

Marketing linkage, Economic Viability and Consumer acceptability of the Small millet-based products developed by Self Help Group

D. C. Shrivastava¹, Sarita Singh², Riya Thakur³

Jawaharlal Nehru Krishi Vishwa Vidhyalya, Krishi Vigyan Kendra Chhindwra (M.P)

Corresponding author's e-mail: dcshrivastava@jnkvv.org

ABSTRACT

Millets are nutritionally superior; the non-availability of refined and processed millets in ready-to-use form has limited their wider use and acceptability. Millets are, therefore, confined to traditional consumers and also to the people of lower economic strata. Hence, there is a need to develop suitable milling systems to obtain milled millet grains at household and small-scale industrial levels with a view to facilitate their easy availability in ready-to-use form and evaluate to economic viability and consumer acceptability of the Small millet-based products developed by Self Help Group

In present investigation the methodology involved quantitative as well as qualitative assessment conducted of two self help group in chhindwara District , namely, one stop center women group, Gulabarra and Venganga SHG from tamia block and the work was carried out during 2022-203. The SHGs were trained in processing of millet and products are being marketed at Rs. 100-120 per kg. At this price, the benefit cost ratio of the product is 1:88 for millet based 'products'. The calculation of cost of production and income was made for 2400 kg final products in both the cases. Consumer acceptability of various kinds of finger millet and little millet based products conducted at Krishi Vigyan Kendra, Chhindwara. A five point hedonic scale (extremely disliked-1 to extremely liked-5) was used. Individuals were divided into two group (A) consist of 30 student age between 16 to 20 year and (B) 20 house women age in between 25 to 40 year and they were asked to comments on the product. The average score values of various sensory attributes viz, taste, flavour and overall acceptability of the different finished products made from finger millet and little millet were found to vary in the range of 4.0 to 4.7 and 4.2 to 4.6, respectively.

Key words: Millets, SHGs, Value addition, sensory evaluation , Economic Viability

INTRODUCTION

Millets are nutritionally superior; the non-availability of refined and processed millets in ready-to-use form has limited their wider use and acceptability. Millets are, therefore, confined to traditional consumers and also to the people of lower economic strata. Hence, there is a need to develop suitable milling systems to obtain milled millet grains at household and small-scale industrial levels with a view to facilitate their easy availability in ready-to-use form. For young children halwa, burfi and biscuits were developed from convenience mix of ragi millets can fulfill on fifth of energy requirement and one third of protein requirement .These food product can serve as nutritious snack items for children in order to fulfill their daily requirements for protein and energy (Shrivastava *et al.* 2001).

Finger millet has the potential to improve resource management in the hills and tribal area of India and serve as a staple food, weaning food, or a cash crop which provides income generating opportunities.

In India inadequate food intake, poor caring practices contribute to enhance levels of malnutrition. Thus, at this present era of food scarcity there is a need to diversity the use of small millets for the development of various food products weaning foods for young children, pregnant, and lactating mothers to combat protein energy prevalent malnutrition Malleshi, *et al.* (1982).

Empowering women need a holistic approach to participate in decision making in the household, community and local domestic sector and prepare women to take up leadership position

in agricultural activities. SHGs in rural India are bringing a silent revolution not only in terms of providing access to micro credit to communities but also in contributing towards a greater sustainability in agriculture in various ways, including a better use of marginalized local agro biodiversity. In this backdrop, the present work aimed at empowering SHGs through improved processing and value addition of finger millet, a species of high nutritional value but suffering from a status neglect for research and development. The specific objectives of this study were i) to understand the social and economic empowerment ii) to evaluate the Economic Viability and consumer acceptability of the small millet-based.

products

MATERIALS AND METHODS

The methodology involved quantitative as well as qualitative assessment conducted of two self help group in Chhindwara District , namely, one stop center women group, Gulabarra and Venganga SHG from tamia block and the work was carried out during 2022-203. The work encompassed 2 SHGs, each group comprising of 19-20 women. The quantitative data was collected with the help of semi-structured interviews. The interviews' format included questions relating to the family income, savings and loan schemes available to SHG members. Secondary information was collected from books, ledger and registers maintained by SHGs. The data on socioeconomic status included the age, education level of family, family size, occupation, land holdings and family income. Dietary pattern was assessed by 24 hour recall method for 7 days. Sets of pre-standard vessels were used to obtain estimates of raw and cooked foods consumed the subjects. Subsequently, the individual consumption of nutrients like energy, protein, fat, iron, calcium, thiamine, riboflavin and niacin were calculated using food consumption table and compared with the recommended dietary allowance (Gopalan *et al.*, 1996) and the adequacy of nutrients was calculated as per the method suggested by Thimmayamma (1987).

