

CHAPTER 1545
DEPARTMENT OF AGRICULTURE
MEAT, FISH, AND POULTRY INDUSTRY

1545.3350 VACUUM PACKAGED HOT
PROCESSED SMOKED OR HOT
PROCESSED SMOKE-FLAVORED
SALMON

**1545.3350 VACUUM PACKAGED HOT PROCESSED SMOKED OR HOT
PROCESSED SMOKE-FLAVORED SALMON.**

Subpart 1. Applicability. Parts 1545.3180 to 1545.3260, 1545.3280, 1545.3290, and 1545.3310 do not apply to air tight or vacuum packaged hot processed smoked or hot processed smoke-flavored salmon which has been processed and packaged in a processing facility in compliance with National Marine Fisheries Service, chapter 2; Code of Federal Regulations, title 50, part 260 and which meets the requirements of this part.

Subp. 2. Defrosting. Defrosting of eviscerated frozen salmon must be carried out in:

A. air at 45 degrees Fahrenheit or below until the salmon is completely thawed and the internal temperature of any part of the salmon does not exceed 45 degrees Fahrenheit; or

B. a continuous water flow tank or spray system until the salmon is thawed. Salmon may not be mixed with other species during thawing. Salmon may not remain in the tank for over four hours after they are completely defrosted and the temperature in any part of the salmon may not exceed 60 degrees Fahrenheit during this period. If longer delays are encountered, the salmon must be returned to temperatures of 38 degrees Fahrenheit or below until the salmon is brined.

Subp. 3. Washing. Both fresh and thawed salmon must be washed thoroughly with a vigorous chlorinated water spray or in a continuous water flow system prior to brining. The chlorine concentration in the water may not exceed 50 parts per million available chlorine.

Subp. 4. Dry-salting; brine. Salmon must be dry-salted at a temperature not to exceed 38 degrees Fahrenheit throughout the salmon, or if brined, the salmon may not be mixed with other species of fish in the same tank and must be brined so that the temperature of the salmon and the brine does not exceed 60 degrees Fahrenheit at the start of brining.

If the brine time exceeds four hours, the brining must take place in a refrigerated room of 42 degrees Fahrenheit or lower. The salmon may not be held above 38 degrees Fahrenheit for more than 48 hours.

Brines may not be reused unless there is an adequate process, such as ultrafiltration, to return the brine to an acceptable microbiological level. Brine tanks that have been used to brine other species of fish must be cleaned and sanitized before being used to brine salmon.

Subp. 5. Sodium chloride, sodium nitrite content. Hot process smoked or hot process smoke-flavored salmon must be brined so that the final sodium nitrite content of the loin muscle of the finished product is not less than 100 parts per million and is not more than 200 parts per million immediately after processing. These same products may not contain less than the minimum concentration of one of the following combinations of water phase salt and sodium nitrite in the deepest part of the loin:

A. 3.5 percent water phase salt with 100 parts per million nitrite.

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- B. 3.4 percent water phase salt with 120 parts per million nitrite.
- C. 3.3 percent water phase salt with 140 parts per million nitrite.
- D. 3.2 percent water phase salt with 160 parts per million nitrite.
- E. 3.1 percent water phase salt with 180 parts per million nitrite.

Subp. 6. **Temperature monitoring.** Hot process smoked or hot process smoke-flavored salmon must be heated by a controlled heat process that provides a monitoring system, such as calibrated probes or dial thermometers, positioned in as many strategic locations in the oven as necessary to assure that all products reach the minimum internal temperature.

The temperature monitoring devices must be tested for accuracy against a known accurate standard thermometer upon installation and at least once a year thereafter, or more frequently if necessary, to ensure their accuracy. Graduations on the temperature monitoring devices may not exceed two degrees Fahrenheit within a range of ten degrees Fahrenheit of the processing temperature.

Each salmon portion must be heated to an internal temperature of 150 degrees Fahrenheit or higher and maintained at 150 degrees Fahrenheit or higher for 30 minutes or longer.

