

One-pound boxes of frozen minced fish prove useful in home menus.

Minced Fish in a New Form

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ABSTRACT—A new market form is introduced that is both convenient and economical for selling minced fish. Results from a market survey show that minced fish in one-pound blocks is a highly acceptable market form and could have commercial potential for both retail and institutional trades.

Fish Cakes

- 2 cups minced fish (raw; thawed)
- 2 cups mashed potato
- 2 eggs (beaten)
- 4 tsp. onion (grated)
- 4 tbsp. butter (melted)
- 2 tsp. salt
- 1/4 tsp. pepper
- 1/4 tsp. garlic powder
- 2 tsp. parsley flakes.

Combine all ingredients and form into cakes. Deep fry or pan fry. (Approx. 6 servings).

Fish in Marinara or Spaghetti Sauce

- 1 lb. minced fish (raw; thawed)
- 1/2 cup rice
- 1/4 cup onion (chopped)
- 1 can marinara or spaghetti sauce
- 1 tsp. salt
- 1/4 tsp. pepper
- 2 tbsp. oil
- 1 cup water

Mix fish, rice, onions and seasonings. Form into balls and pan fry until brown. Add sauce and water. Simmer (covered) for 45 min. (Approx. 6 servings).

The ever-increasing need for protein has resulted in a concerted effort to develop our natural marine resource as a supply of animal protein. With the nearing depletion of traditional species of fish, research into new processes and products is in progress to fully employ the underutilized and/or overabundant species of finfish and shellfish that have a sustainable yield large enough for commercial application. Expansion of fishing efforts to underutilized species provides the added incentive of year-round fishing which affords full-time employment for the fishermen and processors and a constant and varied supply of marine protein for American consumers.

Another method for augmenting the available protein is to increase the yield of the landed fish, and this has been successfully demonstrated with the use of mechanical deboning equipment. The minced flesh produced by this means can be described as having the texture of hamburger.

With the introduction in the early 1970's of the meat-bone separator as a means for recovering the maximum amount of fish flesh from whole fish (Miyachi and Steinberg, 1970) and from fish frames (King et al., 1971), a new fishery technology was begun. A variety of new products made from minced fish were developed (Anderson and Mendelsohn, 1971; King, 1973; King and Flick, 1973).

PRODUCTS FROM MINCED FISH

Large Minced Blocks

Within the last two years, there developed a shortage of blocks (16½ and 18½ pounds) made from whole fillets. The fish processors immediately turned to minced flesh as a substitute for fillets in the blocks. Today an ever-increasing amount of minced fish is being made into blocks for use in the production of sticks and portions. However, the market for these prod-

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ucts is limited, and new uses for minced fish flesh must be found if the full potential of this technology is to be realized.

New Form—Small Minced Blocks

The market potential for a small one-pound frozen fish block, suitable for home use, was investigated. A package of this type would contain enough fish for one meal, to be purchased by the housewife for use in tested recipes provided on the package or in recipes she might develop herself. The small block could be stored in her freezer until ready for use. It could be thawed overnight for use the next day or be added directly (frozen) into certain products.

Whiting (*Merluccius bilinearis*), an overabundant species in the Gloucester, Mass. area during the summer months, was processed in a meat-bone separator and the resulting minced flesh was packaged in one-pound polyethylene-coated cardboard cartons and plate frozen.

A variety of products including fish cakes, chowders, fish in spaghetti or marinara sauce, fish and rice (kedgeree), fish stew, scalloped fish, and fish with beef were prepared and evaluated at the Atlantic Fishery Products Technology Center (AFPTC). Most of the products were highly acceptable. The recipes used to prepare the most acceptable products are shown on these pages.

Acceptance Survey

To further test the concept, samples of the blocks were given to AFPTC personnel who normally eat fish at home. Recipe sheets shown here were provided, with the comment that the minced fish could be used in a number of favorite fish dishes. Of the nine families given the minced fish, all reported that the meals were well liked by both the children and grownups. Also noted by those making the minced-fish meal was the convenience of preparation and absence of a "fishy" smell.

