



TECHNICAL NOTE NO. 55 - RECOMMENDED PRACTICES FOR PROCESSING CHILLED AND FROZEN WHITING

ABSTRACT

This paper contains recommendations for handling and processing whiting (*Merluccius bilinearis*) which will upgrade product quality and value, and increase consumer acceptance. Although whiting constitutes one of the major species of fish landed in New England, its delicate tissue structure facilitates rapid quality loss during handling and processing. A check list which may be used by the fisherman, processor, and wholesaler to insure maintenance of product quality is included in the paper.

INTRODUCTION

Although large quantities of whiting (*Merluccius bilinearis*) are landed in the New England area annually, the value of this fishery is relatively small. The low return is due primarily to the delicate nature of the fish, since it rapidly loses its initial high quality under normal pre-processing and processing conditions. A study was therefore undertaken to determine practices in which the initial high quality of the whiting could be retained. The immediate objective of the study was to recommend practices for processing chilled and frozen whiting that would: (1) assist in upgrading product quality, (2) increase consumer acceptance, (3) increase value, and (4) act as a check list for fisherman, processor, and wholesaler.

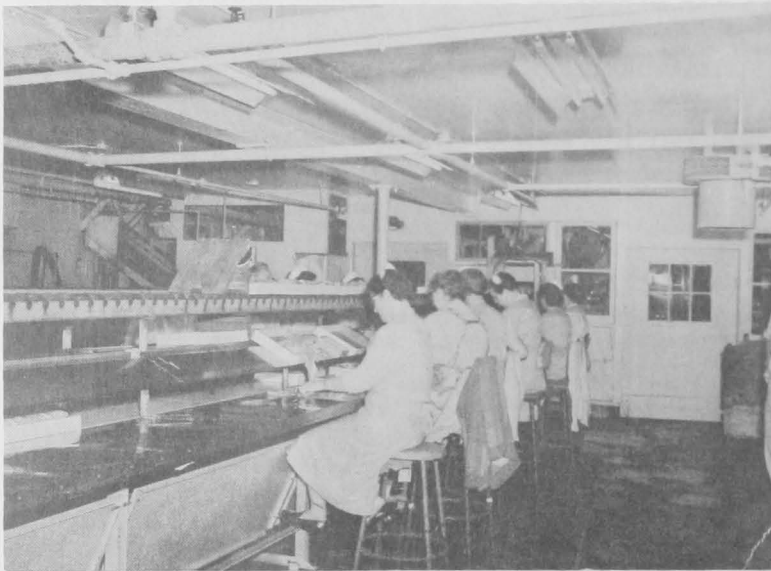


Fig. 1 - Packaging fillets of whiting in a modern processing plant.

PROCEDURE

Information required for this paper was gathered from various organizations representative of the whiting industry. Plants were visited to observe current commercial practices. Samples were obtained and evaluated for quality in relation to the quality of the original raw material and to the production methods employed. Data obtained in this study, together with the industry's comments and a consideration of the latest methods of quality control, resulted in the following recommendations.

RECOMMENDED PRACTICES

This specification applies to fresh or frozen, clean, whole, wholesome fillets cut away from either side of whiting (*Merluccius bilinearis*) and to fresh or frozen, clean, wholesome "headed and gutted" whiting.

Requirements for good quality are explained in the following sections and, as an aid for convenient reference, are listed in table 1. The subjects discussed are raw fish, wash media, products, packaging, refrigeration, and transportation.

Table 1 - Quality Requirements for Whiting

Factor Specified	Requirements for Fillets and Headed and Gutted Whiting	
Raw Fish	a. Appearance--bright; not damaged. b. Odor--characteristically fresh. c. Eyes--prominent and clear. d. Gills--bright red; no off-odor. e. Scales--firmly adhering and glistening. f. Slime--transparent or creamy white; if present. g. Flesh--firm, elastic, and tight on bones. h. Abdominal blood--bright red.	
Wash Media	a. Cold brine. b. Chlorinated sea water; 5 to 10 ppm. chlorine. c. Potable water.	
Product	a. Flesh--firm, resilient; white, pinkish white, off-white. b. Chalky, jellied, diseased, or parasitized tissue--none. c. Slight discoloration or yellowing--insignificant areas allowed.	
	Fillets d. Fins, scales, blemishes, black-belly linings, blood spots, bones--none. e. Scraps, badly ruptured fillets--none. f. Minimum weight--2 ounces.	Headed and Gutted Whiting d. Scales, gills, viscera spawn--none. e. Minimum weight--3 ounces.
Packaging	a. 1-pound cartons with or without overwrap. b. 1- to 1½-pound packages with cellophane or equivalent wrap. c. Packed in 5- to 10-pound cartons.	a. 1½- to 10-pound cartons; tail ends of fish alternating and long axes of fish parallel.
	Carton overwrap--moisture-proof, heat-sealable on all cartons.	
Refrigeration	a. Chilled--held at 32° F. to a maximum of 36° F. b. Freezing--frozen at -10° F. or lower. c. Frozen storage--held at 0° F. or lower.	
Transportation	a. Chilled--held at 32° F. to a maximum of 36° F. b. Frozen--held at 0° F. or lower.	

RAW FISH: Immediately after capture, the fish shall be chilled and maintained in a thoroughly chilled condition by being packed in adequate amounts of clean, finely crushed or flaked ice. Fillets and headed and gutted whiting shall be processed only from good or excellent quality fish.

