

FSIS has developed the following guidance for water, ice and solution reuse.

ICE REUSE

Ice from ice packed poultry may be reused to repack raw whole birds or parts. The following are recommended:

- * Establish a procedure to assure that ice is collected and held in a container that drains freely and in a sanitary manner. The procedure should address collection and washing of ice before it is reused.
- * Establish a procedure for identifying reused ice from fresh ice.
- * The ice or the product should be packaged in an impervious, sealed container, such as a plastic bag, to prevent direct contact between the product and ice.
- * Ice used on raw product should not be reused on any partially- or fully-cooked product.
- * The ice should be free of any observable foreign material as well as large particles of poultry meat and fat. If the ice is washed, continuous drainage should be maintained during the washing procedure.
- * Ice from damaged containers should not be used.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

BRINE REUSE

Brine may be reused to chill cooked product for various lengths of time based on the type of casing, salinity, and temperature.

Brine solution that is reused to chill raw or heat-treated, but not fully cooked product (e.g., smoked bacon) should be reconditioned in a manner to prevent the brine solution from becoming contaminated and adulterating the product.

Brine reuse to chill raw product should follow the same criteria as brine reused to chill heat-treated, not fully cooked product.

The following are recommended:

- * Establish procedures for monitoring the temperature, salinity, and free chlorine concentration of the brine being reused to chill heat-treated product.
- * Establish an ongoing microbiological plan to ensure that the brine solution is maintained pathogen free. The monitoring plan should cover the type and frequency of any microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reused brine solution:

Cooked Product

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Daily	>2500 cfu/ml
Total Coliform	Weekly	Positive
Fecal Coliform	Weekly	Positive

Raw or Heat-Treated, Not Fully Cooked Product (i.e. Bacon Bellies)

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Daily	>5000 cfu/ml
Total Coliform	Weekly	>10 cfu/ml
Fecal Coliform	Weekly	Positive

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established.

However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.

- * Visible contamination defects should be removed from the product before it is placed in the brine solution.
- * The solution should be kept free of visible meat and fat particles and other objectionable conditions by effective methods such as filtration, skimming, or overflow.
- * When the brine solution is used without reconditioning for one shift or longer, the solution should be discarded at the following specified intervals, and all equipment, tanks, lines should be thoroughly cleaned and sanitized:

<u>Duration of Use</u>	<u>Heat-Treated Product (Classes)</u>	<u>Additional Conditions</u>
One production shift	All Classes: No casing Perforated casing Edible casing Semipermeable casing Impermeable casing	None
Up to 24 hours	All classes: No casing Perforated casing Edible casing Semipermeable casing Impermeable casing	1. Minimum salt 5% (19° salimeter) 2. Maintain 40° F. or lower
Up to 1 week	One class: Semipermeable casing Impermeable casing	1. Minimum salt 9% (32° salimeter) 2. Maintain 28° F. or lower
Up to 4 weeks	One class: Semipermeable casing Impermeable casing	1. Minimum salt 20% (76° salimeter) 2. Maintain 10° F. or lower

- * Cooked product, for example frankfurters, cannot be chilled in a brine solution that has been used to chill raw or heat-treated, not fully cooked product, for example, bacon bellies. (Raw product may be chilled after cooked product).
- * Products with semipermeable or impermeable casing that are being chilled in brine that is being reused for longer than 24 hours should be trimmed if they have broken casings or have been similarly exposed. The trimmings should be discarded as inedible.
- * A free chlorine concentration of 1-5 ppm should be maintained in the reuse brine solution.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

COOK AND CHILL WATER REUSE

Water may be reused to cook product and to chill cooked product. The following are recommended:

- * Establish procedures for monitoring the temperature of the cook or chill water, and free chlorine concentration of the chill water being reused to chill cooked product.
- * Establish an ongoing microbiological plan to ensure that the reuse cook or chill water is maintained pathogen free. The monitoring plan should cover the type and frequency of any microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reused cook and/or chill water:

Chill Water

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Daily	>500 cfu/ml
Total Coliform	Weekly	Positive
Fecal Coliform	Weekly	Positive
Turbidity	Weekly	>5 NTU

Cook Water

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Daily	>500 cfu/ml
Gas Forming Anaerobes	Weekly	>10 cfu/ml
Total Coliform	Weekly	Positive
Turbidity	Weekly	>5 NTU

- * Initially, frequency of microbial testing would be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Visible contamination defects should be removed from the product before it is placed in the cook and/or chill water.
- * The cook or chill water should be kept free of visible meat and fat particles and other objectionable conditions by effective methods such as filtration, skimming, or overflow.

