

# PROPOSED REGULATION ON THE USE OF ANTIMICROBIAL TREATMENTS (AMT) TO REMOVE SURFACE CONTAMINATION FROM POULTRY CARCASSES

## Issue

1. A Commission proposal to permit the use of antimicrobial processing aids in poultry meat production will be referred to the Agriculture Council and may be on the agenda on 29 September 2008.

## Strategic Aims

2. The Agency recognises that the use of antimicrobial treatments during poultry processing may be a worthwhile intervention to reduce pathogenic micro-organisms, particularly where hygienic processing is unable to control the hazard when present in animals at slaughter e.g. *Campylobacter* in poultry. A strategic target was set in 2005 to work with industry to achieve a 50% reduction in the incidence of UK produced chicken testing positive for *Campylobacter* by 2010 and this target contributes to the overall aim of reducing foodborne disease.

## Background

3. Regulation (EC) No 853/2004 provides that substances other than potable water cannot be used to remove surface contamination from foods of animal origin unless the use of the substance has been approved. At present no approvals have been granted. In the USA, on the other hand, a range of substances are permitted to be used as processing aids. Poultry meat produced using these processing aids is not allowed to be imported into the EU.
4. The USA views this as a trade barrier, arguing that controlled use of these substances is both safe and effective in reducing the number of pathogens on the carcass. In recent negotiations, DG Trade has undertaken to secure the removal of this barrier.
5. The Commission issued a proposal for discussion at the SCoFCAH (2 June) meeting to permit the use of four antimicrobial agents (chlorine dioxide, acidified sodium chlorite, peroxyacids and trisodium phosphate) whose safety has been assessed by EFSA panels. Use of hyperchlorinated water (also permitted in the USA) is not part of the proposal as there remain concerns about the toxicity of this substance.

6. The proposal would permit use of the four substances within the overall context that:

- there are controls in primary production
- the use of the treatments is part of an integrated control strategy

and provided that:

- food business operators collect data on the likelihood of emerging resistance and on environmental impact and make these available to Competent Authorities
- there is a rinsing step
- products treated in this way are labelled.

7. The UK abstained from the vote at the SCoFCAH meeting in June on the basis that there was insufficient time to consider the proposal. All other MS's voted against the proposal, however we consider these objections are not based on sound science.

8. In accordance with EU procedures the proposal has been referred to the Agriculture Council and the proposal may be on the Agriculture Council agenda on 29 September. Therefore we are seeking agreement from other Government departments for our negotiating line. The proposal was discussed by the Directors who considered the issues of efficacy and safety.

### **Food Safety Benefits**

9. The four substances in the proposal are broad-spectrum antimicrobial agents that are effective in inactivating most bacterial, viral, and protozoan pathogens commonly found on poultry and in poultry processing plants, including *Salmonella* and *Campylobacter*.

10. *Campylobacter* is the most common bacterial cause of foodborne illness in the UK and is therefore one of the key organisms the Food Standards Agency is tackling in order to reduce levels of foodborne disease. In terms of disease burden, the risk matrix approach ranks *Campylobacter* the highest pathogen in terms of total number of cases (estimated as 295,500 in 2005), hospitalisations (estimated as 13,930 in 2005) and cost of illness. It also accounted for an estimated 70 deaths. Since 2005, cases of *Campylobacter* have increased by almost 10%. It is accepted that there are a number of routes by which humans are exposed to *Campylobacter*. However, there is strong evidence that the most significant is the presence of this organism on chicken.

11. A risk assessment model developed in Denmark (2002) estimates that a 2 log reduction<sup>1</sup> in the number of *Campylobacter* on chicken carcasses during processing would reduce the incidence of human cases associated with eating

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<sup>1</sup> A 1 log reduction means 10 times smaller, a 2 log reduction means 100 times smaller, etc.

chicken meals by a factor of 30 (e.g. from 300 to 10 human cases per 100,000 of the population). In the UK there were 69.4 *Campylobacter* cases per 100,000 of the population in 2006 (provisional data) and a 2 log reduction achieved through the use of antimicrobial treatments on poultry carcasses could therefore lead to a reduction in *Campylobacter* to 2.3 cases per 100,000 of the population.

12. Current research by the Food Standards Agency (unpublished) indicates a 1 log reduction in *Campylobacter* may be achievable in poultry carcasses using acidified sodium chlorite and trisodium phosphate. The largest commercial trial in the US involving 5 poultry processing plants reported a 1.75 log reduction in *Campylobacter* on poultry carcasses following use of acidified sodium chlorite (Kemp *et al*, 2001<sup>2</sup>). A more recent commercial trial in Australia (Sexton *et al*, 2007<sup>3</sup>) has reported a 3.8 log reduction in *Campylobacter* on poultry carcasses following use of acidified sodium chlorite.
13. The efficacy of the four substances has been previously reviewed in a series of publications (2002) prepared for the United States Department of Agriculture Foreign Agricultural Service (USDA FAS) and Food Safety and Inspection Service Office of International Affairs (FSISO). As little as one part per million of chlorine dioxide in poultry process water provides a very effective antimicrobial effect. Under commercial operating conditions, 2 to 3 ppm residual chlorine dioxide in process water can achieve 2 to 3 log reductions in microbial levels in poultry chiller water and 1 to 2 log reductions on poultry carcasses. Under commercial operating conditions, an 8-12% solution of trisodium phosphate can achieve 1 to 2 log microbial reductions on poultry carcasses, acidified sodium chlorite solutions can achieve 1 to 2 log reductions, and peroxyacid solution can achieve 1 to 3 log reductions of microorganisms on poultry carcasses.
14. While the main case for benefits relies on the modelling approach, we are aware of data emerging from New Zealand which, until recently, had the highest incidence of *Campylobacter* in the world. Following the approval of acidified sodium chlorite washes, for use as an intervention as part of a control plan based on industry and processing plant compliance targets, a decrease in the incidence of *Campylobacter* has been observed (see attached graph).