Fish of such quality have the following characteristics: appearance that is bright and that shows no damage; odor that is characteristically fresh; eyes that

are prominent and clear; gills that are bright and red and that have no off-odor; scales that adhere firmly and that are glistening; slime that, if present, is transparent or creamy white; flesh that is firm, elastic, and tight on the bones; and blood in the abdomen that is bright red. (Fish in rigor and with no blemishes shall be considered excellent in quality.)

WASH MEDIA: In the production of fillets, they shall be cut from fish that were scaled and washed in cold brine, chlorinated sea water, or cold clean potable water. The fillets thus produced shall then be washed in a similar manner and drained prior to being packaged. The brine shall be no more than 15 degrees salometer, and the washing time shall not exceed 2 minutes. Chlorinated sea water shall have a residual of 5 to 10 parts per million of free chlorine. Fillets that are to be used in low-sodium diets shall not be dipped in brine or otherwise brine treated.

In the production of the headed and gutted product, the whiting shall be headed, thoroughly scaled, and eviscerated in accordance with good commercial practice. Good commercial practice shall mean that the spawn and visceral parts are completely removed except that a slight amount of "stringing" shall be allowed. Before being packaged, the headed and gutted whiting shall be washed and drained as described for the fillets.

PRODUCTS: The flesh of fillets shall be firm and resilient, and white, pinkish white, or off-white. The fillets shall be free of any tissue that is chalky, jellied, diseased, parasitized, or otherwise abnormal. Small insignificant areas of slight discoloration or yellowing shall be allowed. The fillets shall be free of fins, scales, and practically free of blemishes, black-belly lining, blood spots, and bones. The fillets shall weigh not less than 2 ounces. Scraps and badly ruptured fillets shall not be accepted.

The flesh of headed and gutted whiting shall be firm and resilient, and white, pinkish white, or off-white. The flesh shall be free of any tissue that is chalky, jellied, diseased, parasitized, or otherwise abnormal. Small insignificant areas of slight discoloration or yellowing shall be allowed. Headed and gutted whiting shall be free of scales, gills, viscera, and spawn. Headed and gutted whiting shall weigh not less than 3 ounces.

PACKAGING: Fillets that are to be frozen shall be packaged in 1-pound capacity cartons with or without inner wrap or shall be wrapped in amounts of 1 to 1½-pounds with cellophane or other suitable packaging material and shall be packed in 5- or 10-pound capacity cartons. Headed and gutted whiting shall be packaged in 1½- to 10-pound capacity cartons and shall be packed with tail ends alternating and long axes parallel. All cartons shall be overwrapped with a moisture-vapor-proof, heat-sealable overwrapping material.

REFRIGERATION: Packages of fillets or of headed and gutted whiting that are to be shipped in the unfrozen state shall be kept at temperatures of 32° F. to a maximum of 36° F. by packing them in boxes with ice or by keeping them in a room maintained at 32° F. to a maximum of 36° F.

Packages of fillets or of headed and gutted whiting that are to be shipped in the frozen state shall be placed in the freezer within 30 minutes after being packaged. The product shall be frozen at a freezer temperature of -10° F. or lower and then shall be maintained in storage at a temperature of 0° F. or lower.

TRANSPORTATION: Fresh whiting shall be transported in either refrigerated or nonrefrigerated vehicles. During transportation, the whiting shall be kept at temperatures not higher than 36° F. by packing the containers of whiting in boxes with ice, and re-icing enroute if necessary, or by shipping them in vehicles that have a storage space maintained at 32° to 36° F.

Frozen whiting shall be transported in refrigerated units. The refrigeration must be turned on and the temperature reduced to 0° F. or lower prior to loading, and the proper temperature of 0° F. or lower shall continuously be maintained during the entire time of shipment.

The temperature of the fresh or frozen whiting shall be measured both before and after shipment, and duly recorded. (Temperatures can be determined by using an accurate stem-type thermometer, inserting it into the center of the chilled product or at the juncture of four package units of the frozen products for several minutes until the temperature indicated by the thermometer ceases to fall, and then reading this steady lowest temperature.)



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SHAD HERALDS SPRING

On April 20, 1787, while living at his Mount Vernon estate on the Potomac River, George Washington made this entry in his diary: "The shad began to run today."

As in the time of Washington when planked shad was the fish dish for gourmets, shad is still one of the best known and most highly-prized food fish on the Atlantic Coast. Its meat is tender and whitemeated, with a distinctive flavor, and the roe is considered a great delicacy.

To the homemaker, bogged-down in a menu-rut from winter, it is good news indeed that the annual spring run of shad is on in important shad-producing streams of the Atlantic and Pacific Coasts.

A Planked Shad Dinner--served on a hardwood plank or oven-glass platter surrounded by mashed potatoes, vegetables, and garnishes--perks up the appetite. Here is how the home economists of the U. S. Bureau of Commercial Fisheries plank a shad.

PLANKED SHAD

3 or 4 pounds dressed shad	Seasoned mashed potatoes
1½ teaspoons salt	Seasoned cooked vegetables
Dash pepper	(peas, carrots, cauliflower,
¼ cup butter or other fat, melted	tomatoes, or onions)

If hardwood plank is used, oil well and place in a cold oven to heat while oven preheats. Clean, wash, and dry fish. Sprinkle inside and out with salt and pepper. Brush with butter. Place fish on plank or well-greased oven-glass platter. Bake in a hot oven, 400° F., for 35 to 45 minutes or until fish flakes easily when tested with a fork. Remove from oven; quickly arrange border of hot mashed potatoes around fish. Place in a broiler until potatoes are slightly browned, about 5 minutes. Remove; arrange two or more hot vegetables around fish. Serves 6.