**UNITED STATES DEPARTMENT OF AGRICULTURE**
**FOOD SAFETY AND INSPECTION SERVICE**
**WASHINGTON, DC**

# FSIS DIRECTIVE

7120.1
Rev. 41

5/12/17

## SAFE AND SUITABLE INGREDIENTS USED IN THE PRODUCTION OF MEAT, POULTRY, AND EGG PRODUCTS

### I. PURPOSE

This directive provides inspection program personnel (IPP) with an up-to-date list of substances that may be used in the production of meat, poultry, and egg products. It also lists the approved On-Line Reprocessing (OLR) and Off-Line Reprocessing (OFLR) Antimicrobial Intervention Systems.

### II. CANCELLATION

FSIS Directive 7120.1, Revision 40, *Safe and Suitable Ingredients Used in the Production of Meat, Poultry, and Egg Products*, 03/14/17

### III. REASON FOR REISSUANCE

This revision includes updates to the list of substances and list of approved OLR/OFLR antimicrobial intervention systems since the March 14, 2017, issuance of the directive. Updates to this directive appear in Table 1. Changes are in **bold** in Table 2, Table 3 and Table 4.

Table 1: Summary of Updates to list of substances

| Substance | Page Number | Category | Type of Update |
|---|---|---|---|
| An aqueous solution of sulfuric acid and sodium sulfate (GRN 000408) | 6 | Acidifiers/Alkalizers | New |
| An aqueous mixture of peroxyacetic acid (FCN 1490) | 14 | Antimicrobial | Revision |
| An aqueous mixture of peroxyacetic acid (FCN 1662) | 16 | Antimicrobial | New |
| An aqueous mixture of peroxyacetic acid (FCN 1688) | 16 | Antimicrobial | New |
| An aqueous mixture of peroxyacetic acid (FCN 1715) | 17 | Antimicrobial | New |
| An aqueous mixture of peroxyacetic acid (FCN 1726) | 17 | Antimicrobial | New |
| An aqueous mixture of peroxyacetic acid (FCN 1738) | 18 | Antimicrobial | New |
| An aqueous solution of sulfuric acid and sodium sulfate (GRN 000408) | 21 | Antimicrobial | Revision |
| Bacteriophage preparation (GRN 000672) | 26 | Antimicrobial | New |

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| Beef Protein GRAS 000313 | 71 | Miscellaneous | New |
| Protease preparations from Bacillus licheniformis | 77 | Miscellaneous | New |
| DiverContact®<br>P16 | 92/100 | OLR/OFLR Antimicrobial Intervention Systems | New |
| Hypochlorous acid | 93 | OLR Antimicrobial Intervention Systems | Revision |
| Inspexx 150, 3DT Inspexx 150, Inspexx 250 3DT, Inspexx 250 | 93/101 | OLR/OFLR Antimicrobial Intervention Systems | Revision |
| OxyFx22 | 94/102 | OLR/OFLR Antimicrobial Intervention Systems | New |
| Pathiclean™ | 95 | OLR Antimicrobial Intervention Systems | Revision |

## IV. REFERENCES

9 CFR Chapter III
Final rule published in Federal Register notice "Food Ingredients and Sources of Radiation Listed and Approved for Use in the Production of Meat and Poultry Products" (78 FR 14636).
Final rule published in Federal Register notice, "Modernization of Poultry Slaughter" (79 FR 49566)

## V. BACKGROUND

A. The Table of Safe and Suitable Ingredients (Table 2) identifies the food grade substances that have been approved in 21 Code of Federal Regulations (CFR) for use in meat, poultry, and egg products as food additives, generally recognized as safe (GRAS) notices and pre-market notifications, and approved in letters conveying acceptability determinations. Prior approved substances are listed in 9 CFR 424.21.

B. The final rule, "Modernization of Poultry Slaughter" (79 FR 49566) permits establishments to use approved OLR (Table 3) and OFLR (Table 4) antimicrobial intervention systems provided that an establishment incorporates procedures for OLR or OFLR into its Hazard Analysis Critical Control Points (HACCP) plan or Sanitation standard operating procedures (Sanitation SOP) or other prerequisite program (9 CFR 381.91(b)(1) and (2)).

C. The final rule amended the regulations to remove the restrictions against using OLR and to remove the requirement that establishments use free available chlorine at 20 ppm to remove visible specks of contamination by OFLR. New or modified OLR/OFLR antimicrobial intervention systems are approved by the Agency prior to establishment use. Information on how to submit a request for new OLR/OFLR or modified OLR/OFLR antimicrobial intervention systems can be found in Guidance Procedures for Notification and Protocol Submission of New Technology.

D. Users of Tables 2- 4 should be aware that some of the ingredient mixtures listed may be considered proprietary even though the components are either approved food additives or GRAS. This information is also available on the USDA websites at:

http://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/labeling/Ingredients-Guidance

http://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/labeling

## VI. QUESTIONS

A. Refer questions regarding this directive to the Policy Development Staff through askFSIS or by telephone at 1-800-233-3935. When submitting a question, use the Submit a Question tab, and enter the following information in the fields provided:

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| Subject Field: | Enter **Directive 7120.1** |
| Question Field: | Enter question with as much detail as possible. |
| Product Field: | Select General Inspection Policy from the drop-down menu. |
| Category Field: | Select New Technology as the main category then select either Ingredients or Processing Aides from the drop-down menu. |
| Policy Arena: | Select Domestic (U.S.) Only from the drop-down menu. |

B. For labeling questions enter the following information:

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| Subject Field: | Enter Ingredient Labeling |
| Question Field: | Enter question with as much detail as possible. |
| Product Field: | Select Labeling from the drop-down menu. |
| Category Field: | Select Ingredients/Additives or other applicable category from the drop-down menu. |
| Policy Arena: | Select Domestic (U.S.) Only from the drop-down menu. |

When all fields are complete, press **Continue** and at the next screen press **Finish Submitting Question.**

**NOTE:** Refer to FSIS Directive 5620.1, *Using askFSIS*, for additional information on submitting questions.

Assistant Administrator
Office of Policy and Program Development

Table 2: Table of Safe and Suitable Ingredients

*1) The use of the substance(s) is consistent with FDA's labeling definition of a processing aid., 2) Generally Recognized as Safe (GRAS), 3) Secondary Direct Food Additive, 4) Direct Food Additive, 5) Color Additive, 6) Food Contact Substance (FCS) subject to food contact notifications (FCN) is defined as any substance that is intended for use as a component of materials used in manufacturing, packing, packaging, transporting, or holding food if such use is not intended to have any technical effect in such food.*

***** *Substances identified in **bold** print in the table are substances that have been added to the directive since it was last issued on May 24, 2016.*

| SUBSTANCE | INTENDED USE OF PRODUCT | AMOUNT | REFERENCE | LABELING REQUIREMENTS |
|---|---|---|---|---|
| ***Acidifiers/Alkalizers*** | | | | |
| A combination of sulfuric acid, ammonium sulfate, copper sulfate, and water | Used as an acidifier in poultry processing water | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Ammonium hydroxide | pH control agent in brine solutions for meat products | Sufficient for purpose to achieve a brine solution with a pH of 11.6 | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of acidic calcium sulfate | pH control agent in water used in meat and poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (3) |
| An aqueous solution of hydrochloric and acetic acid | pH control agent in water used in poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (3) |
| An aqueous solution of citric acid, calcium sulfate and water | pH control agent in water used in meat and poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (3) |
| An aqueous solution of citric and hydrochloric acids | pH control agent in water used in poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of citric acid, hydrochloric acid, and phosphoric acid | To adjust the pH in processing water in meat and poultry plants | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of hydrochloric acid, phosphoric acid, and lactic acid | As a pH control agent on raw and ready- to-eat (RTE) meat products and in water used in poultry processing | Hydrochloric acid and phosphoric acid- sufficient for purpose; lactic acid not to exceed 5.0 % | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, | As an acidifier in poultry scald tanks | The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not | 21 CFR 173.370 | None under the accepted conditions of use (3) |

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| 1-diphosphonic acid (HEDP) | | exceed 110 ppm, and HEDP will not exceed 13 ppm | | |
| An aqueous solution of sodium bisulfate and sulfuric acid | pH control agent in water used in poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of sulfuric acid, citric acid, and phosphoric acid | To adjust the pH of PAA for use on poultry carcasses as a spray or dip. | A blend of sulfuric (35%), citric (1%) and phosphoric acid (1%) solution that is injected into a diluted water stream of peroxyacetic acid (PAA) [100 PPM or less], hydrogen peroxide , acetic acid, and 1-hydroxyethylidine-1,1-diphosphonic acid (FCN 993) - to lower the pH of the PAA water stream from approximately 4.5 to under 2.5. | Sufficient for Purpose | None under the accepted conditions of use (1), (2), and (6) |
| An aqueous solution of hydrochloric, citric and phosphoric acid | To adjust the pH of PAA for use on poultry carcasses as a spray or dip. | A blend of hydrochloric (13%), citric (14%) and phosphoric acid (1.6%) solution that is injected into a diluted water stream of peroxyacetic acid (PAA) [100 PPM or less], hydrogen peroxide , acetic acid, and 1-hydroxyethylidine-1,1-diphosphonic acid (FCN 993) - to lower the pH of the PAA water stream from approximately 4.5 to under 2.5. | Sufficient for Purpose | None under the accepted conditions of use (1), (2), and (6) |
| An aqueous solution of hydrochloric and citric acid | To adjust the pH of PAA for use on poultry carcasses as a spray or dip. | A blend of hydrochloric (14.6%) and citric acid (5.5%) solution that is injected into a diluted water stream of peroxyacetic acid | Sufficient for Purpose | None under the accepted conditions of use (1), (2), and (6) |

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| | | (PAA) [100 PPM or less], hydrogen peroxide , acetic acid, and 1-hydroxyethylidine-1,1-diphosphonic acid (FCN 993) - to lower the pH of the PAA water stream from approximately 4.5 to under 2.5. | | |
| **An aqueous solution of sulfuric acid and sodium sulfate** | **As an acidifier agent on meat (beef and pork) and poultry products in the form of a spray, wash, or dip.** | **Sufficient for purpose** | **GRAS Notice No. 000408** | **None under the accepted conditions of use (1)** |
| Encapsulated sodium diacetate | pH control agent in fresh and ready-to-eat (RTE) comminuted and whole muscle meat and poultry added as a component in seasoning blends and meat and poultry sauces | At a level not to exceed 1.0 percent (total formula weight) in combination with other GRAS acids at a level sufficient to achieve a pH of 4.8 – 5.5 | Acceptability determination | Listed by common or usual name in the ingredients statement. Comminuted product must be descriptively labeled. (2) |
| Citric acid | To adjust pH in egg products | Sufficient for purpose | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Potassium carbonate or potassium bicarbonate | To adjust pH in egg products | Sufficient for purpose | 21 CFR 184.1619 | None under the accepted conditions of use (1) |
| Potassium carbonate/ Potassium bicarbonate | pH control agents in meat and poultry products and/or processing meat and poultry products | levels sufficient for purpose | 21 CFR 184.1619<br><br>21 CFR 184.1613 | None under the accepted conditions of use (1) |
| Potassium hydroxide | pH control agent in water used in poultry processing | Sufficient for purpose | 21CFR 184.1631 | None under the accepted conditions of use (1) |
| Potassium hydroxide and sodium hydroxide | To adjust pH in egg products | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium carbonate or sodium bicarbonate | To adjust pH in egg products | Sufficient for purpose | 21 CFR 184.1736 | None under the accepted conditions of use (1) |

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| Sodium carbonate or sodium bicarbonate | pH control agent in meat and poultry products and for processing meat and poultry products | Sufficient for purpose | 21 CFR 184.1742<br><br>21 CFR 184.1736 | None under the accepted conditions of use (1) |
| Sodium hydroxide | pH control agent in water used in poultry processing and in red meat processing | Sufficient for purpose | 21 CFR 184.1763 | None under the accepted conditions of use (1) |
| Sodium hydroxide and potassium hydroxide | pH control agent in water used in poultry processing and red meat processing | Sufficient for purpose | 21 CFR 184.1763; 21CFR 184.1631 | None under the accepted conditions of use (1) |
| An aqueous solution of sulfuric acid, citric acid, and phosphoric acid | To adjust the pH in poultry chiller water and the processing water in meat and poultry plants | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium bisulfate | pH control agent in water used in meat and poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium bisulfate | pH control agent in meat and poultry soups | Not to exceed 0.8 percent of product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium bisulfate | Added to sauces used as separable components in the formulation of various meat products | Sufficient for purpose | GRAS Notice No. 000003 | Listed by common or usual name in the ingredients statement (2) |
| Sodium metasilicate | Poultry chiller water | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Sulfuric acid | pH control agent in water used in poultry processing | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (3) |
| An aqueous solution of sulfuric acid and sodium sulfate | As an acidifier agent on meat and poultry products in the form of a spray, wash, or dip. | Sufficient for purpose | 21 CFR 170.36 | None under the accepted conditions of use (1) |
| *Sulfuric acid, phosphoric acid, citric acid, and hydrochloric acid* | To adjust the pH in poultry chiller water | Sufficient for purpose | Acceptability determination; 21 CFR 184. 095; 21 CFR 182.1073; 21 CFR 184.033; 21 CFR 182.1057 | None under the accepted conditions of use (1) |

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| ***Anticoagulants*** | | | | |
| Sodium tripolyphosphate | Sequestrant/anti-coagulant for use in recovered livestock blood which is subsequently used in food products | Not to exceed 0.5 percent of recovered blood | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| ***Antimicrobials*** | | | | |
| Acetic acid | Dried and fermented sausages, prosciutto | Use of up to 4 percent acetic acid solution measured prior to application applied as a spray | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous mixture of peroxyacetic acid (PAA)**,** hydrogen peroxide (HP)**,** acetic acid, 1-hydroxyethylidine-1, 1-diphosphonic acid HEDP), and sulfuric acid (optional) | For use in process water used for washing, rinsing, or cooling whole or cut meat or poultry including carcasses, parts, trim, and organs. | (1) Final poultry process water not to exceed 1000 ppm PAA, 385 ppm HP and 50 ppm HEDP<br><br>(2) Meat applica-tions as a spray not to exceed 400 ppm PAA, 155 ppm HP, and 20 ppm HEDP.<br><br>**(**3) Hide wash applications as a spray not to exceed 400 ppm PAA, 155 ppm HP, and 20 ppm HEDP with a contact time of 5-30 seconds. | Food Contact Substance Notification No. FCN 1132 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | (1) In poultry process water for spraying, washing, rinsing, dipping, chill water, low-temperature (less than 40°F) immersion baths, or scald water on poultry parts, organs, and carcasses.<br>(2) In process water used for washing, rinsing, or cooling whole or cut meat including carcasses, parts, trim, and organs. (3) In process water or ice for washing, rinsing, storing or cooling of processed and pre- | (1) The level of peroxyacetic acid (PAA) not to exceed 2000 ppm, hydrogen peroxide (HP) not to exceed 750 ppm, and HEDP not to exceed 136 ppm. (2) Not to exceed 400 ppm PAA, not to exceed 350 ppm HP, and not to exceed 22.5 ppm HEDP. (3) Not to exceed 230 ppm PAA, not to exceed 165 ppm HP, and not to exceed 14 ppm HEDP | Food Contact Substance Notification No. FCN 001247 | None under the accepted conditions of use (6) |

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| | formed meat and poultry products. | | | |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | As an antimicrobial agent to treat poultry process water or ice as a spray, wash, rinse, dip, chiller water, or scald water for whole or cut poultry including parts, trim, and organs. | Not to exceed use concentra-tions of 2000 ppm peroxyacetic acid (PAA), 728 ppm hydrogen peroxide, and 13.3 ppm of HEDP | Food Contact Substance Notification No. FCN 1379 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid (optional) and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | (1) Poultry post-main chiller (air or water) secondary processing of whole birds, parts, pieces, skin on or off; organs, in the washing, rinsing, cooling and processing of poultry products; and, (2) poultry use in pre-air chiller dip tanks and post-main water chiller systems as finishing chillers. | The level of peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 770 ppm, and HEDP not to exceed 100 ppm measured prior to application. | Food Contact Substance Notification No. FCN 1419 | None under the accepted conditions of use (6) |
| Aqueous mixtures of peroxyacetic acid (PAA), hydrogen peroxide, acetic acid and 1-hydroxyethylidine-1, 1-diphosphonic acid (HEDP) | (1) In poultry process water for spraying, washing, rinsing, dipping, chill water, low-temperature (less than 40°F) immersion baths, or scald water on poultry parts, organs, and carcasses. (2) In process water used for washing, rinsing, or cooling whole or cut meat including carcasses, parts, trim, and organs. (3) In process water or ice for washing, rinsing, storing | (1) The level of peroxyacetic acid (PAA) not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 136 ppm. (2) Not to exceed 400 ppm PAA, not to exceed 350 ppm hydrogen peroxide, and not to exceed 22.5 ppm HEDP. (3) Not to exceed 230 ppm PAA, not to exceed 165 ppm hydrogen | Food Contact Substance Notification No. FCN 1465 | None under the accepted conditions of use (6) |

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| | or cooling of processed and pre-formed meat and poultry products | peroxide, and not to exceed 14 ppm HEDP | | |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid (optional) and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), catalyzed with sulfuric acid | (1) In process water used for washing, rinsing, or cooling whole or cut meat including carcasses, parts, trim, and organs. (2) In process water or ice for washing, rinsing, storing, or cooling of processed and pre-formed meat products | (1) The level of peroxyacetic acid (PAA) not to exceed 1800 ppm, hydrogen peroxide not to exceed 600 ppm, and HEDP not to exceed 22.5 ppm; (2) Not to exceed 495 ppm PAA, 165 ppm hydrogen peroxide, and 14 ppm HEDP | Food Contact Substance Notification No. FCN 1664 | None under the accepted conditions of use (1) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid (optional) and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), catalyzed with sulfuric acid | (1) in spray, mist, wash, rinse, post chill dip chiller water, and scald water for meat and poultry (including livestock and game) carcasses, parts, trim, and organs. (2) washing, rinsing, or cooling processed and pre-formed meat and poultry (including livestock and game) products. | (1) The level of peroxyacetic acid (PAA) not to exceed 2000 parts per million (ppm) PAA, 750 ppm HP, and 10 ppm HEDP (2) Not to exceed 495 ppm PAA, 186 ppm HP, and 2.5 ppm HEDP | Food Contact Substance Notification No. 1666 | None under the accepted conditions of use (1) |
| An aqueous mixture of peroxyacetic acid, and hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), and optionally sulfuric acid | Process water or ice for washing, rinsing, storing, or cooling whole or cut meat, including carcasses, parts, trim, and organs | The level of peroxyacetic acid will not exceed 400 ppm, hydrogen peroxide will not exceed 267 ppm, and HEDP will not exceed 27 ppm | Food Contact Substance Notification No. FCN 1394 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), water, and optionally sulfuric acid | (1) Process water or ice for washing, rinsing, or cooling whole or cut meat, including carcasses, parts, trim, and organs; (2) Process water, ice, or brine for washing, rinsing, storing, or cooling processed | For application (1) the level of peroxyacetic acid will not exceed 400 ppm, hydrogen peroxide will not exceed 280 ppm, and HEDP will not exceed 20 ppm. For application (2) the level of | Food Contact Substance Notification No. FCN 1284 | None under the accepted conditions of use (6) |

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| | and preformed meat as defined in 21 CFR 170.3(n)(29) and poultry as defined in 21 CFR 170.3(n)(34); and (3) Process water used as a spray, wash, rinse, dip, chiller water, low-temperature (e.g. less than 40 degrees F) immersion baths, or scald water for poultry parts, organs, and carcasses. | peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 280 ppm, and HEDP will not exceed 14 ppm. For application (3) the level of peroxyacetic acid will not exceed 2000 ppm and HEDP will not exceed 136 ppm | | |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), water, and optionally sulfuric acid | (1) Process water or ice for washing, rinsing, or cooling whole or cut meat, including carcasses, parts, trim, and organs; (2) Process water, ice, or brine for washing, rinsing, storing, or cooling processed and preformed meat as defined in 21 CFR 170.3(n)(29) and poultry as defined in 21 CFR 170.3(n)(34); And (3) Process water used as a spray, wash, rinse, dip, chiller water, low- temperature (e.g. less than 40 degrees F) immersion baths, or scald water for poultry parts, organs, and carcasses | For application (1) the level of peroxyacetic acid will not exceed 388 ppm, hydrogen peroxide will not exceed 155 ppm, and HEDP will not exceed 19 ppm. For application (2) the level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 92 ppm, and HEDP will not exceed 11 ppm. For application (3) the level of peroxyacetic acid will not exceed 2000 ppm, hydrogen peroxide will not exceed 800 ppm, and HEDP will not exceed 96 ppm | Food Contact Substance Notification No. FCN 1389 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid (PAA), hydrogen | (1) for washing, rinsing or cooling meat carcasses, | (1) An aqueous mixture not exceeding 460 ppm | Food Contact Substance Notification | None under the accepted conditions of use |

