

DRAFT STRATEGY FOR THE CONTROL OF *MYCOBACTERIUM AVIUM* SUBSPECIES *PARATUBERCULOSIS* (MAP) IN COWS MILK

Objective

1. The Food Standards Agency (FSA) is developing a strategy to reduce the likelihood of consumers being exposed to MAP when consuming cows' milk. In setting this objective, the Agency has put on one side the question of whether or not there is a link between MAP and Crohn's disease. The Agency believes that precautionary action to reduce human exposure to MAP should start now and should not be dependent on waiting for the link to be proved or disproved.

Background

2. Crohn's disease is a chronic inflammatory bowel disease of humans that can be severe, prolonged and debilitating. The cause of the disease is unknown, although one suggestion which has received a lot of attention is a link with *Mycobacterium avium* subspecies *paratuberculosis* (MAP), a bacterium that causes a chronic gastrointestinal infection called MAP infection in cattle and other ruminants. The evidence for and against such a link has been examined by the Advisory Committee on Dangerous Pathogens (twice), by the European Union and, more recently, was the subject of a review produced on behalf of the Food Standards Agency. All of these pieces of work reached a similar conclusion, which is that on the basis of the available information a link between MAP and Crohn's disease can neither be proved nor disproved.

3. Nevertheless, the FSA considers it important to take the possibility of such a link seriously since a survey commissioned by the Food Standards Agency found MAP in approximately 2% of samples of pasteurised milk in the United Kingdom. The results of this survey were reported to the Advisory Committee on the Microbiological Safety of Food in September 2000. The Committee noted that the risk to human health had not yet been established and did not recommend any change in the current advice regarding the consumption of milk, i.e. that on the basis of the current evidence there is no need for anyone to change their dietary habits.

4. The Committee did however recommend that, given differing views on possible links to human illness which are unlikely to be resolved in the foreseeable future, the Agency should convene an expert group of stakeholders to consider ways of reducing exposure to MAP in milk. The Agency accordingly organised a stakeholder workshop in May 2001 to help gather information on possible controls to reduce or eliminate MAP in milk.

The output from the workshop¹, along with information gathered from other sources, has been used to prepare the strategy.

The Strategy

5. The various elements of the strategy cover the whole milk production chain. Some of these can be put in place relatively quickly, whilst others will take time and should be seen in the context of this being a long term strategy. Although the Agency prepared the strategy, there has been strong input from DEFRA. The responsibility for implementation will fall to both Agriculture Departments and the Agency.

Control in Cattle

6. A long-term aim should be to introduce control measures that would stop MAP at source. This would require reducing or eliminating MAP infection in dairy cattle in the UK which would not be an easy task. There are problems to be confronted, for example, there are no accurate data on the level of Johne's in the national herd. This needs to be addressed in order to establish the extent of the disease and to have a baseline against which to assess the effectiveness of any future intervention measures. Whilst a survey of MAP infection is seen as a priority, its reliability will be dependent on ensuring that suitable detection methods are used. Some methods are available but they do not detect all infected cattle and their use in the UK requires further validation.

7. There is uncertainty over the extent of survival of MAP in the environment and research has indicated that the organism can be found in a variety of animals (both farmed and wild). The existence of possible reservoirs outside the cattle population raises doubts about the feasibility of eradication and questions about some of the possible control measures. For example, a control strategy for cattle based on the introduction of animals testing negative for MAP infection (acknowledging the limitations of testing) to a farm, would not be fully effective if these animals were then able to acquire MAP from the environment or from other animals on the farm.

8. Despite the above problems, it is judged that preliminary control measures on farm can and should be introduced. Other countries have developed control programmes for MAP infection and although these may not be applicable in their entirety to the UK situation there should be some aspects that could be introduced here. There are already certain initiatives within the UK to control the disease, including various cattle health schemes, limited vaccination and veterinary advice to farmers. However, it needs to be recognised that some of the measures that are most effective in preventing transmission of MAP from cow to calf, such as removal of calves from the cows and withholding of bulked colostrum, have implications for animal welfare and may also increase the susceptibility of calves to infection with other agents. The effectiveness of control programmes also needs to be

¹ Workshop report available on the FSA website – www.foodstandards.gov.uk/events/control_map.htm

evaluated, since they have not yet been in operation long enough for their effectiveness to be established.

