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Seafood Protein Extenders\*

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In working with seafoods one is bound to think about the potential of the lower priced items as protein and flavor extenders. N. C. S. U. Seafood Laboratory has worked with mechanical methods of separating valuable meats from dressed fish and from edible portions of shellfish. The products, so obtained, have a definite potential as extenders or replacements for other more expensive proteins.

Mechanical deboning machines are not available in home appliance sizes, but still you can produce fish meats and excellent flavor enhancers in your own kitchen, making it possible to prepare tasty and nutritious dishes.

For this purpose obtain almost any kind of good fresh fish and have it scaled, headed and gutted. Be sure the body cavity is completely freed of membrane and blood streak. Retain the heads, removing only the gills.

These dressed fish parts can be used to prepare meats and flavor extracts, as follows:

1. Select large covered pot, adding 1/4 stick of butter to grease bottom. Arrange bed of cut carrots, onions, celery tops, bay leaf, touch of garlic, and spices. Saute 10 minutes.
2. Place fish parts, including heads, on the vegetable layer. Add water to half submerge fish. Cover and boil fast enough to steam exposed areas. Continue for 40 minutes, then remove dressed fish.
3. Allow fish to cool, scrape off skin, shake meat from backbones. Return backbones and skin to pot. Cover and continue cooking for 1/2 hour. The FISH FLAKES should be checked for small bones.
4. Use potato masher to squeeze solid matter in bottom of pot - then carefully pour liquid into saucepan - reduce volume 1/2 to 1/3, cool in refrigerator until it congeals.
5. Remove solid fat layer from top and unsightly material from bottom. Transfer remaining FISH BROTH to refrigerator container.

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\*Presented 4/23/75 Lions Club Cooking School, Elizabeth City, N. C.  
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The value of this method in producing high quality protein, the yield of which is usually increased over 10% by including broth in the recipes, is indicated by the following data:

<u>Recovered Nutrients per Pound of Round Fish</u>				
	<u>Grey Trout</u>	<u>Spots</u>	<u>Croakers</u>	<u>Bluefish</u>
<u>Flakes, Oz.</u>	7.30	5.89	4.52	6.26
Protein in Flakes, Oz.	1.39	1.21	0.99	1.49
Protein in Flakes, gms.	39.4	34.3	28.1	42.2
<u>Broth Protein, Oz.</u>	0.28	0.22	0.24	0.10
Broth Protein, gms.	7.9	6.2	6.8	2.8

The importance of stating the above protein figures in grams can be judged by examining "Recommended Daily Allowances of Protein," appearing on the next page. Please note that the combined flake and broth protein supplied by one (1) pound of round fish is sufficient daily requirement for most children.

The economy of seafood proteins depends on purchasing fish when readily available at low prices. The cost of proteins in certain staple foods was indicated by visiting a chain store on June 6, 1975, and calculating costs in terms of one pound units. While the following foods undoubtedly have attributes and nutritional values beyond merely supplying protein, this is also true of finfish. Consequently there is basis for comparing these foods with protein the major value factor:

<u>PRODUCT</u>	<u>PRICE</u>	<u>COST OF 100 gm. PROTEIN</u>
Beans with pork	\$.29/lb.	\$1.04
Broilers, oven ready	.69/lb.	1.20
Eggs	.74/doz.	.88
Turkey	.65/lb.	.99
Hamburger, regular	.95/lb.	1.17
Frankfurters, regular	.79-1.43/lb.	2.00
Salami, cooked	.69/4 oz.	3.46
Bologna, sliced	.79/8 oz.; .99/12 oz.	2.20
Sirloin steak	2.28/lb.	3.23
Bacon, sliced	1.39-1.89/lb.	4.19

Source: Seafood Laboratory, Morehead City, N. C.

Calculating the cost of 100 grams of protein is a convenient way to compare one food with another. In order to obtain 100 grams of protein, 2 lb. 8 oz. of whole spot must be purchased. Currently these are selling in Morehead City at 40¢/lb., so the cost of 100 grams of protein in this instance is \$1.00.

In order to estimate the cost of 100 grams of protein derived from producing flakes and broth, check local fish market prices (whole fish) and multiply by the following:

grey trout	- 2.1
spots	- 2.5
croakers	- 2.9
bluefish	- 2.2

RECOMMENDED DAILY ALLOWANCES OF PROTEIN

	<u>AGE</u> (years)	<u>WEIGHT</u> (lbs.)	<u>HEIGHT</u> (in.)	<u>PROTEIN</u> (gm.)
CHILDREN	2 - 3	31	36	25
	4 - 6	42	43	30
	8 - 10	62	52	40
MALES	12 - 14	95	59	50
	18 - 22	147	69	60
	35 - 55	154	68	65
	55 - 75+	154	67	65
FEMALES	12 - 14	97	61	50
	16 - 18	119	63	55
	18 - 22	128	64	55
	35 - 55	128	63	55
	55 - 75+	128	62	55

Source: Food and Nutrition Board, National Academy of Sciences, National Research Council, 1968.