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| peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP), and sulfuric acid (optional) | parts, trim, and organs carcasses, hides, parts, trim and organs.<br>(2) for use in process water applied as a spray, wash, rinse, dip, chiller water, post-main chiller, secondary processing, pre-air chiller dip tanks and post-main water chiller systems as finishing chillers, low-temperature (e.g. less than 40°F) immersion baths, or scald water for poultry carcasses, parts and pieces, and skin on or off and organs.<br>(3) for use in process water, ice, or brine used for washing, rinsing, or cooling of processed and pre-formed meat and poultry products. | peroxyacetic acid (PAA), 220 ppm hydrogen peroxide (HP), 30 ppm 1-hydroxyethylidene-1, 1-disphosphonic acid (HEDP).<br>(2) An aqueous mixture not exceeding 2000 ppm PAA, 950 ppm HP, and 113 ppm HEDP<br>(3) An aqueous mixture not exceeding 230 ppm PAA, 110 ppm HP, 15 ppm HEDP. | No. FCN 1638 | (1) |
| An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), 1-hydroxyethylidine-1,1-diphosphonic acid (HEDP) and dipicolinic acid (DPA); and optionally sulfuric acid. | (1) In poultry as a spray, wash, rinse, dip, chiller water, low-temperature (e.g., less than 40°F) immersion baths, or scald water for whole or cut poultry carcasses, parts, trim, and organs;<br>(2) In process water, ice, or brine used for washing, rinsing, or cooling of whole or cut meat, including carcasses, parts, trim, and organs;<br>(3) In process water, ice, or brine used for washing, rinsing, or cooling of | (1) The level not to exceed: (1) 2000 ppm peroxyacetic acid (PAA), 933 ppm hydrogen peroxide (HP), 120 ppm 1-hydroxyethylidine-1,1-diphosphonic acid (HEDP) and 0.5 ppm dipicolinic acid (DPA);<br>(2) Not to exceed 400 ppm PAA, 187 ppm HP, 24 ppm HEDP, and 0.5 ppm DPA;<br>(3) Not to exceed 230 ppm PAA, 107 ppm HP, 14 ppm HEDP, and 0.1 ppm DPA. | Food Contact Substance Notification No. FCN 1639 | None under the accepted conditions of use (6) |

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| | processed and pre-formed meat. | | | |
| An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP), and sulfuric acid (optional) | Used in the process water used in the production of meat, carcasses, parts, trim and organs. | An aqueous mixture not exceeding 1800 ppm peroxyacetic acid (PAA), 600 ppm hydrogen peroxide (HP), 12 ppm 1-hydroxyethylidene-1, 1-disphosphonic acid (HEDP) for washing, rinsing or cooling meat carcasses, parts, trim, and organs.<br><br>An aqueous mixture not exceeding 495 ppm PAA, 165 ppm HP, 6 ppm HEDP for washing, rinsing, or cooling processed and pre-formed meat. | Food Contact Substances Notification No. FCN 1694 | None under the accepted conditions of use (1) |
| A mixture of peroxyacetic acid and hydrogen peroxide; includes optionally acetic acid or sulfuric acid, depending on the desired pH of the wash/chiller process water. | As an antimicrobial agent applied to meat (beef or pork) and poultry products for: (1) beef or pork carcasses, parts, trim, and organs; and (2) poultry parts, organs, and carcasses. | For: (1) beef or pork carcasses, parts, trim, and organs at a level not to exceed 400 ppm peroxyacetic acid and 280 ppm hydrogen peroxide; and (2) poultry parts, organs, and carcasses at a level not to exceed 1000 ppm peroxyacetic acid and 700 ppm hydrogen peroxide. | Food Contact Substances Notification No. FCN 1362 | None under the accepted conditions of use (6) |
| A mixture of peroxyacetic acid, hydrogen peroxide, and 1-hydroxyethylidine-1, 1-diphosphonic acid (HEDP), | As an antimicrobial additive in water or ice for: 1) washing, rinsing, cooling, or processing whole or cut meat, including parts, trim and organs; and 2) application to whole or cut poultry, | 220 ppm of peroxyacetic acid, 80 ppm of hydrogen peroxide, and 13 ppm of HEDP | Food Contact Substance Notification No. FCN 0001363 | None under the accepted conditions of use (6) |

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| An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP), dipicolinic acid (DPA), and sulfuric acid | Used in process water used in the production of meat carcasses, parts, trim and organs | Not to exceed 460 ppm PAA, 100 ppm HP, 2 ppm HEDP, 0.5 ppm DPA, acetic acid and sulphuric acid | Food Contact Substance Notification No. FCN 1477 | None under the accepted conditions of use (1) |
| An aqueous solution of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | (1) In process water used for washing, rinsing or cooling whole or cut red meat including carcasses, parts, trim, and organs.<br>(2) In process water or ice for washing, rinsing, storing or cooling of processed and pre-formed red meat. | Not to exceed (1) 1800 ppm peroxyacetic acid (PAA), 600 ppm hydrogen peroxide and 12 ppm HEDP for use in process water or ice used for washing, rinsing, **spraying, misting** or cooling whole or cut meat including carcasses, parts, trim, and organs;<br>(2) 495 ppm PAA, 165 ppm HP, and 6 ppm HEDP for use in process water, brine, or ice used for washing, rinsing, storing, **misting** or cooling processed and pre-formed red meat. | Food Contact Substance Notification No. FCN 1490 | None under the accepted conditions of use (6) |
| Aqueous mixtures of peroxyacetic acid (PAA), hydrogen peroxide,1-hydroxyethylidine-1, 1-diphosphonic acid (HEDP), acetic acid and water | **(**1) Used as a spray, wash, rinse, dip, chiller water or scald water for poultry parts, organs, trim and carcasses; and in process water, ice, or brine for washing, rinsing, storing, or cooling processed and preformed poultry.<br>**(**2) Used as a spray**,** rinse dip, chiller water or scald water for raw meat carcasses, parts, trim and organs; and in process water, ice, or brine for washing, | (1) The level of peroxyacetic acid (PAA) not to exceed 2000 ppm, hydrogen peroxide not to exceed 1474 ppm, HEDP not to exceed 118 ppm<br>(2) Not to exceed 400 ppm PAA, not to exceed 295 ppm hydrogen peroxide, not to exceed 23.7 ppm HEDP | Food Contact Substance Notification No. FCN 1495 | None under the accepted conditions of use (6) |

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| | rinsing, storing, or cooling processed and preformed meat. | | | |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulphuric acid and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | 1. Spray, wash, rinse, dip, chiller water, low-temperature immersion baths(e.g., less than 40°F), scald water or other process water for poultry parts, organs and carcasses and;<br>2. Process water, brine, or ice used for washing, rinsing, storing, or cooling processed and pre-formed poultry products as defined in 21 CFR 170.3(n)(34). | 1.The level of peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 666 ppm and HEDP not to exceed 130 ppm.<br><br>2. The level of peroxyacetic acid not to exceed 230 ppm, hydrogen peroxide not to exceed 77 ppm and HEDP not to exceed 15 ppm | Food Contact Substance Notification No. FCN 1514 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulphuric acid, dipicolinic acid and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | 1. Spray, wash, rinse, dip, chiller water, low-temperature immersion baths(e.g., less than 40°F) or scald water for whole or cut poultry carcasses, parts, trim and organs.<br><br>2. Process water, ice or brine used for washing, rinsing, storing, or cooling of processed and pre-formed meat and poultry products as defined in 21 CFR 170.3(n)(29) and 21 CFR 170.3(n)(34). | 1.The level of peroxyacetic acid not to exceed 1150 ppm, hydrogen peroxide not to exceed 235 ppm, HEDP not to exceed 2.5 ppm and dipicolinic acid not to exceed 0.5 ppm.<br><br>2. The level of peroxyacetic acid not to exceed 230 ppm, hydrogen peroxide not to exceed 50 ppm, HEDP not to exceed 0.5 ppm and dipicolinic acid not to exceed 0.1 ppm | Food Contact Substance Notification No. FCN 1522 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1, 1-dphosphonic acid (HEDP) | (1) Used as a spray, wash, rinse, dip, chiller water, low-temperature (e.g., less than 40°F) immersion baths, or scald water for whole or cut poultry carcasses, parts, | (1) Not to exceed 2000 ppm PAA, 730 ppm HP, and 14 ppm HEDP<br>(2) Not to exceed 1800 ppm 655 ppm HP, and 12 ppm HEDP | Food Contact Substance Notification No. FCN 1580 | None under the accepted conditions of use (1) |

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| | trim, and organs.<br>(2) Used in process water or ice used for washing, rinsing, storing, or cooling whole or cut meat, including carcasses, parts, trim, and organs. | | | |
| **An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidine - 1,1-diphosphonic acid (HEDP), dipicolinic acid (DPA), and sulfuric acid** | **In process water and ice used in spray, wash, r inse, dip (minimum dwell time 1-15 seconds), chiller, or scald water for poultry carcasses, parts, and organs** | **The level of peroxyacetic acid (PAA) not to exceed 2000 ppm, hydrogen peroxide not to exceed 403 ppm, HEDP not to exceed 5 ppm, DPA not to exceed 0.88 ppm.** | **Food Contact Substance Notification No. 1662** | **None under the accepted conditions of use (1)** |
| **An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP) and optionally sulfuric acid** | **1. Used in water or ice for washing, rinsing or cooling meat carcasses, parts, trim, and organs**<br>**2. Used in process water, brine or ice for washing, rinsing, storing, or cooling of processed and pre- formed meat products as defined in 21 CFR 170.3 (n)(29).** | **1. An aqueous mixture not exceeding 1800 ppm peroxyacetic acid (PAA), 1215 ppm hydrogen peroxide (HP), 121.5 ppm 1-hydroxyethylidene-1, 1-disphosphonic acid (HEDP)**<br>**2. An aqueous mixture not exceeding 495 ppm PAA, 335 ppm HP, and 33.5 ppm HEDP;** | **Food Contact Substance Notification No. 1688** | **None under the accepted conditions of use (6)** |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | (1) in spray, wash, rinse, dip, chiller water, low-temperature immersion baths, or scald water for whole or cut poultry including carcasses, parts, trim, and organs.<br>(2) In process water or ice used for washing, rinsing, | 1) The level of peroxyacetic acid (PAA) not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 136 ppm; (2) Not to exceed 1800 ppm PAA, 675 ppm hydrogen | Food Contact Substance Notification No. 1713 | None under the accepted conditions of use (1) |

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| | storing, or cooling whole or cut meat including carcasses, parts, trim, and organs. | peroxide, and 33 ppm HEDP | | |
| **An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP)** | **1. Used in spray, wash , rinse, dip (≤ 45 seconds), chiller water (main chiller ≤ 120 minutes, pre/post chill ≤ 20 seconds), low temperature (e.g. less than 40°F) immersion baths (3-30 seconds), or scald water for whole or cut poultry carcasses, parts, trim, and organs or in water for washing shell eggs.**<br>**2. Used in spray, wash, rinse, dip (≤ 45 seconds), chiller water (main chiller ≤ 120 minutes, pre/post chill ≤ 20 seconds), or scald water for meat carcasses, parts, trim, and organs**<br>**3. Used in process water or ice for washing, rinsing, or cooling of processed and preformed meat products.**<br>**4. In water or ice used for washing, rinsing, or cooling processed and preformed poultry products;** | **1. An aqueous mixture not exceeding 2000 ppm peroxyacetic acid (PAA), 773 ppm hydrogen peroxide (HP), 118 ppm 1-hydroxyethyli-dene-1, 1-disphosphonic acid (HEDP)**<br>**2. An aqueous mixture not exceeding 460 ppm PAA, 177 ppm HP, and 27 ppm HEDP;**<br>**3. An aqueous mixture not exceeding 495 ppm PAA, 190 ppm HP, 29 ppm HEDP**<br>**4. 230 ppm PAA, 88 ppm HP, and 14 ppm HEDP** | **Food Contact Substance Notification No. FCN 1715** | **None under the accepted conditions of use (1)** |
| **An aqueous mixture of peroxyacetic acid (PAA),** | **For use as an antimicrobial agent in:** | **An aqueous mixture not exceeding 50 ppm** | **Food Contact Substance Notification** | **Non under the accepted conditions of** |

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| **hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and sulfuric acid (optional)** | **1) brines, sauces, and marinades applied either on the surface or inject into processed or unprocessed, cooked or uncooked, whole or cut, poultry or parts and pieces, 2) surface sauces and marinades applied on processed and preformed meat and poultry products as described in 21 CFR 170.3(n)(29) and (34).** | **peroxyacetic acid (PAA), 33 ppm hydrogen peroxide (HP), 3.3 ppm 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP)** | **No. 1726** | **use (1)** |
| **An aqueous mixture of Peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP), and sulfuric acid (optional)** | **For use in process water or ice used for washing, rinsing or cooling whole or cut meat, including carcasses, hides, parts, trim and organs** | **An aqueous mixture not exceeding 1200 ppm peroxyacetic acid (PAA), 275 ppm hydrogen peroxide (HP), and 33 ppm1-hydroxyethylidene - 1, 1-disphosphonic acid (HEDP).** | **Food Contact Substance Notification No. 1738** | **None under the accepted conditions of use (1)** |
| An aqueous potassium hydroxide-based solution with proprietary salts | Hide-on carcass wash in spray cabinet | Wash solution used at a final concentration of 1.0 – 3.0 oz. of wash solution per gallon of water | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous sodium hydroxide- based solution with proprietary blends of adjuvants | Hide-on carcass wash in spray cabinet | Wash solution used at a final concentration of 0.5 – 2.0 oz. of wash solution per gallon of water | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1-hydroxyethylidene, 1,1-diphosponic acid (HEDP) and | As an antimicrobial agent in: (1) brines, sauces, and marinades to be applied on the surface or injected into | Not to exceed 50 ppm PAA, 18 ppm hydrogen peroxide, 6 ppm HEDP acetic acid, and optionally sulfuric acid | Food Contact Substance Notification No. FCN 1654 | None under the accepted conditions of use (6) |

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| optionally sulfuric acid | processed or unprocessed, cooked or uncooked whole or cut poultry or parts and pieces and (2) surface sauces and marinades applied on processed and preformed meat and poultry products as described in 21 CFR 170.3(n) (29) and (34) | | | |
| An aqueous solution of potassium hydroxide | Hide-on carcass wash in spray cabinet | Wash solution used at final concentration 1.5 – 4.0 oz. of wash solution per gallon of water | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of potassium hydroxide | Hide-on carcass wash in spray cabinet | Wash solution used at a final concentration of 0.01 – 0.40% (weight per weight) | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of sodium diacetate (4%), lactic acid (4%), pectin (2%), and acetic acid (0.5%) | Cooked meat products | Not to exceed 0.5 percent of finished product formulation. | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| An aqueous solution of acidic calcium sulfate and lactic acid | Raw poultry carcasses, parts, giblets, and ground poultry | Acidic calcium sulfate sufficient for purpose; lactic acid not to exceed 5.0% and 55ºC applied as a continuous spray or a dip. | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of hydrochloric acid, phosphoric acid, and lactic acid | Raw and ready-to-eat (RTE) meat products and in water used in poultry processing | Hydrochloric acid and phosphoric acid-sufficient for purpose; lactic acid not to exceed 5.0 % | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of citric and hydrochloric acids adjusted to pH less | Permeable and impermeable casings of meat and poultry products | Applied as a spray, dip, or immersion to casings prior to opening, removal, | Acceptability determination | None under the accepted conditions of use (1) |

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| than 2.5 | | or slicing operations | | |
| An aqueous solution of citric and hydrochloric acids adjusted to a pH of 0.5 to 2.0 | Processed and comminuted red meat products | Applied to processed and comminuted red meat products in an enclosed mixing, grinding, and/or blending system. | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of silver dihydrogen citrate stabilized with sodium lauryl sulfate and citric acid | As an antimicrobial solution applied by spray or dip on poultry carcasses, parts and organs<br><br>The FCS is not for use in combination with any other silver containing antimicrobial and is not intended to be used in chiller baths | For use at levels up to 30 ppm silver dihydrogen citrate in the spray or dip applied to poultry carcasses parts and organs | Food Contact Substance Notification No. FCN 1569 | None under the accepted conditions of use (6) |
| An aqueous solution of sodium octanoate or octanoic acid and either glycerin and/or propylene glycol and/or a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of octanoic acid emulsi-fication) adjusted to a final solution pH of 1.5 to 4.0 using sodium hydroxide, potassium hydroxide, or an acceptable GRAS acid | Various non-standardized RTE meat and poultry products and standardized meat and poultry products that permit the use of any safe and suitable antimicrobial agent | Applied to the surface of the product at a rate not to exceed 400 ppm octanoic acid by weight of the finished food product | Acceptability determination | None under the accepted conditions of use (3) |
| An aqueous solution of sodium octanoate, potassium octanoate, or octanoic acid and either glycerin and/or propylene glycol and/or a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of octanoic acid emul-sification) adjusted to a final solution pH of 1.5 to 6.0 using | Fresh meat primals and subprimals and cuts | Applied to the surface of the product at a rate not to exceed 400 ppm octanoic acid by weight of the final product | Acceptability determination | None under the accepted conditions of use (3) |

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| sodium hydroxide, potassium hydroxide, or an acceptable GRAS acid | | | | |
| An aqueous solution of sulfuric acid and sodium sulfate | In the form of a spray, wash, or dip on the surface of meat **(beef and pork)** and poultry products | At concentrations sufficient to achieve a targeted pH range of 1.0 – 2.2 on the surface of meat and poultry | GRAS Notice No. 000408 | None under the accepted conditions of use (2) |
| An aqueous solution of sulfuric acid, citric acid, and phosphoric acid | Process water applied to poultry parts, trim, organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water. | Sufficient for purposes | Acceptability determination | None under the accepted conditions of use (1) |
| A blend of citric acid and sorbic acid in a 2:1 ratio | To reduce the microbial load of purge trapped inside soaker pads in packages of raw whole muscle cuts of meat and poultry | Incorporated into soaker pads at a level not to exceed 1 to 3 grams per pad | Acceptability determination | None under the accepted conditions of use (1) |
| A blend of lactic acid (45-60%), citric acid (20-35%), and potassium hydroxide (>1%) | Poultry, beef, pork, and lamb carcasses, heads, and organs including unskinned livers (outer membrane intact); skinned livers (outer membrane removed) tongues, tails, primal cuts, sub-primal cuts, cuts, and trimmings. Skinned livers must be drained for a minimum of 1-2 minutes after application and before packaging. | Applied as a spray or dip at a level not to exceed 2.5% solution by weight. | Acceptability determination | None under the accepted conditions of use (1) |
| A blend of salt, sodium acetate, lemon extract, and grapefruit extract | Ground beef, cooked, cured, comminuted sausages (e.g., bologna), and RTE whole muscle meat products | Not to exceed 0.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement for the RTE whole muscle meat products, and cooked, cured, comminuted |

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| | | | | sausages. Ground beef must be descriptively labeled (4) |
| A blend of salt, sodium acetate, lemon extract, and grapefruit extract | Beef steaks | Steaks that are sliced, scored and dipped in a solution containing 2.5 percent of the blend | Acceptability determination | Product must be descriptively labeled (4) |
| A blend of salt, lemon extract, and grapefruit extract | Ground beef | Not to exceed 0.5 percent of the product formulation | Acceptability determination | Product must be descriptively labeled (4) |
| A blend of salt, lactic acid, sodium diacetate, and mono- and diglycerides | Various non-standardized RTE meat and poultry products and standardized meat and poultry products that permit the use of any safe and suitable antimicrobial agent | Not to exceed 0.2 percent of product formulation | Acceptability determination | All ingredients, except for the mono- and diglycerides, must be listed by common or usual name in the ingredients statement (4) |
| A mixture of hops beta acids, egg white lysozyme, and cultured skim milk | In a salad dressing used in refrigerated meat and poultry deli salads | Not to exceed 1.5 percent of the finished salad | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| A combination of celery powder and cherry powder | As an antimicrobial agent in ground and formed poultry that will be processed to be RTE | For use as a component in the product formulation at a rate not to exceed 100 ppm of nitrite from celery powder and 250 ppm of ascorbate from cherry powder by weight of the finished food product | Acceptability determination | Listed by common or usual name in the ingredients statement (1). The products must be labeled as uncured under 9 CFR 317.17. The statement “no nitrates or nitrites added” needs to be qualified with the statement * except for those naturally occurring in celery powder. |
| A combination of sulfuric acid, ammonium sulfate, and water | Used as an acidifier in poultry processing water | Sufficient of purpose | Acceptability determination | None under the accepted conditions of use (1) |
| A mixture of maltodextrin (DE of 5 or greater), cultured dextrose, sodium diacetate, egg white lysozyme, and nisin preparation | In salads, sauces, and dressings to which fully cooked meat or poultry will be added | Not to exceed 1.5 percent by weight of the finished product | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |

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| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | 1. Spray, wash, rinse, dip, chiller water, low-temperature (e.g., less than 40°F) immersion baths, scald water for whole or cut poultry carcasses, parts, trim, skin on or off, organs, and egg shell washes;<br><br>2. Water or ice used for washing, rinsing, storing, or cooling whole or cut meat, including carcasses, parts, trim, organs and;<br><br>3. Water, ice, or brine used for washing, rinsing, storing, or cooling of processed and pre-formed meat as defined in 21 CFR 170.3(n)(29) and poultry as defined in 21 CFR 170.3(n)(34). | 1.The level of peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 933 ppm and HEDP not to exceed 120 ppm.<br><br>2. The level of peroxyacetic acid not to exceed 400 ppm, hydrogen peroxide not to exceed 187 ppm and HEDP not to exceed 24 ppm<br><br>3. The level of peroxyacetic acid not to exceed 230 ppm, hydrogen peroxide not to exceed 107 ppm and HEDP not to exceed 14 ppm | Food Contact Substance Notification No. FCN 1501 | None under the accepted conditions of use (6) |
| A mixture of sodium acetate, sodium diacetate, and *Carnobacterium maltaromaticum* strain CB1 (viable and heat-treated) | Meat and poultry product | Not to exceed 0.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Acidified sodium chlorite | Poultry carcasses and parts; meat carcasses, parts, and organs; processed, comminuted, or formed meat food products (including RTE) | 500 to 1200 ppm in combination with any GRAS acid at a level sufficient to achieve a pH of 2.3 to 2.9 in accordance with 21 CFR 173.325 (*Note: The pH depends on the type of meat or poultry product.)* | 21 CFR 173.325 | None under the accepted conditions of use (3) |
| Acidified sodium chlorite | Processed, comminuted or formed poultry products (including | 500 to 1200 ppm in combination with any GRAS acid at a level sufficient to | Acceptability determination | None under the accepted conditions of use (3) |

