Acidic Calcium Sulphate

INTERVENTION SUMMARY	
Status	Currently available
Location	Packaging/Retail
Intervention type	Incorporated into meat products
Treatment time	Storage life of product
Regulations	Approved in US. Calcium sulphate approved by FSANZ as a food additive.
Effectiveness	Not yet clearly identified
Likely cost	Not known
Value for money	Difficult to ascertain
Plant or process changes	Minimal
Environmental impact	None known
OH&S	None known
Advantages	Acts on packaged product, so removes risk of recontamination
Disadvantages or limitations	Possible organoleptic effects. A food additive and must be declared in the labelling.

Acidic Calcium Sulphate

Acidic calcium sulphate (ACS), acidified with a GRAS acid, has been shown to decrease pathogen levels, as well as to extend the shelf life of the treated product. Aqueous solutions containing ACS and other antimicrobial compounds (sodium phosphate, lactic acid, propionic acid) may be added to various Ready-to-Eat (RTE) meat products and raw comminuted beef, or to raw whole muscle beef cuts, cooked beef products, and to cooked poultry carcasses/parts. It has also been shown that ACS has minimal corrosive properties to plastics, rubber, stainless steel or human skin. Therefore, its application is thought to be suitable for ground meat and meat products.

ACS has exhibited antimicrobial activity against a range of bacteria, including *Escherichia coli*, *Listeria monocytogenes*, *Campylobacter*, *Pseudomonas* sp. and *Staphylococcus* sp. In addition, ACS has exhibited antimicrobial activity against molds (1). Beef carcasses treated with ACS had about two logs less total bacteria than chlorine-treated carcasses did, and 73% of the carcasses treated with this compound had no detectable aerobic plate counts, while in comparison all of the chlorine-treated carcasses had detectable levels of bacteria (2). Vacuum-packaged frankfurters treated with ACS and propionic acid and lactic acid as a post-processing dipping solution, have been reported to inhibit or control the growth of *L. monocytogenes* (3). It has been demonstrated that spraying a higher concentration of ACS (4 ml/wing) increased the shelf life of chicken wings from 7 to 10 days when compared with deionized water-spray controls (4). ACS reduced counts of *Pseudomonas* sp., *Staphylococcus* sp., *L. monocytogenes* and psychrotrophs by up to 2.2 log units at the end of 10 days refrigerated storage. Depending on the concentration added, ACS was shown to result in a 1.2-3.1 CFU/ham reduction in *L. monocytogenes* after 24 hours at 4°C, when added to table brown ham in shrink-wrap bags just before being sealed (5).

Mionix Corporation uses acidified calcium sulfate (ACS) as the foundation for a family of FDA and USDA approved formulations of $Safe_2O^{®}$ brand products. $Safe_2O^{®}$ RTE 01 is used as a food antimicrobial and a food shelf-life extender for frankfurters, beef or other jerky, sausage products, roast beef, pastrami, corned beef, sandwich meats, cured and uncured turkey, roast chicken, pre-packaged fruits, vegetable and salads. $Safe_2O^{®}$ RTE 03 is also used as a food antimicrobial and food shelf-life extender. $Safe_2O^{®}$ RTE 03 is formulated for use on various ham products and other Ready-to-Eat (RTE) food products, including comminuted ham products, bone-in whole ham, boneless ham,

diced ham, prosciutto, frankfurters and sausage products including pepperoni. $Safe_2O^®$ ACS 50 is a food acidulant, animal feed acidulant and an acidulant for poultry chiller water.

$Safe_2O^®$ RTE 01 and $Safe_2O^®$ RTE 03 are generally diluted one part concentrate to two or three parts water depending upon function. $Safe_2O^®$ RTE 01 and $Safe_2O^®$ RTE 03 are applied to foods by spray, deluge or submersion. $Safe_2O^®$ RTE 01, $Safe_2O^®$ RTE 03 and $Safe_2O^®$ ACS 50 have minimal organoleptic effect if applied according to the manufacturer's instructions. $Safe_2O^®$ RTE 01 and $Safe_2O^®$ RTE 03 are validated one-step solutions to achieve Alternative 1* (FSIS Directive 10,240.4).

Proponent/Supplier Information

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References

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