Acidified Sodium Chlorite

INTERVENTION SUMMARY	
Status	Currently Available
Location	Post slaughter
Intervention type	Surface treatment of carcasses, primals, trimmings
Treatment time	10-15 seconds
Regulations	Approved in Australia and US; not yet approved for use in EU
Effectiveness	Good if application is adequate (eg. sprays configured correctly)
Likely Cost	Capital cost for spray cabinet and on-going cost for purchase of chemicals
Value for money	Good
Plant or process changes	Space is required for installation of spray cabinet, though can modify and existing spray cabinet.
Environmental impact	No toxic by-products
OH&S	Appropriate ventilation around spray cabinet, safe handling of chemicals at point of generation
Advantages	Not corrosive at recommended concentrations Classified as a 'No-rinse' food grade sanitiser Not affected by organic loading on product
Disadvantages or Limitations	Full coverage of meat surface required

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The antimicrobial activity of acidified sodium chlorite is attributed to the oxidative effect of chlorous acid, which is derived from the conversion of chlorite ion into its acid form under acidic conditions. The reactions happen instantly on mixing the sodium chlorite with an acid (eg. citric or phosphoric acid) and therefore the antibacterial solution needs to be prepared shortly before spraying – the effective shelf-life is less than one hour. One company (Grayson Australia) has developed a system which mixes the chemicals immediately before application to maximise the oxidising power of the solution.

Some studies have demonstrated a 1.9 – 2.3 log reduction in *Salmonella* and *E. coli* O157 on beef carcass tissue using a wash or spray of sodium chlorite activated with citric acid (Ransom et al 2003). One laboratory trial showed up to 4.6 log reduction in *E. coli* O157:H7 and *Salmonella* using a water wash followed by an acidified sodium chlorite spray (Castillo et al., 1999). Other studies indicate limited success (Gill and Badoni 2004).

It appears that the method of activation (i.e. type of acid used), the method of application (eg. Type of sprays), and the contact time with the meat surface are strong influences on the success of this microbial inhibitor. Research using acidified sodium chlorite to sanitize beef trim (using SANOVA® system marketed by Alcide Corporation) achieved reductions of 1.4-2.3 log *E. coli* depending on the feed rate of the spray. There is evidence to suggest that ASC may be a long-acting microbial inhibitor and may be suitable for pre-packaged meat. Bosilevac et al. (2004) recently published results using a 300 ppm ASC treatment that reduced total microbial counts by 1.0-1.5 log and maintained desirable organoleptic qualities of the ground beef. Sanova is available through EcoLab.

Acidified sodium chlorite is approved for use in the US at concentrations between 500-1200 ppm (21 CFR 173.325; FDA 2003). In Australia, FSANZ has made a final assessment for the approval of an application from Alcide Corporation to use acidified sodium chlorite as a processing aid for use on poultry meats, meat and formed meat products at a concentration of 500-1200 ppm. As a result, the Food Standards Code was amended to accommodate this application – Standard 1.3.3., Clause 14 permits the use of sodium chlorite as an antimicrobial agent for meat, fish, fruit and vegetables as long as a residual level of chlorous compounds is not detected.

A supplier of acidified sodium chlorite (Grayson Australia) will custom-build a cabinet that is designed for spraying carcasses at the end of dressing but prior to entry into the chiller.

Proponent/Supplier Information

Grayson Australia

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Website: http://www.tecnica.com.au/Products.html

Brandname: Vibrex

References

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