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| | RTE) | achieve a pH of 2.3 to 2.9 in accordance with 21 CFR 173.325 *(Note: The pH depends on the type of meat or poultry product.)* | | |
| Acidified sodium chlorite | Poultry carcasses, parts, trim, and organs | Mixing an aqueous solution of sodium chlorite with any GRAS acid to achieve a pH of 2.2 to 3.0 then further diluting this solution with a pH elevating agent (i.e., sodium bicarbonate, sodium carbonate, or an un-acidified sodium chlorite solution) to a final pH of 3.5 to 7.5. When used in a spray or dip the final sodium chlorite concentration does not exceed 1200 mg/kg and the chlorine dioxide concentration does not exceed 30 mg/kg. When used in a pre-chiller or chiller solution on poultry carcasses and parts the additive is used at a level that results in sodium chlorite concentrations between 50 and 150 ppm. Contact times may be up to several minutes at temperatures between 0 and 15 degrees C. | Food Contact Substance Notification No. FCN 739 | None under the accepted conditions of use (6) |
| Acidified sodium chlorite | Red meat, red meat parts and organs, and on processed, comminuted, formed meat products (including RTE) | Applied as a spray or dip, the additive is produced by mixing an aqueous solution of sodium chlorite with any GRAS acid to achieve a pH in the range of 2.2 to | Food Contact Substance Notification No. FCN 450 | None under the accepted conditions of use (6) |

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| | | 3.0, then further diluting this solution with a pH elevating agent such that the resultant sodium chlorite concentration does not exceed 1200 ppm, and the chlorine dioxide concentration does not exceed 30 ppm.<br><br>The pH of the use solution is between 3.5 and 7.5 | | |
| Ammonium hydroxide | Beef carcasses (in hot boxes and holding coolers)and boneless beef trimmings | In accordance with current industry standards of good manufacturing practice | Acceptability determination | None under the accepted conditions of use (1) |
| Anhydrous ammonia | Lean finely textured beef which is subsequently quick chilled to 28 degrees Fahrenheit and mechanically "stressed" | In accordance with current industry standards of good manufacturing practice | Acceptability determination | None under the accepted conditions of use (1) |
| Anhydrous ammonia | Ground beef | Followed with carbon dioxide treatment in accordance with current industry standards of good manufacturing practice | Acceptability determination | None under the accepted conditions of use (1) |
| A proprietary vinegar, spice extractive and natural flavor | A proprietary blend of vinegar, spice extractives and natural flavor to be applied as an antimicrobial for raw meat and poultry products. | ≤ 2.1% on the surface of raw meat and poultry parts in liquid form;<br><br>≤ 2.1% of product formulation in liquid form to raw meat and poultry products as an inject, vacuum-tumble, spray or dip;<br><br>≤ 1.0% of ground product formulation | Acceptability determination | Listed as "vinegar with natural flavoring" in the ingredients statement for various non-standardized meat and products and on standardized meat and poultry products where antimicrobial agents are permitted. |

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| | | in spray-dried form | | Meat and poultry standardized products that do not permit the use of any safe and suitable antimicrobial agents, for example, ground beef, must be descriptively labeled, for example "ground beef (ground pork or ground turkey) with vinegar and natural flavoring." (4) |
| Bacteriophage preparation (Salmonella targeted) | On the hides of live animals in the holding pens prior to slaughter | Applied as a spray mist or wash | Acceptability determination | None under the accepted conditions of use (1) |
| *Salmonella*-specific bacteriophages, Fo Ia and S 16 | Applied at prechill and postchill locations on raw poultry carcasses and parts | At a level up to $10^8$ plaque forming units (pfu) per gram | GRAS Notice No. 000468 | None under the accepted conditions of use (1) |
| **Bacteriophage preparation (containing five bacterial monophages specific to Shigella spp.)** | **RTE meat and poultry products** | **Applied as a spray at levels up to 1 x 108 PFU/g of food.** | **GRAS Notice No. 000672** | **None under the accepted conditions of use (1)** |
| Bacteriophage preparation (*E. coli* O157:H7 targeted) | On the hides of live animals (cattle) in the holding pens prior to slaughter and hide removal | Applied as a spray, mist, rinse or wash to the hides of live animals (cattle) within lairage, restraining areas, stunning areas, and other stations immediately prior to hide removal. | Acceptability determination | None under the accepted conditions of use (1) |
| Bacteriophage preparation (Salmonella targeted) | On the feathers of live poultry prior to slaughter | Applied as a spray mist or wash | Acceptability determination | None under the accepted conditions of use (1) |
| Bacteriophage preparation (Salmonella targeted) | Ready-to-eat (RTE) poultry products prior to slicing and on raw | Applied as a spray at $10^6$ to $10^7$ plaque forming units (pfu) | GRAS Notice No. 000435 | None under the conditions of use (1) |

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| | poultry, including carcasses and parts applied as a spray | per gram of food product | | |
| Bacteriophage preparation (a mixture of equal proportions of six different individually purified lytic-type bacteriophages specific against *Listeria monocytogenes*) | Various RTE meat and poultry products | Applied as a spray at a level not to exceed 1 ml of the additive per 500 $cm^2$ product surface area | 21 CFR 172.785 | None under the conditions of use (1). Standardized meat and poultry products that do not permit the use of any safe and suitable antimicrobial agent must be descriptively labeled. (4) |
| Bacteriophage preparation | Various RTE meat and poultry products | Applied to the surface of the product to achieve a level of 1 x $10^7$ to 1 x $10^9$ plaque forming units (pfu) per gram of product | GRAS Notice No. 000218 | None under the accepted conditions of use (1). Standardized meat and poultry products that do not permit the use of any safe and suitable antimicrobial agent must be descriptively labeled. (4) |
| Bacteriophage preparation | Red meat parts and trim prior to grinding | Applied as a mixture diluted with water at a ratio of 1:10. Application rate of approximately 2 ml diluted solution per 500 $cm^2$ of surface area may be used | FCN No. 1018 | None under the accepted conditions of use. (1) |
| Calcium hypochlorite | Red meat carcasses down to a quarter of a carcass | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hypochlorite | On whole or eviscerated poultry carcasses | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hypochlorite | In water used in meat processing | Not to exceed 5 ppm calculated as free | Acceptability determination | None under the accepted condi- |

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| | | available chlorine | | tions of use (1) |
| Calcium hypochlorite | In water used in poultry processing (except for product formulation) | Not to exceed 50 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hypochlorite | Poultry chiller water | Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water) | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hypochlorite | Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller) | Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller) | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hypochlorite | Reprocessing contaminated poultry carcasses | 20 ppm calculated as free available chlorine<br>Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine | 9 CFR 381.91 | None under the accepted conditions of use (1) |
| Calcium hypochlorite | On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts | Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling. | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hypochlorite | Beef primals | 20 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Carbon Monoxide, Carbon Dioxide and Nitrogen gas as part of a modified atmosphere packaging (MAP) | To extend the shelf life and stabilize the color of red meat sausages, poultry sausages and sausages made with red meat / poultry blend. | The use of carbon monoxide (up to 0.4 percent), carbon dioxide (20 percent) and remaining balance of nitrogen as part of the modified atmosphere packaging system. | Acceptability determination | Packages will be lot coded with a manufacturing date during initial production. Before shipping to retailers, product must be labeled with the "Use or Freeze By" date.<br><br>None under the accepted condi-tions of use (2) |

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| *Carnobacterium maltaromaticum* strain CB1 | Ready-to-eat comminuted meat products (e.g., hot dogs) | Applied as a spray to meat products at a maximum concentration of at inoculation of $1X10^4$ colony forming units per gram (cfu/g) | GRAS Notice No. 000159 | Listed as "*Carnobacterium maltaromaticum"* or "bacterial culture" in the ingredients statement (2) |
| *Carnobacterium maltaromaticum* strain CB1 (viable and heat-treated) | Ready-to-eat meat products; meat and poultry products | Viable CB1 applied at levels up to 1 X $10^9$ colony forming units per gram (cfu/g). Heat-treated CB1 applied at levels up to 5000 (typically between 1000-5000) parts per million (ppm) | GRAS Notice No. 000305 | Listed as "*Carnobacterium maltaromaticum"* or "bacterial culture" in the ingredients statement (2) |
| Cetylpyridinium chloride (The solution shall also contain propylene glycol complying with 21 CFR 184.1666 at a concentration of 1.5 times that of cetylpyridinium chloride) | To treat the surface of raw poultry carcasses or giblets, or raw poultry parts (skin-on or skinless) | As a fine mist spray of an ambient temperature aqueous solution applied to raw poultry carcasses/parts prior to immersion in a chiller, at a level not to exceed 0.3 gram cetylpyridinium chloride per pound of raw poultry carcass/parts, provided that the additive is used in systems that collect and recycle solution that is not carried out of the system with the treated poultry carcasses/parts, or<br><br>Except when used as an immersion such as a dip tank**,** a liquid aqueous solution such as a drench applied to raw poultry carcasses/ parts either prior to or | 21 CFR 173.375 | None under the accepted condi-tions of use (3) |

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| | | after chilling at an amount not to exceed 5 gallons of solution per carcass, provided that the additive is used in systems that recapture at least 99 percent of the solution that is applied to the poultry carcasses/ parts. The concentration of cetylpyridinium chloride in the solution applied to the carcasses/parts shall not exceed 0.8 percent by weight.<br><br>When application of the additive is not followed by immersion in a chiller, the treatment will be followed by a potable water rinse of the carcass/parts. The potable water may contain up to 50 ppm free available chlorine. | | |
| Cetylpyridinium chloride (The solution shall also contain propylene glycol complying with 21 CFR 184.1666 at a concentration of 1.5 times that of cetylpyridinium chloride) | To treat the surface of raw poultry carcasses or parts (skin-on or skinless) | Immersion such as a dip tank application to treat poultry carcasses/ parts not to exceed a 10-second dwell time in aqueous solution of cetylpyridinium chloride. The concentration shall not exceed 0.8 percent by weight. When application of the additive is not followed by immersion in a chiller, the treatment will be followed by a | Acceptability determination | None under the accepted conditions of use (3) |

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| | | potable water rinse. The potable water may contain up to 50 ppm free available chlorine. | | |
| Chlorine dioxide | An antimicrobial agent to be applied to red meat (including meat parts and organs), processed, comminuted, or formed meat products. | Applied as a spray or dip at a level not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500- Cl02 E in the "Standard Methods for the Examination of Water and Wastewater," 18th ed., 1992, or an equivalent method. The application of chlorine dioxide on red meat (including meat parts and organs), processed, comminuted, or formed meat products shall be followed by a potable water rinse or by blanching, cooking, or canning. | Food Contact Substance Notification No. FCN 1578 | None under the accepted conditions of use (6) |
| Chlorine dioxide | In water used in poultry processing | At levels not to exceed 3 ppm residual chlorine dioxide (FCN 001123), and in accordance with 21 CFR 173.300 | Food Contact Substance Notification No. FCN 001123 | None under the accepted conditions of use (6) |
| Chlorine dioxide | In water used in poultry processing | Not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-$ClO_2$ E in the "Standard Methods for the Examination of Water and Wastewater," 18th ed., 1992, or an equivalent method | 21 CFR 173.300 | None under the accepted conditions of use (3) |

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| Chlorine dioxide | In water used in poultry processing | Not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-ClO2-D, modified for use with the Hach Spectrophotometer, or UV absorbance at 360 nm. (2) Chlorine dioxide produced through the "CLOSURE" process produces a concentrated solution that contains at least 600 ppm chlorine dioxide, and no greater than 10 ppm chlorite and 90 ppm chlorate | Food Contact Substance Notification No. FCN 644 | None under the accepted conditions of use (6) |
| Chlorine dioxide | In water used in poultry processing | Not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-$ClO_2$ E in the "Standard Methods for the Examination of Water and Wastewater," 20th ed., 1998, or an equivalent method | Food Contact Substance Notification No. FCN 1011 | None under the accepted conditions of use (6) |
| Chlorine dioxide | Red meat, red meat parts and organs; processed, comminuted, or formed meat food products | Applied as a spray or dip at a level not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-$ClO_2$ E in the "Standard Methods for the Examination of Water and Wastewater," 18th ed., 1992, or an equivalent method | Food Contact Substance Notification No. FCN 668 | None under the accepted conditions of use (6) |
| Chlorine dioxide | Red meat, red meat parts and organs; processed, comminuted, or formed meat food products | Applied as a spray or dip at a level not to exceed 3 ppm residual chlorine dioxide as determined by | Food Contact Substance Notification No. FCN 1052 | None under the accepted conditions of use (6) |

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| | | Method 4500-$ClO_2$ E in the "Standard Methods for the Examination of Water and Wastewater," 20th ed., 1998, or an equivalent method | | |
| Chlorine dioxide | Ready-to-eat meats | The FCS will be applied as a spray or dip, prior to the packaging of food for commercial purposes in accordance with current industry good manufacturing practice. The FCS will be applied in an amount not to exceed 3 ppm residual chlorine dioxide as determined by Method 4500-C102-E in the "Standard Methods for the Examination of Water and Wastewater; 20th ed.., 1998", or an equivalent method. | Food Contact Substance Notification No. FCN 1158 | None under accepted conditions of use. |
| Chlorine gas | Red meat carcasses down to a quarter of a carcass | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Chlorine gas | On whole or eviscerated poultry carcasses | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Chlorine gas | In water used in meat processing | Not to exceed 5 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Chlorine gas | In water used in poultry processing | Not to exceed 50 ppm calculated as | Acceptability determination | None under the accepted |

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| | (except for product formulation) | free available chlorine | | conditions of use (1) |
| Chlorine gas | Poultry chiller water | Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water) | Acceptability determination | None under the accepted conditions of use (1) |
| Chlorine gas | Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller) | Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller) | Acceptability determination | None under the accepted conditions of use (1) |
| Chlorine gas | Reprocessing contaminated poultry carcasses | 20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine | 9 CFR 381.91 | None under the accepted conditions of use (1) |
| Chlorine gas | On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts | Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling. | Acceptability determination | None under the accepted conditions of use (1) |
| Chlorine gas | Beef primals | 20 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Citric acid | Beef trimmings prior to grinding and beef subprimals | Up to 5 % of a citric acid solution applied as a spray | Acceptability determination | None under the accepted conditions of use (1) |
| Citric acid | Bologna in an edible casing | Up to a 10 percent solution applied prior to slicing | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Citric acid | Bologna in an inedible casing | Up to a 10 percent solution applied prior to slicing | Acceptability determination | None under the accepted conditions of use (1) |
| Citric acid | Fully cooked meat and poultry products in impermeable and permeable pre-stuck casings. | Up to a 3 percent solution is applied to the casing just prior to removal. | Acceptability determination | None under the accepted conditions of use (1) |
| Citric acid | Separated beef heads and | A 2.5 percent solution applied as a | Acceptability determination | None under the accepted |

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| | associated offal products (e.g., hearts, livers, tails, tongues) | spray prior to chilling | | conditions of use (1) |
| Citric acid | In brine to cool fully-cooked RTE meat products (a) sausages and similar products in natural casings (including permeable casings), (b) hams in impermeable casings/netting prior to the removal of the casing/netting | Up to 3 percent of the brine solution | Acceptability determination | None under the accepted conditions of use (1) |
| Cultured substrates that are produced by the fermentation of natural food sources such as caramel, dairy sources (lactose, whey, and whey permeate, milk, milk solids, yogurt), fruit and vegetable based sources (including juices, pastes, and peels), honey, maple syrup, molasses, starch (from barley, corn, malt, potato, rice, tapioca, and wheat), sugars, (from corn, beet, palm or sugar cane), and wheat. The substrate is fermented to organic acids by individual microorganisms including *Streptococcus thermophilus, Bacillus coagulans, Lactobacillus acidophilus, Lactobacillus paracasei subsp. Paracasei, Lactobacillus plantarum,* | In meat and poultry products (e.g., beef or chicken injected with cultured substrates) and ready-to-eat meat and poultry products (e.g., hot dogs and luncheon meat) that provide for the use of ingredients of this type. Cultured substrates are not intended for use in infant formula or foods. | At up to 4.5 percent of the product formula<br><br>Components of the cultured substrates in the final product are not to exceed: 0.16% for sodium and calcium, 0.75% for potassium, 2.1% for lactate, 0.6% for acetate and propionate, 0.9% for protein, 0.25% for sugar and 0.1% for succinic acid. | GRAS Notice No. 000378 | Cultured_____" where the blank is replaced by the name of the natural substrate, listed by common or usual name, (dairy sources identified by common or usual name, sugars, wheat, malt, and fruit and vegetable based sources all identified by common or usual name) used in fermentation |

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| *Lactobacillus sakei, Lactobacillus bulgaricus, and Propionibacterium freudenreichii subsp. Shermanii,* or mixtures of these strains. | | | | |
| Cultured Sugar (derived from corn, cane, or beets) | In enhanced meat and poultry products (e.g., beef or pork injected with a solution) and RTE meat and poultry products (e.g., hot dogs and cooked turkey breast) | At up to 4.8 percent of the product formula | GRAS Notice No. 000240 | Cultured cane and beet sugar listed by common or usual name (e.g., "cultured cane sugar)" Cultured corn sugar listed as "cultured corn sugar" or "cultured dextrose." |
| Cultured Sugar and Vinegar (derived from corn, cane, or beets) | In enhanced meat and poultry products (e.g., beef or pork injected with a solution) and RTE meat and poultry products (e.g., hot dogs and cooked turkey breast) | At up to 4.8 percent of the product formula | Acceptability determination | Cultured cane and beet sugar listed by common or usual name and vinegar (e.g., "cultured cane sugar, vinegar" or "cultured sugar, vinegar" Cultured corn sugar listed as "cultured corn sugar, vinegar" or "cultured dextrose, vinegar." |
| DBDMH (1,3-dibromo-5,5-dimethylhydantoin) | For use in poultry chiller water and in water applied to poultry via an Inside-Outside Bird Washer (IOBW) and in water used in poultry processing for poultry carcasses, parts, and organs | At a level not to exceed that needed to provide the equivalent of 100 ppm active bromine | Food Contact Substance Notification No. FCN 334 and FCN 453 | None under the accepted conditions of use (6) |
| DBDMH (1,3-dibromo-5,5-dimethylhydantoin) | For use in water supplied to ice machines to make ice intended for general use in poultry processing | At a level not to exceed that needed to provide the equivalent of 100 ppm of available bromine (corresponding to a maximum level of 90 mg DBDMH/kg water) | Food Contact Substance Notification No. FCN 775 | None under the accepted conditions of use (6) |

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| DBDMH (1,3-dibromo-5,5-dimethylhydantoin) | For use in water applied to beef hides, carcasses, heads, trim, parts, and organs. | At a level not to exceed that needed to provide the equivalent of 300 ppm active bromine. | Food Contact Substance Notification No. FCN 792 | None under the accepted conditions of use (6) |
| DBDMH (1,3-dibromo-5,5-dimethylhydantoin) | For use in water applied to swine, goat, and sheep carcasses and their parts and organs | At a level not to exceed that needed to provide the equivalent of 500 ppm of available bromine | Food Contact Substance Notification No. FCN 1102 | None under the accepted conditions of use (6) |
| DBDMH (1,3-dibromo-5,5-dimethylhydantoin) | For use in water and ice for meat and poultry products | At levels not to exceed 900 ppm available bromine in water or ice applied to meat products and 450 ppm available bromine in water or ice applied to poultry products. | Food Contact Substance Notification No. FCN 1190 | None under the accepted conditions of use (6) |
| Egg white lysozyme | In casings and on cooked (RTE) meat and poultry products | 2.5 mg per pound in the finished product when used in casings; 2.0 mg per pound on cooked meat and poultry products | GRAS Notice No. 000064 | Listed by common or usual name in the ingredients statement (2) |
| Electrolytically generated hypochlorous acid | Red meat carcasses down to a quarter of a carcass | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | On whole or eviscerated poultry carcasses | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | In water used in meat processing | Not to exceed 5 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | In water used in poultry processing (except for product formulation) | Not to exceed 50 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | Poultry chiller water | Not to exceed 50 ppm calculated as free available | Acceptability determination | None under the accepted conditions of use |

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| | | chlorine (measured in the incoming potable water) | | (1) |
| Electrolytically generated hypochlorous acid | Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller) | Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller) | Acceptability determination | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | Reprocessing contaminated poultry carcasses | 20 ppm calculated as free available chlorine<br>Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine | 9 CFR 381.91 | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts | Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling. | Acceptability determination | None under the accepted conditions of use (1) |
| Electrolytically generated hypochlorous acid | Beef primals | 20 ppm calculated as free available chlorine | Acceptability determination | None under the accepted condi-tions of use (1) |
| An aqueous solution of citric and hydrochloric acids adjusted to a pH of 1.0 to 2.0 | Poultry carcasses, parts, trim, and organs | Applied as a spray or dip with a minimum contact time of 2 to 5 seconds measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous solution of citric and hydrochloric acids adjusted to a pH of 0.5 to 2.0 | Meat carcasses, parts, trim, and organs | Applied as a spray or dip for a contact time of 2 to 5 seconds measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| A blend of citric acid (1.87%), phosphoric acid (1.72%), and hydrochloric acid (0.8%) | Poultry carcasses | Applied as a spray with a minimum contact time of 1 to 2 seconds and allowed to drip from the carcasses for 30 seconds | Acceptability determination | None under the accepted conditions of use (1) |
| A blend of citric acid, hydrochloric acid, and phosphoric acid | To adjust the acidity in various meat and poultry products | Sufficient for purpose | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Hops beta acids | In casings and on cooked (RTE) meat | 2.5 mg per pound in the finished product | GRAS Notice No. 000063 | Listed by common or usual name in |

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| | and poultry products | when used in casings; 2.0 mg per pound on cooked meat and poultry products | | the ingredients statement (2) |
| Hypobromous acid | In water or ice used for processing meat and poultry products | Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 300 ppm available bromine (or 133 ppm available chlorine*) in water or ice applied to meat products, and 200 ppm available bromine (or 89 ppm available chlorine*) in water or ice applied to poultry products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.) | Food Contact Substance Notification No. FCN 944 | None under the accepted conditions of use (6) |
| Hypobromous acid | In water or ice used for processing meat and poultry products | Generated on-site from an aqueous mixture of sodium bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 900 ppm available bromine (or 400 ppm available chlorine*) | Food Contact Substance Notification No. FCN 1122 | None under the accepted conditions of use (6) |

