Determining Treatment Specifications for Peracetic Acid Interventions in Meat and Poultry Processing

Peracetic acid (PAA) is a potent oxidizing biocide primarily used in the food, beverage, medical, and agricultural industries. Enviro Tech Chemical Services, Inc. holds three FDA Food Contact Notifications (FCN) pertaining to the use of our PAA products on meat and poultry; FCN 887, 1132, and 1419. The FCN **only** regulates the maximum concentration of PAA that can be used in a particular application not a minimum or maximum treatment time. Contact time is determined by the processing plant and scientific data should be available to support the chosen parameters.

Selecting treatment parameters such as contact time and concentration for PAA can be difficult. There are many variables that must be taken into account when selecting PAA treatment parameters;

Microbial Load - Does the product contain high counts of organisms?
Type of Application - Spray, dip, etc.?
Product Being Treated - Whole birds, parts/pieces, RTE etc.?
Organic Load - Process water containing a high organic load such as; poultry serum, bovine serum, dirt etc. typically requires increased PAA concentrations.
Target Organism(s) - Different organisms can respond differently.
Temperature - Increased temperature typically allows for lower PAA concentrations
Product aesthetics - In some cases the organoleptic properties of a product may be affected by higher concentrations of PAA or longer contact times. While a change in the organoleptic properties of a product poses no food safety risk, it is undesirable to customers.
Desired Results - Depending on the application a certain bacterial reduction must be achieved.
Compliance - It is very important that when choosing a concentration that it does not exceed the maximum limit set by the governing bodies. The label, FCNs, and 7120.1 list are the best sources of information on the highest allowed concentrations of peracetic acid on meat and poultry.

Each of the aforementioned variables as well as other variables that may not be listed influence the concentration of PAA needed as well as the treatment time.

500 Winmoore Way * Modesto, CA 95358 * (209) 581-9576 * Fax (209) 581-9653

www.envirotech.com * www.stabilizedbromine.com

Enviro Tech Chemical Services' Food Contact Notifications (FCNs)

FCN 887

Intended Use:

The FCS will be used as an antimicrobial additive in: (1) water or ice for washing, rinsing, cooling or otherwise processing whole or cut meat, including parts, trim, and organs; and, (2) water or ice applied to whole or cut poultry, including parts, trim, and organs as a spray, wash, rinse, dip, chiller water or scald water.

Limitations

Not to exceed 220 parts per million peroxyacetic acid.

FCN 908

Intended Use:

The FCS will be used as an antimicrobial additive in process water, ice, or brine for washing, rinsing, storing or cooling of processed and pre-formed meat and poultry products (RTE).

Limitations

Not to exceed 220 parts per million peroxyacetic acid.

FCN 1132

Intended Use:

As an antimicrobial agent for use in process water used for washing, rinsing, or cooling whole or cut meat or poultry including carcasses, parts, trim, and organs.

Limitations

For Poultry: Not to exceed 1000 ppm peroxyacetic acid.
For Meat: Not to exceed 400 ppm peroxyacetic acid.

500 Winmoore Way * Modesto, CA 95358 * (209) 581-9576 * Fax (209) 581-9653

www.envirotech.com * www.stabilizedbromine.com

FCN 1419

Intended Use:

The FCS will be used as an antimicrobial additive in process water (processing aid) for poultry products such as: Post-main chiller (air or water) secondary processing of whole birds, parts and pieces, skin on or off and organs, in the washing, rinsing, cooling and processing of poultry products; and, use in pre-air chiller dip tanks and post-main water chiller systems such as finishing chillers.

Limitations

Not to exceed 2000 ppm peroxyacetic acid

Typical Use Concentrations and Contact for Poultry Applications

Intervention Point	Typical Conc. PAA	Max. Conc. Allowed	Typical Contact Time
Picker	10-30 ppm	1000 ppm (FCN 1132)	Continuous
Cropper	100-250 ppm	1000 ppm (FCN 1132)	Continuous
OLR/OFLR	80-400 ppm	FSIS OLR/OFLR Table	15-120 seconds
IOBW	80-300 ppm	1000 ppm (FCN 1132)	10-20 seconds
Pre-Chill (Dip)	15-500 ppm	1000 ppm (FCN 1132)	10-45 seconds
Main Chiller	10-50 ppm	1000 ppm (FCN 1132)	35-120 minutes
Pre-Air Chill (Dip/Spray)	500-1500 ppm	2000 ppm (FCN 1419)	5-15 seconds
Post-Air Chill (Dip/Spray)	200-500 ppm	2000 ppm (FCN 1419)	10-20 seconds
Finishing Chiller (Dip)	400-1000ppm	2000 ppm (FCN 1419)	5-20 seconds
Deboning/MSC	500-1500 ppm	2000 ppm (FCN 1419)	Continuous

Typical Use Concentrations and Contact for Meat Applications

Intervention Point	Typical Conc. PAA	Max. Conc. Allowed	Typical Contact Time
Carcass Wash (Spray)	200-300 ppm	400 ppm (FCN 1132)	10-30 seconds
Head Wash (Spray)	200-300 ppm	400 ppm (FCN 1132)	10-30 seconds
Hot Box (Spray)	20-50 ppm	400 ppm (FCN 1132)	5-15 seconds
Primals/Cuts (Dip/Spray)	200-300 ppm	400 ppm (FCN 1132)	10-30 seconds
Tenderizers (Spray)	200-300 ppm	400 ppm (FCN 1132)	10-20 seconds

500 Winmoore Way * Modesto, CA 95358 * (209) 581-9576 * Fax (209) 581-9653

www.envirotech.com * www.stabilizedbromine.com

It is very important to understand that the above intervention points, concentrations, and contact times are a **strictly** general guidance for determining the most suitable parameters for a particular processing facility. The Food Contact Notifications determine the limitations of peracetic acid. Therefore, the aforementioned parameters (concentration and contact time) should not be considered as regulation. A processor plant may choose concentrations and contact times outside the "typical" parameters as long as the concentration does not exceed the limitations on the FCN.

The best and only way to determine if specific treatment parameters for a certain plant application are sufficient is with in-plant microbiological testing. While there are numerous laboratory studies on the efficacy of PAA, plant applications will differ due to presence of unpredictable variables. Typically, USDA/FSIS inspectors require scientific data to validate that the PAA treatment parameters employed in a specific plant is sufficient at reducing pathogens. Therefore, having in-plant microbiological results are necessary in order to show plant inspectors that the antimicrobial intervention being employed is sufficient at reducing pathogens. Most microbiological testing validation studies are simple and inexpensive to accomplish.

Joseph Donabed
R&D Chemist/Microbiologist
Direct: (209) 232-2201
JDonabed@envirotech.com