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**CURRENT TRENDS IN FRESH FISH PURCHASING, PREPARATION, UTILIZATION
AND CONSUMPTION IN FOODSERVICE SYSTEMS IN RHODE ISLAND**

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Abstract

Fresh fish was purchased regularly by 75% to 78% of college and university student dining services, hospital, nursing home and extended care facilities and by 40% to 50% of schools and senior citizen meal sites surveyed in 1979-80. Responses by non-users to budget allowance, supply source, and lack of refrigeration and holding facilities as the major constraints to serving fresh fish were twice the number given for other constraining factors. Baking was the most preferred and widely practiced method of preparation among 74% to 98% of the respondents. Less frequent menu items included chowder, soup, or deep fat frying among 65% to 71% of the study's participants. More than 90% of the respondents expressed satisfaction regarding schedule, species and quality of supply. More than 60% noted absence of ice in the packaging of fish delivered to them. Examination of four-week menus revealed that seafood was offered as a meat alternative entree in 41%, 39% and 15% of the two main meals served in a university student dining service, a hospital and a nursing home, respectively. Canned tuna was used most frequently, followed by frozen fish fillet baked or fried, shellfish in chowder or casserole, and fish cake. Among fresh fish species, cod/scrod was most often purchased, followed by blue, haddock, flounder and pollock. Of the 25 vendors of fresh fish, five large suppliers, 16 local fish markets and four fishermen handled 52%, 38% and 10%, respectively, of the 42 foodservice clientele. The biweekly mean weight of the fresh fish purchased ranged from 37 to 76 pounds, 132 to 157 pounds, and 750 to 1,000 pounds per purchase among 79%, 15% and 5% of the foodservices surveyed, respectively.

Introduction

Although the United States fish crop is one of the largest in the world, in 1981 the national per capita consumption was 14 pounds per person per year, in contrast to 50-80 pounds of meat and poultry. (Weiss, 1972; Anon, 1973; Martin, 1981). From a nutritional standpoint, fish is considered to be more desirable than meat or poultry because of its low caloric and fat content in conjunction with its high protein quality. (Bulter, C. 1963; Anon, 1973). A survey of institutional users of fish in two Ohio counties concluded that school and hospital caterers served less fish than independent restaurants. Fish sales to foodservices between 1968 and 1973 had either remained unchanged or declined among 56% of the institutions studied. (Logan and Mulvihill, 1973).

A total catch of 96.6 million pounds of fin and shell fish in the State of Rhode Island, valued at \$51.4 million, signified its importance to the State's economy. (Olson and Stevenson, 1975). Since foodservice systems, engaged in mass feeding, reach a substantial percentage of the State's population, the promotion of regional fresh fish among the clientele should further revitalize the fishing industry as well as contribute to the health and well-being of individuals and groups. Therefore, the purpose of this study was to assess current trends in the procurement of fish, its utilization and consumption among foodservice systems in Rhode Island.

Method

The data on current fish purchasing practices of foodservice systems, methods of preparation, frequency in menu offerings and problems of availability were compiled from a pretested mail-in questionnaire, review of selected menus and telephone interviews. The questionnaire, adapted from the Ohio study (Logan and Mulvihill, 1973) was pretested for clarity, reliability and validity by the

directors of three foodservices selected on the basis of client profile: a university student dining service, K-12 school system and an extended care facility, which represented all categories to be surveyed. The results of pretesting indicated that the intent of the questions were misinterpreted and the questionnaire was too long to obtain adequate number of responses.

A revised Questionnaire I was designed to fit on a postcard for the purpose of obtaining information on the purchaser as well as the non-purchaser of fresh fish. Questionnaire II was sent only to the purchaser of fresh fish to obtain data on consumption trends, preparation methods and identification of specific supply source problems. Additional information regarding species, quantities purchased and the source of supply was obtained via telephone interviews of fresh fish users. Statistical data analysis included frequency distribution and chi square test of significance ($\alpha 0.05$) (Fryer, 1968).

Results

Response of the surveyed foodservices categorized on the basis of client profile and organizational framework are shown in Table 1. Of the 150 foodservices surveyed, 141 were considered as eligible participants in the second phase of the study, whereas nine of the 41 schools, K-12, were ineligible on the basis of lack of hot lunch preparation facilities. Of the 141 potential respondents, 117 (83%) returned the questionnaire. Fresh fish was purchased by 75% to 78% of the colleges and universities, hospitals, nursing homes, and extended care facilities and by 40% to 50% of schools and senior citizen meal sites. Foodservice response to factors influencing fresh fish utilization are shown in Table 2. All factors except employee attitude and client demand showed a significant difference in response between those who use fish and those who do not. Budget allowance, client demand and supply source were identified as the chief constraints to more frequent usage of fresh fish by

13% to 29% of the fresh fish users. On the other hand, 28% to 50% of the non-users of fresh fish considered budget allowance, supply source, lack of refrigeration and holding equipment facility as the major limitations to initiating the service of fresh fish. Among the 78 users of fresh fish 31% reported an increase, 53% observed no change, whereas 16% noted a decline in fresh fish consumption in the past three years.