### **Safety Concerns**

15. The main safety concerns relate to toxicity of the substances, the possibility that their use will give rise to resistance to antibiotics and other antimicrobial compounds, and the effect on the environment.

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<sup>2</sup> Kemp *et al.* (2001) Continuous online processing of fecal- and ingesta-contaminated poultry carcasses using acidified sodium chlorite antimicrobial intervention *Journal of Food Protection* **64** (No. 6) 807-812

<sup>3</sup> Sexton *et al.* (2007) Effect of acidified sodium chlorite treatment on chicken carcasses processed in South Australia *International Journal of Food Microbiology* **115** 252-255

16. In December 2005, the EFSA Scientific Panel on food additives, flavourings, processing aids and materials in contact with food issued an opinion on toxicological risks, concluding that treatment with the four substances under consideration under the described conditions of use would be of no safety concern.
17. In March 2008, the EFSA BIOHAZ Panel issued a draft opinion for consultation in which it concluded that, despite a long history of use, there are currently no published data to conclude that the application of the four substances under the proposed conditions of use would lead to reduced susceptibility to these substances or to resistance to therapeutic antimicrobials. However, this reflects an absence of evidence rather than evidence of absence. This is demonstrated by panel recommendations that the potential for the occurrence of resistance should be considered in the process for approving these substances and that research should be encouraged into the likelihood of such resistance emerging.
18. The mechanism of action of the four substances, which kill the target bacterium through interaction with a large number of different parts of the bacterial cell wall rather than one specific action on the bacterial cell, significantly reduce the likelihood that resistance will develop<sup>4</sup>.
19. The environmental impact of the use of these four substances has recently been considered by the Scientific Committee on Health and Environmental Risks and the Scientific Committee on Emerging and Newly Identified Health Risks. Concerns were expressed about the potential risks to the environment from the direct discharge of all four substances, as well as the potential for the dissemination of resistant strains of bacteria. The Committees concluded that additional information was required for a proper assessment of these issues and the environmental consequences.
20. The use of these four substances has been previously reported in a series of publications (2002) prepared for the USDA FAS and ISOIA. It was noted that chlorine dioxide has been used as a water treatment disinfectant in the United

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<sup>4</sup> The active ingredient of acidified sodium chlorite is chlorous acid. Chlorous acid, like chlorine dioxide, is an oxidizing biocide and not a metabolic toxin. It kills microorganisms by direct action on the cellular membrane and through disruption of fundamental cellular processes leading to a loss in the ability to synthesize proteins.

The mechanism of action of trisodium phosphate as an antimicrobial agent is thought to result from its high alkalinity in solution, which may both disrupt the cellular membrane and act as a surfactant to facilitate removal of bacteria from carcasses.

The active ingredients of peroxyacids are peroxyacetic acid and octanoic acid, and, to a lesser extent, peroxyoctanoic acid and hydrogen peroxide. Peroxyacids are a class of strongly oxidizing compounds. They kill microorganisms by direct action on the cellular membrane and through disruption of fundamental cellular processes.

States and Europe for over 50 years. The levels of chlorite, chlorous acid, and chlorine dioxide released to the environment as a result of using acidified sodium chlorite or chlorine dioxide will be very low. Poultry plant aqueous effluents containing trisodium phosphate can be treated effectively and present few environmental concerns. The primary products released to the environment from the use of peroxyacids in poultry processing waters are oxygen, water, acetic acid and octanoic acid. Acetic acid and octanoic acid are normal constituents of the human diet and are found in living cells. The overall conclusion was that the use of the four substances as antimicrobial agents in poultry process water should not have a significant impact on the environment.

### **Independent Scientific Advice: the ACMSF view**

21. In March 2005, the Advisory Committee on the Microbiological Safety of Food (ACMSF) considered a draft Commission Regulation laying down specific conditions for antimicrobial treatment of food of animal origin. The Committee considered that:

- the draft regulation was premature, and that more work was needed on the use of proposed antimicrobial decontamination treatments before their use was approved
- the Scientific Committee on Veterinary Measures Relating to Public Health opinion was inadequate in terms of toxicological assessment
- a risk assessment as proposed by Codex was needed to consider potential food safety benefits in the context of any possible toxicity
- adoption of the proposal could adversely affect efforts to promote hygiene measures
- consumer concerns about the use of these treatments and requirements for labelling were unknown.

22. A further draft proposal was considered by the Committee in 2007. On that occasion, members acknowledged that the approval process had adopted a precautionary approach and that the revised proposal addressed previous ACMSF concerns on product safety. However some concerns were raised about placing all four substances in the same group and Members emphasised that there should be a strong approach to approval. Members also stressed the need for continued good farm biosecurity.

