

Adoption of Recommended Practices by Fish Processing Plants in Kerala

Braj Mohan, D.P. Singh* and R. Thiagarajan**

*Research Centre of Central Institute of Fisheries Technology,
Mumbai - 400703*

This paper attempts to explore the extent of adoption of practices identified by the Central Institute of Fisheries Technology for fish freezing and fish processing plants and the influence of socio-economic factors on the adoption. Practices such as sanitary conditions of processing unit, maintaining temperature of cold storage, personal hygiene of workers and glazing the material before/after freezing showed higher level of adoption. However, use of deodorants, use of recommended packing materials for individually quick frozen shrimps and use of recommended containers for transportation showed lower level of adoption.

Key words: Adoption, fish processing, socio-economic factors, knowledge level, skill level, adoption behaviour

The Central Institute of Fisheries Technology, Cochin, have recommended several quality control measures for upgrading the post harvest technology of fish. These include modern handling and transportation practices, introducing suitable quality control measures and also diversifying the products (Gopakumar, 1991; Iyer, 1979; Joseph, 1979; Balachandran, 1995). The present study was undertaken to identify the extent of adoption of these practices by the industry.

Materials and Methods

The study was conducted among the fish freezing/processing plant owners in Ernakulam District of Kerala State. The selected practices, viz., use of quick-freezers, glazing (before/after freezing the material), temperature of cold storage, use of quality assurance systems, quality assessment of the products from the incoming raw materials to the finished products, assessment of the sanitary conditions of processing unit, personal hygiene of workers, cleaning schedule for utensils, tables, floor etc., use of deodorants, use of antiseptic ointment, use of recommended packing materials for

individually quick frozen (IQF) shrimps, use of recommended packing materials for block frozen (BF) shrimp, use of recommended containers for transportation and use of insulated/refrigerated vehicles for transportation were carefully verified. Socio-economic characteristics viz., age, education, occupation, number of days employed per year, experience, size and type of family, social participation, annual income, debt, house owned, extent of land owned, sources of information, contact with extension agency, exposure to media and perception of profitability and 3 dependent variables such as knowledge level, skill level and adoption behaviours of fish freezing/processing plant owners were selected for the study. The data were collected through interview schedules/questionnaires from 40 selected respondents at random. The collected data were analyzed by using statistical methods like frequencies/numbers, percentage analysis, correlation, regression etc.

Results and Discussion

The study indicated that several important practices were not adopted by the fish

* Department of Agricultural Extension, R.B.S. College, Bichpuri, Agra, U.P., India

** Agricultural Extension, Sugarcane Breeding Institute, Coimbatore, Tamilnadu, India

Table 1. Extent of adoption of improved practices of fish processing method (in terms of adopters)