9. The production of guidance which brings together all the available information and helps farmers understand what action they can take now to control MAP infection in their herds would be a worthwhile first step to the introduction of a concerted programme to control the disease on the farm. This should contain practical information on husbandry, basic hygiene and biosecurity measures.

10. Dissemination and implementation of guidance may have some early effect in starting to reduce the level of MAP infection. However, this is unlikely to provide a complete solution and there is a need to consider other options. In the long term, vaccination is seen as having the greatest potential although further research is needed as the efficacy of the currently available vaccine has been questioned.

11. In summary, the strategy for control in cattle contains the following elements;

- **assessment and validation of current methods for detecting MAP infection in cattle.**
- **a survey of MAP infection in the UK dairy herd.**
- **production of guidance for farmers on the control of MAP infection.**
- **Prioritisation for further research, including development of vaccines against MAP infection.**

Action to Implement the Cattle Measures

12. Once currently available tests have been validated DEFRA are planning to carry out a UK survey of MAP infection.

13. DEFRA have commissioned work to produce two advisory leaflets relating to the control of MAP infection in cattle. The first will be aimed at farmers trying to produce Johne's free herds. It will include guidance on testing programmes to identify infected animals so they can be removed and on measures to prevent the introduction of infection to the herd. The second leaflet will be aimed at those farmers who do not wish to test livestock at this stage but who might wish to take measures that would be likely to reduce the level of infection over time. It is intended that the leaflets will be available early in 2002.

14. It should be noted that advice on MAP infection has been included with other diseases in a leaflet "*Golden rules for a healthy herd – Advice to farmers restocking cattle herds*" that has been sent to all cattle farmers following the Foot and Mouth outbreak. In addition to information on prevention of introduction of the disease there is information on industry led

health schemes which include testing for MAP infection. It is accepted that on the basis of currently available tests for MAP infection there are relatively few Johne's negative herds in the UK from which to source replacements but it is hoped that this will increase.

Control During Milking

15. The lower the level of MAP in raw milk the smaller the chance that it will be present after the pasteurisation process. Although MAP may be secreted in the milk, the main source of MAP in milk is thought to be faecal contamination. Hygiene during the milking process is therefore fundamental to the control of MAP in milk. Minimising the amount of faecal contamination of raw milk, which is a key part of the Agency's foodborne disease strategy, should minimise the amount of MAP present. Control measures during milking are thus already being actively promoted through initiatives to promote good milking hygiene in general.

16. One important area which has been identified as requiring attention is teat cleaning prior to milking. Opinion differs on how best to carry this out in order to reduce faecal contamination of the milk and farmers currently use a variety of different practices. Since teat cleaning is a crucial step in reducing the level of faecal contamination (and consequently could be a crucial step for reducing MAP) there is a need for research to determine best teat cleaning practice, recognising that this may vary depending upon farming practices and the time of year.

17. In summary, the strategy for control during milking contains the following elements;

- **a review of current advice on hygiene practices during milking with a view to issuing consolidated guidance.**
- **a review of the ways of disseminating advice on hygiene practices during milking so as to optimise future delivery.**
- **research into teat cleaning practices and subsequent publication of advice.**

Action to Implement the Milking Measures

18. In England and Wales, the Dairy Hygiene Inspectorate (DHI) assesses milk production holdings for compliance with the Dairy Products (Hygiene) Regulations 1995 and enforces these Regulations on behalf of the FSA. In the course of this work, the DHI provide advice to milk producers on an unofficial basis. The role of the DHI is under review as part of the foodborne disease strategy in relation to the need to reduce the risks of faecal contamination of milk during milking. It will be considered whether the DHI's unofficial advisory role function should be clarified and expanded in order to benefit public health. The issues in relation to controlling MAP in milk will be considered in the context of this review.

