

Effect of Demonstration in Transferring Fish Processing Technology

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A group of 28 fisherwomen who attended demonstration on three subjects, namely, preparation of fish wafers, fish pickles and fish soup powder showed significant knowledge and skill gain for all the three messages. The total knowledge and skill gain was maximum for preparation of fish wafers followed by that for preparation of fish soup powder and fish pickles.

Among the communicational and educational techniques, 'demonstration' are supposed to be the oldest, best and simplest tool for transmitting technologies. Marks (1955) stated that most people learnt about 10 to 15% from reading, 20 to 25% from hearing, 30 to 35% from seeing and 50% and more from seeing and hearing together. This study was conducted to find out the effect of demonstration in teaching the methods of production of processed fish products.

Materials and Methods

An experimental group of 28 fisherwomen was selected from the Vypeen block of Ernakulam district. Demonstrations were conducted on three fish processing methods, namely, preparation of fish wafers, fish pickles and fish soup powder. The knowledge gained was measured by well structured knowledge check list. The knowledge checklist for the preparation of fish wafers, fish pickles and fish soup powder had 5, 11 and 12 questions respectively. Each correct answer was given score 'one' incorrect answer was given score 'zero'.

The operational skill of the respondent was measured by adopting the procedure followed by Sundararajan (1985). The response indicating the correct performance of a particular skill was given score 'one' while the incorrect response received score 'zero'. The skill involved in the methods of preparation of fish wafers, fish pickles and fish soup powder had 6, 10 and 6 steps respectively arranged in sequential order.

The scoring technique for the socio-economic variables was followed as described below.

Age refers to the chronological age of the respondent. The completed years of age was taken for analysis. Educational status was operationalised as the extent to which the respondent had formal education. Scores allotted are as follows:

Level of education	Score
Illiterate	0
Primary school	1
Middle school	2
High school	3
Pre degree	4
University degree	5

The size of the family refers to the number of individuals living together in a household, employment status of the family refers to the number of family members having regular and seasonal employment and annual income refers to the net income for a year of the family members which included income from all sources.

Contact with extension agency was operationalised as the nature of contact with extension agency availed by the fisherwomen and it was scored as follows.

Type of extension contact	Score
Informal	1
Mass media	2
Institutional	3

The knowledge and skill gain of the clients were calculated as follows:

Knowledge gain	Post exposure knowledge score - pre-exposure knowledge score
Skill gain	Post exposure skill score - pre-exposure skill score

The pre-exposure knowledge and skill scores were considered as zero because the fisherwomen did not have the exposure to the preparation of fish wafers, fish pickles and fish soup powder.

The knowledge and skill scores of the respondents were converted to percentage for statistical analysis. The paired 't' test, analysis of variance, correlation and multiple regression were used for analysis of the data.

Results and Discussion

The mean values of scores obtained for knowledge, skill and total knowledge and skill gains at immediate post exposure stage

are presented in Table 1. From Table 1 it could be seen that the knowledge, skill and total knowledge and skill gain were maximum for preparation of fish wafers. The method of preparation of fish wafers was simple and hence the knowledge, skill and total knowledge and skill gain were maximum for this product compared with the other two products. The ingredients involved in the preparation of pickles were familiar to fisherwomen. So a better knowledge gain for fish pickles was noted than for fish soup powder. The preparation of fish soup powder was simple compared to fish pickles and resulted in more skill gain for soup powder.

To find out the effect of demonstration on knowledge gain for the preparation of fish wafers, fish pickles and fish soup powder, the analysis of variance was worked out and presented in Table 2. The significant 'F' value shows that the knowledge gain for three different subjects differed significantly.

From the critical difference presented in Table 3 it could be seen that the knowledge gain for fish wafers and fish pickles was on par whereas the knowledge gain for fish

Table 1. Knowledge, skill and total knowledge and skill gains after the demonstration

Subject	Mean gain		Overall knowledge and skill	Knowledge	Skill	Overall knowledge and skill
	Knowledge	Skill				
Fish wafers	97.8571	92.2611	94.8057	82.18**	32.24**	50.02**
Fish soup powder	88.3932	76.5264	84.0032	29.66**	26.70**	32.81**
Fish pickles	94.9057	57.8571	77.21	74.38**	73.27**	97.95**

** significant at 1% level

Table 2. Analysis of variance

Source	Df	SS	MSS	F
Subjects	2	1306.64	653.32	5.8716**
Error	81	9012.68	111.2676	
Total	83	10319.32		

** significant at 1% level

Table 3. *Mean values of knowledge gain for different subjects*

Subjects	Mean	Critical difference
Fish wafers	97.8571	5.5255
Fish pickles	94.8057	
Fish soup powder	88.3932	5.5255

wafers and fish pickles were superior to the fish soup powder.