Baking plain, stuffed or in sauce was the most preferred and widely practiced method of fresh fish preparation among 74% to 98% of the respondents. Other forms such as chowder, soup or deep fat frying were served by 65% to 71% of those surveyed, but much less frequently.

Consistently occurring conditions experienced during delivery of fresh fin fish to foodservice establishments are summarized in Table 3. The fish supply with reference to time schedule, species ordered and quality was considered satisfactory by 93% to 97% of the respondents. Of significant note is the absence of statement of product origin and ice in packaging fish sold to 52% to 64% of foodservices surveyed. Thirty-four percent noted a discrepancy between pre-determined and actual cost. Approximately 18% to 19% expressed dissatisfaction concerning lack of uniformity in fish fillet size or weight and would prefer smaller size packaging to facilitate handling by a single employee.

Typical methods of preparation of fish and serving frequency in a university student dining service, a hospital and a nursing home are summarized in Table 4. Examination of two- to four-week menus revealed that the nature of clientele dictated the frequency and the methods of preparation of seafood served. Seafood was offered as a meat alternate entree in 41%, 39% and 15% of the two main meals served in a university student dining service, a hospital and a nursing home, respectively. In decreasing order of frequency, canned tuna was used more frequently followed by

frozen fish fillet baked or fried (batter dipped), shellfish in chowder or casserole on the student dining service and hospital menu. In the nursing home, fish was served less often and predominantly baked; other less frequent forms included fish cakes and canned tuna in salad or sandwich.

Among the fresh fish species, cod/scrod (59%) was the most often purchased followed by blue and haddock (38%), flounder (27%) and pollock (14%). (Table 5.) Less than 10% mentioned silver hake, ocean bass, whiting or swordfish. Of the 25 purveyors or vendors of fresh fish, five large suppliers, 16 local fish markets and four fishermen handled 52%, 38% and 10% respectively of the foodservice clientele. The mean weight of fresh fish purchased on a bi-weekly basis ranged between 37 to 76, 132 to 157, and 750 to 1,000 pounds among 78%, 16% and 5% of the 42 foodservices, at \$1.05 to \$2.00 per pound (Table 6).

Each foodservice had its own bookkeeping system, purchasing procedure and job specifications relating to job title. Therefore, fish purchasing information was not always available from the person contacted and further referrals had to be made. Foodservice or dietary supervisor, food purchasing agent, cook/chef or the administrator/director served as the source of information for 30%, 30% and 24%, and 16% respectively of the 42 foodservices contacted in the study.

Discussion

Questionnaire design pertaining to type and extent of informational details requested is critical to return rate with usable, meaningful data. An 83% return of the questionnaire was considered an excellent response. Telephone interviews, although expensive and time consuming, were found to be an efficient and immediate on-target method of getting information.

High cost and inadequate storage and holding facilities seem to be the major

limitation in substituting fresh for frozen form. Cod, haddock and flounder, being the highly desirable species, command a premium price; therefore, foodservices should consider other less expensive underutilized species as a means to cost control.

An additional constraint in more extensive utilization of fish appears to be the lack of uniformity of fillets by weight, size and shape, thus interfering with portion control. It requires a foodservice employee to cut, weigh and portion out fillets manually, thus adding the labor cost factor to the total cost of the fish entree.

Some concern has been expressed regarding the origin of the product, because many consumers including those in the foodservice facilities surveyed have the right to expect that the menu terminology is accurate in the written description. Truth in Menu Legislation and Accuracy in Menu Movement places the responsibility of indicating the point of origin of the product on the vendor. (Buchanan, 1978; Anon, 1978).

Considering the highly perishable nature of fish, neglect on the part of the vendor to maintain low temperature through ice packing during transportation subjects fish to rapid deterioration leading to lower consumer acceptability and loss of clientele. Therefore, vendor awareness or education in optimum quality maintenance as a means to successful marketing and building of patronage volume is recommended.

Table 1. Extent of fresh fish utilization in foodservice systems in Rhode Island

Type of Food Service	Potential Respondent	Response Received		Fresh Fish					
				Purchaser Response		Non-purchaser Response		No Response	
				#	%	#	%	#	%
College & Universities	14	12	86	9	75	3	25		
Schools, K-12	32	25	78	10	40	13	52	2	8
Hospitals	19	18	95	14	78	4	22		
Nursing homes & Extended care facility	69	55	80	42	76	13	24		
Senior Citizen Meal sites	6	6	100	3	50	3	50		
R.I. Dept. of Administration	1	1	100	0	0	1	100		
TOTAL	141	117		78		37		2	

Table 2. Factors Influencing the Foodservice Usage of Fresh Fish

Factor	Purchaser			Non-purchaser		
	yes	no	no response	yes	no	no response
	%	%	%	%	%	%
Refrigeration space ^b	5	90	5	39	56	5
Cooking Equipment ^b	5	90	5	14	67	19
Holding Equipment ^b	1	91	8	28	58	14
Employee Skill ^b	3	91	6	14	72	14
Employee Schedule ^b	4	88	8	17	67	17
Employee Attitude ^a	3	88	9	5	78	17
Supply Source ^b	13	83	4	33	47	19
Budget Allowance ^b	29	67	4	50	39	11
Client Demand ^a	18	73	9	19	64	17

A common letter in superscript (a,b) indicates no significant difference ($p < 0.05$).