- * The chill water should be maintained at a temperature of 50° F. or less.
- * The cook water should be maintained at a temperature of 150° F. or higher.
- * A free chlorine concentration of 1-5 ppm should be maintained in the reuse chill water
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

PROPYLENE GLYCOL REUSE

Propylene glycol solution may be reused to chill raw product such as hamburger chubs, sausage chubs, and bagged poultry for up to an indefinite length of time. The following are recommended:

- * Establish procedures for monitoring the temperature, propylene glycol concentration, and free chlorine concentration of the propylene glycol solution being reused to chill raw product.
- * Establish an ongoing microbiological plan to ensure the continuous safety of the propylene glycol solution. The monitoring plan should cover the type and frequency of any microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reused propylene glycol solution:

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Weekly	>500 cfu/ml
Total Coliform	Weekly	>10 cfu/ml
Fecal Coliform	Weekly	Positive

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Visible contamination defects should be removed from the product before it is placed in the propylene glycol solution.
- * The propylene glycol solution should be kept free of visible meat and fat particles and other objectionable conditions by effective methods such as filtration, skimming, or overflow.
- * The propylene glycol solution should be maintained at a temperature of 10° F. or less during production hours and 40° F. or less during nonproduction hours.
- * The propylene glycol should be of a type that is authorized for use for immersion freezing of meat and poultry products.
- * The product should be enclosed in a package that does not allow the propylene glycol solution directly or indirectly

to contact it. It is recommended that product be enclosed within an impervious package.

- * Products that are exposed to the propylene glycol solution should be appropriately handled as contaminated product. One appropriate way of handling the contaminated product would be to rewash the product by water spraying. All traces of refrigerant should be removed before product is passed for food. If water washing or trimming cannot remove all contamination, the affected portion should be condemned.
- * The propylene glycol solution should be adequately removed from the packaged products after freezing and before placing into shipping containers by effective methods such as water spray washing equipment.
- * A free chlorine concentration of 1-5 ppm is recommended to be maintained in the propylene glycol.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

CHILLER OVERFLOW WATER REUSE

Overflow water from the poultry chilling units may be reused to move heavy solids in eviscerating troughs (not to flush sides of trough), scald tank, picker aprons, and washing picking room floors. The following are recommended:

- * Establish a procedure to assure that chiller overflow water is collected and used in a sanitary manner.
- * Chiller overflow water added to the scalding should be a minimum of 140° F.
- * The use of chiller overflow water to rinse picker aprons and wash picking room floors should be used in a manner that prevents cross-contamination to other areas of the plant such as that due to employee traffic.
- * The chiller overflow water should be kept free of visible solids.
- * The chiller overflow water is collected and handled in a sanitary manner.
- * Establish an ongoing microbiological plan to ensure that the chiller overflow reuse water is maintained pathogen free. The monitoring plan should cover the type and frequency of any microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reused chiller overflow water:

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Coliforms	Weekly	Positive
Fecal Coliforms	Weekly	Positive
<u>Salmonella</u>	Weekly	Positive
<u>Staphylococcus aureus</u> (coagulase positive staphylococci)	Weekly	Positive

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Establish procedures to correct deficiencies that occur and

to prevent reoccurrence.