Improved Practices	Non-adopter		Low adopter		Partial adopter		Full adopter	
	No.	%	No.	%	No.	%	No.	%
1 Use of insulated/refrigerated vehicles for transportation	0	0.00	1	2.50	1	2.50	38	95.00
2 Use of recommended packing materials for block frozen shrimps (BF) like strapping materials of master carton-12 mm width (Polypropylene straps)	3	7.50	0	0.00	1	2.50	36	90.00
3 Use of chloritest paper	0	0.00	0	0.00	4	10.00	36	90.00
4 Assessment of the sanitary conditions of processing unit	0	0.00	1	2.50	6	15.00	33	82.50
5 Temperature of cold storage	0	0.00	3	7.50	6	15.00	31	77.50
6 Personal hygiene of workers	0	0.00	3	7.50	6	15.00	31	77.00
7 Glazing (before/after freezing the material)	2	5.00	1	2.50	7	17.50	30	75.00
8 Cleaning schedule for utensils, tables, floor, etc.	0	0.0	0	0.00	10	25.00	30	75.00
9 Use of recommended packing materials for block frozen shrimps (BF) like 60 gauge high molecular weight high density polythene film or 60 gauge linear low density polythene to use as inner wrap for frozen fish/shrimp packaging to replace the conventional 100 gauge low density polythene film (in block frozen shrimps)	10	25.00	1	2.50	1	2.50	28	70.00
10 Use of recommended packing materials for block frozen shrimps (BF) like code slip recommended based on the polyester sheet to replace the conventional paper code slip	11	27.50	0	0.00	1	2.50	28	70.00
11 Use of quick freezers	4	10.00	1	2.50	11	27.50	24	60.00
12 Use of recommended packing materials for block frozen shrimps (BF) like type of corrugated box-use of regular fluted, corrugated fibre board box for frozen shrimps packaging with a maximum bursting strength of 12 kg/cm ² to export 20-25 kg products	17	42.50	0	0.00	1	2.50	22	55.00
13 The assessment of the quality of water and ice used for processing	0	0.00	0	0.00	20	50.00	20	50.00
14 Quantity assessment of the products from the incoming raw material to the finished products	0	0.00	7	17.50	17	42.50	16	40.00
15 Use of recommended containers for transportation (polyurethane foam) (PUF)	20	50.00	0	0.00	5	12.50	15	37.50
16 Use of recommended packing materials for individually quick frozen shrimps (IQF) (polyester/polythene laminate)	26	65.00	0	0.00	0	0.00	14	35.00
17 Use of deodorants	27	67.50	1	2.50	6	15.00	6	15.00
18 Use of antiseptic ointment	17	42.50	6	15.00	12	30.00	5	12.50
19 Use of quality assurance systems	2	5.00	11	27.50	25	62.50	2	5.00

freezing/processing plants (Table 1, Fig. 1 a,b,c). It could be seen that the fish processors had not adopted the practices such as use of deodorants (67.5%), use of antiseptic ointment (42.5%), use of recommended packing materials for IQF shrimp (65%), type of corrugated box (42.5%) and use of recommended containers for transportation (50%). This might be probably due to the fact that they might be using material which was comparatively cheaper and more easily available in plenty in the locality.

The practices such as use of quality assurance systems (62.5%) and assessing the quality of water and ice used for processing (50%) showed partial adoption. The extent of adoption was quite high among the respondents for the 10 practices viz., glazing (before/after freezing the material 75%), temperature of cold storage (77.5%), use of chloritest paper (90%), assessment of the sanitary conditions of processing unit (82.5%), personal hygiene of workers (77.5%), cleaning schedule for utensils, tables, floor etc. (75%), strapping materials of the master carton (90%), 60 gauge high molecular weight high density polythene film or 60 gauge linear low density polythene to use as an inner wrap for frozen fish/shrimp packaging to replace the conventional 100 guge low density polythene film (70%), code

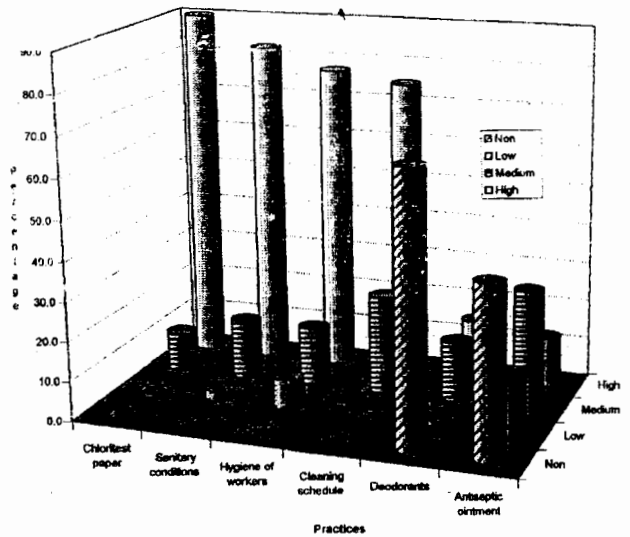


Fig. 1(b). Extent of adoption of improved fish processing practices.

slip recommended based on the polyester sheet to replace the conventional paper code slip (70%) and use of insulated/refrigerated vehicles for transportation (95%). The extent of adoption was high among the respondents for the three practices namely, use of quick freezers (60%), assessment of process water quality (50%) and type of corrugated box for frozen shrimp (55%). This indicates that the processors are well aware of the advantages of these advanced technology in improving the appearance, and reducing the post-process losses.