The analysis of variance was worked out to find the effect of demonstration on skill gain in different messages and the same is presented in Table 4. The 'F' value in Table 4 shows that the skill gain of fisherwomen differed significantly.

Table 4. *Analysis variance*

Source	Df	SS	MS	F
Subjects	2	16611.02	8305.51	53.799**
Error	81	12505.45	1154.38	
Total	83	29116.45		

**significant at 1% level

The critical difference presented in Table 5 shows that the skill gain in the production of fish wafers is maximum followed by fish soup powder and fish pickles.

The analysis of variance to find out the relative effect of demonstration in total gain (knowledge and skill) for the three different messages is presented in Table 6. The

Table 5. *Mean values of skill gain for different subjects*

Subjects	Mean	Critical difference
Fish wafers	92.2611	6.5
Fish soup powder	76.5264	6.5
Fish pickles	57.8571	

Table 6. *Analysis of variance*

Source	Df	SS	MSS	F
Subjects	2	4408.26	2204.13	21.9229**
Error	81	8143.87	100.54	
Total	83	12552.13		

** significant at 1% level

Table 7. *Mean values of total knowledge and skill for different messages*

Subjects	Mean	Critical difference
Fish wafers	94.8057	3.714
Fish soup powder	84.0203	
Fish pickles	77.21	3.714

score of the knowledge and skill was pooled together to get the total score for knowledge and skill gain. The significant value of the 'F' from the Table 6 shows that

Table 8. *Mean and standard deviation for the socio-economic variables*

Variables	Mean	Standard deviation
X ₁ Age	21.07	2.37
X ₂ Education	3.24	4.48
X ₃ Size of the family	7.03	2.00
X ₄ Employment status of the family	2.04	0.91
X ₅ Annual income	1476.78	724.05
X ₆ Extension agency contact	2.36	0.42
Y Total knowledge and skill gain	14.11	1.27

Table 9. *Intercorrelation matrix of the selected socio-economic variables*

	X ₂	X ₃	X ₄	X ₅	X ₆
X ₁	0.22 NS	0.27 NS	0.37 NS	0.014 NS	0.29 NS
X ₂		0.67**	0.14 NS	0.0031 NS	0.21 NS
X ₃			0.06 NS	0.009 NS	0.03 NS
X ₄				0.11 NS	0.32 NS
X ₅					0.11 NS

NS = Non significant; ** = significant at 1 % level

total knowledge and skill gain differed significantly for the three subjects.

The calculated critical difference (Table 7) shows that the total knowledge and skill gain for the preparation of fish wafers was maximum followed by preparation of fish soup powder and fish pickles.

The mean and standard deviations were worked out for the selected socio-economic variables and the same is presented in Table 8. From Table 8 it could be seen that the average age of the respondent was 21, educational qualification upto high school and the size of the family 7. In each fisherwomen family two persons were employed and the average annual income was Rs. 1500/-. The fisherwomen family had high extension agency contact.

To find out the relation between selected socio-economic variables, intercorrelation

was worked out. The intercorrelation (Table 9) of the selected socio-economic variables showed non-significant relationship for all the variables except education and size of the family.

The correlation co-efficients were worked out to find out the relationship between the socio-economic status of the fisherwomen with their total knowledge and skill gain (Table 10). The education and extension agency contact showed positive and significant relationship with overall knowledge and skill gain.

The multiple regression equation was $y = 4.9 + 1.06 X_1 + 1.54 X_2 + 1.35 X_3 + 3.94 X_4 + 0.006 X_5 + 0.17 X_6$

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Table 10. *Correlation co-efficients for the socio-economic status of fisherwomen with their total knowledge and skill gain*

Variables	Correlation coefficients
X ₁	0.13 NS
X ₂	0.53*
X ₃	0.21 NS
X ₄	0.15 NS
X ₅	0.35 NS
X ₆	0.40*

NS = non significant; * = significant at 5% level.