The training programmes of the project concentrated on processing and value addition methods for finger millet and Little millet. Altogether, 50 SHG members were trained of which 20 were selected for detailed skill development in processing of value added products. Secondly, intensive value added product trials both on and off the campus were conducted to select the suitable products having commercial potential for income generation activities and to facilitate enterprise building by the SHG women. Further training was also imparted to these women on nutrition education, importance of value addition in food products, Hazard Analysis and Critical Control Point (HACCP), handling of milling unit, labeling and marketing of the product. The impact of the training programme on the empowerment of women was also assessed, Tesoriero, (2006).

Consumer acceptability of food products:

An evaluation of consumer acceptability of various kinds of finger millet and little millet based products conducted at Krishi Vigyan Kendra Chhindwara. Individuals were divided into two group (A) consist of 30 student age between 16 to 20 year and (B) 20 house women age in between 25 to 40 year and they were asked to comments on the product. The sheet contained 5-points hedonic scale viz., extremely liked-5, liked-4, neither like nor disliked-3, disliked-2, extremely disliked-1. Individuals were asked to write their opinion according to scale provided (Laurie, *et.al* 2012) .One time one product was evaluated by the individuals and recorded the data for calculations. The total 16 products based on finger millet (*chaptties, sweet mathari, laddoo, sattu, biscuits, and weaning food*) and little millet (*chakli, dhokla and khichdi*) product were served in ready -to-eat form for sensory evaluation. A ship of water was taken in between sample to clean the palate before testing the next product.

RESULTS AND DISCUSSION

Socio-demographic Profile of women Members of SHGs

The socio-demographic profile of the members of SHGs in presented in Table 1. The age

profile indicated that the SHG members belonging to the age group of 22-35 years formed the largest class (60%) followed by that of 36-40 years (26%). With regard to literacy, 24 per cent of members were illiterate, 60 per cent had primary school level literacy and only 2 per cent had high school education. The occupation pattern indicated that

majority of them were labors, largely involved in dairy and sericulture activities. Majority of the rural women were having two children (70%) and the family size was 2-4 members in 90 per cent of the samples. The results also showed that 90 per cent of families were nuclear.

Table 1
Socio-demographic profile of women members of SHGs

Variables	Category	Respondents	
		Number	Percentage
Age	21-25 years	7	14
	26-35 years	30	60
	36-40 years	13	26
Education	Illiterate	12	24
	Primary	30	60
	Secondary	7	14
	High School	1	2
Occupation	Housewife	2	4
	Laborer	48	96
Type of family	Nuclear	45	90
	Joint	5	10
Family size	2-4 members	45	90
	5-7 members	5	10
Number of children	One	10	20
	Two	35	70
	Three and above	5	10

Dietary Pattern of SHG Families

The assessment of dietary pattern of SHG members showed that all the families were non vegetarian by habit. The food from animal sources was consumed twice in a week by 45.3 per cent of the families. The common meal of the family was cereal for breakfast and finger millet dumpling with dhal (pulse) and vegetables for lunch and dinner. The commonly consumed fruits were custard apple, papaya and guava, Milk and milk product were used only for tea and coffee and not for consumption as such by children/pregnant/lactating women as they sell the most part of milk to dairy cooperatives.

Nutrient Intake

The mean intake of nutrients by SHG women, viz. energy, protein, fat, iron, thiamine, riboflavin and niacin, were below the recommended dietary allowances (RDA), except for calcium (Table 2). The statistical analysis of the difference in mean values of RDA and actual intake by t-test showed that the inadequacy was highly significant (1% level of probability). The inadequacy of micronutrients is attributed to inadequate intake to protective foods. The adequacy of calcium is attributed to consumption of finger millet which has high calcium intake. The share of millets in the dietary energy and protein was 50 per cent.

Table 2
Mean dietary pattern of SHG women

Nutrients	RDA	Nutrient Mean	Intake SD	% Adequacy	't' value
Energy (kcal)	2225	1600	219	72	32.72**
Protein (g)	50	34	7.7	68	21.02**
Fat (g)	20	10.8	8.4	54	7.58**
Iron (mg)	30	19	4.2	63	17.23**
Thiamine (mg)	1.1	0.77	0.3	70	9.39**
Riboflavin (mg)	1.3	0.88	0.4	68	12.86**
Niacin (mg)	14	9.3	3.3	65	17.44**
Vitamin A (mg)	600	378	343	63	7.93**

** Highly significant (at 0.01 level of probability)

Empowerment of SHG Members through Training

After analyzing the socioeconomic and

dietary intake of SHG members, different training methods employed in these efforts and their degree of preference by SHGs are presented in Table 3.