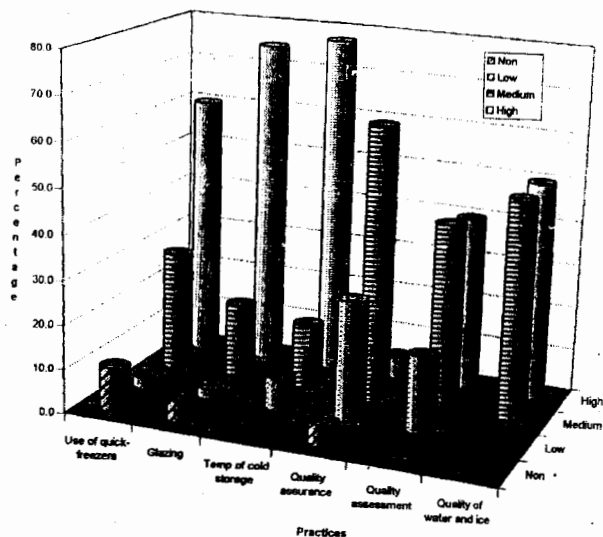


Fig. 1(a). Extent of adoption of improved fish processing practices.

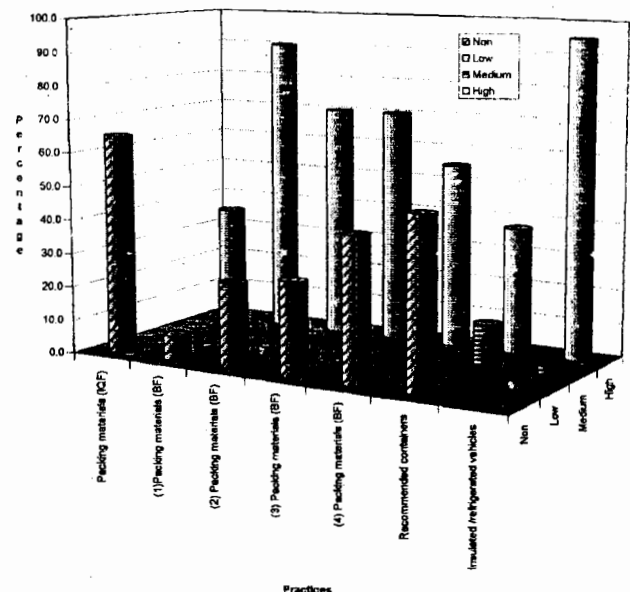


Fig. 1(c). Extent of adoption of improved fish processing practices.

Table 2. Correlation of selected independent variables of fish processors with their knowledge level, skill level and adoption behaviour

N = 40 x = 15

Variables No.	Selected independent variables	Correlation Co-efficient		
		Knowledge level (Y ₁)	Skil level (Y ₂)	Adoption behaviour (Y ₃)
X ₁	Age	-0.0069	0.1157	-0.2120
X ₂	Education	0.3124*	0.1344	0.1089
X ₃	Occupation	-0.1135	-0.1350	0.0436
X ₄	Number of days employed/year	0.0409	-0.0475	-0.0698
X ₅	Experience	0.1069	0.0727	-0.0009
X ₆	Size & type of amily	-0.0653	0.0033	-0.2626
X ₇	Social participation	0.1429	-0.1473	0.1350
X ₈	Annual income	0.0504	-0.0855	0.1447
X ₉	Debt	-0.1597	-0.1159	0.3421*
X ₁₀	House owned	0.0048	0.0239	-0.1687
X ₁₁	Extent of land owned	-0.1123	-0.2614	-0.0898
X ₁₂	Sources of information	0.5763**	-0.0085	0.1849
X ₁₃	Contact with extension agency	0.3580*	0.0776	0.0224
X ₁₄	Exposure to media	0.3603*	0.1108	-0.0329
X ₁₅	Perception of profitability	0.3155*	0.1197	0.2109