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NOTE

Fabrication of a Water Sampler for Use in Aquaculture

Water samples from aquacultural ponds are collected in different ways for different types of analysis. Samples collected for estimating dissolved gases should not come in contact with atmospheric air and other gases and they are not agitated unduly, to avoid changes in its gas contents. A Kemmerer, Friendinger or Forest type sampler may be used for collecting samples for dissolved gases (Jhingran *et al.*, 1969). Of these, Kemmerer type sampler is widely used. When a Kemmerer type sampler is used, the sample from the bottom of the sampler is let out through a tube extending to the bottom of the sample bottle. For dissolved gases the sample bottle is filled over flowing for at least 10 seconds taking care to avoid turbulence and formation of bubbles during filling the bottle (Anon, 1975).

Usually the aquaculture ponds are shallow water impoundments and their depths are not more than 2.5 metres. Water samples from aquaculture ponds may be collected in narrow mouth glass-stoppered bottles. Tapered ground glass stoppers with flat head may avoid contact with atmosphere and 100 ml sample bottles have been suggested (Anon, 1969; Jhingran *et al.*, 1969). Boyd and Lichtkoppler (1979) have reported that the samples of surface water may be collected by immersing and filling an open mouthed bottle and samplers may be used for obtaining samples from different depths. They have suggested a sampler having a stoppered bottle attached to a wooden stick for lowering to the desired depth. It has been suggested that a Kemmerer type sampler is suitable for collecting samples from depths greater than two metres and the APHA type sampler is suitable for ponds and tanks of moderate depth (Anon, 1975).

Keeping in view of the requirements for aquacultural work, a water sampler has been constructed with 3 metres long aluminium angle of section 37 x 37 x 3 mm having a small piece of M.S. plate of about 120 mm diameter fixed at the bottom to support and hold

the sample bottle (Fig. 1). Arrangement for attaching the bottle with the aluminium angle is made through an adjustable clamp made of G.I. sheet both ends being fitted with threaded bars for fixing and tightening the bottle by fly nuts. For sampling with this sampler glass stoppered bottle of size between 100 and 1000 ml can be used. A graduated scale is attached with the aluminium angle to record the depth from which

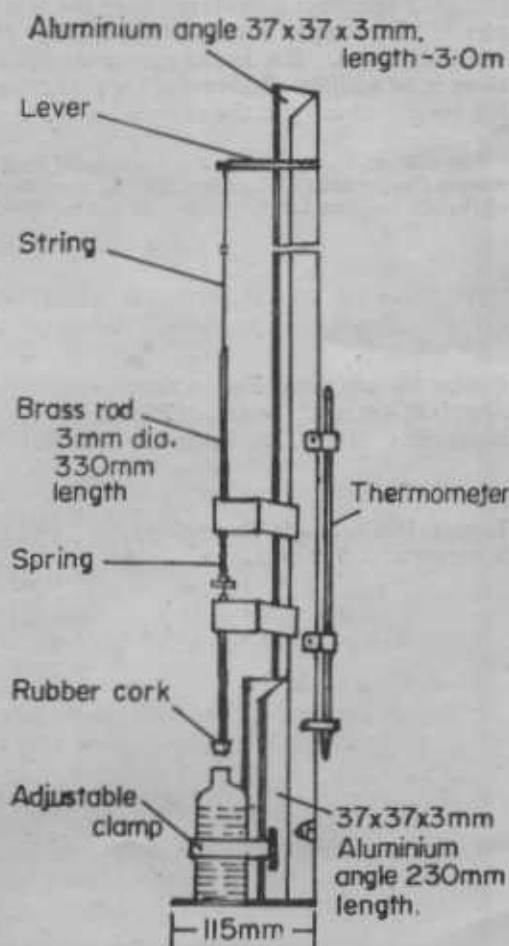


Fig. 1. The water sampler.

the water sample is collected. The sampler is lowered to the desired depth and the stopper (rubber cork) is jerked out with the help of G.I. string fitted with a lever so that the bottle may be filled. The rubber cork is fixed with a brass rod of 3 mm diameter and 330 mm long tied with the G.I. string and guided through two clamps and a spring for smooth and trouble-free operation. Provision has also been made for attaching a thermometer to record the temperature of water simultaneously (Fig. 1).

This sampler is light and handy and is useful for field and laboratory model studies. Since aluminium angle is used this is not affected by rusting due to repeated use in water. This simple equipment is easy to fabricate and operate. In Kemmerer type samplers, the sample is transferred from the sampler to the sample bottle for estimation of dissolved gases. But in the present sampler there is an additional advantage of collecting the sample directly in the sample bottle.

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