19. A call for proposals to carry out research on teat cleaning practice will be included in issue 7 of the Agency's Research Requirements document to be published in December 2001. Once the research has been completed guidance will be issued to farmers.

Control After Milking (Pasteurisation)

20. Post-milking controls currently depend upon pasteurisation and the avoidance of subsequent cross contamination. Whilst there is evidence that MAP can survive pasteurisation, it is also clear that pasteurisation significantly reduces the number of viable bacteria. Therefore it is essential to ensure that dairies are carrying out pasteurisation correctly. Any failure, either not pasteurising at the correct time/temperature combination or post-pasteurisation contamination, would increase the likelihood of the presence of MAP in milk sold to the consumer. In view of the importance of pasteurisation as a control measure for pathogens such as *Salmonella* and *E.coli* O157, dairies should already have effective means of ensuring that the process is being carried out correctly. However, it is known that problems do occur from time to time (particularly in smaller dairies and on-farm pasteurisers) and there is the need for further guidance and an active programme of inspection and enforcement. Such guidance needs to review and consolidate what has previously been produced.

21. When information first showed the presence of MAP in pasteurised milk, most of the major dairies changed their process conditions by increasing the pasteurisation time from 15 to 25 seconds. There was no direct evidence to prove that such a change would be effective in eliminating MAP, but laboratory work did indicate that this might be the case. It should be noted that this work also showed that increasing the pasteurisation temperature had much less effect than increasing the pasteurisation time.

22. However, the 1999/2000 FSA milk survey found MAP in some samples of milk that had been pasteurised for 25 seconds, indicating that the extra 10 seconds of heating does not guarantee the complete elimination of MAP. Nevertheless, although there may still be survival of MAP at this extended time, it is considered that this would be less likely than with the conventionally practised 15 seconds. Therefore it is suggested that those dairies currently pasteurising for 25 seconds should maintain this time, whilst those that are pasteurising for a shorter period should increase their time to 25 seconds. Further research on the pasteurisation conditions required to eliminate MAP is also required.

23. In summary, the strategy for control during milk pasteurisation contains the following elements;

- **production of pasteurisation guidance for dairies (this should be aimed particularly at small dairies and on-farm pasteurisers).**
- **measures to improve inspection and enforcement (particularly in relation to on-farm pasteurisers).**

- **a recommendation that all dairies should pasteurise milk for 25 seconds.**
- **research to find effective ways of treating milk to eliminate MAP.**

Action to Implement Measures After Milking

24. The Dairy Industry Federation (DIF) intends to publish a Code of Practice on HTST (high temperature short time) Pasteurisation. The Agency welcomes such industry initiatives and will investigate ways of ensuring that its contents become as widely known as possible. For example, in Scotland the Scottish Dairy Association will circulate and recommend the DIF Code of Practice to their members.

25. With respect to the enforcement of pasteurisation requirements the Agency is reviewing, as part of the foodborne disease strategy, responsibility for and the approach to enforcement of dairy products hygiene legislation at approved establishments pasteurising milk on farms. The aim will be to determine how the enforcement of pasteurisation requirements in these establishments can be enhanced.

26. A LINK project (partially funded by DEFRA) investigating the pasteurisation conditions and technologies required to eliminate MAP from milk, is currently taking place. The full results of this project will be available in January 2003 and it is planned that information from this study should be utilised when considering future action on MAP.

Evaluation of the Strategy

27. The strategy consists of a number of elements. Some of these are already being implemented, others can be put in place relatively quickly, whilst others are longer term options requiring further investigation. As the strategy develops and is implemented it will be essential to have some mechanism by which it will be possible to assess whether it is working. At this time, it is considered that the most appropriate way of doing this will be to repeat the milk survey that the Agency undertook in 1999/2000. This will provide information on the levels of MAP and faecal contamination in raw and pasteurised milk and details of pasteurisation times and temperatures.