

*The food service industry evaluates a fish cake made from underutilized species.*

## A Report on the National Marine Fisheries Service Comminuted Fish Cake Survey

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### INTRODUCTION

For the past two years, the National Marine Fisheries Service (NMFS) has been engaged in utilization research involving comminuted or minced fish flesh. The objectives of this research have been to develop marketable product forms which will:

- (1) Facilitate the greater usage of underutilized species, and
- (2) Enable companies to recover and sell a higher percentage of the flesh from all harvested fish.

One of the results of this research has been the development of a comminuted fish cake produced from species such as whiting, ocean perch, and hake. In recovering the fish flesh used in preparing the comminuted cakes, a meat-bone separation process is used as opposed to the traditional filleting technique.<sup>1</sup> A description of the specific recipe and the processing method for the fish cake appears in Appendix II.

This survey was aimed at the food service industry, which is a large user of portion controlled items. Producers of fishery products traditionally have found the institutional markets highly receptive to their product lines. Small to medium size processors, who are in the majority among fishery

product firms, can particularly take advantage of these institutional markets.

The stiff competition for shelf space in retail stores makes it difficult for the smaller processors without a brand image supported by national advertising to gain entry into the retail market. Moreover, there are presently several national brand fish cakes on the retail market, and the NMFS test product may not be sufficiently differentiated in terms of quality or price to interest retailers in adding it to their product line.

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For these reasons, it was decided market evaluation efforts would center on food service operations such as in-plant feeders, hospitals, universities, and school lunch programs. The survey was conducted by NMFS marketing specialists in 10 cities. Contacts were made with a total of 90 establishments, of which 73 tested and evaluated the product.<sup>2</sup>

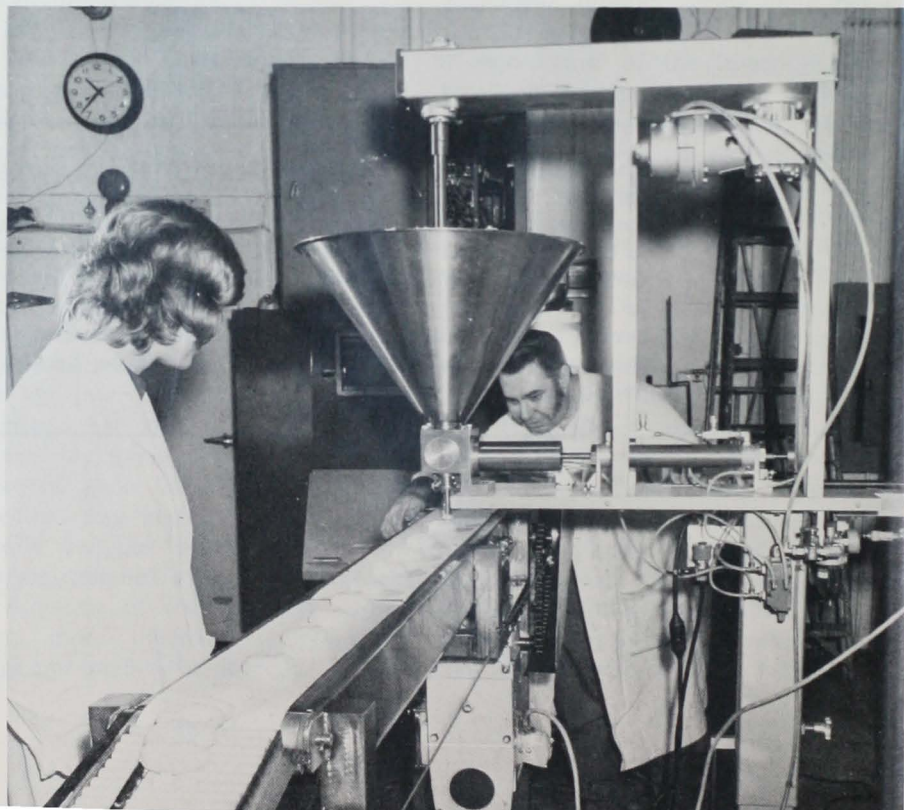
### SURVEY RESULTS

The following is an analysis of the survey responses which highlight the important factors bearing on product acceptability:

- (1) Forty-three percent of all respondents indicated a willingness to buy the product. The highest favorable response (50 percent) was re-

<sup>2</sup> A full discussion of research rationale and methodology can be found in Appendix I.