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| | | in water or ice applied to meat products, and 200 ppm available bromine (or 89 ppm available chlorine*) in water or ice applied to poultry products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.) | | |
| Hypobromous acid | In water or ice used for processing meat products | Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 900 ppm available bromine (or 400 ppm available chlorine*) in water or ice applied to meat products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.) | Food Contact Substance Notification No. FCN 1036 | None under the accepted conditions of use (6) |
| Hypobromous acid | In water or ice used for processing poultry products | Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, | Food Contact Substance Notification No. FCN 1098 | None under the accepted conditions of use (6) |

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| | | or calcium hypochlorite for use at a level not to exceed that needed to provide 450 ppm available bromine or 200 ppm available chlorine | | |
| Hypobromous acid | In water or ice, used as either a spray or a dip, for meat (hides on or off) or poultry processing | Generated on-site from an aqueous mixture of hydrogen bromide and sodium, potassium, or calcium hypochlorite for use at a level not to exceed that needed to provide 300 ppm total bromine (182 ppm HOBr) (or 133 ppm total chlorine*) in water or ice applied to meat products. At a level not to exceed 200 ppm total bromine (121 ppm HOBr) (or 90 ppm total chlorine*) in water or ice applied to poultry products. *(NOTE: Because there are a limited number of commercial test kits specific for bromine, chlorine kits may be used. The ppm levels between available bromine and chlorine is due to the difference in their molecular weight.) | Food Contact Substance Notification No. FCN 1106 | None under the accepted conditions of use (6) |
| Hypobromous acid | For use in water or ice used for process-ing poultry products, generated on-site from an aqueous mixture of sodium bromide and sodium, potassium or calcium hypochlorite | At levels not to exceed 450 ppm available bromine or 200 ppm available chlorine. | Food Contact Substance Notification No. FCN 1197 | None under the accepted conditions of use (6) |

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| Lactic acid | Livestock carcasses prior to fabrication (i.e., pre- and post-chill), offal, and variety meats | Up to a 5 percent lactic acid solution | Acceptability determination | None under the accepted conditions of use (1) |
| Lactic acid | Beef and pork sub-primals and trimmings | 2 percent to 5 percent solution of lactic acid not to exceed $55^0$C | Acceptability determination | None under the accepted conditions of use (1) |
| Lactic acid | Beef heads and tongues | A 2.0 to 2.8 percent solution applied to brushes in a washer cabinet system used to clean beef heads and tongues | Acceptability determination | None under the accepted conditions of use (1) |
| Lactic acid | Poultry carcasses, meat, parts, trim and giblets | Up to 5% lactic acid solution on post chill poultry carcasses, meat, parts, trim and giblets. | Acceptability determination | None under the accepted conditions of use (1) |
| Lactic acid bacteria mixture consisting of *Lactobacillus acidophilus* (NP35, NP51), *Lactobacillus lactis* (NP7), and *Pediococcus acidilactici* (NP3) | RTE cooked sausages (e.g., frankfurters, bologna, etc.) and cooked, cured whole muscle products (e.g., ham) | Applied by dipping product into a solution containing $10^7$ colony forming units lactobacilli per ml | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Lactic acid bacteria mixture consisting of *Lactobacillus acidophilus* (NP35, NP51), *Lactobacillus lactis* (NP7), and *Pediococcus acidilactici* (NP3) | Poultry carcasses and fresh whole muscle cuts and chopped/ground poultry | $10^5$ to $10^6$ colony forming units of lactobacilli per gram of product | Acceptability determination | Listed by common or usual name in the ingredients statement of non-standardized products. Single ingredient raw products must be descriptively labeled (2) |
| Lactic acid bacteria mixture consisting of *Lactobacillus acidophilus* (NP35, NP51), *Lactobacillus lactis* (NP7), and *Pediococcus acidilactici* (NP3) | Non-standardized comminuted meat products (e.g., beef patties), ground beef, and raw whole muscle beef cuts | $10^6$ to $10^8$ colony forming units of lactobacilli per gram of product | GRAS Notice No. 000171 | Listed by common or usual name in the ingredients statement of non-standardized comminuted meat products. Ground beef and raw whole muscle beef cuts must be descriptively labeled (2) |
| Lactoferrin | Beef carcasses and parts | At up to 2 percent of a water-based antimicrobial spray | GRAS Notice No. 000067 | Listed by common or usual name in ingredients statement (2) |

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| Lactoferrin | Beef carcasses | As part of an antimicrobial spray that would deliver 1 gram of lactoferrin per dressed beef carcass, followed by a wash with tempered water and rinse with lactic acid | GRAS Notice No. 000130 | None under the accepted conditions of use (1) |
| Lauramide arginine ethyl ester (LAE), silicon dioxide, and refined sea salt | Non-standardized RTE comminuted meat products and standardized RTE comminuted meat products that permit the use of any safe and suitable antimicrobial agent | Not to exceed 200 ppm LAE by weight of the finished product | Acceptability determination | Listed by common or usual name (i.e., lauric arginate, refined sea salt) in the ingredients statement (2) |
| Lauramide arginine ethyl ester (LAE), silicon dioxide, and refined sea salt | Fresh cuts of meat and poultry; and, non-standardized, non-comminuted RTE meat and poultry products and standardized, non-comminuted RTE meat and poultry products that permit the use of any safe and suitable antimicrobial agent | Not to exceed 200 ppm LAE, 67 ppm silicon dioxide, and 1640 ppm refined sea salt by weight of the finished product | Acceptability determination | Listed by common or usual name (i.e., lauric arginate, silicon dioxide, refined sea salt) in the ingredients statement (2) When applied to the surface of fresh cuts of meat and poultry none under the accepted conditions of use (1) |
| Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in either propylene glycol, glycerin, or water to which may be added a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of LAE emulsification) | Non-standardized RTE comminuted meat products and standardized RTE comminuted meat products that permit the use of any safe and suitable antimicrobial agent | Not to exceed 200 ppm LAE by weight of the finished product | Acceptability determination | Listed by common or usual name (i.e., lauric arginate) in the ingredients statement (2) |
| Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in | Fresh cuts of meat and poultry and various non-standardized RTE | Applied to the surface of the product at a rate not to exceed 200 ppm | GRAS Notice No. 000164 | When applied to the surface of RTE products listed by common or usual |

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| either propylene glycol, glycerin, or water to which may be added a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of LAE emulsification) | meat and poultry products and standardized RTE meat and poultry products that permit the use of any safe and suitable antimicrobial agent | LAE by weight of the finished food product | | name (i.e., lauric arginate) in the ingredients statement (2) When applied to the surface of fresh cuts of meat and poultry none under the accepted condi-tions of use (1) |
| Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in water | RTE meat and poultry products; raw pork sausage; RTE ground poultry sausage | Applied to the inside of the package or to product surfaces at up to 44 ppm (with a process tolerance of 20 percent, allowing for an LAE concentration not to exceed 53 ppm) by weight of the finished food product | Acceptability determination | None under the accepted conditions of use (1) |
| Lauramide arginine ethyl ester (LAE) dissolved at specified concentrations in either propylene glycol, glycerin, or water to which may be added a Polysorbate surface active agent (quantity sufficient to achieve the intended technical effect of LAE emulsification) | Ground poultry**;** ground poultry sausage | Applied in a mixer, blender, or tumbler designed to mix and/or blend other ingredients into ground poultry at a level not to exceed 200 ppm by weight in the finished product. The LAE is sprayed with a metered dose into the mixer, blender, or tumbler as the product is being mixed, blended, or tumbled | Acceptability determination | None under the accepted conditions of use (1) |
| Lauramide arginine ethyl ester (LAE) | Ground beef | Applied at a level not to exceed 200 ppm by weight in the finished product | Acceptability determination | None under the accepted conditions of use (1) |
| Maltodextrin, vegetable juice color, citric acid, and ascorbic acid | As a coloring agent for a solid acid tablet to be used in meat and poultry product processing water | Up to 0.5 percent (by weight of total formulation of the tablet) | Acceptability determination | None under the accepted conditions of use (1) |
| Nisin preparation | Cooked, RTE meat and poultry products containing sauces | Not to exceed 600 ppm nisin preparation in the finished product | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |

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| Nisin preparation | Meat and poultry soups | Not to exceed 200 ppm of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Nisin preparation | In casings and on cooked (RTE) meat and poultry products | Not to exceed 276 ppm in the finished product when used in casings; not to exceed 220 ppm on cooked meat and poultry products | GRAS Notice No. 000065 | Listed by common or usual name in the ingredients statement (2) |
| Nisin preparation | Egg products | Not to exceed 250 ppm in formulated product | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| A blend of encapsulated nisin preparation (90.9 percent), rosemary extract (8.2 percent) and salt (0.9 percent) | Frankfurters and other similar cooked meat and poultry sausages | Not to exceed 550 ppm of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| A blend of nisin preparation, rosemary extract, salt, maltodextrin, and cultured dextrose | Cooked (RTE) meat and poultry sausages and cured meat products | Not to exceed 0.55 percent of product formulation in cooked (RTE) meat and poultry sausages and 0.7 percent of product formulation in cured meat products (where the nisin preparation will not exceed 250 ppm) | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| A blend of nisin preparation, rosemary extract, salt, and sodium diacetate | Cooked (RTE) meat and poultry sausages and cured meat products | Not to exceed 0.25 percent of product formulation (where the nisin preparation will not exceed 250 ppm) | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Organic Acids (i.e., lactic, acetic, and citric acid) | As part of a carcass wash applied pre-chill | As an aqueous solution of up to 2.5 percent Concentration. May be applied as a mist, fog or small droplet rinse | Acceptability determination | None under the accepted conditions of use (1) |
| Ozone | All meat and poultry products | In accordance with current industry standards of good manufacturing practice | 21 CFR 173.368 | None under the accepted conditions of use (3) |

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| An aqueous solution of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | In poultry processing water, scalder, ice, spray applications, and as an acidifier in scald tanks as a scald additive | The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 110 ppm, and HEDP will not exceed 13 ppm | Acceptability determination | None under the accepted conditions of use (3) |
| Peroxyacetic acid, octanoic acid, acetic acid, hydrogen peroxide, peroxyoctanoic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | Meat and poultry carcasses, parts, trim and organs | Maximum concentrations for meat carcasses, parts, and organs: Peroxyacetic acids 220 ppm, hydrogen peroxide 75 ppm; Maximum concentrations for poultry carcasses, parts, and organs: Peroxyacetic acids 220 ppm, hydrogen peroxide 110 ppm, HEDP 13 ppm | 21 CFR 173.370 | None under the accepted conditions of use (3) |
| A mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | (1) Process water for washing, rinsing, cooling, or otherwise for processing meat carcasses, parts, trim, and organs; and (2) process water applied to poultry parts, organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water | In either application, the level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 165 ppm, and HEDP will not exceed 14 ppm | Food Contact Substance Notification No. FCN 323 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | Added to process water applied to poultry parts, organs, and carcasses as a spray, wash, rinse, dip, chiller water, immersion baths, or scald water | At a level not to exceed 2,000 ppm peroxyacetic acid and 136 ppm HEDP | Food Contact Substance Notification No. FCN 880 | None under the accepted conditions of use (6) |
| A combination of two aqueous mixtures (FCN 323 and FCN 880) of Peroxyacetic (peracetic) acid, hydrogen peroxide, acetic acid, and stabilizer 1-hydroxyethylidene-1, 1-diphosphonic acid | (1) Process water for washing, rinsing, cooling, or otherwise for processing meat carcasses, parts, trim, and organs; and (2) process water applied to poultry carcasses as a spray, wash, rinse, | An equilibrium solution of peracetic acid (15%), hydrogen peroxide (10%), and stabilizer (<1%) using a combination of FCN 323 and FCN 880 | Acceptability determination | None under the accepted conditions of use (6) |

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| (HEDP) | dip, chiller water, or scald water | | | |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and optionally sulfuric acid | (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 scalder water | In either application, the level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 85 ppm, and HEDP will not exceed 11 ppm measured prior to application. | Food Contact Substance Notification No. FCN 887 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and sulfuric acid | Red meat carcasses, parts, and trim | The level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 75 ppm, and HEDP will not exceed 13 ppm. | Food Contact Substance Notification No. FCN 951 | None under the accepted conditions of use (6) |
| A mixture of peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | (1) Water or ice for washing, rinsing, cooling, or processing whole or cut meat including carcasses, 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 | The level of PAA not to exceed 220 ppm, hydrogen peroxide will not exceed 80 ppm, and HEDP will not exceed 1.5 ppm measured prior to application | Food Contact Substance Notification No. FCN 993 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | In process water or ice for washing, rinsing, storing, or cooling of processed and preformed meat and poultry products | The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 85 ppm, and HEDP will not exceed 11 ppm. | Food Contact Substance Notification No. FCN 1082 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, and 1- | In process water used for washing, rinsing, cooling or otherwise for | The level of peroxyacetic acid will not exceed 220 ppm, hydrogen | Food Contact Substance Notification No. FCN 1089 | None under the accepted conditions of use (6) |

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| hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | processing meat carcasses, parts, trim, and organs; and in process water applied to poultry parts, organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water | peroxide will not exceed 160 ppm, and HEDP will not exceed 11 ppm. | | |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), and optionally sulfuric acid | In process water or ice used for washing, rinsing, cooling or processing whole or cut meat including parts, trim, and organs; and in process water or ice applied to whole or cut poultry including parts, trim and organs, and carcasses as a spray, wash, rinse, dip, chiller water, or scald water | The level of peroxyacetic acid will not exceed 220 ppm, hydrogen peroxide will not exceed 80 ppm, and HEDP will not exceed 13 ppm measured prior to application. | Food Contact Substance Notification No. FCN 1093 | None under the accepted conditions of use (6) |
| An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP), dipicolinic acid, and sulfuric acid | Red meat carcasses, parts, trim, and organs | The level of peroxyacetic acid will not exceed 230 ppm, hydrogen peroxide will not exceed 75 ppm, and HEDP will not exceed 1 ppm, and dipicolinic acid will not exceed 0.5 ppm. | Food Contact Substance Notification No. FCN 1094 | None under the accepted conditions of use (6) |
| A mixture of peroxyacetic acid, hydrogen peroxide, acetic acid and hydroxyethylidene-1,1-diphosphonic acid (HEDP) and water | Use as a spray, rinse, dip, chiller water or scald water for poultry carcasses, parts, and organs. | Not to exceed 220 ppm peroxyacetic acid (PAA), 162 ppm hydrogen peroxide, and 13 ppm 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | Food Contact Substance Notification No. FCN 1096 | None under the accepted conditions of use (3) |
| A mixture of peroxyacetic acid, hydrogen peroxide, acetic acid and hydroxyethylidene-1,1-diphosphonic acid (HEDP) and water | Use as a spray, rinse, dip, chiller water or scald water for raw meat carcasses, parts, trim and organs. | Not to exceed 220 ppm peroxyacetic acid (PAA), 162 ppm hydrogen peroxide, and 13 ppm 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) | Food Contact Substance Notification No. FCN 1236 | None under the accepted conditions of use (3) |
| A mixture of sodium bicarbonate and | As an antimicrobial agent when used in | Sufficient for purpose | Acceptability determination | None under the accepted |

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| sodium carbonate with a GRAS approved activator | packaged meat or poultry products. Moxiyo packets absorbs oxygen and releases carbon dioxide to maintain a low oxygen atmosphere in packaged meat or poultry products when packets are placed next to meat or poultry products. (Note – When Moxiyo packets are placed next to packaged beef jerky, the water activity (aw) of the beef jerky must be no higher than 0.88). | | | conditions of use (1) |
| A solution of water, lactic acid, propionic acid, and acidic calcium sulfate (solution with a pH range of 1.0-2.0)* | Various RTE meat products, e.g., hot dogs. | Applied as a spray for 20-30 seconds of continual application just prior to packaging **Propionic acid may be removed from the solution; sodium phosphate may be added to the solution as a buffering agent (the amount of sodium phosphate on the finished product must not exceed 5000 ppm* measured prior to application. | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| A solution of water, acidic calcium sulfate and 85-95,000 ppm of lactic acid (solution with a pH range of 0.35 to 0.55) | Raw comminuted beef. | To treat raw beef during grinding to lower the pH of the product. | Acceptability determination | Product must be descriptively labeled (2) |
| A solution of water, acidic calcium sulfate, lactic acid, and sodium phosphate (solution with a pH range of 1.45 to 1.55) | Raw whole muscle beef cuts and cooked roast beef and similar cooked beef products (e.g., corned beef, pastrami, etc.). | Spray applied for up to 30 seconds of continual application **sodium phosphate on the finished product must not exceed 5000 ppm.* | Acceptability determination | Listed by common or usual name in the ingredients statement of multi-ingredient products. Single ingredient roast beef products and |

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| | | | | raw whole muscle beef cuts must be descriptively labeled (2) |
| PA solution of water, acidic calcium sulfate, lactic acid, and sodium phosphate (solution with a pH of 1.45 to 1.6) | Cooked poultry carcasses and parts. | Spray applied for 20 to 40 seconds of continual application * *sodium phosphate on the finished product must not exceed 5000 ppm*. | Acceptability determination | Listed by common or usual name in the ingredients statement of multi-ingredient products. Single ingredient whole muscle cuts of poultry must be descriptively labeled (2) |
| A solution of water, acidic calcium sulfate, lactic acid, and disodium phos-phate (solution with a pH of 1.0 to 2.0) | Beef jerky | Applied to the surface of the product with a contact time not to exceed 30 seconds | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Potassium diacetate | Various meat and poultry products which permit the addition of antimicrobial agents, e.g., hot dogs | Not to exceed 0.25 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Potassium propionate/Propionic acid | Ready-to-eat meat and poultry, where antimicrobials are permitted | Up to 0.5 percent (by weight of total formulation) | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Potassium sorbate | Added to raw boneless beef in the production of dry beef snacks and beef jerky as a mold inhibitor. | 0.0703 % by weight of total formulation of raw meat. | Acceptability determination | Listed by common or usual name in the ingredients statement with a qualifying statement disclosing the treatment and purpose, such as "potassium sorbate added to retard mold growth" (2) |
| Potassium sorbate | Dry sausage, imitation dry sausage, dry beef snacks and beef jerky as an external mold inhibitor (applied by dipping or | 10 percent in water solution applied to: (1) the external surface of product, (2) casings after stuffing or (3) casings dipped in | Acceptability determination | Listed by common or usual name in the ingredients statement (2) with a qualifying statement |

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| | spraying). | solution prior to stuffing. | | disclosing the treatment and purpose, such as "dipped in potassium sorbate to retard mold growth." |
| Propylene glycol (PG) and lactic acid (FDA, PNC 1537) or phosphoric acid (FDA PNC 836) as an adjuvant to sodium hypo-chlorite in process water for poultry products | (1) Poultry water pre-chiller spray applications; whole bird chillers and post chiller wash and/or spray applications. (2) Poultry chiller red water (i.e., poultry chiller water recirculated, usually through heat exchangers, and reused back in the chiller) | (1) Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water) (2) Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller) | Acceptability determination | None under the accepted conditions of use (1) |
| Salmonella phage preparation containing the bacterial monophages FO1a and S16 | Beef products | At levels up to 108 PFU/g. | GRAS Notice No. 000468 | None under the accepted conditions of use (1) |
| *Salmonella* phage preparation consisting of two monophages (BP-63 and BP-12 Triumvirate) | Poultry | Applied at 1 x 108 PFU/g | GRAS Notice No. 000603 | None under the accepted conditions of use (2) |
| Skim milk or dextrose cultured with *propionibacterium freudenreichii* subsp. *Shermanii* | Meat and poultry sausages including those with standards of identity which permit the use of antimicrobial agents | Not to exceed 2 percent by weight of the finished product | GRAS Notice No. 000128 | Listed by common or usual name in the ingredients statement (2) |
| Sodium Benzoate and benzoic acid | Ready-to-eat meat and poultry products that permit the use of any safe and suitable antimicrobial agent | Up to 0.1 percent (by weight of total formulation) | 21 CFR 184.1733 | Listed by common or usual name in the ingredients statement (4) |
| Sodium citrate buffered with citric acid to a pH of 5.6 | Non-standardized and standardized comminuted meat and poultry products which permit ingre-dients of this type | Not to exceed 1.3 percent of the product formulation in accordance with 21 CFR 184.1751 | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |

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| Sodium diacetate, sodium propionate, and sodium benzoate and benzoic acid | Ready-to-eat meat and poultry products that permit the use of any safe and suitable antimicrobial agent | The maximum level for the combination cannot exceed (by weight of total formulation) 0.5 percent for sodium propionate, 0.25 percent for sodium diacetate, and 0.1 percent for sodium benzoate and benzoic acid. | 21 CFR 184.1784 and 184.1733 | Listed by common or usual name in the ingredients statement (4) |
| Sodium hypochlorite | Red meat carcasses down to a quarter of a carcass | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | On whole or eviscerated poultry carcasses | Applied as a spray at a level not to exceed 50 ppm calculated as free available chlorine measured prior to application | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | In water used in meat processing | Not to exceed 5 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | In water used in poultry processing (except for product formulation) | Not to exceed 50 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | Poultry chiller water | Not to exceed 50 ppm calculated as free available chlorine (measured in the incoming potable water) | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | Poultry chiller red water (i.e., poultry chiller water re-circulated, usually through heat exchangers, and reused back in the chiller) | Not to exceed 5 ppm calculated as free available chlorine (measured at influent to chiller) | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | Reprocessing contaminated poultry carcasses | 20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm | 9 CFR 381.91 | None under the accepted conditions of use (1) |