Table 3. Factors/Conditions Related to delivery of fresh fish to foodservice systems

Condition or Factor	yes		no		no response	
	#	%	#	%	#	%
Cost same as expected ^a	37	66	19	34	7	11
Easy to handle packages ^b	46	81	11	19	6	10
Good quality ^b	59	97	2	3	2	3
Label stating product						
origin ^a	27	48	29	52	7	11
On schedule ^b	57	97	2	3	4	16
Packed in crushed ice ^a	21	36	37	64	5	8
Species same as ordered ^b	52	93	4	7	7	11
Uniform size/wt. of						
fillet as ordered ^b	47	82	10	18	6	10

A common letter in superscript (a, b) indicates no significant difference ($p < 0.05$).

Table 4. Typical methods of fish preparation and frequency on menu in selected foodservices in Rhode Island

W E E K

<u>Foodservice</u>	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Fourth</u>
University Student	Seafood newburg	Tuna salad	Tuna noodle casserole) ^a	Fish cake
Resident Dining	Tasty tuna melt	Fried flounder	Crab meat salad)	Tuna salad
Services	Fried fish flounder	Clam chowder) ^a	Baked cod	Fish baked in sauce)
	Tuna salad	Tuna salad)	Fried clam, scallop plate	Tuna salad) ^a
	Fried shrimp	Fisherman's platter) ^b	Tuna salad	Clam chowder) ^a) ^b
	Tuna grinder	(clams, shrimp, fish)	Fish sticks))	Fried fish flounder)
Nursing home	Baked fish	Swordfish with lemon sauce	Fried flounder	Fish sandwich
	Fish cakes	Tuna salad	Baked cod	Baked fish
Hospital				
Regular diet	Tuna salad)	Tuna salad	Tuna salad)	Tuna salad
	Shrimp scallop) ^b	Baked haddock) ^b	Shrimp scallop) ^b	Baked haddock) ^b
	casserole)	Tuna salad)	casserole)	Tuna salad)
	Baked haddock	Seafood newburg) ^b	Baked haddock	Seafood newburg) ^b
	Baked flounder) ^b	Broiled halibut) ^b	Baked flounder) ^b	Broiled halibut) ^b
	Fried fish)		Fried fish)	
	Tuna salad		Tuna salad	
Restricted diet (Low fat, calorie or sodium)	Tuna salad	Baked/broiled fish	Tuna salad	Baked/broiled fish
	Baked haddock	Baked haddock) ^b	Baked haddock	Baked haddock) ^b
	Baked flounder) ^b	Tuna salad) ^b	Baked flounder) ^b	Tuna salad) ^b
	Baked halibut)	Baked haddock) ^b	Baked halibut) ^b	Baked haddock) ^b
		Broiled halibut) ^b	Broiled halibut) ^b	Broiled halibut) ^b

a Same meal. b Served same day.

Table 5. Species purchased among fresh fish users in foodservice systems

<u>Common Name</u>	<u>Species</u>	<u>Foodservice</u>	
		<u>Number</u>	<u>Percent</u>
Blue	Pomatomus saltatrix	16	38
Haddock	Melanogrammus aeglefinus	16	38
Atlantic cod, scrod	Gadus morhua	25	59
Flounder, Winter	Pseudopleuro nectas)	11	27
	americanus)		
Summer	Paralichthys dentatus)		
Pollock	Pollachius virens	6	14
Black fish, tautog	Tautoga onitis	1	2
Silver hake	Merluccius bilinearis	2	5
Ocean bass	Centropristis striata	2	5
Whiting	Silla gonidae	2	5
Swordfish	Xiphias gladius	1	2

Table 6. Fresh fish purchasing patterns in foodservice systems in Rhode Island

<u>Type of Foodservice</u>	<u>Foodservice</u>		<u>Fish (lb.) Per Purchase</u>	
	<u>Number</u>	<u>Percent*</u>	<u>Mean</u>	<u>Range</u>
Extended care facility)	24	57	36.6	25 - 50
Health center)				
Nursing home)				
Extended care facility)	9	22	76.3	60 - 100
Hospital)				
School)				
Hospital	3	7	132	125 - 140
College)	4	9	157	170 - 225
Fraternity)				
Hospital)				
College)	2	5	875	750 - 1000
University)				
TOTAL:	42			

* Expressed as percent of total number of foodservices interviewed.

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