Extruding equipment forming fish cakes.



<sup>1</sup> A full description of the meat-bone separation process can be found in the following: King, Frederick J. 1973. Improving the Supply of Minced Blocks for the Fish Stick Trade: A Progress Report. *Marine Fisheries Review* 35(8):26-32. MFR Paper 998.

corded by food service outlets not currently using fish cakes.

(2) Establishments without prior experience in using fish cakes in their operations reacted more favorably to the flavor of the test product than those who had previously used (or were using) a similar product. Among respondents who were not using fish cakes, but apparently had sampled them in the past, 60 percent of food service respondents and 50 percent of school lunch respondents rated them slightly better to much better in terms of flavor than other fish cake products they had sampled. In comparison, the percentages for food service and school lunch operations using fish cakes were 28 percent and 14 percent respectively.

(3) In all categories of respondents, the ratings for texture were lower than those for flavor. A majority of the negative comments received made reference to a "mushy potato-like" texture of the product and a low amount of fish flesh.

(4) As would be expected, food service companies were willing to pay more for the product than the school lunch trade. Also, in both categories, respondents who had not used a similar product were willing to pay more than those who had. The heavy majority of school lunch respondents would want to pay under 60 cents per pound, whereas a substantial proportion of the food service respondents would pay over 60 cents.

(5) The 3-ounce cake size was the choice of most school lunch respondents, while the food service trade expressed interest in 2, 3, and 4-ounce cakes.

(6) The 10-pound carton was the most popular size of package. However, the food service firms which were using fish cakes expressed considerable interest in the 5-pound container.

(7) School lunch personnel were primarily interested in recipes as marketing aids, while food service

respondents saw a need for table tents and menu clipons, as well as recipes. One food service company requested that the product be supported by national advertising efforts.

(8) The open-ended comments received were classified into positive and negative categories and a third category containing suggestions. Over half of the comments were of a negative nature, mostly relating to the product texture. The most common remark was that the product was too "mushy," and did not have enough of a fish texture. The consensus was that the product could be improved by adding more fish to the formulation. Several respondents also thought that the breading was too tough. It should be noted that some school lunch personnel questioned whether the product contained the proper protein levels for use in their feeding programs. Protein specifications would have to be met if any firm was considering the school lunch market. Some respondents suggested that the cakes should be larger and flatter, while others objected to garlic and far too much salt.

Tables 1 and 2 show the tabulation of responses by each question.

## CONCLUSIONS

Overall, the product was found to be acceptable to a significant proportion of the respondents. However, as has been indicated, the comment concerning the fish cake that continuously appeared was one related to texture. There was a consensus that more of a fishlike texture (and in some cases taste) was required. An interesting corollary to this point was that some of those, although giving the test product low marks on texture, would still be willing to purchase it for use in their operation. One could conclude that product quality in terms of taste and texture is not as important as

possibly price considerations in selling to the food service market, although even some of those who indicated they would buy the product stated the need for product improvement. From all of the comments received, it was apparent that reformulation of the product will be required to assure continuing wide acceptance.

The range of acceptable prices was quite broad in both food service and school lunch categories. However, about 40 percent of the prices given did fall between 40 cents and 70 cents per pound. Based on our data, the upper limits of this range would be more acceptable to the food service trade, while prices closer to 40 cents per pound would probably be within the cost requirements of most school lunch operations.

## APPENDIX I

### Research Rationale and Methodology

It was the intent of this survey to obtain an evaluation of the NMFS fish cake from representative firms in the food service industry. Included in the evaluation were to be opinions on product qualities, expected prices, promotion, and other factors concerned with the potential marketability of the product.

#### Rationale

The judgment of NMFS technology and marketing personnel was that the food service market offered the best opportunity for the fish cakes.

This determination was based on the following factors:

(1) Stiff competition for shelf space in retail stores makes that market a poor alternative for the small-to-medium-sized processor without a brand image supported by national advertising.

(2) There are presently several national brand fish cakes on the retail market. The NMFS test product is not sufficiently differentiated in terms of quality or price to interest retailers in adding it to their product line.

(3) The promotional effort required to successfully introduce a new product would probably be beyond

the financial resources of a small-to-medium-sized firm.

(4) The large volume requirements of retail food chains could be beyond the capabilities of a small-or-medium-sized processor.