Table 3
Training methods preferred by SHG women

Training	Percentage of preference
Demonstration	13
Lecture with projected aids	8
Video film	3
Exhibition	3
Field visit	7

The training activities organized through the project included lecture-cum-demonstration related to value added products of finger millet and little millet involving also fruits and vegetables processing for home consumption. Finger millet is a dominant grain crop in the target areas. Major portion of the grain harvested is marketed without value addition and the rest is kept for domestic consumption. The training on value addition of Finger and little millet in the village was aimed at enhancing the income from the marketed grain through value addition. The different SHGs identified finger millet sattu and composit mix as the products for value addition and marketing. The nutrient content of the products which were promoted through these interventions ranged from 327-364 kcal of energy, 11-13 g protein, 7-12 g fat, 65-300 mg calcium and 1-5 mg iron, values that are on par with several products available in the market but costing about three times more.

Sale of the Value-added Products

The value added products, were first commercialized by the SHGs during the Krishi Mela (farmers' fair) festival held on 16-19 November, 2023 and sell the product in Employment fair in 202-2023, As a result of increasing demand of the products.

Economics of Value Addition in Millet

The SHGs were trained in processing of millet, cleaning, milling, packaging and labeling. These products are being marketed at Rs. 100-120 per kg. At this price, on an average, the net income generated by the SHG is substantial as shown Table 4 for finger millet based 'products'. The calculation of cost of production and income was made for 2400 kg final products in both the cases. This model was found scalable provided market demand is expanded with consistency in quality, timely delivery and suitable market promotion.

Table 4
Economics of ragi energy mix production

Particulars	Amount (Rs.)
Variable cost (raw material + fuel + labour + 10% interest)	133000
Fixed cost (depreciation of equipment + interest)	2950
Space (500/month)	5000
Total cost of production 2400 kg/annum	140950
(rounded amount)	141000
Gross income = 125 x 2400 =	Rs. 300000
Net income = Gross income - total expenditure = Rs. 300000- 141000 =	159000
B/C ratio (benefit/cost) = 300000/159000 =	1.88 (benefit of one rupee 88 paise for every rupee spent)

From these data, it is evident that as a result of this interventions, the skills, self confidence and leadership enhanced through the training courses played an important role in boosting the income generation activities pursued by their women members.

Consumer acceptability of millet based products

Consumer acceptability of various kinds of finger millet and little millet based products

conducted at Krishi Vigyan Kendra, Chhindwara . A five point hedonic scale (extremely disliked-1 to extremely liked-5) was used. The average score values of various sensory attributes viz, taste, flavour and overall acceptability of the different finished products made from finger millet and little millet were found to vary in the range of 4.0 to 4.7 and 4.2 to 4.6, respectively as shown in Table 5 to justify the consumers acceptability.

Table No 5
Consumer acceptability of millet based products.

(Average value of 50 individuals)

S.No	Name of products	Taste	Flavour	Over all acceptability	Average
Finger millet products					
1	<i>Chapatties</i>	4.1	3.9	4.2	4.0
2	<i>Sweet mathari</i>	4.2	4.2	4.4	4.2
3	<i>Ladoo</i>	4.5	4.1	4.5	4.3
4	<i>Sattu</i>	4.2	4.6	4.3	4.3
5	<i>Biscuits</i>	4.3	4.3	4.5	4.3
6	<i>Weaning food</i>	4.7	4.6	4.8	4.7
Littlemillet products					
1	<i>Chakli</i>	4.1	4.2	4.6	4.3
2	<i>Dhokla</i>	4.5	4.5	4.5	4.5
3	<i>Khichdi</i>	4.1	4.3	4.4	4.2

All products had a high hedonic rating of above 80 per cent and the products made from finger and little millet were equally liked by the community people similarly equally liked the products made from

wheat and ric

The trial conducted at community level for their acceptability the results showed that all the products based on finger millet and little millet were

well acceptable and ranged 4.0 to 4.7 on 5 points hedonic scale. Hence, products based on finger millet and little millet could be recommended for production at commercial level which will fulfill the need and availability in the market.

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