CONDENSER OR COMPRESSOR WATER REUSE

Water from condensers or compressors may be reused in edible and inedible product areas providing that it is maintained pathogen free. The following are recommended:

- * The reuse condenser or compressor water should be collected and handled in a sanitary manner.
- * The reuse condenser or compressor water should be maintained in a manner that prevents the solution from becoming contaminated with coliforms, oil and grease, refrigerant, or heavy metals that can adulterate product.
- * A free chlorine concentration of 1-5 ppm should be maintained in the reuse condenser or compressor water.
- * An ongoing monitoring plan should be established to ensure that the reuse condenser and compressor water is maintained pathogen free. The monitoring plan should cover the type and frequency of any physical, chemical, and microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reuse chill water:

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Weekly	>500 cfu/ml
Total Coliform	Weekly	Positive
Fecal Coliform	Weekly	Positive
Turbidity	Weekly	no samples > 5 NTU

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

REUSE WATER TO FLUME CHICKEN FEET (PAWS)

Poultry chiller overflow water and water used to flume chicken feet (paws) may be used to flume chicken feet including through an in-line paw chiller. The following are recommended:

- * Potable water should be added periodically to prevent organic matter buildup.
- * The chiller overflow water and paw flume water should be kept free of visible solids.
- * A free chlorine concentration of 1-5 ppm should be maintained in the reuse water used to convey chicken feet (paws).
- * An ongoing microbiological monitoring plan should be established to ensure that the reuse chiller overflow water and paw flume water used to flume chicken paws is maintained pathogen free. The monitoring plan should cover the type and frequency of any microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reuse chiller overflow water and paw flume water:

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Coliforms	Weekly	Positive
Fecal Coliforms	Weekly	Positive
<u>Salmonella</u>	Weekly	Positive
<u>Staphylococcus aureus</u> (coagulase positive staphylococci)	Weekly	Positive

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

**REUSE WATER USED TO WASH LIVESTOCK PENS, TRUCKS, POULTRY CAGES,
AND SIMILAR AREAS**

Water from establishment's secondary and tertiary wastewater treatment facility or other processing water may be reused to wash livestock pens, trucks, poultry cages, and other similar areas. The following are recommended:

- * Water from the establishment's wastewater treatment facility or other processing water used for washing should be kept free of visible solids.
- * A free chlorine concentration of 1-5 ppm should be maintained in the reuse water.
- * The water from the establishment's wastewater treatment facility or other processing water should be collected and handled in a sanitary manner.
- * The establishment's wastewater treatment system must not be treating human waste. Human waste must be kept separate from plant waste and not commingled at the wastewater treatment system.
- * An ongoing microbiological monitoring plan should be established to ensure that the reuse water from the establishment's wastewater treatment facility or other processing water are maintained pathogen free. The monitoring plan should cover the type and frequency of any microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reuse water from the establishment's wastewater treatment facility or other processing water:

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Coliforms	Weekly	Positive
Fecal Coliforms	Weekly	Positive
<u>Salmonella</u>	Weekly	Positive
<u>Staphylococcus aureus</u> (coagulase positive staphylococci)	Weekly	Positive

- * Initially, frequency of microbial testing should be at the

highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing until system controls are re-established.

- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

REUSE WATER USED TO WASH INEDIBLE PRODUCT AREAS

Water from throughout the plant may be reused in inedible product areas (i.e. washing offal sump screen, flushing feather flow-away troughs, flushing eviscerating troughs that are covered with metal plates, etc.). The following are recommended:

- * The reuse water should be used in a manner that prevents cross-contamination to other areas of the plant such as that due to employee traffic.
- * The reuse water used should not violate any OSHA requirements.
- * The reuse water used in inedible areas under FDA jurisdiction, such as pet food areas, must also meet FDA requirements.
- * The reuse water should be kept free of visible solids.
- * The reuse water is collected and handled in a sanitary manner.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

REUSE WATER FROM AN ADVANCED WASTEWATER TREATMENT FACILITY

Reuse water from an advanced wastewater treatment facility may be used on edible product (but not in product formulation) and throughout the plant in edible and inedible production areas. The following are recommended:

- * An advanced wastewater treatment facility should meet EPA requirements.
- * The establishment's advanced wastewater treatment must not be treating human waste. Human waste must be kept separate from plant waste and not commingled at the advanced wastewater treatment facility.
- * The establishment should have qualified and trained personnel who monitor, regulate, and record the wastewater treatment system.
- * The establishment should have a program in place that identifies, monitors, and records the treatment measures necessary for safe and effective operation of the wastewater treatment facility.
- * The potable and reuse water lines should be identified and separated except at junctions where appropriate valves, etc. protect the potable water supply.
- * Dual check valves, alarms, etc., should be in place in case the reuse water system malfunctions to prevent the reuse water from contaminating the potable water supply.
- * A "Fail-Safe" system should be in place to prevent substandard reuse water from entering the "end use" part of the system and contaminating edible product.
- * A final potable water rinse should be applied to any edible product and any equipment that contacts reuse water.
- * The "End Use" reused water should be monitored and tested daily to ensure that the reuse water meets the criteria for the intended use.
- * The reuse water should meet the following "Safe for the Intended Use" EPA Criteria:
 1. Microbiological analysis
 - a. Total Aerobic Plate Count \leq 500 CFU/ML
 - b. Total Coliforms - None