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

Correlation coefficient was worked out to know the relationship between socio-economic characteristics of fish processors with their knowledge, skill and adoption behaviour of improved fish processing method. The result indicated (Table 2) that education, sources of information, contact with extension agency and exposure to media of the fish processors showed positive and significant relationship with knowledge level. It is needless to say that the person with higher educational background, sources of information, contact with extension agency and exposure to media used to have knowledge regarding improved fish processing methods. The debt of the fish processors showed positive and significant relationship with adoption behaviour. The perception of profitability positively and significantly influenced the knowledge level. The fish processors who perceived the fishery business as profitable might have gathered more information regarding fish freezing/fish processing plants which made them more knowledgeable.

Multiple regression analysis (Table 3) of socio-economic characteristics revealed that the R² value was found to be 0.5698 and indicated that the fifteen selected independent variables of fish processors taken together explained for 56.98% of the variation in their knowledge level. The R² was tested for its significance and F value was found to be significant at 0.05 level of probability. The partial regression co-efficient indicated that a unit increase in the level of social participation will increase 0.187 unit in the respondent's skill level and a unit increase in the number of days employed per year will increase 0.1462 unit increase in the adoption behaviour of the respondents.

The practices such as use of deodorants, use of antiseptic ointment, use of recommended packing materials for IQF shrimp, type of corrugated box and use of recommended containers for transportation have showed higher level of non-adoption by the plants. The reason for their non adoption may be identified and, if necessary, a training

Table 3. Multiple regression of socio-economic characteristics with knowledge, skill and adoption behaviour

Socio-economic characteristics	Partial regression co-efficient		
	Knowledge	Skill	Adoption
Age	0.0790 (-1.435)	0.0073 (0.420)	0.0564 (-1.198)
Education	0.0530 (1.159)	0.0401 (1.002)	0.1405 (1.981)
Occupation	0.0041 (-0.313)	0.0460 (-1.076)	0.0049 (-0.345)
Number of days employed/year	0.0341 (-0.882)	0.0025 (-0.246)	0.1462 (-2.028)*
Experience	0.1172 (1.785)	0.0060 (0.380)	0.0918 (1.557)
Size & type of family	0.0090 (-0.466)	0.0030 (-0.269)	0.0129 (0.560)
Social participation	0.0074 (0.424)	0.1870 (-2.350)*	0.0290 (0.847)
Annual income	0.0111 (-0.518)	0.0019 (-0.212)	0.0731 (-1.376)
Debt	0.0561 (-1.194)	0.0120 (0.539)	0.1180 (1.792)
House Owned	0.0013 (-0.180)	0.0796 (-1.441)	0.0882 (-1.524)
Extent of land owned	0.0024 (0.241)	0.281 (-0.833)	0.0146 (0.595)
Sources of information	0.1176 (1.788)	0.1155 (-1.770)	0.0170 (0.645)
Contact with extension agency	0.0142 (-0.589)	0.1127 (1.746)	0.0476 (-1.095)
Exposure to media	-0.0009 (0.148)	0.0370 (0.960)	0.0230 (-0.751)
Perception of profitability	0.1237 (1.841)	0.0606 (1.244)	0.0587 (1.224)
R ²	0.5698	0.3392	0.4131
F	2.119*	0.821 NS	1.126 NS

Figures in the Parenthesis indicates 't' value

* - Significant at 0.05 level of Probability

NS = Not significant

programme may be organized to improve the adoption percentage. Education, sources of information, contact with extension agency, exposure to media and perception of profitability played a major role in their knowledge level. Above all, the adoption behaviour of the respondents is crucially decided by their credit facilities, so necessary credit facility should be arranged through co-operatives, commercial banks and Governmental agencies.

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