RECIPES\*\*

Seafood Pizza Sauce

4 1/2 Tbsp. cooking oil	1 nine-ounce can tomato paste
1 1/2 cups finely chopped onions	1 1/2 Tbsp. dried oregano
1/2 tsp. garlic powder	1 1/2 tsp. dried basil, crumbled
6 cups Italian or California	1 bay leaf
tomatoes, coarsely chopped,	1 Tbsp. sugar
not drained	1 1/2 Tbsp. salt
2 cups FISH FLAKES	Freshly ground black pepper
1 cup clams, minced	1/2 cup chopped shrimp, shelled,
1 cup FISH BROTH	raw

Heat oil, gently saute FISH FLAKES. Add chopped onions, cook until transparent. Add garlic powder, stir for one minute. Stir in tomatoes, paste, oregano, basil, bay leaf, sugar, salt, black pepper, FISH BROTH. Steam shrimp in liquid drained from clams. Add shrimp and clam meats as well as shrimp-clam juices to sauce. Simmer 1 to 2 hours, gradually reducing volume to half, or until thickening occurs.

We recommend spreading cheese on the raw dough, baking in a 450° oven long enough to melt the cheese, and then applying the sauce. Spread sauce thinly and evenly to avoid a soggy pizza. Sprinkle on more cheese and finish baking in a 450° oven until done.

Chowder

1 1/2 cups FISH FLAKES	6 Tbsp. melted margarine
1 1/2 cups clams, chopped	1 medium onion, diced
6 medium white potatoes, diced	salt and pepper to taste
5 cups water	1 cup FISH BROTH

Combine FISH FLAKES, clams, potatoes, water, margarine, and onion. Bring to boiling point. Add salt, pepper, and FISH BROTH. Cook until potatoes are done. (Clams will become tough if overcooked.)

Sausage

2 1/2 cups FISH FLAKES	1/2 tsp. oregano
1 1/2 cups ground pork, raw	1/2 tsp. sage
2 tsp. salt	1/2 tsp. thyme
1/2 tsp. pepper	1/4 tsp. celery salt
	1/4 tsp. hickory salt

Blend thoroughly and let stand in refrigerator for flavors to marry. Fry patties in small amount of margarine.

Crab-Fish Imperial

2 cups toasted bread crumbs (prepared from sliced white bread toasted dark)	1/4 lb. margarine, melted
2 eggs	1/2 tsp. parsley
3 Tbsp. mayonnaise	Pepper to taste
2 Tbsp. Worcestershire sauce	1 cup FISH FLAKES
1 small onion, minced	1 cup crab meat
Juice of 1/2 fresh lemon with scraping of rind	Salt to taste
	Paprika
	1 cup FISH BROTH
	20 crab cases

Wash and boil 20 crab cases. Toast bread and place in blender until ground fine. Mix, in a large bowl, bread crumbs, eggs, mayonnaise, Worcestershire sauce, grated onion, lemon juice, margarine, parsley, salt, and pepper. Mix in FISH FLAKES and FISH BROTH. Stuff mixture into cleaned and boiled crab cases. Sprinkle with paprika. Bake in 250° oven for 25-30 minutes or until slightly browned on top.

Stuffed Clam

2 cups toasted bread crumbs	1/4 lb. margarine, melted
2 eggs	1/2 tsp. parsley
3 Tbsp. mayonnaise	Salt and pepper to taste
2 Tbsp. Worcestershire sauce	Paprika
1 small onion, grated	20 ounces of minced clams (reserve liquid)
Juice of 1/2 fresh lemon with scraping of rind	20 hard clam shells - about 4" in diameter
1 1/2 cups FISH FLAKES	
1 cup FISH BROTH	

Wash and boil 20 hard clam shells. Toast bread and place in blender until ground fine. Mix, in a large bowl, bread crumbs, eggs, mayonnaise, Worcestershire sauce, grated onion, lemon juice, margarine, parsley, and pepper. Add clams, FISH FLAKES, and FISH BROTH to mixture. Use liquid drained from clams to adjust consistency to that similar to bread dough. Stuff mixture into cleaned and boiled hard clam shells. Sprinkle with paprika. Bake in 350° oven for 25-30 minutes or until slightly browned on top. Serves 7-8 people.

\*\*Committee members attending April 14 meeting to test the above recipes were:

Mrs. Floy Garner, Home Economics Extension Agent		
Mrs. Emma Avery	Mrs. Elmore Lawton	Mrs. Lucy Piper
Mrs. Olivia Chadwick	Mrs. Ruby Matthews	Mrs. Frances Turbyfill
Mrs. Julia Gillikin	Mrs. Beatrice Phillips	Mrs. Jim Youraine
Mrs. Herbert Kerman		