- c. E. coli - None
 - 2. Chemical analysis
 - Total Organic Carbon (TOC) \leq 100 MG/L
 - 3. Physical analysis
 - Turbidity - \leq 5% of samples analyzed \geq 1 NTU by EPA nephelometry method or equivalent method;
no samples > 5 NTU
 - 4. The reuse water should be tested for heavy metals at least once a year and meet the appropriate EPA Maximum Contaminant Levels (MCL's).
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.

REUSE WATER IN VAPOR LINES FROM DEODORIZERS

Water in vapor lines from deodorizers (condensers) used in preparation of lard and similar edible product may be reused for the same identical use. The following are recommended:

- * The complete drainage and disposal of the reused water, effective cleaning of the equipment, and renewal with fresh potable water should be accomplished often enough to assure an acceptable supply of reuse water for the preparation of lard and similar edible product.
- * The reuse water in vapor lines from deodorizers should be maintained in a manner that prevents the solution from becoming contaminated such as with coliforms, oil, or grease that can adulterate the product.
- * An ongoing monitoring plan should be established to ensure that the reuse water in vapor lines from deodorizers is maintained pathogen free. The monitoring plan should cover the type and frequency of any physical, chemical, and microbiological analysis, action limits (upper/lower control limits), and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reuse water:

<u>Analysis</u>	<u>Frequency</u>	<u>Action Level</u>
Total Plate Count	Weekly	>500 cfu/ml
Total Coliform	Weekly	Positive
Fecal Coliform	Weekly	Positive
Turbidity	Weekly	No samples > 5 NTU

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Establish procedures to correct deficiencies that occur to prevent reoccurrence.

**Reuse Water From Single Or Multiple Point Sources Can Be Used For
Single Or Multiple Point Sources In The
Slaughter Process**

Reuse water from any slaughter process location(s) (e.g., scalding, inside/outside bird washer, chiller overflow water, etc) can be used at any location(s) in the slaughter process including the chiller make-up water and for general sanitation purposes. For example, chiller overflow water and water from the final bird washer that are reconditioned and meet the criteria listed below can be reused in the scalding, throughout the eviscerating line, inside/outside bird washer, final bird washer, chiller make-up water and for general sanitation purposes. Consequently, since the reuse water can replace potable water used during the slaughter process, it needs to meet a higher water reuse standard than pathogen free. The following are recommended:

- * Establish procedures for monitoring turbidity and concentration of the water being reused during the slaughter process.
- * A free chlorine concentration of 1-5 ppm should be maintained in the reuse water.
- * The potable and reuse water lines should be identified and separated except at junctions where appropriate valves, etc, protect the potable water supply.
- * A system should be in place to prevent substandard reuse water from entering the "end use" part of the system and contaminate edible product.
- * Establish an ongoing microbiological plan to ensure the continuous safety of reuse water during the slaughter process. The monitoring plan should cover the type and frequency of any microbiological analysis, and action limits (upper/lower control limits) and actions taken to ensure product safety when those limits are exceeded. It is recommended that the establishment perform the following ongoing monitoring of the reconditioned water:

<u>Analysis</u>	<u>Frequency</u>	<u>Action level</u>
Total Plate Count	Weekly	>500 cfu/ml
Total Coliform	Weekly	Positive
Fecal Coliform	Weekly	Positive
Turbidity	Daily	>5 NTU

- * Initially, frequency of microbial testing should be at the highest level until control is established. Reduced testing may be appropriate once control has been established. However, loss of control may necessitate a return to increased testing frequency until system controls are re-established.
- * Establish procedures to correct deficiencies that occur and to prevent reoccurrence.