Storage Stability

After storage at -10°F for several months, the one-pound minced blocks showed signs of some dehydration along the edges near the carton open-

Fish and Rice — Kedgeree

2 cups minced fish (cooked)
1 cup rice (cooked)
2 eggs (hard boiled)
4 tbsp. butter
1 tsp. salt
1/4 tsp. pepper

Heat fish, rice, and chopped egg whites in butter. Add salt and pepper to taste. Sprinkle sieved egg yolk on top. (Approx. 6 servings).

Chili Con Carne

2/3 lb. hamburger (raw) 1 8-oz. can tomato juice
1/3 lb. minced fish (raw;
thawed) 1/2 cup water
1 lb. can kidney beans 1/3 cup "chili mix"¹

Mix beef and fish together first. Brown 1 lb. beefish in skillet; remove from heat. Add one lb. can kidney beans undrained, one 8-oz. can tomato sauce, 1/2 cup water, 1/3 cup "chili mix". Stir until blended, bring to boil over moderate heat stirring frequently. Reduce heat, simmer 10 mins., stirring occasionally. (Approx. 4 servings).

¹Available in supermarkets.

Fish Chowder

1 lb. minced fish (raw;
thawed or frozen) 2 tbsp. shortening - liquid
or solid (or salt pork)
3 potatoes (small) 1 tsp. salt
1 onion (med. sliced thin) 1/8 tsp. pepper
1 cup water (& Bac*O's, if (optional: 1 heaping tsp.
desired) Bac*O's¹)
1 qt. milk (evaporated milk
& regular milk to thicken)

Saute onions in shortening until cooked (not brown). Stir in diced potatoes, salt, and pepper. Add water and bring to boil - cover and simmer gently for 10 min. Spoon in fish, replace cover, and continue slow cooking (stir occasionally) until fish is cooked. Add scalded milk and let stand to meld. To serve, heat, add a pat of butter and dash of paprika. (Approx. 6 servings).

¹No endorsement implied.

ings. A polypropylene overwrap (2 mil thick) is now being used to prevent this dehydration; however, any overwrap having vapor barrier properties can be used.

Production Costs

An estimate of the cost for producing the one-pound blocks was based on an ex-vessel price of 8 cents per pound for whiting. The average price of whole whiting during 1972 was 7.97 cents per pound—7.75 cents during the summer months and 6.42 cents per pound during 1973—6.24 cents during the summer months (U.S. Dept. of Commerce, 1972, 1973). Equipment, labor, utilities, packaging, etc., costs were taken from the research paper on minced whiting by Anderson and Mendelsohn (1971). Upon their cost of 31 cents a pound, an additional 9 cents per pound is included as the processor's markup on frozen products (E. S. Penn, 1973). Therefore, a one-pound block should be produced for 40 cents per pound. It was assumed that the profit margins of frozen minced fish should be similar to those of frozen ocean perch fillets. When calculated on the basis that the wholesaler sells at 15.5 percent above his cost and the retailer sells at 37.1 percent above his cost (E. S. Penn, 1973), the one-pound minced block

cost at the retail level should be about 65 cents per pound.

DISCUSSION

Advantages of New Market Form

The one-pound frozen block of minced fish is adaptable for use in most fish recipes and as an extender to hamburger. It is convenient, requiring no preparation for use directly into many products and very economical when compared to other fish products (frozen fillets at over \$1.25 per pound) and beef (hamburger at over \$1.20 per pound). Only that amount necessary for a given recipe need be removed from the freezer, since if less than one pound of fish is needed for a recipe, the block can be portioned with a frozen food knife. The remaining part of the block remains frozen and can be returned to the freezer for future use.

Future Potential

The idea of selling convenient-sized packages of frozen minced fish to the housewife can be extended to restaurants, school lunch programs, and to most institutional feeders. The highly acceptable recipes can be scaled-up to produce hundreds of servings. Five- or ten-pound blocks of frozen minced

fish can be made by the processor to satisfy any requirements. As an example, if a recipe calls for 25 pounds of fish, the correct combination of ten- and five-pound blocks can be removed from the freezer and used.

Convenience-type fish blocks having a variety of flavors are possible as soon as blocks made from mixed species are accepted. Blocks made from shellfish and finfish (i.e. clams and hake, or oysters and hake) in any combination could be available to suit any taste and need.

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