed and Feed Ingredients and the United Kingdom Supply Trade Association (UKASTA)'s Feed Assurance Scheme all encourage the use of HACCP principles to control *Salmonella* in feed. The need to take this approach was emphasised at the Poultry Target Workshop as it was a way of controlling all aspects of feed production; including selection of ingredients, sourcing of ingredients, processing, transport, etc.

31. Although there is a lot guidance on preventing feed being contaminated with *Salmonella*, this still occurs. *Salmonella* testing on animal feedingstuffs and ingredients is performed under the Processed Animal Order 1989 and the MAFF Codes of Practice and the results indicate that about 1% of products destined for consumption by poultry are positive for *Salmonella*. Whilst many of these *Salmonella* may not be of human health significance, it must be noted that *Salmonella enteritidis* and *Salmonella typhimurium* are still being isolated from ingredients and finished poultry feed.

32. The above suggests that there is still work to do in preventing *Salmonella* contamination of feed and suggestions were made on how this could be achieved at the Poultry Target Workshop. Much was made of the need to ensure that the relevant guidance was being followed and that procedures should be in place to identify and rectify any problems. Comments were also made that the current guidance could be worth building on, but that in doing so it would be essential to get all stakeholders involved.

33. It was also apparent that the sourcing of *Salmonella* free ingredients was vital and it was suggested that feed mills could make use of commercial contracts to ensure

this was the case (i.e. reduce the amount paid should *Salmonella* be found). Leading on from this was the suggestion that feed mills should identify and stop using ingredient suppliers that were not up to the required standards. In addition, it was also noted that improving the flow of information between feed companies about positive *Salmonella* results could be useful. In relation to ingredients as a whole, the introduction of an assured grain scheme in 2001 may be useful. In relation to the actual feed mills, it must be recognised that these are designed for the production of feed and not for food safety. As such, environmental testing might be a useful way of identifying where *Salmonella* contamination problems may be occurring.

34. In summary, it is generally agreed that the procedures required to produce *Salmonella*-free feed are known. The main issue to be addressed is making sure that all of these procedures are being followed, and that should a problem occur this is identified quickly and the relevant action taken. As such, consideration needs to be given to assessing the current guidance and deciding whether this could be built on.

Transportation

35. Whilst many of the issues relating to catching and transportation of birds to slaughterhouses are related to animal welfare, there are also obvious *Salmonella* contamination issues. This was recognised by the ACMSF in their 1996 Poultry Report where a number of specific comments were made about transportation. Many of which related to the need to both minimise faecal contamination during transport and to ensure that crates and associated equipment (such as transport vehicles) are properly cleaned and disinfected.

36. There appears to be a general acceptance within the industry that transport of birds does present a specific problem with regard to *Salmonella* contamination. The issue of crate cleaning in particular elicited a significant amount of discussion at the Poultry Target Workshop, with there being general agreement that this was an area where control was not as good as it should be. Hence there was the potential for transfer of *Salmonella* from one flock to another. Indeed, it was identified that was evidence to back this up, both from research and from visual inspection of crates after washing.

37. The Workshop identified two specific areas relating to crates; the actual design of the crates and how they are washed. As redesigning crates may prove difficult, then this emphasises the need for adequate washing and disinfection. There can be

difficulties with these processes as washing is often carried out in a limited space and that, especially in high throughput processors, there may be limited time for the washing of each crate. This links in to comments that it may not be the current crate washing systems that are fault, but the way that they are being used, i.e. are the systems being used properly. It was also noted that new crate washing systems are becoming available and a critical assessment of these, as well as those currently on the market, would be useful.

38. It should be noted that there is already legislation in place requiring the cleansing and disinfection of crates between batches of birds. As such, should it be identified that there are simple measures that could be in place by the industry, improved enforcement of this legislation could be considered.

39. In summary, crate washing is something that needs to be investigated in more detail. There is evidence that it is not effective in removing *Salmonella*, leading to the possibility of recycling of *Salmonella* from one flock to another. A review of current crate washing systems, and how these are being used, would be the first step in identifying what further action may be required.

Slaughter

40. The 1996 ACMSF Poultry Report provides an excellent overview of the main steps in the primary processing of poultry, including comments on the relative contribution each of these steps might make to bacterial contamination of the bird. One of the most salient points was the fact that with some plants processing 8,000 or more birds per hour, there were important implications for cross-contamination. This problem was exacerbated by the difficulties involved in thoroughly cleaning processing equipment. Consequently the Committee recommended, amongst other things, that those manufacturing processing equipment should place much greater emphasis on cleanability and hygiene control.

41. Whilst there was general support for the recommendations outlined above, plus others made by the ACMSF in the this area, it was recognised that there were some difficulties. Particularly the fact that any changes which require major capital investment are only likely to be made as part of a phased programme over time.

42. At the Poultry Target Workshop agreement on control measures for *Salmonella* at the slaughterhouse could not be reached . Some participants felt that *Salmonella*

control must take place pre-slaughter as there is little that can be done to avoid cross-contamination from one carcass to another during the slaughter process. Others disagreed, stating that HACCP principles could be used in the slaughterhouse.

43. Perhaps these two views are not that far apart, as there would be little argument that the best control system for the slaughterhouse is not to introduce *Salmonella* in the first place. However, currently this is not an option and hence the scheduling of positive flocks for the end of the process should be carried out. This means that *Salmonella* infected birds are entering the slaughterhouse and every step that can be taken should be taken to minimise cross contamination within the slaughterhouse.

44. It was identified that any strategies to control cross contamination would need to be tailored to individual slaughterhouses, starting with an investigation of strategic points with the slaughter process. There were no points where elimination of *Salmonella* could be achieved, although hurdles to reduce cross contamination could be identified. Obvious areas for control were scalding and plucking although this may require major redevelopment of equipment (with the associated costs).

45. It was also noted that most *Salmonella* testing at the slaughterhouse was at the request of customers and took place at the end of the slaughter process. It was suggested that there was scope for testing at the various stages of the process as this may help to identify problems. An agreed standard for the way *Salmonella* testing in the slaughterhouse should be undertaken would be helpful, although it was identified that testing had cost implications.

46. The issue of terminal decontamination to control *Salmonella* was raised a number of times. It was accepted that there were legal implications (e.g. only potable water should be used) but it was felt the issue should at least be considered. Ideas that were put forward were steam pasteurisation, the use of organic acids and irradiation.

47. In relation to *Salmonella* control in slaughterhouses, it should be noted that the Food Standards Agency has taken the decision that from 1st May 2001 it will enforce the existing prohibition in EU and UK laws on the use of hyperchlorinated water in UK poultry meat production. It had previously been considered that the use of chlorine might be beneficial to public health because it helped to control bacteria on equipment and in immersion chiller waters. However, the Agency has reviewed the question and, on the basis of new scientific advice, has concluded that the use of chlorine offers only limited public health benefits.

48. In summary, it would be inappropriate to ignore the slaughterhouse when considering *Salmonella* control measures. There are steps that can be taken and whilst some of these may be a long-term option (as it may necessitate changing equipment) others may be simpler to apply. As a first step it would seem appropriate to identify best practice in slaughterhouses.