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| | | calculated as free available chlorine | | |
| Sodium hypochlorite | On giblets (e.g., livers, hearts, gizzards, and necks) and salvage parts | Not to exceed 50 ppm calculated as free available chlorine in the influent to a container for chilling. | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hypochlorite | Beef primals | 20 ppm calculated as free available chlorine | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium metasilicate | Component of marinades used for raw meat and poultry products | Not to exceed 2 percent by weight of the marinade | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium metasilicate | Raw beef carcasses, subprimals, and trimmings | A 4 percent (plus or minus 2 percent) solution | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium metasilicate | RTE meat and poultry products | Up to a 6 percent solution applied to the surface of the product at a rate not to exceed 300 ppm of the finished product | Acceptability determination | None under the accepted condition of use (1) |
| Sodium metasilicate and sodium carbonate blend | RTE poultry products | Up to 15 percent of a solution of sodium metasilicate and sodium carbonate (sodium metasilicate not to exceed 6 percent) applied as a surface application at a rate not to exceed 700 ppm by weight of the finished poultry product | Acceptability determination | None under the accepted condition of use (1) |
| Sodium propionate/ Propionic acid | Ready-to-eat meat and poultry, where antimicrobials are permitted. | Up to 0.5 percent (by weight of total formulation) | 21 CFR 184.1784 and 184.1081 | Listed by common or usual name in the ingredients statement (4) |
| Trisodium phosphate | Raw poultry carcasses, parts, and giblets | Pre-chill: Applied to carcasses or parts as a spray or dip up to 15 seconds using an 8-12 percent solution within the | Acceptability determination | None under the accepted conditions of use (1) |

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| | | temperature range of 65° F to 85° F. Applied to giblets as a spray or dip up to 30 seconds using an 8-12 percent solution. Both applied in accordance with good manufacturing practice.(21 CFR 182.1778)<br><br><u>Post-chill</u>: Applied to carcasses or parts as a spray or dip up to 15 seconds using an 8-12 percent solution within a temperature range of 45° F to 55° F and used in accordance with good manufacturing practice. (9 CFR 424.21 (c) and 21 CFR 182.1778) | | |
| | | ***Antioxidants*** | | |
| BHA (butylated hydroxyanisole) | "Brown N Serve" sausages | 0.02 percent in combination with other antioxidants for use in meat, based on fat content | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| BHT (butylated hydroxytoluene) | "Brown N Serve" sausages | 0.02 percent in combination with other antioxidants for use in meat, based on fat content | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| A combination of canola oil, mono- and di-glycerides, the natural spice extract rosemary, and natural mixed tocopherols derived from sunflowers | Dried turkey broth powder | At a level not to exceed 0.12 percent during production of dried turkey broth powder | Acceptability determination | None under the accepted conditions of use (1) except for rosemary extract. Rosemary extract should be identified as "rosemary extract, flavoring, or natural flavoring" in the ingredients statement |

| ***Binders*** | | | | |
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| A combination of food starch (e.g., modified corn starch) and carrageenan | Turkey ham and water products and cured pork products where binders are permitted per 9 CFR 319.104 | Combination not to exceed 3 percent of the product formulation with carrageenan not to exceed 1.5 percent (9 CFR 424.21(c)) | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| A mixture of carrageenan, sodium carbonate, and xanthan gum | Raw poultry filets, whole carcasses, and parts | Applied as a brine solution not to exceed 0.65% by weight in the finished product | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| A mixture of carrageenan, whey protein concentrate, and xanthan gum | Sausages where binders are permitted; cooked poultry products; beef and poultry patties; modified breakfast sausage, cooked sausages, and fermented sausages covered by FSIS Policy Memo 123; and modified substitute versions of fresh sausage, ground beef, or hamburger covered by FSIS Policy Memo 121B. | Not to exceed 3.5 percent by weight of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| A mixture of sodium alginate, calcium sulfate, glucono delta-lactone, and sodium pyrophosphate | Various meat and poultry products where binders are permitted | Mixture not to exceed 1.55 percent of product formulation with the sodium alginate not to exceed 1 percent of the product formulation and the sodium pyrophosphate not to exceed 0.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Beef collagen | Various meat and poultry products where binders are permitted | Not to exceed 3.5 percent of product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Beef protein | As a coating or marinade or addition | Beef protein is only used in beef food | GRAS Notice No. 000313 | “Beef Protein” used when the |

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| | to beef patties mix when the beef protein is used as (a) a water binding agent to retain moisture and/or (b) used to block fat in cooked product | products where binders are permitted and the ingredient "Beef Protein" is appropriately declared on the label of raw "Beef with Beef Protein" product per 9 CFR Section 317.2(c)(2). When used as a marinade or coating, beef protein does not exceed 0.8% by weight of the final product formulation. When used in the batter only, beef protein does not exceed 0.14% by weight of the final product formulation. When used as both coating and in the batter, beef protein does not to exceed 0.89% by weight of the final product formulation | | protein concentration is 18% or less; "Concentrated Beef Protein" used when protein concentration is greater than 18%. Final determination will be made by FSIS when label is submitted for approval (2) |
| Binders listed in 9 CFR 424.21(c) for use in cured pork products and poultry products | "Turkey ham and water products" | In accordance with 9 CFR 319.104(d) and 424.21(c) | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Canola Protein (CPI) and Hydrolized Canola Protein (HCPI) | Used as a binder in ground meat (beef and pork patties) and whole muscle poultry products where binders are permitted | Up to 2% of product formulation | GRAS Notice No. 000386 | Listed by the common or usual name in the ingredient statement (2) |
| Carboxymethyl cellulose (cellulose gum) | Poultry franks | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Carboxymethyl cellulose | Cured pork products | Not to exceed 3 percent of product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Carrageenan | Thickener in batter used to prepare poultry franks | Not to exceed 0.5°/o of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Carrot Fiber | Various comminuted | Not to exceed 3.5 | GRAS Notice | List as "isolated |

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| | meat and poultry products where binders are permitted | percent of the product formulation | No. 000116 | carrot product" (2) |
| Cellulose, powdered conforming to the specifications in the Food Chemicals Codex 5th Edition | Various comminuted poultry products where binders are permitted | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Chicken Protein | Whole muscle poultry food products where binders are permitted provided the protein is used in products of the same kind (e.g., chicken protein in a marinade injected into whole muscle chicken food products) | Not to exceed 0.80 percent of the final product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Chicken Protein, concentrated Turkey Protein | Various poultry products where the protein solution is used in products of the same kind (e.g., chicken protein in a coating of a breaded chicken fritter) | As a coating applied to the product and/or as a portion of the batter. Not to exceed 0.8 percent of product formula-tion when applied as a protein coating only, 0.14 percent of product formulation when used in the batter only, and 0.89 percent of product formulation when used as both a coating and in the batter | GRAS Notice No. 000168 | Listed by common or usual name in the ingredients statement (2) |
| Citrus fiber products derived from the albedo or pith layer of lemon or lime peels with or without guar gum (containing a minimum of 85% dietary fiber based on appropriate AOAC method of analysis) | In whole muscle cuts of meat and poultry and various comminuted meat and poultry products where binders are permitted | Not to exceed 3.0% of product formulation | GRAS Notice No. 541 | Listed as "Citrus Fiber" in the ingredient statement (2) |
| Citrus fiber (containing less than 85% dietary fiber based on appropriate AOAC methods of | Various whole muscle and comminuted meat and poultry products and RTE meat and | Level not exceeding the product's standard of identity limits with a maximum of 5% of | GRAS Notice No. 000599 | Listed as "isolated citrus product," which would also include the residual sucrose |

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| analysis) | poultry products where binders are permitted | total product formulation | | without the need to label it separately (2) |
| Corn Bran Fiber (containing a minimum of 85% dietary fiber based on edappropriate AOAC method of analysis) | As a formulation aid or as a texturizer in ground, whole muscle, emulsified and processed meat and poultry products, including sauces, soups and gravies, where binders are permitted | Not to exceed 2 percent of the product formulation | GRAS Notice No. 000427, (21 CFR 170.3(o)(14)), (21 CFR 170.3(o) (32)) | Listed as “corn bran fiber in the ingredients statement (2) |
| Guar powder, micronized | Various meat and poultry products where binders are permitted | Not to exceed 3.0 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Hydroxypropyl methylcellulose | Seasoning mixtures added to sauces and gravies produced under FDA jurisdiction that will be used in meat and poultry products | Sufficient for purpose | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Hydroxypropyl methylcellulose | Thickener in meat and poultry pot pie fillings, sauces, soups, and gravies | Not to exceed 1 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Inulin | Various meat and poultry products (e.g., frankfurters, sausage, patties, loaves, pates) where binders are permitted | 2 to 5 percent of the product formulation | Acceptability determination and GRAS Notice No. 000118 | Listed by common or usual name in the ingredients statement (2) |
| Konjac flour | Meat and poultry products in which starchy vegetable flours are permitted | No to exceed 3.5 percent of the product formulation individually or collectively with other binders | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Methylcellulose | Various comminuted meat and poultry products where binders are permitted | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Methylcellulose | Thickener in meat and poultry pot pie fillings, sauces, soups, and gravies; a binder in poultry patties, loaves, and nuggets; a binder in meat patties, loaves, and nuggets; texturizer in Policy | Not to exceed 1 percent of the product formulation as a thickener in meat and poultry pot pie fillings, sauces, soups, and gravies; 1.6 percent as a binder in poultry patties, loaves, and | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |

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| | Memo 121B and 123 products. | nuggets; 0.25 percent as a binder in meat patties, loaves, and nuggets; 0.6 percent as a texturizer in Policy Memo 121B and 123 products | | |
| Microcrystalline cellulose and sodium carboxymethylcellu-lose | As a fat replacer and binder in standardized and non-standardized comminuted meat and poultry products | In standardized comminuted meat and poultry products where binders are permitted and in non-standardized comminuted meat and poultry products at levels up to 3 percent | Acceptability determination | Listed as "cellulose gel, cellulose gum" in the ingredients statement (2) |
| MPEs (Meat Protein Extracts) (poultry protein, beef protein, and pork protein). Produced through the use of Flavourzyme enzyme up to 0.5% by weight of raw meat and poultry products or the combination of Flavourzyme and Protamex enzymes up to 0.5% each by weight of raw meat and poultry products | As binding agents and coatings (flavorings) in meat and poultry products of the same species | In non-standardized meat and poultry products that permit binders at levels not to exceed 0.89% by weight and in standardized meat and poultry products where standards of identity permit at levels not to exceed 0.89% by weight | Acceptability determination | Listed as "partially hydrolyzed (source of protein) in the ingredients statement (2) |
| Oat Fiber | Various meat products (e.g., frankfurters, sausage patties, loaves) where binders are permitted and whole muscle meat products | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed as "isolated oat product" or "modified oat product" in the ingredients statement. Whole muscle meat products must be descriptively labeled (4) |
| Oat Fiber (containing a minimum of 85% dietary fiber based on appropriate AOAC method of analysis) | In whole muscle cuts of meat and poultry and comminuted meat and poultry products where binders are permitted | Not to exceed 3.5% of product formulation | Acceptability determination | Listed as "Oat Fiber" in the ingredient statement |
| Oat Hull Fiber | Various non-standardized | Not to exceed 3.5 percent of the | GRAS Notice No. 000261 | Listed as "isolated oat product" in the |

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| | comminuted meat products | product formulation | | ingredients statement (2) |
| Oat Hull Fiber | Whole muscle and comminuted poultry products where binders are permitted | Not to exceed 3.5 percent of the product formulation | GRAS Notice No. 000342 | Listed as “isolated oat product” in the ingredients statement (2) |
| Oat Hull Fiber (containing a minimum of 85% dietary fiber based on appropriate AOAC method of analysis) | In whole muscle cuts of meat and poultry and comminuted meat and poultry products where binders are permitted | Not to exceed 3.5% of product formulation | Acceptability determination | Listed as “Oat Hull Fiber” in the ingredient statement |
| Oat Hull Fiber (containing a minimum of 85% dietary fiber based on appropriate AOAC method of analysis) | Anti-caking agent within powdered or crystallized organic acids and/or oleoresin-containing injectable brines for meat and poultry | At levels below 2 % (w/w) of the dry mixtures, and at levels of 0.1% or less of the total product formulation | GRAS Notice No. 000261 | Listed as “oat hull fiber” or as “isolated oat product” (if under 85% dietary fiber) in the ingredients statement (2) |
| Orange pulp, dried | Non-standardized whole muscle meat and poultry products where binders are permitted and standardized whole muscle meat and poultry products where standards of identity permit the use of binders | Not to exceed 3.5 percent of the product formulation | Acceptability determination | List as “citrus flour” or “dried orange pulp” (2) |
| Orange pulp, dried and orange pulp, dried with guar gum | Various ground meat and poultry products where binders are permitted | Not to exceed 3.5 percent of the product formulation | GRAS Notice No. 000154 | List as “citrus flour” or “dried orange pulp” (2) |
| Orange pulp, dried and orange pulp, dried with guar gum | Various ground meat and poultry products where binders are permitted | Not to exceed 3.5 percent of the product formulation | GRAS Notice No. 000487 | List as “citrus flour” or “dried orange pulp” with guar gum (2) |
| Orange pulp, dried and orange pulp, dried with guar gum | Processed egg products (liquid, frozen, and dried whole eggs) | Not to exceed 3.0% of total product formulation | Acceptability determination | Listed as "citrus flour" or "dried orange pulp". If containing guar gum, label as "citrus flour with guar gum" or "dried orange pulp with guar gum". (2) |
| Partially hydrolyzed proteins | Various meat and poultry products where binders are permitted. | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |

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| Pea fiber | Standardized meat and poultry products where binders are permitted and non-standardized meat and poultry products, e.g., meat patties and poultry nuggets | Sufficient for purpose | Acceptability determination | Listed as “isolated pea product” (2) |
| Pea protein proteolysate | Various whole muscle and comminuted meat and poultry products and RTE meat and poultry products | Not to exceed the product’s specific standard of identity limits and not more than 7% of the total product formulation | GRN 1581 | Listed as “pea protein proteolysate”’ or ‘pea protein isolate’.(2) |
| Pectin | Various meat and poultry products where binders are permitted | Not to exceed 3 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2 |
| Plum extract, Plum puree, Plum fiber, Plum powder | Whole cuts of meat and poultry products. Various, meat and poultry products where binders are permitted. | Not to exceed Up to 2% product formulation | Acceptability Determination | List as “isolated plum product” |
| Pork collagen | Various meat and poultry food products where binders are permitted | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Pork skin proteins | Various meat products where binders are permitted | Not to exceed 1.5 percent of product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Pork Protein | As a coating or marinade or addition to pork when the pork protein is used as (a) water binding agent to retain moisture and/or (b) block fat in cooked product | Pork protein is only used in pork products where binders are permitted and the ingredient “Pork Protein” is appropriately declared on the label of raw “Pork with Pork Protein” product per 9 CFR Section 317.2(c)(2); when used as marinade or protein coating not to exceed 0.8% by weight of final product formulation; | GRAS Notice No. 000314 | “Pork Protein” used when the protein concentration is 21% or less; “Concentrated Pork Protein” used when protein concentration is greater than 21%. Final determination will be made by FSIS when label is submitted for approval for “Pork with Pork Protein” product (2) |

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| | | when used in batter only not to exceed 0.14% by weight of final product formulation; when used as both coating and in batter not to exceed 0.89% by weight of final product formulation | | |
| Potato fiber | Whole muscle poultry products and comminuted meat and poultry products where binders are permitted | Not to exceed 3.5 percent of product formulation | GRAS Notice No. 000310 | Listed as “isolated potato product” (2) |
| Potato protein isolate | Various whole muscle and comminuted meat and poultry products where binders are permitted | Not to exceed 3.0 percent of the product formulation | GRAS Notice No. 000447 | Listed as “potato protein isolate” in the ingredients statement (2) |
| Psyllium Husk | As a binder in meat and poultry products where binders are permitted | At levels up to 0.3% of total product weight | Acceptability determination | Listed as “Psyllium” or “Psyllium Husk” in the ingredients statement (2) |
| Rice bran | Various comminuted meat and poultry products where binders are permitted (e.g., hot dogs, meatballs, and chicken patties) | Not to exceed 3.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Rice starch | Cured pork products | Not to exceed 0.8 percent of product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Sodium alginate | Various meat products where binders are permitted | Not to exceed 1 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium alginate | Various poultry products where binders are permitted | Not to exceed 0.8 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Soy Fiber (Okara) | Sausages as provided for in 9 CFR Part 319, bockwurst | Not to exceed 3.5 percent of the formulation individ-ually or collectively with other binders for use in meat | Acceptability determination | Listed as “Isolated Soy Product” in the ingredients statement (2) |

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| Soy Fiber (Okara) | Chili con carne, chili con carne with beans | Not to exceed 8 percent of the formulation individually or collectively with other binders for use in meat | Acceptability determination | Listed as “Isolated Soy Product” in the ingredients statement (2) |
| Soy Fiber (Okara) | Spaghetti with meatballs and sauce, spaghetti with meat and sauce and similar products | Not to exceed 12 percent of the formulation indivi-dually or collectively with other binders for use in meat | Acceptability determination | Listed as “Isolated Soy Product” in the ingredients statement (2) |
| Soy Fiber (Okara) | Various meat and poultry products (e.g., patties, loaves, pates) where binders are permitted | Sufficient for purpose | Acceptability determination | Listed as “Isolated Soy Product” in the ingredients statement (2) |
| Sugar beet fiber | Used as a binding and/or thickening agent in standardized meat and poultry products, and in non-standardized meat and poultry products such as beef and poultry patties, sausages, or chicken links. | In non-standardized meat and poultry products at levels up to 5%, and in standardized meat and poultry products where binding and/or thickening agents are permitted. | GRAS Notice No. 000430 | Listed as “sugar beet pulp,” or “sugar beet powder,” or “sugar beet pulp powder” in the ingredients statement (2) |
| Transglutaminase enzyme | Texturizing agent in meat and poultry food products where texturizing agents and binders are permitted | Not to exceed 65 ppm of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Transglutaminase enzyme | Cross-linking agent in modified meat and poultry products addressed in Policy Memos 121B and 123. | Not to exceed 65 ppm of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Transglutaminase enzyme | Binding and cross-linking agent in uncooked restruc-tured chicken breasts | Not to exceed 100 ppm of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Trehalose | Binding and purge control agent in various meat and poultry products where binders are permitted | Not to exceed 2 percent of the product formulation | GRAS Notice No. 000045 | Listed by common or usual name in the ingredients statement (2) |

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| Xanthan gum (purified by recovery with ethyl alcohol) | Various meat and poultry products where binders are permitted | Non-standardized meat and poultry products and products with a standard of identity which currently permit the use of xanthan gum listed in 9 CFR 424.21(c) | GRAS Notice No. 000121 | Listed by common or usual name in the ingredients statement (4) |
| ***Coloring Agents*** | | | | |
| Annatto powder (annatto extract, water, potassium carbonate, potassium hydroxide) | To tint sodium nitrite containing cure meat or poultry blends for purposes of visual confirmation of addition in batching operations (in lieu of FD&C Red #3) | At less than 1 ppm per 1000 pounds of meat or poultry blending | Acceptability determination | None under the accepted conditions of use (1) |
| Carmine (cochineal) | To color isolated soy protein for use in dry cured acidified sausages | 0.2 to 0.4 percent of the hydrated protein gel. The protein gel must not exceed 30 percent of the meat food product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (5); Product name requires qualifying statement such as "Artificially Colored" |
| Carmine (cochineal) | To color non-standardized fully cooked poultry products and standardized fully cooked poultry products that permit the use of coloring agents | Not to exceed 0.0075 percent of total finished product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (5); Product name requires qualifying statement such as "Artificially Colored" |
| Citric acid | For use as color stabilizer in egg products | Sufficient for purpose | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Monopotassium phosphate or monosodium phosphate | For use as color preservative in egg products | Not to exceed 0.5 percent in liquid whole egg. If water is used as a carrier, not to exceed 50% of the solution mixture by weight | Acceptability determination; 21 CFR 160.110(a) | Listed by common or usual name in the ingredients statement (2) |
| Titanium dioxide | To color non-standardized RTE poultry products and standardized RTE poultry products that permit the use of coloring agents | Not to exceed 0.25 percent by weight of the food product | Acceptability determination; 21 CFR 73.575 | Listed by common or usual name in the ingredients statement (5). Product name requires qualifying statement |

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| | | | | contiguous to product name such as “Artificially Whitened” or “Artificially Lightened” |
| Tomato lycopene extract and concentrate | To color RTE meat products that permit the use of coloring agents | Tomato lycopene extract used at a level not to exceed 50 mg/kg lyco-pene in product. Tomato lycopene concentrate used at a level not to exceed 100 mg/kg Of lycopene in product. | GRAS Notice No. 000156 | Listed by common or usual name in the ingredients statement (5); Product name requires qualifying statement such as “Colored with lycopene tomato extract” |
| ***Curing Accelerators (must be used only in combination with curing agents)*** | | | | |
| Potassium erythorbate | Cured pork and beef cuts; cured meat food products; cured comminuted poultry or poultry products | 87.5 oz. to 100 gallons of pickle at 10 percent pump; 7/8 oz. to 100 lbs. Of meat, meat byproduct or poultry product; 10 percent to surfaces of cured meat cuts or poultry products prior to *packaging* | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| ***Denuding agents (may be used in combination. Must be removed from tripe by rinsing with potable water.)*** | | | | |
| Calcium carbonate | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium citrate | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Calcium hydroxide | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Potassium carbonate | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Potassium citrate | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |

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| Potassium hydroxide | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Tricalcium phosphate | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Tripotassium phosphate | Denuding agent for washing tripe | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| ***Emulsifying Agents*** | | | | |
| DATEM (diacetyl tartaric acid esters of mono- and diglycerides) | Used to emulsify shortening products*<br><br>*9 CFR 424 also refers to the use of DATEM in various poultry products, however the safety has not been confirmed in meat and poultry products other than shortening. | Sufficient for purpose | 9 CFR 424.21 | Listed by common or usual name in the ingredients statement "DATEM." |
| Papain enzyme | Egg products (egg white) | Not to exceed 0.25 percent of total product formulation | Acceptability determination | Listed by common or usual name "Papain" in the ingredients statement. (2) |
| Phospholipase A2 enzyme derived from a non-animal source | Egg products (egg yolks and whole eggs) | Not to exceed 0.05 % of total product formulation | GRN 183 | Listed by common or usual name "Phospholipase" in the ingredients statement. (2) |
| Phospholipase A2 enzyme derived from a non-animal source | Egg products (egg yolks and whole eggs) | Not to exceed 0.05 % of total product formulation | GRN 212 | Listed by common or usual name "Phospholipase" in the ingredients statement. (2) |
| ***Film Forming Agents*** | | | | |
| *A mixture of invert sugar, water, maltodextrin, malic acid, modified food starch, pectin, and xanthan gum* | Used to transfer flavorings, spices or coloring to the packaging materials of meat and poultry products | Not to exceed 0.5% of the total of the finished product | Acceptability determination | None under the accepted conditions of use (1) |
| A mixture of water, glycerin, carrageenan, and | Used to aid in the release of elastic netting on cooked | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use |

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| cornstarch | meat products that are cooked in elastic netting | | | (1) |
| A mixture of water, glycerin, carrageenan, cornstarch, and caramel | Used to aid in the release of elastic netting on cooked meat products that are cooked in elastic netting | Sufficient for purpose | Acceptability determination | “Caramel Color” listed as an ingredient and as a product name qualifier (2) |
| A mixture of water, glycerin, carrageenan, cornstarch, and smoke flavoring | Used to aid in the release of elastic netting on cooked meat products that are cooked in elastic netting | Sufficient for purpose | Acceptability determination | “Smoke Flavor” listed as an ingredient and as a product name qualifier (2) |
| A mixture of water, liquid smoke, citric acid, phosphated mono-and diglycerides, sodium salt, cellulose gum, calcium chloride, propylene glycol, sodium alginate, xanthan gum, and potassium sorbate | For use as an aid in the release of netting and/or casing on meat and poultry products after cooking | Not to exceed 2 percent of the product formulation | Acceptability determination | Listed as "liquid smoke" in the ingredients statement (1) |
| A mixture of water, liquid smoke, citric acid, cellulose gum, calcium chloride, propylene glycol, sodium alginate, xanthan gum, and potassium sorbate | For use as an aid in the release of netting and/or casing on meat and poultry products after cooking | Not to exceed 2 percent of the product formulation | Acceptability determination | Listed as "liquid smoke" in the ingredients statement (1) |
| A mixture of water, liquid smoke, citric acid, cellulose gum, rice bran extract, calcium chloride, propylene glycol, sodium alginate, xanthan gum, and potassium sorbate | For use as an aid in the release of netting and/or casing on meat and poultry products after cooking | Not to exceed 2 percent of the product formulation | Acceptability determination | Listed as "liquid smoke and rice bran extract" in the ingredients statement (1) |
| A mixture of water, propylene glycol, sodium alginate, potassium sorbate, citric acid, and calcium chloride | For use as an aid in the release of netting and/or casing on meat and poultry products after cooking | Not to exceed 2 percent of the product formulation | Acceptability determination | None under the accepted conditions of use (1) |
| A mixture of water, sunflower oil and | For use as an aid in the release of netting | Not to exceed 2 percent of the | Acceptability determination | Listed as "liquid smoke" in the |

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| sunflower lecithin, liquid smoke with polysorbate, citric acid, calcium chloride, propylene glycol, sodium alginate, xanthan gum, and potassium sorbate | and/or casing on meat and poultry products after cooking | product formulation | | ingredients statement (1) |
| A solution of sodium alginate, dextrose, isolated pea protein, sugar, and maltodextrin (DE of 6) used with a solution of calcium chloride, powdered sugar, oleoresin black pepper, and isolated pea protein. | Used to form a calcium alginate-based casing on pork and poultry sausages. | Quantity of the casing on the sausage ranges from 8 to 15 percent of total product formulation and calcium alginate not to exceed 0.219 percent of the finished product formulation | Acceptability determination | List all ingredients used in the casing by common or usual name in the ingredients statement (4) |
| Canola oil | Used as a release agent on belts during the freezing of raw poultry products. | Applied on the freezer belt at a maximum amount of approximately 6 pounds (1 gallon) resulting in 0.001 g/in$^2$ of canola oil on the form freeze belt. | Acceptability determination | None under the accepted conditions of use (2) |
| Gelatin spice sheets | To ensure even distribution of seasonings on cooked pork products | Sufficient for purpose | Acceptability determination | None under the accepted conditions of use (1) |
| Hydroxypropyl methylcellulose | Film-forming agent in glazes for meat and poultry products | Not to exceed 4 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Methylcellulose | Film-forming agent in glazes for meat and poultry products | Not to exceed 3 percent of the product formulation for poultry products, 3.5 percent of the product formulation for meat products | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium alginate, guar gum, dicalcium phosphate, acetylated distarch adipate (modified food starch), and sodium hexametaphosphate | For use as a component in sausage casing for various types of sausages, specifically as part of the solution used to encase the sausage | As a component in sausage casing, specifically as part of the solution used to encase the sausage, at a range from 2 to 15% of total product formulation | Acceptability determination | Listed as "alginate-based casing (sodium alginate, guar gum, dicalcium phosphate, modified food starch, and |

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| | | | | sodium hexametaphosp-hate)"at the end of the ingredients statement (4) |
| Sodium alginate, acetylated distarch adipate (modified food starch), and sodium hexametaphosphate | For use as a component in sausage casing for various types of sausages, specifically as part of the solution used to encase the sausage | As a component in sausage casing, specifically as part of the solution used to encase the sausage, at a range from 0.7 to 5.5% of the casing solution and the dry mixture not to exceed 0.6% of total product formulation | Acceptability determination | Listed as “alginate-based casing (sodium alginate, modified food starch, and sodium hexametaphosp-hate)”at the end of the ingredients statement (4) |
| ***Flavoring Agents*** | | | | |
| A blend of lemon juice and vinegar | Various non standardized raw, cured, and ready to eat meat and poultry products and on standardized meat and poultry products where flavoring agents are permitted | Up to 3.5% of product formulation | Acceptability determination | Listed by common or usual name "lemon juice and vinegar" in the ingredients statement for various non standardized raw, cured, and ready to eat meat and poultry products and on standardized meat and poultry products where flavoring agents are permitted. Ground beef and ground poultry must be descriptively labeled (4) |
| Adenosine 5'-monophosphoric acid (AMP) and its monosodium and disodium salts | As a flavor enhancer for meat and poultry soups and soup mixes | Not to exceed 200 ppm of the product formulation | GRAS Notice No. 000144 | Listed by common or usual name in the ingredients statement (2) |
| A mixture of L-lysine and L-glutamic acid | Raw meat and poultry products | Applied as a brine solution prior to cooking and/or smoking not to exceed 0.6% in finished product | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |

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| Carboxypeptidase enzyme preparation | To accelerate the development of flavor during the ripening process of fermented meat | At levels of 1.2-6.0 milligrams TOS/kg of fermented meat | GRAS Notice No. 000345 | Listed as Carboxypeptidase (CPG) enzyme or "enzyme" in the ingredients statement (2) |
| Encapsulated sodium diacetate | Flavor enhancer in fresh and ready-to-eat (RTE) comminuted and whole muscle meat and poultry added as a component in seasoning blends and meat and poultry sauces | At a level not to exceed 1.0 percent (total formula weight) in combination with other GRAS acids at a level sufficient to achieve a pH of 4.8 – 5.5 | Acceptability determination | Listed by common or usual name in the ingredients statement. Comminuted product must be descriptively labeled. (2) |
| Lactic acid | As a flavor enhancer added to pork fatty tissue used in the production of dehydrated pork fatty tissue | Not to exceed 0.367 percent of the pork fatty tissue, prior to dehydration | Acceptability determination | Product must be descriptively labeled (4) |
| Laminaria japonica (brown algae) | As a flavor enhancer or flavoring agent in marinades for meat and poultry, meat and poultry soups, gravies, and seasonings | Not to exceed 0.08 percent of the product formulation | GRAS Notice No. 000123 | Listed by common or usual name in the ingredients statement (2) |
| Mixture of citrus (orange) extract, oregano extract, and rosemary extract | As a natural flavoring in meat and poultry products including RTE, fresh, cooked and frozen beef, pork, and poultry products where currently permitted by FSIS regulations | Up to 1000 ppm of the final product formulation | Acceptability determination | Each ingredient listed by common or usual name or collectively as "natural flavoring" (4) |
| Pea protein proteolysate | Various whole muscle and comminuted meat and poultry products and RTE meat and poultry products | Not to exceed the product's specific standard of identity limits and not more than 7% of the total product formulation | GRN 1581 | Listed as "pea protein proteolysate"' or 'pea protein isolate'.(2) |
| Potassium acetate | Various meat and poultry products | No to exceed 1.2 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Potassium citrate | As a flavor or flavor enhancing agent in meat and poultry products | Not to exceed 2.25% of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (4) |
| Sodium acetate and sodium diacetate | Various meat and poultry products | As a combination, not to exceed | Acceptability determination | Listed by common or usual name in |

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| mixture | | 0.80 percent of total formulation weight. Sodium acetate not to exceed 0.50 percent of the formulation weight; Sodium diacetate not to exceed 0.30 percent of the formulation weight. | | the ingredients statement (4) |
| Sucralose | Non-nutritive sweetener in various non-standardized meat and poultry products | Not to exceed 500 ppm in the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Trehalose | As a flavor enhancer in non-standardized RTE meat and poultry products | Not to exceed 2 percent by weight of product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| ***Miscellaneous*** | | | | |
| **Beef Protein** | **A 1.8% beef protein solution pH adjusted with the use of up to 0.5% citric acid used as a processing aid in frying beef products to reduce fat uptake.** | **Applied as a coating at up to 0.8% (by weight of the final product), or as a component of batter at up to 0.14%, and as both at a combined total of up to 0.89%** | **GRAS Notice No. 000313** | **None under the accepted conditions of use (1)** |
| Activated charcoal | Use of activated charcoal in collecting and removing gases and liquid impurities during the beef aging process. | For single-use only and the amount of activated charcoal used will not exceed 0.00135 wt.% or 13.5 ppm on beef. The inedible fat layer that contains the activated charcoal will be cut off and discarded prior to retail. | Food Contact Substance Notification No. FCN 1629 | None under the accepted conditions of use (6) |
| Alkyl polyglycosides | Hog scalding | Sufficient for purpose of increasing the wetting ability of the caustic solution | GRAS Notice No. 000237 | None under the accepted conditions of use (1) |
| Alkyl polyglycosides | Wash meat (i.e., beef carcasses after the | Used at 2% active solution level | GRAS Notice No. 000237 | None under the accepted |

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| | hide has been removed to remove any extraneous hair, dirt, etc.) during butchering | followed by a potable water rinse | | conditions of use (1) |
| Ammonium hydroxide | To adjust the pH of brine solutions prior to injection into meat | Sufficient for purpose to achieve a brine solution with a pH of up to 11.6 | Acceptability determination | None under the accepted conditions of use (1) |
| An aqueous mixture of dimethylpolysilo-xane,Tween 60, S-Maz 60, a Kosher Base (DMPS and Silicone Dioxide) and Formaldehyde | Spray, drench, or dip for raw poultry carcasses/parts (may be used with Cecure™) | A proprietary blend (including ≤10% DMPS, ≤0.08% Formaldehyde) | 21 CFR 173.340, 21 CFR 172.842, CFR 172.480 and 9 CFR 424.21(c) | None under the accepted conditions of use (1) |
| An aqueous solution of arginine, potassium hydroxide, salt, and water | pH control agent in brine solutions for beef subprimals or to make beef patties | Arginine is added to the salt and water brine solution and the pH is adjusted. The potassium hydroxide is then added and the pH is adjusted. | Acceptability determination<br><br>L-arginine: GRAS Notice No. 000290 | Salt and water must be listed by common or usual name on the ingredients statement |
| A 60/40 blend of sodium bicarbonate and citric acid | To generate carbon dioxide in packages of raw whole muscle cuts of meat and poultry; raw meat and poultry trimmings; raw ground meat and poultry | Incorporated into soaker pads at a level not to exceed 0.5 to 2 grams per pad | Acceptability determination | None under the accepted conditions of use (1) |
| A mixture of potato starch, sodium and postassium di-and triphosphate, dextrose, carrageenan, microcrystalline cellulose (cellulose gel), xanthan gum, sodium ascorbate, and sodium erythorbate | For use in meats and poultry as a binder where binders are permitted, although the presence of the sodium ascorbate and sodium erythorbate would limit the use of this ingredient to cured products, and their levels of use must comply with the limits prescribed in 9 CFR 424.21. | In meats and poultry as a binder where binders are permitted at 3 percent of the finished | Acceptability determination | Listed as “potato starch, sodium and postassium di-and triphosphate, dextrose, carrageenan, microcrystalline cellulose (cellulose gel), xanthan gum, sodium ascorbate, and sodium erythorbate" in the ingredients statement (2) |
| A mixture of sodium chloride, potassium chloride, and sodium gluconate | For use in whole muscle meats and poultry for sodium reduction | At levels sufficient for purpose | Acceptability determination | Listed as “salt, potassium chloride, and sodium gluconate” in the ingredients statement (2) |

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| A mixture of sodium chloride, sodium ferrocyanide, potassium chloride, magnesium carbonate, sodium nitrite, medium chain triglycerides (MCT) and sodium gluconate | For use in whole muscle meats, meat products and poultry products for sodium reduction and curing | At a level of up to 3% of product formulation | Acceptability determination | Listed as "salt, sodium gluconate, potassium chloride, and sodium nitrite" in the ingredients statement (2) |
| A solution of water, dextrose, glycerin, maltose, and sodium phosphate | To aid in the removal of residual blood from beef, bison, pork, lamb and goat carcasses after the typical exsangui-nation process is completed. | Sufficient for purpose | Acceptability determination | For all edible tissue none under the accepted conditions of use unless the Moisture Fat Free% (MFF%) analysis shows treated carcasses are not in compliance with retained water requirements. (1) |
| Algal oil derived from *Schizochytrium sp.* | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 1.45 percent by weight of the product formulation for meat products and 0.87 percent by weight of the product formulation for poultry products | GRAS Notice No. 000137 | Listed by common or usual name in the ingredients statement (2) |
| Barley fiber | For use as a texturizer in sauces, soups, and gravies containing meat and poultry | Not to exceed 2.5 percent by weight of the product formulation | GRAS Notice No. 000344 | Listed as "isolated barley product" in the ingredient statement (2) |
| Cellulose (powdered) | To facilitate grinding and shredding in cheese | Not to exceed 2 percent of the cheese | Acceptability determination | None under the accepted conditions of use (1) |
| Choline chloride with or without magnesium stearate | For use as a direct replacement for sodium chloride in meat and poultry products including processed, ready-to-eat (RTE), fresh and frozen meat and poultry products with or without stated standards of identity | Not to exceed 6000 ppm choline chloride. When magnesium stearate is used with choline chloride it is used with 2% added magnesium stearate | Acceptability determination | Listed as "choline chloride" in the ingredient statement (1) |

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| | or composition | | | |
| Citroglycerides (citric acid esters of mono- and diglycerides) | To aid in the dispersion of lauric arginate (LAE) | Used in a 5:1 mixture with lauric arginate with the maximum amount in meat and poultry products not to exceed 1125 ppm | GRAS Notice No. 000222 | Listed by common or usual name in the ingredients statement (2) |
| Cultured Sugar (derived from cane, corn, or beets) | In uncooked (raw) sausage meat | At up to 4.8 percent of the product formula | GRAS Notice No. 000240 | Cultured cane and beet sugar listed by common or usual name (e.g., "cultured cane sugar) or as "cultured sugar."<br><br>Cultured corn sugar listed as "cultured corn sugar" or "cultured dextrose" (2) |
| Diacylglycerol oil | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 11 percent of the meat or poultry product formula | GRAS Notice No. 000115 | Listed by common or usual name in the ingredients statement (2) |
| Dimethylpolysiloxane (methyl polysilicone) | Antifoaming agent in soups, rendered fats, curing solutions and non-curing brine solutions | Up to 10 ppm in soups and rendered fats; up to 50 ppm in curing solutions and non-curing brine solutions | 21 CFR 173.340 and 9 CFR 424.21(c) | None under the accepted conditions of use (1) |
| Erythorbic Acid | To delay discoloration in ground beef and ground beef patties | Not to exceed 0.04 percent of the product formulation | Acceptability determination | Product must be descriptively labeled (2) |
| Fish oil concentrate | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 2.9 percent by weight of the product formulation for meat products and 1.7 percent by weight of the product formulation for poultry products | GRAS Notice No. 000105 | Listed by common or usual name in the ingredients statement (2) |
| Fish oil (predominantly sardine, anchovy, and tuna) | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 3.3 percent by weight of the product formulation for meat products and 2.0 percent by weight of the product formulation for poultry products | GRAS Notice No. 000193 | Listed by common or usual name in the ingredients statement (2) |

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| Fish oil (predominantly anchovy) | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 3.3 percent by weight of the product formulation for meat products and 2.0 percent by weight of the product formulation for poultry products | GRAS Notice No. 000138 | Listed by common or usual name in the ingredients statement (2) |
| Fish oil (predominantly anchovy) microencapsulated | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 6.0 percent by weight of the product formulation for meat products and 3.6 percent by weight of the product formulation for poultry products | GRAS Notice No. 000138 | Listed by common or usual name in the ingredients statement (2) |
| Glucose oxidase and catalase enzymes from *Aspergillus niger* with a dextrose energy source and sodium bicarbonate buffer | To maintain a low oxygen atmosphere in packages of raw whole muscle cuts of meat and poultry | Incorporated into soaker pads such that the enzymes do not exceed 0.03 percent by weight of the meat or poultry | Acceptability determination | None under the accepted conditions of use (1) |
| Glucose oxidase and catalase enzymes from *Aspergillus niger* with a dextrose energy source and sodium bicarbonate buffer | To maintain a low oxygen atmosphere in packages of shelf-stable, ready-to-eat, meat products | Applied to the surface of the product such that the enzymes do not exceed 0.03 percent by weight of the meat food product | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Glycerophospholipid cholesterol acyltransferase (GCAT) enzyme preparation from *Bacillus licheniformis* expressing a modified GCAT gene from *Aeromonas salmonicida* subsp. s*almonicida* (GCAT enzyme preparation) | For use as an emulsifier in comminuted meat products | Not to exceed 22.6 mg TOS/kg of total product formulation | GRAS Notice No. 000265 | Listed by common or usual name in the ingredients statement (2) |
| Guar gum | For use as whipping aid in egg products | Not to exceed 0.5 percent | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Hydrogen peroxide | To minimize biofilm buildup on reverse | Not to exceed 100 ppm added just prior | Acceptability determination | None under the accepted |

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| | osmosis and ultrafiltration membranes for processing beef plasma | to plasma entering membranes | | conditions of use (1) |
| Hydrogen peroxide | Used as prescribed for alternative pasteurization treatments of egg products | Used at 10 percent solution | 21 CFR 178.1005 | None under the accepted conditions of use (1) |
| Hydrolyzed gelatin | To prevent moisture loss from fresh cuts of meat and poultry | A 13 percent aqueous solution of hydrolyzed gelatin sprayed on the surface not to exceed 2 percent hydrolyzed gelatin by weight of the meat or poultry | Acceptability determination | Listed by common or usual name in the ingredients statement. Label must also bear a statement, contiguous to the product name, indicating product has been coated with hydrolyzed gelatin to prevent moisture loss. (4) |
| Medium and long chain triacylglycerol (tailored triglycerides containing approximately 12 percent medium chain fatty acids) | For use as a supplementary source of vegetable oil in the production of various meat and poultry products | Sufficient for purposes | GRAS Notice No. 000217 | Listed by common or usual name in the ingredients statement (2) |
| Microcrystalline cellulose coated with cellulose gum, potato starch, sodium tripolyphosphate (a stabilizer), chicken egg white powder, tetrasodium pyrophosphate (a stabilizer), and transglutaminase | For use as a fat replacer and moisture binder in non-standardized comminuted meat products or standardized comminuted meat products that permit the use of binders and phosphates | Not to exceed 2.77% by weight of the final products | Acceptability determination | Labeled in the correct order of predominance followed by a sublisting of each ingredient of the blend listed by its common or usual name in the ingredients statement. Phosphates may be listed collectively as "sodium phosphate" in the correct order of predominance in the sublisting of the blend in the ingredients statement |
| Polyglycerol ester produced by | Added to fresh livestock blood during | Not to exceed 60 ppm in the fresh | Acceptability determination | None under the accepted |

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| transesterification of triglycerol with soybean oil | collection to eliminate foaming | livestock blood | | conditions of use (1) |
| Polyglycerol polyricinoleic acid (PGPR) | For use as an emulsifier in the formulation of color additives which are subsequently used in processed meat and poultry products for which colors are permitted | Sufficient for purpose using good manufacturing practices | GRAS Notice No. 000270 | Listed by common or usual name in the ingredients statement (2) |
| Potassium magnesium chloride, and salt | For use as a replacement for a portion of the salt normally used in meat and poultry products | Sufficient for purpose | GRAS Notice No. 000403 | Listed as Sea salt (Potassium magnesium chloride, and salt) in the ingredients statement (2) |
| **Protease preparations from *Bacillus licheniformis*** | **Used as a processing aid to prevent gel formation in making chicken broth** | **Applied to chicken broth at a rate up to 0.5% of the weight of protease to the weight of protein in the chicken broth** | **Acceptability determination** | **Listed by common or usual name in the ingredients statement (2)** |
| Rice protein | 1) For use as a replacement for fat and/or meat or poultry in processed meat and poultry products (e.g. meat and poultry patties) where the use of ingredients of this type are permitted. 2) For use in the formulation of substitute standardized meat and poultry products named by an expressed nutrient content claim described in 9 CFR 319.10 and 381.172 which allow the use of ingredients of this type as a replacement for fat | Rice protein comprised of 19% rice flour, 1% natrium (sodium) alginate, and 80% water used at a level not to exceed 25% of the finished product | Acceptability determination | The ingredient must be listed as "Textured Rice Protein with a sublisting of ingredients in the ingredient statement, i.e., Textured Rice Protein (water, rice flour, sodium alginate)." |
| Salmon oil | For use as an alternative edible oil | Not to exceed 5.0 percent by weight of | GRAS Notice No. 000146 | Listed by common or usual name in |

