

Overview of Hot Smoking Process for Fish

	Process	Food Safety Parameters	Hazard Considerations	CCP ?
Receiving	Quality check	Sensory Evaluation	Removal of rotten & diseased fish	Yes
	Temperature check	Product is at or below 4°C (39°F)	Prevention of spoilage	
Eviscerate	Guts and gills are removed and discarded. Parasites are removed if found in flesh.	Visual inspection of fish to remove parasites, use of candling if possible per 93/140/EEC	Gut and gills contain parasites, botulinum spores & other spoilage bacteria. Delay in evisceration allows parasites to migrate from gut into flesh.	
Wash	Cold potable water is used to remove blood & bacteria before brining	Water meets Drinking Water Regulation BC Reg 200/2003 (Schedule A) for potable water, and meets Canadian guidelines.	Non-potable water may have contaminants.	
Brine	Brine consists of potable water, salt, sugar, color, flavoring, preservatives etc. ^a	Fresh brine each batch Nitrites not allowed Max. 1000 ppm sorbates ★2.5-3.5% WPS achieved	Reduction in moisture content from brining will inhibit bacterial growth, specifically, <i>C. botulinum</i> Type E.	Yes
	Cold potable water is used to remove blood & excess salt.	Water meets Drinking Water Regulation BC Reg 200/2003 (Schedule A) for potable water, and meets Canadian guidelines.	Non-potable water may have contaminants.	
Dry	Fish are air dried (often done in smoker)	Air temp less than 28°C (82°F), Relative Humidity ≥ 70%.	Drying must be slow enough to prevent case hardening (to prevent bacterial decomp)	
Smoke	Food grade wood chips used to impart flavor. Smoke has some bactericidal & anti-oxidative properties. Fish should not touch or be overcrowded. Hot smoke to specified time & temperature.^b	Hot Smoke: Process to achieve internal temp. of 63°C (145°F) for 30 min with 3.5% WPS. Eg. 32°C (90°F) 2 hr + 66°C (150°F) for 4 to 8 hrs.	Hot Smoke: this is the kill step. Internal temp of 63°C (145°F) for 30 min must be achieved.	Yes
	Smoked product is cooled in refrigerator or (blast) freezer	Chill product to ≤4°C (39°F). (1) Cool to <10°C (50°F) within 3 hrs and to ≤4°C within 12 hrs, OR (2) Cool to <20°C (68°F) within 2 hrs and to ≤4°C within 4 hrs	Cooling time does not allow for germination of spore forming bacteria. Cross contamination with raw product after smoking.	Yes
Package	Cooled smoked product is packaged and labeled.	Food grade packaging for fish sold frozen; food grade MAP for fish sold fresh per FDA Reg. B21.025 & B27.001 Labeling per FIR Part II.29 & FDA B.01.401	<i>Clostridium botulinum</i> spores as a hazard mean all smoked fish must be either frozen or sold fresh in MAP, held at or below 4°C (40°F) & sold w/in 14 days.	Yes
	During storage and shipping the product temperature is acceptable Lot and batch identify is maintained so product is traceable.	Refrigerated product must not exceed 4°C (39°F). Frozen product must not exceed -18°C (-0.4°F) during transit and -26°C (-15°F) during storage.	Refrigerated product storage above 3°C (37.5°F) increases risk for <i>C. botulinum</i> Type E.	Yes
Storage/Shipping		Records		

Temperature Control: product <10°C (50°F) for max. time of 10 hr, ideally <3°C

Hygienic handling of product

^a – Ingredients approved by [CFIA](#).

^b – Time and temperature per [FDA](#).