(5) The food service or institutional market for the most part, contains none of the above disadvantages for the processor. A firm which can provide the required quantity and quality at the right price can enter the food service market without substantial promotional outlays. Marketing efforts are primarily directed towards food service purchasing agents. Any extensive promotional effort, if done at all, is carried out by the food service firms. The absence of a national image or resources to conduct extensive advertising efforts would not be a barrier in this market. The diversity in size of food service firms compared with the uniformly large retail food operations presents many more opportunities for the small-to medium-sized firm.

### Methodology

For the reasons stated, it was decided market evaluation efforts would center on food service operations such as in-plant feeders, hospitals, universities, and school lunch programs. NMFS marketing specialists in Gloucester, Mass.; New York, N.Y.; Baltimore, Md.; Atlanta, Ga.; St. Petersburg, Fla.; Dallas, Tex.; St. Paul, Minn.; Los Angeles, Calif.; San Francisco, Calif.; and Seattle, Wash. were requested to identify potential food service operations that would cooperate in evaluating the fish cakes. These contacts were chosen on a judgment basis, as we were not planning to attribute the results to the full universe of institutional feeding operations.

Ninety food service operations in the 10 market areas mentioned above were contacted in person by NMFS marketing personnel and provided with samples, questionnaire, and background information on the test product. Where feasible, the fish cakes were evaluated and the questionnaire completed in the presence of the marketing specialist. If this was not possible, the evaluator was requested to mail the completed questionnaire to the local marketing office at his earliest convenience. In certain cases, follow-up calls were made to obtain the questionnaires. From these 90 contacts, 73 usable

Table 1.—Tabulation of responses by question.

	School lunch				Food service			
	<sup>1</sup> Yes (%)	(7)	<sup>2</sup> No (%)	(18)	<sup>1</sup> Yes (%)	(21)	<sup>2</sup> No (%)	(27)
I. Would buy this product								
Yes	44%	3	33%	6	48%	10	50%	13
No	28	2	28	5	48	10	43	11
No comment	28	2	39	7	4	1	7	2
Total	100%	7	100%	18	100%	21	100%	26
II. Rating of flavor								
Much better	14%	1	7%	1	14%	3	36%	9
Slightly better	0	0	43	6	14	3	24	6
About the same	14	1	36	5	29	6	8	2
Slightly poorer	72	5	14	2	29	6	20	5
Much poorer	0	0	0	0	14	3	12	3
Total	100%	7	100%	14	100%	21	100%	25
III. Rating of texture								
Much better	0%	0	0%	0	5%	1	17%	4
Slightly better	0	0	21	3	5	1	25	6
About the same	14	1	36	5	30	6	8	2
Slightly poorer	57	4	28	4	25	5	29	7
Much poorer	29	2	15	2	35	7	21	5
Total	100%	7	100%	14	100%	20	100%	24
IV. Price per pound willing to pay								
Under 60c	100%	4	82%	9	58%	8	42%	6
60c and over	0	0	18	2	42	6	58	8
Total	100%	4	100%	11	100%	14	100%	14
V. Desired cake size								
2 oz.	14%	1	7%	1	37%	7	26%	6
2½					5	1	4	1
2½-3			7	1	5	1		
3	86	6	65	9	11	2	30	7
3-4			7	1			14	3
4			14	2	32	6	22	5
4-5					5	1		
4-6							4	1
5					5	1		
Total	100%	7	100%	14	100%	19	100%	23
VI. Size of pack desired								
5 lbs.	14%	1	6%	1	48%	9	24%	5
10 lbs.	57	4	50	8	21	4	52	11
15 lbs.	0	0	13	2	5	1	5	1
20 lbs.	29	2	31	5	26	5	19	4
Total	100%	7	100%	16	100%	19	100%	21
VII. Selling tools needed								
Table tents	0%	0	0%	0	21%	3	33%	6
Menu clipons	0	0	40	4	36	5	39	7
Recipes	100	4	60	6	43	6	28	5
Total	100%	4	100%	10	100%	14	100%	18

Numbers in parentheses at top indicate total number of establishments surveyed in each category. Numbers in the = columns indicate the number of responses.

<sup>1</sup> Yes—currently using a fish cake product.