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| | in the production of various meat and poultry products | the product formulation for meat products and 3.0 percent by weight of the product formulation for poultry products | | the ingredients statement (2) |
| Silicon dioxide | For use as anticaking agent in egg products | Not to exceed 1.0 percent in dried whole eggs or yolks | Acceptability determination; 21 CFR 172.480 | Listed by common or usual name in the ingredients statement (2) |
| Small planktivorous pelagic fish oil | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 3.3 percent by weight of the product formulation for meat products and 2.0 percent by weight of the product formulation for poultry products | GRAS Notice No. 000102 | Listed by common or usual name in the ingredients statement (2) |
| Sodium bicarbonate | Neutralize excess acidity (maintain pH) in fresh pork and beef cuts | In an injected solution, not to exceed 0.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium bicarbonate | Maintain pH and reduce purge in fresh turkey products | In an injected solution, not to exceed 0.5 percent of the product formulation | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium bicarbonate | To soak natural casings to ease stuffing | 1.06 percent of an aqueous solution. Casings must be rinsed with potable water prior to stuffing | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium carbonate | Used as an anti-scaling agent with authorized sodium metasilicate (SMS) meat and poultry uses | Up to 15 percent of a solution of sodium metasilicate and sodium carbonate (sodium metasilicate not to exceed 6 percent) applied as a surface application at a rate not to exceed 700 ppm by weight of the authorized SMS meat and poultry product uses | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium carbonate | For moisture retention in meat and poultry products | At a minimum of 750 ppm in brine solutions, in accordance with | 21CFR 184.1736 | Listed by common or usual name (i.e., sodium carbonate) in the |

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| | | current industry standards of good manufacturing practice | | ingredients statement (2) |
| Sodium desoxycholate | For use as whipping aid in egg products | Not to exceed 0.1 percent in egg products | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium gluconate | For use as a stabilizer in emulsion-type sausages (derived from its sequestering properties) | When used in accordance with 21 CFR 182.6757 as a sequestraint and in accordance with good manufacturing practice | Acceptability determination | Listed as “sodium gluconate” in the ingredients statement (2) |
| Sodium hydroxide | For application to poultry carcasses immediately after removal of feathers and prior to evisceration to minimize fecal material from adhering to the carcass | 0.05 percent solution | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium hydroxide and hydrochloric acid | To adjust the pH of (species) plasma during processing (in which it is exposed to heat) to prevent gelling | Sufficient for purpose to adjust pH | Acceptability determination | None under the accepted conditions of use (1) |
| Sodium lauryl sulfate | For use as whipping aid in egg products | Not to exceed 0.1 percent in dried egg whites; Not to exceed 0.0125 percent in liquid or frozen egg whites | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Sodium nitrite | For use on one side of a food packaging film used for vacuum packaging raw red meat and raw whole muscle cuts of red meat as a color fixative | At a maximum level of 113 milligrams per square meter of film. | GRAS Notice No. 000228 | Red meat packaged in a film containing sodium nitrite must be coded with a “Use or Freeze by” date not to exceed 34 days after packaging for ground red meat and 36 days for whole muscle cuts of red meat. |
| Sodium potassium hexametaphosphate | To decrease the amount of cooked out | Not to exceed 0.5 percent of product | GRAS Notice No. 000316 | Listed by common or usual name in |

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| | juices in meat and poultry products except where otherwise prohibited by the meat or poultry inspection regulations | formulation | | the ingredients statement (2) |
| Sodium siliocoaluminate | For use as anticaking agent in egg products | Not to exceed 2.0 percent in dried whole eggs or yolks | Acceptability determination; 21 CFR 160.105(d)(1) | Listed by common or usual name in the ingredients statement (2) |
| Stearidonic acid (SDA) soybean oil | For use as an ingredient in meat and poultry products | Sufficient for purpose | GRAS Notice No. 000283 | Listed by common or usual name in the ingredients statement (2) |
| Triethyl citrate | For use as whipping aid in egg products | Not to exceed 0.03 percent in liquid or frozen egg whites; not to exceed 0.025 percent in dried egg whites | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Triple salt of magnesium, ammonium, and potassium chloride | For use as a substitute for a portion of the sodium chloride normally used in meat and poultry products. | Sufficient for purpose | GRAS Notice No. 000272 | Listed by common or usual name in the ingredients statement (2) |
| Trisodium phosphate (as a component of phosphate blends, not to exceed 40 percent of the phosphate blend) | To decrease the amount of cooked out juices in meat food products except where otherwise prohibited by the meat inspection regulations and poultry food products except where otherwise prohibited by the poultry products inspection regulations | For meat food products, 5 percent of phosphate in pickle at 10 percent pump level; 0.5 percent of phosphate in meat food product (only clear solution may be injected into meat food product). For poultry food products, 0.5 percent of total product. | Acceptability determination | Listed by common or usual name in the ingredients statement (4) Note: Phosphates may be collectively designated as “sodium phosphates” or “potassium phosphates” |
| Trisodium diphosphate | For use as a stabilizer, moisturizer, and sequestraint for use in sausages (fine emulsions) | Not to exceed 0.5 percent of phosphate in product | GRAS Notice No. 000300 | Listed by common or usual name in the ingredients statement (2) Note: Phosphates may be collectively designated as “sodium phosphates” or “potassium phosphates” |

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| Tuna oil | For use as an alternative edible oil in the production of various meat and poultry products | Not to exceed 3.1 percent by weight of the product formulation for meat products and 1.8 percent by weight of the product formulation for poultry products | GRAS Notice No. 000109 | Listed by common or usual name in the ingredients statement (2) |
| Xanthan gum | To aid in suspending carrageenan and other insoluble solids (e.g., starch and soy protein) in the brine tank before poultry and ham pumping | Not to exceed 2 percent of the amount of carrageenan | Acceptability determination | None under the accepted conditions of use (1) |
| ***Packaging Systems*** | | | | |
| Carbon monoxide gas as part of Cryovac's modified atmosphere packaging system (for use with 550P Tray/Lid and LID551P) | Packaging fresh cuts of case ready muscle meat and case ready ground meat to maintain wholesomeness, provide flexibility in distribution, and reduce shrinkage of the meat | The use of carbon monoxide (0.4 percent), carbon dioxide (30 percent) and nitrogen (69.6 percent) as part of the Cryovac low oxygen modified atmosphere pack-aging system used with 550P Tray /Lid | Acceptability Determination | None under the accepted conditions of use (2) |
| Carbon monoxide gas as part of Cryovac's modified atmosphere packaging system | Packaging fresh cuts of case ready muscle meat and case ready ground meat to maintain wholesomeness | The use of carbon monoxide (0.4 percent), carbon dioxide (30 percent) and nitrogen (69.6 percent) introduced directly into the package. System uses a barrier lid that only covers a highly permeable patch. The permeable patch is a one half inch hole in the lid film. Barrier lid removed prior to display for retail sale | Acceptability determination | None under the accepted conditions of use (2) |
| Carbon monoxide gas as part of the Pactiv modified atmosphere packaging system (ActiveTech 2001) | Packaging fresh cuts of case ready muscle meat and case ready ground meat to maintain wholesomeness | The use of carbon monoxide (0.4 percent), carbon dioxide (30 percent) and nitrogen (69.6 percent) as part of | GRAS Notice No. 000083 | None under the accepted conditions of use (2) |

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| | | the Pactiv modified atmosphere packaging system | | |
| Carbon monoxide gas as part of a high oxygen modified atmosphere packaging (MAP) system used in accordance with GRN 000083 (Pactiv) | Packaging fresh cuts of fresh ground and whole muscle meat to maintain wholesomeness, provide flexibility in distribution, and reduce shrinkage of the meat | Not to exceed 0.4 percent of the modified atmosphere gas mixture | GRAS Notice No. 000251 | None under the accepted conditions of use (2) |
| Carbon monoxide gas as part of a high oxygen modified atmosphere pack-aging system used in accordance with GRN 000083 (Cargill) | Packaging fresh cuts of case-ready muscle meat and ground meat to maintain wholesomeness | Not to exceed 0.4 percent of the modified atmosphere gas mixture | Acceptability determination | None under the accepted conditions of use (2) |
| Carbon monoxide gas a part of Cargill's modified atmosphere packaging system introduced directly into the bulk or master container used for bulk transportation of fresh meat products. Meat products are subsequently repackaged in packages not containing a carbon monoxide modified atmosphere prior to retail sale (In accordance with GRN 000083) | Packaging fresh cuts of muscle meat and ground meat to maintain wholesomeness | Not to exceed 0.4 percent of the modified atmosphere gas mixture | Acceptability determination | None under the accepted condi-tions of use (2) |
| Carbon monoxide gas as part of the Precept modified atmosphere packaging system | Packaging case-ready fresh cuts of beef and pork as well as ground beef and pork to maintain wholesomeness | Carbon monoxide 0.4 percent (with a process tolerance of 20 percent, allowing for a carbon monoxide concentration up to 0.48 percent) in combination with carbon dioxide (20-100 percent) and nitrogen (0-80 percent) | GRAS Notice No. 000143 | None under the accepted conditions of use (2) Products packaged in this MAP system must be coded with a "Use or Freeze by" date not to exceed 28 days after packaging for ground meat and 35 days for whole muscle cuts |

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| Carbon monoxide gas as part of Precept's modified atmosphere packaging system | Packaging case-ready fresh cuts of poultry as well as ground poultry | Carbon monoxide 0.3 percent (with a process tolerance of 20 percent, allowing for a carbon monoxide concentration up to 0.36 percent), in combination with nitrogen (0-80 percent), and carbon dioxide (20-100 percent) | Acceptability determination | None under the accepted conditions of use (2) Products packaged in this MAP system must be coded with a "Use or Freeze by" date not to exceed 28 days after packaging for ground poultry and 35 days for whole muscle cuts of poultry |
| Carbon monoxide as a component of a modified atmosphere packaging system (Tyson Foods, Inc.) | Packaging case-ready fresh cuts of beef and pork as well as ground beef and pork | Carbon monoxide (at a level not to exceed 2.2 mg carbon monoxide per pound of packaged meat) in combination with carbon dioxide and nitrogen | GRAS Notice No. 000167 | None under the accepted conditions of use (2) Products packaged in this MAP system must be coded with a "Use or Freeze by" date not to exceed 28 days after packaging for ground meat and 35 days for whole muscle cuts |
| Carbon monoxide as part of the packaging system | Wholesale (primals and subprimals) | Carbon monoxide (21.4 ml/1 of water) dissolved in a brine/marinade (27.8 percent by weight) solution which is injected into meat wholesale-primals and subprimals. | GRAS Notice No. 000194 | None under the accepted conditions of use (2). |
| ***Poultry scald agents (must be removed by subsequent cleaning operations)*** | | | | |
| Alkyl polyglycosides | To remove feathers from poultry carcasses | Sufficient for purpose | GRAS Notice No. 000237 | None under the conditions of use (1) |
| Calcium acid phosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium acid pyrophosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |

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| Calcium bicarbonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium carbonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium dodecylbenzene sulfonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium 2-ethylhexyl sulfate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium hexametaphosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium hydroxide | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium lauryl sulfate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium phosphate (mono-, di-, and tribasic) | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium pyrophosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium sesquicarbonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium sulfate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Calcium tripolyphosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium acid phosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium acid pyrophosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium bicarbonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium carbonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium dodecylbenzene sulfonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium 2-ethylhexyl sulfate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |

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| Potassium hexametaphosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium hydroxide | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium lauryl sulfate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium phosphate (mono-, di-, and tribasic) | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium pyrophosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium sesquicarbonate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium sulfate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Potassium tripolyphosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Tetracalcium pyrophosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| Tetrapotassium pyrophosphate | To remove feathers from poultry carcasses | Sufficient for purpose | Acceptability determination | None under the conditions of use (1) |
| ***Tenderizing Agents*** | | | | |
| Calcium gluconate | Raw meat products | Solutions applied or injected into raw meat shall not result in a gain of 3 percent above green weight | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Protease preparation derived from *Bacillus subtilis* | Raw meat products | Solutions applied or injected into raw meat shall not result in a gain of 3 percent above green weight | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |
| Protease produced from *Bacillus subtilis* var. *amyloliquefaciens* | Raw meat products | Solutions applied or injected into raw meat shall not result in a gain of 3 percent above green weight | Acceptability determination | Listed by common or usual name in the ingredients statement (2) |

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| Protease produced from *Aspergillus niger* | Raw meat cuts and raw poultry muscle tissue of hen, cock, mature turkey, mature duck, mature goose, and mature guinea | Solutions applied or injected into raw meat or poultry tissue shall not result in a gain of 3 percent above green weight | GRAS Notice No. 000089 | Listed by common or usual name in the ingredients statement (2) |

Table 3: List of Approved On-Line Reprocessing (OLR) Antimicrobial Systems for Poultry

| **Approved OLR System** | **Company Name/ Distributor** | **Substance (antimicrobial) and if applicable, FDA's Food Contact Notification (FCN)** | **PPM Concentration (range), pH, contact time, temperature (if applicable)** | **Method of Application (e.g., Spray, Wash, Inside Outside Bird Washer (IOBW) with or without brushes** |
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| Accutab Chlorination™ | Southeastern Systems Inc. | Chlorine (Calcium hypochlorite**)** | Between 20 and 40 ppm, pH between 6 - 7, Citric acid Sodium bisulfate or an approved acidifier will be used to adjust pH level, spray rate in brush cabinet 5-10 gallons per minute. | IOBW **and** brush cabinet with spray nozzles. |
| AFCO 4360 FC-100 | AFCO | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1389) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 800 ppm, and HEDP not to exceed 96 ppm, minimum contact time of three (3) to ten (10) seconds | Spray |
| AFCO 4363 Perasafe 23 | AFCO | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 765 ppm, and HEDP not to exceed 62.6 ppm, with a contact time of three (3) to ten (10) seconds | Spray |
| AFCO Peragonn™ | AFCO Safe Foods | An aqueous solution of Peroxyacetic acid, hydrogen peroxide, | Peroxyacetic acid (not to exceed 220 ppm), 160 ppm for | Spray cabinet |

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| | Corporation | and HEDP. FCN 1089 | hydrogen peroxide, and 11 ppm for 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP). Delivery pressure of 55-80 psi for a total contact time that can be from 55-65 seconds. | |
| Amplon™ formerly AFTEC 3000 (AFT Clear 3000) | Zoetis formerly Advanced Food Technologies | Sulfuric acid, sodium sulfate and water | Fed continuously with tap water dosed with Amplon™ to a target pH of 1.8 +/- 0.4. For spray cabinets, the fresh mixture will be delivered to spray bars at a minimum system pressure of 10 psi and mixture flow between 5 gal/minutes and 10 gal/minute. | Spray cabinet |
| ASCEND™ | Zee Company | Acidified Sodium Chlorite. | Acidified Sodium Chlorite 500 to 1200 ppm in combination with citric acid, sodium bisulfate (sodium acid sulfate), or any GRAS acid sufficient to achieve a pH of 2.3 to 2.9 in accordance with 21 CFR 173.325 (Note: The pH depends on the type of poultry product.) | Spray |
| AVGard®XP | Danisco Inc. | Anhydrous sodium metasilicate (SMS) and Sodium sulfate or sodium carbonated as an anti- scaling agent | SMS rinse applied at a level of 4% +/- 2% | First Spray Cabinet - 20 ppm chlorine Second Spray Cabinet - SMS rinse applied at a level of 4% +/- 2% utilizing drench nozzles at sufficient flowrates and pressures so as to reduce particulate and microbial levels. |
| Avibrom | Albemarle Corp. | 1,3-dibromo-5,5-dimethylhydantion DBDMH | AviBrom minimum of 60 ppm and maximum of 100 ppm available bromine; 0.1 gallons of aqueous bromine solution for | First Spray Cabinet - 60-100ppm available bromine Second Spray Cabinet - recycled solution used for this cabinet to meet the |

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| | | | up to 15 seconds; Flow of water 25 psi pressure and 10 gallons per minute water input. | requirements of water reuse, specifically 9 CFR 416.2(g) |
| Bio-Cide | Bio-Cide International, Inc. | Acidified sodium chlorite FCN 739 | Mixing an aqueous solution of sodium chlorite with any GRAS acid to achieve a pH of 2.2 to 3.0 then further diluting this solution with a pH elevating agent (i.e., sodium bicarbonate, sodium carbonate, or an un-acidified sodium chlorite solution) to a final pH of 5.0 to 7.5. The final sodium chlorite concen-tration does not exceed 1200 mg/kg and the chlorine dioxide concentration does not exceed 30 mg/kg. | Spray cabinet |
| Birkoside MP-2 | Envirotech, Birko Corp. | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. FCN 887 | PAA between 80-150ppm Hydrogen peroxide not to exceed 110 ppm, HEDP not to exceed 13ppm, pH 3.0 – 7.0, contact time between 3 – 30 seconds. | Spray cabinet |
| CECURE™ | Safe Foods Corp | Cetylpyridinium chloride (The solution shall also contain propylene glycol complying with 21 CFR 184.1666 at a concentration of 1.5 times that of cetylpyridinium chloride). May be used in combination with an approved defoamer (i.e. | As a fine mist spray of an ambient temperature aqueous solution applied to raw poultry carcasses/ parts prior to immersion in a chiller, at a level not to exceed 0.3 gram cetylpyridinium chloride per pound of raw poultry | Spray cabinet, drench, dip |

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| | | Foamfix) in accordance with 21 CFR 173.340 and 9 CFR 424.21(c) | carcass/ parts, provided that the additive is used in systems that collect and recycle solution that is not carried out of the system with the treated poultry carcasses/ parts, or<br><br>Except when used as an immersion such as a dip tank (≤10 seconds), an aqueous solution such as a drench (minimum of 2 to 5 seconds) applied to raw poultry carcasses/ parts either prior to or after chilling at an amount not to exceed 5 gallons of solution per carcass, provided that the additive is used in systems that recapture at least 99 percent of the solution that is applied to the poultry carcasses/ parts. The concentration of cetylpyridinium chloride in the solution applied to the carcasses/ parts shall not exceed 0.8 percent by weight.<br><br>When application of the additive is not followed by immersion in a chiller, the treat-ment will be followed by a potable water rinse of the arcass/parts. The potable water | |

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| | | | may contain up to 50 ppm free available chlorine. | |
| ChemSan RBR | ChemStation | Peroxyacetic acid (PAA), FCN 887 | PAA between 80-150 ppm and a pH between 3-7 | Spray cabinet/ IOBW |
| ChemSan RBR-22/ ChemSan RBR-XC | Envirotech ChemStation | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. (FCN 1132) | The concentrated PAA formula is diluted and is to be supplied to the spray application at a concentration of: PAA between 80-400 ppm, Hydrogen peroxide not to exceed 385 ppm, HEDP not to exceed 50 ppm, pH 2.0 – 7.0, contact time between 15-120 seconds. | Spray cabinet |
| ChloroSan | Ecolab Inc., Alcide Corporation | Acidified sodium chlorite | Between 500 to 1200 ppm in combination with any GRAS acid at a level sufficient to achieve a pH of 2.3 to 2.9. | Spray cabinet, |
| Circlean IOBW Hypochlorous acid | Tecumseh Farms Smart Chicken, LLC | A mixture of sodium hypochlorite briquettes, carbon dioxide and water (citric acid may be added for chlorine tank descaling) | Between 20 – 50 ppm hypochlorous acid solution, pH 5-7, contact time of 2-4 seconds at 5-170 psi. 50% Citric acid at a final concentra-tion of 1.995 ppb. | IOBW (with small brushes inside) |
| Citrilow™ | Safe Foods Corporation | Citrilow™, formerly Precure™, is an aqueous solution of Citric and Hydrochloric acids | pH 1.0 – 2.0, contact time is a minimum 2 seconds | Spray cabinet |
| CMS Clear | CMS Technology, Inc. | An aqueous mixture of sulfuric acid, sodium sulfate, and water | The aqueous mixture is to be supplied for the spray application at a target pH of 1.8, with a range of 1.4 to 2.2. The mixture will be delivered at a minimum system pressure of 10 psi and mixture flow between 5 to 10 gallons per minute. | Spray Cabinet |

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| **DiverContact® P16** | **Diversey, Inc. and Cryovac , Inc.** | **An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylid ene-1,1-diphosphonic acid (HEDP), and sulfuric acid (optional, as a catalyst) and water (FCN 1284)** | **An aqueous mixture of peroxyacetic acid (PAA) not exceeding 2000 ppm and 1-hydroxyethylidine -1,1-diphosphonic acid (HEDP) and 136 ppm as listed in FCN 1284. Application pressures range between 20 and 90 pounds per square inch with a contact time between 3 and 30 seconds. An aqueous mixture of peroxyacetic acid (PAA) not exceeding 2000 ppm and 1-hydroxyethyli dine-1,1-diphosphonic acid (HEDP) and 136 ppm as listed in FCN 1284. Application Pressures range between 20 and 90 pounds per square inch with a contact time between 3 and 30 seconds.** | **Spray** |
| Enviro Tech | Enviro Tech Chemical Services, Inc. | Peroxyacetic acid FCN 887 | Between 80-150 ppm and a pH between 3-7 | Spray cabinet/ IOBW |
| FRESHFX L-12 | PeroxyChem LLC, formerly SteriFx, Inc. | A mixture of GRAS acids (citric, phosphoric and hydrochloric) that utilizes low pH to kill pathogens | pH 2.2 or less | Spray cabinet |
| FreshFX LP | PeroxyChem LLC, formerly SteriFx, Inc. | A mixture of GRAS Acids (citric, phosphoric and sulfuric) that utilizes low pH to kill pathogens | pH of 2.2 or less | Spray cabinet/ |