Subp. 7. **Application of smoke.** Liquid smoke, generated smoke, or a combination of liquid smoke and generated smoke must be applied to the entire product. If only liquid smoke is used in the process, it may be applied to the product prior to, at the beginning of, or during the process. Liquid smoke added during the process must be applied before the internal temperature of the product exceeds 125 degrees Fahrenheit. The liquid smoke must be prepared by the aqueous process (U.S. Patent 3,106,473) and have a minimum of the following major constituents in its compositions: ten percent titratable acidity, nine milligrams phenol per gram, 12 grams carbonyls per 100 milliliter. The constituents must be used at concentrations of 50 percent or more.

When only generated smoke is used in the process, dense smoke must be applied to the salmon for at least 90 minutes at the beginning of the process. If a drying cycle is used in the smoking process, the air temperature surrounding the salmon may not exceed 110 degrees Fahrenheit and the time period may not exceed 60 minutes at temperatures between 60 degrees Fahrenheit and 110 degrees Fahrenheit before the application of smoke. If temperatures below 60 degrees Fahrenheit are used, the time period may not exceed six hours. Generated smoke must be produced from burning hardwood. If a combination of liquid smoke and generated smoke is used, the procedures for liquid smoke must be followed and the generated smoke may be applied at any stage of the process.

Subp. 8. **Cooling; storage and distribution.** The finished product must be cooled to a temperature of 50 degrees Fahrenheit or below within five hours after cooking and further cooled to a temperature of 38 degrees Fahrenheit or below within 12 hours after cooking. The finished product must be maintained at 38 degrees Fahrenheit or lower during all subsequent storage and distribution.

Subp. 9. **Labeling.** Primary packages and master cartons must be clearly marked with a statement to maintain the product below 38 degrees Fahrenheit. If salmon is frozen, the label must clearly direct users to thaw the salmon at refrigerated temperatures and to store the thawed salmon below 38 degrees Fahrenheit.

Subp. 10. **Analysis.** The finished product must be analyzed chemically with sufficient frequency to assure that the required water-phase salt and sodium nitrite is obtained and the other chemical additives are present at authorized levels. To reduce the possibility of postprocessing contamination with food poisoning bacteria, the product must be vacuum-packaged only within the facility in which it was processed.

Subp. 11. **Methods.** Samples must be analyzed by the procedures described in the 14th edition of Official Methods of Analysis of the Association of Official

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Analytical Chemists (AOAC) (Sidney Williams (ed.), 1984), which is incorporated by reference, or by methods which have been demonstrated to be comparable to the AOAC methods. The publication incorporated in this subpart is available at the Saint Paul Public Library and is not subject to frequent change.

A. Water-phase salt analysis method. Determine sodium chloride (NaCl in the following equation) according to AOAC (14th ed.), sections 18.034 and 18.035.

Determine moisture (H₂O in the following equation) according to AOAC (14th ed.), section 24.003(a).

Calculate water-phase salt as follows:

$$\frac{\text{g NaCl in sample} \times 100}{\text{g NaCl} + \text{g H}_2\text{O in sample}} = \text{percent NaCl in water phase}$$

B. Sodium nitrite analysis method. Determine sodium nitrite content according to AOAC (14th ed.) sections 24.044 and 24.045.

Subp. 12. **Code marks; records.** Permanently legible code marks must be placed on the outer layer of every finished product package and master carton. The marks must identify at least the plant where the product was packed and the date of packing. Records must be maintained at the processing facility for a minimum of six months from the date of processing to provide positive identification of (1) the process procedures, including process time, temperature, and sodium nitrite and water-phase salt levels, used for the manufacture of hot process smoked and hot process smoke-flavored salmon, and (2) the distribution of the finished product.

Subp. 13. **Sale in other containers.** Salmon meeting the requirements of this part may also be packaged, stored, transported, sold, offered, and exposed for sale in containers which are not air-tight or vacuum-packed.

Statutory Authority: *MS s 31.11*

History: *9 SR 2341*