<sup>2</sup> No—not currently using a fish cake product.

questionnaires were obtained. The responses were categorized in the following manner:

	Number of responses	Range of meals served daily by respondents
School lunch programs	25	1,000- 40,000
Food service management firms	13	1,500-400,000
In-plant feeding operations	17	95- 64,000
Hospitals	7	1,000- 4,000
Universities	4	4,500- 18,000
Other	7	400-600,000
Total	73	

As demonstrated above, there was considerable variation in the size of the organizations in the sample, particularly in the food service area. For example, the food service management and in-plant feeder categories contain national food management organizations, large corporations running their own employee feeding program, and small independent operations. However, there were not enough organizations of different sizes in each category to justify separate treatment.

Instead, the responses were divided into two main groups: food service

and school lunch. School lunch respondents were differentiated based on requirements food products must meet to be used in school feeding programs. All the food service operations, regardless of location, e.g., in-plant cafeteria, university, etc., were grouped together because of similar requirements: relatively low priced and convenient food items. However, they differ from school lunch programs in that commercial food service operations have no specific protein requirements that must be met and are generally able to afford higher food costs.

Both groups were subdivided into those who have used a fish cake and those who have not. We believed that the evaluations would vary enough, based on the amount of experience with a fish cake product, to analyze separately.

## APPENDIX II

### Processing Technology and Description of Product

In developing the comminuted fish cake, the National Marine Fisheries Service's Atlantic Fishery Products Technology Center has taken advantage of underutilized species caught locally, such as whiting and red or white hake that have limited marketability in traditional product form.<sup>3</sup>

<sup>3</sup> A further discussion of this work can be found in the following: Anderson, M.L., and J.M. Mendelsohn. 1971. A Study to Develop New Products from Whiting or Other Underutilized Species. Technical Assistance Project No. 01-6-09131. U.S. Department of Commerce, Economic Development Administration.

**Table 2.—General comments.**

	School lunch		Food service	
	Yes	No	Yes	No
<b>Negative</b>				
(1) Needs a firmer fish texture and flavor, less potato	4	8	10	11
(2) Does not contain required 2 oz of protein		4		
(3) Breading is tough		2	1	4
(4) Overbearing fish smell			1	
Total	4	14	12	15
<b>Positive</b>				
(1) Good taste				1
(2) Product is good as is				4
(3) Good breading				1
Total				6
<b>Suggestions</b>				
(1) Make flatter	2	3		1
(2) Make larger	2		1	
(3) National advertisement needed				1
(4) Omit garlic	1			
(5) Use less salt				1
(6) Make in shape of finger food for smaller children	1			
(7) Make less dry				1
(8) Add yellow color and pimiento				1
(9) Make shape similar to a fillet				1
(10) Use as a 1/2 oz hors d'oeuvre				1
(11) Use textured vegetable protein in place of potato				1
(12) Could be used on a bun				1
(13) Deep fat frying—best cooking method				1
Total	6	3	1	10

A meat-bone separator is used to collect the maximum amount of fish flesh. The flesh is then mixed with the ingredients as shown in the recipe and blended. This mix is fed into a former which can make cakes, puffs, or portions. The product is then put through a batter and breading machine, deep-fat-fried, and frozen in a carbon dioxide freezer tunnel. The product is then packaged, over-wrapped, and stored frozen until ready for use. To be eaten, this convenience-type product is heated in an oven at 400°F for 20 minutes or until hot.

#### Fish Cake Recipe

Ingredients	Weight	Percent
Whiting or hake (minced flesh)	33.0 pounds	43.27
Water (hot)	18.0 pounds	23.06
Potato flakes	6.0 pounds	7.68
Salt fish (rapid salt-cured)	3.0 pounds	3.84
Bread crumbs (unflavored)	2.0 pounds	2.56
Onion (minced)	140.0 grams	.39
Parsley flakes	20.0 grams	.05
Ribotide	13.0 grams	.03
Garlic powder	10.0 grams	.02
Pepper (white)	10.0 grams	.02
Citric acid	3.0 grams	<.01
Allspice (ground)	2.0 grams	<.01
Batter and breading	15.62 pounds (7,091.5 grams)	20.01

*MFR Paper 1065. From Marine Fisheries Review, Vol. 36, No. 5, May 1974. Copies of this paper, in limited numbers, are available from D83, Technical Information Division, Environmental Science Information Center, NOAA, Washington, DC 20235.*