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| Hypochlorous acid | CMS Technology, Inc. | Hypochlorous acid acidified with CMS Blue, a combination of sulfuric acid, ammonium sulfate, copper sulfate, and water | CMS Blue added to 20-50 ppm chlorinated water to form hypochlorous acid at a pH range of 5 to 7. The mixture will be delivered at a system pressure range of 5-170 psig. | Spray cabinet |
| Hypochlorous Acid | Tyson Foods | Hypochlorous acid, acidified chlorine | Between 20 – 50 ppm hypochlorous acid solution, pH 5 to 7 | Spray cabinet |
| Hypochlorous acid | **TOMCO2 Systems** | Hypochlorous acid | Not to exceed 50 ppm, contact time minimum of 10 seconds. **Delivery pressure:** 5-170 psi, **pH: 5-10** | IOBW/**spray** cabinet system |
| INSPEXX™ 100 | Ecolab, Inc. | An aqueous mixture of peroxyacetic acid (PAA), peroxyoctanoic acid, acetic acid, octanoic acid, hydrogen peroxide, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | 1. PAA Concentration: The PAA concentration is applied at a concentration between 20-220 ppm using a single spray cabinet, wash or rinse. 2. Carcass Exposure Time: Carcass exposure to the PAA concen-tration is a minimum of 8 seconds. 3. Pressure: Cabinet water pressure is a minimum of 20 psi. | IOBW/spray wash |
| Inspexx 150 | ECOLAB | Peroxyacetic acid (PAA), acetic acid, hydrogen peroxide, and 1-hydroxyethylidene-1, 1- diphosphonic acid (HEDP). FCN 1096 | The level of PAA is applied at a concentration between 20- 220 ppm. | Spray cabinet/ Wash/IOBW |
| Inspexx 150, **3DT Inspexx 150, Inspexx 250, 3DT, Inspexx 250** | ECOLAB | Peroxyacetic acid (PAA), acetic acid, hydrogen peroxide, and 1- | The level of PAA is applied at a concentration | Spray cabinet/ Wash/IOBW |

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| | | hydroxyethylidene-1, 1- diphosphonic acid (HEDP). FCN 1495 | between 20- 2000 ppm, **exposure time: minimum of five (5) seconds, pH 2.0-8.0, pressure: minimum of 5 psi.** | |
| Microtox 5 P | Valley Chemical Solutions | Peroxyacetic acid (PAA), hydrogen peroxide, 1-hydroxyethylidine-1, 1- diphosphonic acid (HEDP) FCN 1247 | PAA is not to exceed 2000 ppm, 750 ppm hydrogen peroxide, and 136 ppm HEDP. Delivery pressure is 10-60 psig. | Spray |
| Microtox Plus | Valley Chemical Solutions | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, 1-hydroxyethylidine-1, 1-diphosphonic acid (HEDP) FCN 1247 | The concentrated PAA formula is diluted and supplied to the spray cabinet at a concentration between 25 - 2,000 ppm, 750 ppm hydrogen peroxide, and 136 ppm HEDP. Delivery pressure is 10-60 psig. | Spray |
| Microtox Plus | Valley Chemical Solutions | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulphuric acid and 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) (FCN 1514) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid (PAA) not to exceed 2000 ppm, hydrogen peroxide not to exceed 666 ppm, acetic acid, sulfuric acid, and HEDP not to exceed 130 ppm. | Spray |
| Microtox Ultra | Zee Company, Inc. | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid (optional), 1-hydroxyethy-lidene-1,1-diphosphonic acid (HEDP), and water (FCN 1666) | Peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 10 ppm | Spray Cabinet |
| **OxyFX 22** | **CraftChem, Inc. Predictive Food Safety Solutions, LLC** | **An aqueous solution Peroxyacetic acid (PAA), acetic acid, hydrogen peroxide, and 1-hydroxyethylidene-1, 1-diphosphoric acid (HEDP) FCN 1495** | **The level of PAA applied will not exceed 2000 ppm, hydrogen peroxide will not exceed 750 ppm,1-hydroxyethylidine-1, 1-diphosphonic acid (HEDP) will not exceed 136 ppm; contact time: two (2) – fifteen (15) seconds; pH 1.0 – 2.0;** | **Spray** |

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| | | | **pressure: 40-80 psi** | |
| OxypHresh 22 | CMS Technology, Inc. | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1379) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 728 ppm, and HEDP not to exceed 13.3 ppm; maximum contact time of fifteen (15) seconds; pressure of 5-170 psi | Spray Cabinet |
| Ozone | BOC Gas | An aqueous ozone solution. | Ozone applied at a rate of 3.5 to 4 ppm of ozone at a 3% concentration. | Spray |
| Pathiclean ™ | **TOMCO2 Systems** | A blend of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidine-1, 1-diphosphoric acid (HEDP), and water. (FCN 887) | Peroxyacetic acid not to exceed 220 ppm, hydrogen peroxide, not to exceed 110 ppm, acetic acid, 1-hydroxyethylidine-1, 1-diphosphoric acid (HEDP) not to exceed 13 ppm. Contact time **minimum o**f 10 seconds**. Delivery pressure**: 5-170 psi, **pH: 3-7** | IOBW/**spray** cabinet system |
| Peracet™ 2000 | CraftChem, Inc. | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1465) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 136 ppm, contact time of two (2) to fifteen (15) seconds | Spray Cabinet |
| Peraclean 22 | Evonik Corporation | An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, sulfuric acid (optional), 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), dipicolinic acid (DPA), sulfuric acid and water (FCN 1522) | The aqueous solution is to be supplied to the spray application at a concentration of: PAA not to exceed 1150 ppm, HP not to exceed 235 ppm, HEDP not to exceed 2.5 ppm and DPA not to exceed 0.5 ppm, pH 2-7, contact time of 1-15 seconds. | Spray |
| Perasan MP-2 | Envirotech | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. FCN | PAA between 80-150ppm Hydrogen peroxide not to exceed 110 ppm, HEDP not to exceed 13ppm, pH 3.0 | Spray cabinet |

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| | | 887 | – 7.0, contact time between 3 – 30 seconds. | |
| Perasan MP-2C | Envirotech | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and water. (FCN 1132) | The concentrated PAA formula is diluted and is to be supplied to the application at a concentration of : PAA between 80-400ppm Hydrogen peroxide not to exceed 385 ppm, HEDP not to exceed 50 ppm, pH 2.0 – 7.0, contact time between 15 – 120 seconds. | Spray cabinet |
| Peroyx X15™ and Peroxy X[22] | Xgenex | An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and sulfuric acid (optional) and water (FCN 1638) | An aqueous mixture not exceeding 2000 ppm PAA, 950 ppm HP, and 113 ppm HEDP | Spray |
| Promoat™ | Brainerd Chemical Company, Safe Foods Corporation | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and water. (FCN 1580) | Not exceed 2000 ppm PAA, hydrogen peroxide will not exceed 730 ppm, and HEDP will not exceed 14 ppm in spray for poultry carcasses measured prior to application. | Spray |
| ProtectFX System | PeroxyChem LLC, formerly Synergy Technologies | An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP). (FCN 1379) | The level of PAA not to exceed use concentrations of 2000 ppm, 728 ppm hydrogen peroxide, and 13.3 ppm of HEDP. | Spray cabinet |
| Protec™ 2000 | Safe Foods Corporation,<br><br>CraftChem, Inc. | An aqueous solution of peroxyacetic acid (PAA), hydrogen peroxide, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and water. (FCN 1465) | The aqueous solution is to be supplied to the spray application at a concentration of: PAA not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 136 ppm, minimum contact time of two (2) to fifteen (15) seconds. | Spray |
| SaniDateFD | Biosafe Systems, LLC | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene- | The aqueous solution is to be supplied to the spray application at a concentration of: | Spray, IOBW |

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| | | 1,1-diphosphonic acid (HEDP), and water (FCN 1501) | peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 728 ppm, and HEDP not to exceed 13.3 ppm with a contact time of 2 to 12 seconds | |
| Sanova | Ecolab Inc., Alcide Corporation | Acidified sodium chlorite | Between 500 to 1200 ppm in combination with any GRAS acid at a level sufficient to achieve a pH of 2.3 to 2.9. | Spray cabinet, |
| Spectrum®/ Spectrum 2000® | PeroxyChem LLC, formerly Peroxygens, FMC | A aqueous mixture of FCS 323 or FCS 880, peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) | PAA between 18-2000 ppm, contact time with the antimicrobial treatment solution will be between 1 – 30 seconds. | Spray, IOBW/ brushes |
| Syntrx3200 | PeroxyChem LLC, formerly Synergy Technologies | An aqueous solution of citric and hydrochloric acids adjusted to a pH of 1.0 to 2.0 | Applied with a contact time of 2 to 5 seconds measured prior to application. | Spray cabinet |
| Terrastat FCN 1379 | Brainerd Chemical Company | An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, and 1-hydroxyethylidene-1, 1- diphosphonic acid (HEDP). (FCN 1379) | The level of PAA not to exceed 2000 ppm, 728 ppm hydrogen peroxide, and 13.3 ppm of HEDP | Spray cabinet |
| Terrastat FCN 1580 | Brainerd Chemical Company | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and water. Peroxyacetic acid (FCN 1580) | Not exceed 2000 ppm PAA, hydrogen peroxide will not exceed 730 ppm, and HEDP will not exceed 14 ppm in spray for poultry carcasses measured prior to application | Spray |
| Trisodium phosphate | | Trisodium phosphate (TSP) | Pre-chill: Applied to carcasses as a spray up to 15 seconds using an 8-12 percent solution. Applied in accordance with good manufacturing practice.(21 CFR 182.1778) | Spray cabinet |

Table 4: List of Approved Off-Line Reprocessing (OFLR) Antimicrobial Systems for Poultry

| **Approved OFLR System** | **Company Name/ Distributor** | **Substance (antimicrobial) and if applicable, FDA's Food Contact Notification (FCN)** | **PPM Concentration (range), pH, contact time, temperature (if applicable)** | **Method of Application (e.g., Spray,** Wash, **Inside Outside Bird Washer (IOBW) with or without brushes** |
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| AFCO 4360 FC-100 | AFCO | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1389) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 800 ppm, and HEDP not to exceed 96 ppm, contact time of three (3) to ten (10) seconds | Spray |
| AFCO 4363 Perasafe 23 | AFCO | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 765 ppm, and HEDP not to exceed 62.6 ppm, with a contact time of three (3) to ten (10) seconds | Spray |
| AVIBROM (DBDMH) | Albemarle Corp. AVIBROM | 1,3-dibromo- ,5 dimethylhydation DBDMH bromine FCN 334 FCN 453 | Avibrom between 60-100 ppm available bromine; complete coverage of outside and inside of carcass for 60-90 seconds. | IOBW/spray cabinets |
| Birkoside MP-2 | Envirotech, Birko Corp. | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. FCN 887 | PAA between 80-150ppm Hydrogen peroxide not to exceed 110 ppm, HEDP not to exceed 13ppm, pH 3.0 – 7.0, contact time between 3 – 30 seconds. | Spray cabinet |
| Calcium Hypochlorite | N/A | Calcium hypochlorite | 20 ppm calculated as free available | Spray |

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| | | | chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine | |
| CECURE™ | Safe Foods Corp | Cetylpyridinium chloride (The solution shall also contain propylene glycol complying with 21 CFR 184.1666 at a concentration of 1.5 times that of cetylpyridinium chloride). May be used in combination with an approved defoamer (i.e. Foamfix) in accordance with 21 CFR 173.340 and 9 CFR 424.21(c) | As a fine mist spray of an ambient temperature aqueous solution applied to raw poultry carcasses/ parts prior to immersion in a chiller, at a level not to exceed 0.3 gram cetylpyridinium chloride per pound of raw poultry carcass/ parts, provided that the additive is used in systems that collect and recycle solution that is not carried out of the system with the treated poultry carcasses/ parts, or<br><br>Except when used as an immersion such as a dip tank (≤10 seconds), an aqueous solution such as a drench (minimum of 2-5 seconds) applied to raw poultry carcasses/ parts either prior to or after chilling at an amount not to exceed 5 gallons of solution per carcass, provided that the additive is used in systems that recapture at least 99 percent of the solution that is applied to the poultry carcasses/ parts. The concentration of | Spray, Dip |

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| | | | cetylpyridinium chloride in the solution applied to the carcasses/ parts shall not exceed 0.8 percent by weight.<br><br>When application of the additive is not followed by immersion in a chiller, the treatment will be followed by a potable water rinse of the carcass/parts. The potable water may contain up to 50 ppm free available chlorine. | |
| ChemSan RBR-22/<br>ChemSan RBR-XC | Envirotech ChemStation | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. (FCN 1132) | The concentrated PAA formula is diluted and is to be supplied to the spray application at a concentration of: PAA between 80-400 ppm, Hydrogen peroxide not to exceed 385 ppm, HEDP not to exceed 50 ppm, pH 2.0 – 7.0, contact time between 15 – 120 seconds. | Spray |
| Citrilow™ | Safe Foods Corporation | Citric Acid (CA), Hydrochloric acid (HCl), and water. | The application time will not be less than 2 seconds. pH between 1 and 2 | Spray |
| **DiverContact® P16** | **Diversey, Inc. and Cryovac , Inc.** | **An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and sulfuric acid (optional, as a catalyst) and water (FCN 1284)** | **An aqueous mixture of peroxyacetic acid (PAA) not exceeding 2000 ppm and 1-hydroxyethylidine-1,1-diphosphonic acid (HEDP) not exceeding 136 ppm; contact time: three (3) –thirty (30) seconds; pH: 3.5 – 6.5; pressure: 20 -** | **Spray** |

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| Enviro Tech | Enviro Tech Chemical Services, Inc. | Peroxyacetic acid (PAA), FCN 887 | PAA between 80-150 ppm and a pH between 3-7 | Spray |
| Hypochlorous acid | N/A | Electrolytically generated hypochlorous acid | 20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine. | Spray |
| Inspexx 150 | ECOLAB | Peroxyacetic acid (PAA), acetic acid, hydrogen peroxide, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP). FCN 1096 | The level of PAA is applied at a concentration between 40-220 ppm PAA. | Spray, Wash or Rinse |
| Inspexx 150, **3DT Inspexx 150, Inspexx 250 3DT, Inspexx 250** | ECOLAB | Peroxyacetic acid (PAA), acetic acid, hydrogen peroxide, and 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP). FCN 1495 | The level of PAA is applied at a concentration between 40 - 2000 ppm, **exposure time: minimum of five (5) seconds, pH 2.0-8.0, pressure: minimum of 5 psi.** | Spray, Wash, or Rinse |
| Microtox 5 P | Valley Chemical Solutions | Peroxyacetic acid (PAA), hydrogen peroxide, 1-hydroxyethylidine-1, 1- diphosphonic acid (HEDP) FCN 1247 | PAA is not to exceed 2000 ppm, 750 ppm hydrogen peroxide, and 136 ppm HEDP. Delivery pressure is 10-60 psig. | Spray |
| Microtox Plus | Valley Chemical Solutions | Peroxyacetic acid (PAA), hydrogen peroxide, 1-hydroxyethylidine-1, 1- diphosphonic acid (HEDP) FCN 1247 | The concentrated PAA formula is diluted, supplied to the spray equipment at ambient pressure and at a concentration of : PAA is not to exceed 2000 ppm, 750 ppm hydrogen peroxide, and 136 ppm HEDP. | Spray |
| Microtox Plus | Zee Company, Inc. | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid (optional), 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 | Spray |

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| | | (FCN 1514) | ppm, hydrogen peroxide not to exceed 666 ppm, and HEDP not to exceed 130 ppm | |
| Microtox Ultra | Zee Company, Inc. | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, sulfuric acid (optional), 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1666) | Peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 10 ppm | Spray |
| **OxyFX 22** | **CraftChem, Inc., Predictive Food Safety Solutions, LLC** | **An aqueous solution Peroxyacetic acid (PAA), acetic acid, hydrogen peroxide, and 1-hydroxyethylide ne-1, 1-diphosphoric acid (HEDP) FCN 1495** | **The level of PAA applied will not exceed 2000 ppm, hydrogen peroxide will not exceed 750 ppm,1-hydroxyethylidine-1,1-diphosphonic acid (HEDP) will not exceed 136 ppm; contact time: of two (2) – fifteen (15) seconds; pH 1.0 – 2.0; pressure: 40-80 psi** | **Spray** |
| Pathiclean TOMCO$_2$ Systems | TOMCO Equipment Co.* | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. (FCN 887)* | *Perasan MP-2 (EnviroTech) PAA not to exceed 220 ppm, hydrogen peroxide, not to exceed 110 ppm, acetic acid, 1-hydroxyethylidine-1, 1-diphosphoric acid (HEDP), not to exceed 13 ppm. Contact time of 5 seconds at 5-170 psig. | Spray |
| Pathiclean TOMCO$_2$ Systems | TOMCO Equipment Co.* | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. (FCN 1132) | *Perasan MP-2C (EnviroTech) The concentrated PAA formula is diluted and is to be supplied to the spray equipment at a concentration of : PAA between 80-400 ppm | Spray |

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| | | | Hydrogen peroxide not to exceed 385 ppm, HEDP not to exceed 50 ppm, pH 2.0 – 7.0, contact time of 5 seconds at 5-170 psig. | |
| Peracet™ 2000 | CraftChem, Inc. | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1465) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 136 ppm, contact time of two (2) to fifteen (15) seconds | Spray Cabinet |
| Peraclean 22 | Evonik Corporation | An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, sulfuric acid (optional), 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), dipicolinic acid (DPA), sulfuric acid and water (FCN 1522) | The aqueous solution is to be supplied to the spray application at a concentration of: PAA not to exceed 1150 ppm, HP not to exceed 235 ppm, HEDP not to exceed 2.5 ppm and DPA not to exceed 0.5 ppm, pH 2-7, contact time of 1-15 seconds. | Spray |
| Peragonn™ | Safe Foods Corporation | Peroxyacetic acid (PAA), hydrogen peroxide, and 1-hydroxyethylidene-1,1- diphosphonic acid (HEDP). FCN 1089 | PAA is not to exceed 220 ppm; hydrogen peroxide; and 11 ppm 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP). | Spray |
| PERASAN MP-2 | Tyson Foods* | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. (FCN 887) | PERASAN MP -2 *(EnviroTech) PAA between 80-150 ppm Hydrogen peroxide not to exceed 110 ppm, HEDP not to exceed 13 ppm, pH 3.0 – 7.0, contact time | Spray |

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| | | | between 3 – 30 seconds. | |
| Perasan MP-2C | Envirotech | Concentrated formula of Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. (FCN 1132) | The concentrated PAA formula is diluted and is to be supplied to the spray application at a concentration of : PAA between 80-400ppm Hydrogen peroxide not to exceed 385 ppm, HEDP not to exceed 50 ppm, pH 2.0 – 7.0, contact time between 15 – 120 seconds. | Spray |
| Peroyx X15™ and Peroxy X[22] | Xgenex | An aqueous mixture of peroxyacetic acid (PAA), hydrogen peroxide (HP), acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and sulfuric acid (optional) and water (FCN 1638) | An aqueous mixture not exceeding 2000 ppm PAA, 950 ppm HP, and 113 ppm HEDP | Spray |
| Promoat™ | Brainerd Chemical Company, Safe Foods Corporation | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and water. (FCN 1580) | Not exceed 2000 ppm PAA, hydrogen peroxide will not exceed 730 ppm, and HEDP will not exceed 14 ppm in spray for poultry carcasses measured prior to application. | Spray |
| PROTECTFX™ 993 | PeroxyChem LLC, formerly Synergy Technologies | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1- hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. Peroxyacetic acid (FCN 993) | The level of PAA not to exceed 220 ppm, hydrogen peroxide will not exceed 80 ppm, and HEDP will not exceed 1.5 ppm measured prior to application | Spray |
| Protec™ 2000 | Safe Foods Corporation<br><br>CraftChem, Inc. | An aqueous solution of peroxyacetic acid (PAA), hydrogen peroxide, 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP) and water. (FCN 1465) | The aqueous solution is to be supplied to the spray application at a concentration of: PAA not to exceed 2000 ppm, hydrogen peroxide not to exceed 750 ppm, and HEDP not to exceed 136 ppm, contact time of two | Spray |

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| | | | (2) to fifteen (15) seconds. | |
| SaniDateFD | Biosafe Systems, LLC | An aqueous mixture of peroxyacetic acid, hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP), and water (FCN 1501) | The aqueous solution is to be supplied to the spray application at a concentration of: peroxyacetic acid not to exceed 2000 ppm, hydrogen peroxide not to exceed 728 ppm, and HEDP not to exceed 13.3 ppm with a contact time of 2 to 12 seconds | Spray |
| Sodium Hypochlorite | N/A | Sodium Hypochlorite | 20 ppm calculated as free available chlorine Note: Agency guidance has allowed the use of up to 50 ppm calculated as free available chlorine | Spray |
| Spectrum® / Spectrum 2000® | PeroxyChem LLC, formerly Peroxygens, FMC | A aqueous mixture of FCS 323 or FCS 880, peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, and 1- hydroxyethyl-lidene-1, 1- diphos-phonic acid (HEDP) | PAA between 18-2000 ppm; Contact with the antimicrobial treatment solution will be between 1 – 30 seconds. | Spray, dip tank, IOBW brush cabinet with spray nozzles. |
| Terrastat FCN 1580 | Brainerd Chemical Company | Peroxyacetic acid (PAA), hydrogen peroxide, acetic acid, 1-hydroxyethylidene-1, 1- diphosphonic acid (HEDP) and water. Peroxyacetic acid (FCN 1580) | PAA not exceed 2000 ppm, hydrogen peroxide will not exceed 730 ppm, and HEDP will not exceed 14 ppm in spray for poultry carcasses measured prior to application | Spray |