

**RESEARCH ARTICLE :**

Convergence led livelihood security: A case study in Chittoor district of Andhra Pradesh

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SUMMARY : Millets are small-seeded grasses that are hardy and grow well in dry areas as rain-fed crops, under marginal conditions of soil fertility and moisture. Millets have certain intrinsic quality characteristic suited for product development. The excellent and unique taste is found suitable for making variety of food products suitable for marketing. The present study was undertaken on value addition and market linkage to the various products of millets which have a commercial feasibility to enhance the income of the rural women. With this intension, the rural women of Kalikiri and Pilermandal, were extensively trained on processing, preparation of value added products, packing, branding and various possible avenues for market linkages. After acquainting with these aspects, rural women Mrs. M. Faridha, S. Thajwarsulthana and Najimunnisha with technical guidance of KrishiVigyan Kendra (KVK), Kalikiri established two small scale processing and value addition units. Registration was also done for marketing of millet value added products under Food Safety and Standards Authority of India – 2006. At present, they are involved in preparation and marketing of value added millet products viz., millet biscuits, *Laddu*, muruku, and mixtures under a brandname of “Arogya Millet Foods” and star healthy snacks. They are marketing the products in Chittoor district and Kurnool district of Andhra Pradesh. The monthly production all the products is on an average 350 to 400 kg with a turnover of Rs. 70,000-80,000/-.

KEY WORDS :

Entrepreneurship,
Processing, Value
addition, Packing,
Branding, Labeling

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BACKGROUND AND OBJECTIVES

Most of the operational area of KrishiVigyan Kendra, Kalikiri is rainfed and the farming community depends mainly on rainfed agriculture for their livelihood, due to continuous, uneven distribution of rain fall and occurrence of frequent drought conditions the farm families are unable to get minimum

returns from agriculture. Further farm women of this region are free from farm works during off-season. KVK made some interventions to engage these women in productive works and involving them in income generating activities that may help farm families to get sustainable income throughout the year.

The empowerment of women through self-help groups (SHGs), a non formal co-

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operative organization would benefit not only the individual women but also the family and community as a whole through collective action for development (Holvoet, 2005 and Tesoriero, 2006).

Millets are one of the oldest foods known to humans and possibly the first cereal grain to be used for domestic purposes. Millet is one of the most important drought-resistant crops and the 6th cereal crop in terms of world agriculture production. Also, millet has resistance to pests and diseases, short growing season, and productivity under drought conditions, compared to major cereals (Devi *et al.*, 2011). In addition to their cultivating advantages, millets were found to have high nutritive value and comparable to that of major cereals such as wheat and rice (Parameswaran and Sadasivam, 1994). Millets must also be accepted as functional food and nutraceuticals because they provide dietary fibers, proteins, energy, minerals, vitamins, and antioxidants required for human health. Several potential health benefits such as preventing cancer and cardiovascular diseases, reducing tumor incidence, lowering blood pressure, risk of heart disease, cholesterol, and rate of fat absorption, delaying gastric emptying, and supplying gastrointestinal bulk were reported for millets (Truswell, 2002; Gupta *et al.*, 2012). It has also been reported that millet proteins are good sources of essential amino acids except lysine and threonine but are relatively high in methionine. Millets are also rich sources of phytochemicals and micronutrients (Mal *et al.*, 2010; Singh *et al.*, 2012). Compared to rice, especially polished rice, millets release lesser percentage of glucose over a longer period of time. This lowers the risk of diabetes.

Millets can be processed and value added into various products like millet flours, multigrain atta, rawa, millet biscuits, ragi malt, millet based snacks etc. It creates income generating opportunity to the rural women and increasing the economic and social strength of women. Linking of farmers to the markets through efficient value chains would reduce the use of intermediaries in the chain and strengthen the value-adding activities by better technology and inputs, upgraded infrastructure and processing and exports. This process can raise the income of farmers and will provide incentive for improving their management practices towards higher farm productivity. The income of the farmers can be enhanced by increasing production, value addition, and better marketing options. The present paper

describes the efforts made by Krishi Vigyan Kendra, Kalikiri to establish village level enterprise on processing and value addition to millets with an objective of self employment and income generation to the rural women.

RESOURCES AND METHODS

Krishi Vigyan Kendra, Kalikiri, Chittoor district of Andhra Pradesh has conducted three skill development training programmes to rural women, each of five days duration on processing and value addition to millets at Kalikiri and Piler of Chittoor dt during the year 2015-16. About 75 self-help group women mobilized by DRDA participated in these three training programmes from different villages of Kalikiri and Piler mandals of Chittoor district.

Trainings and demonstrations:

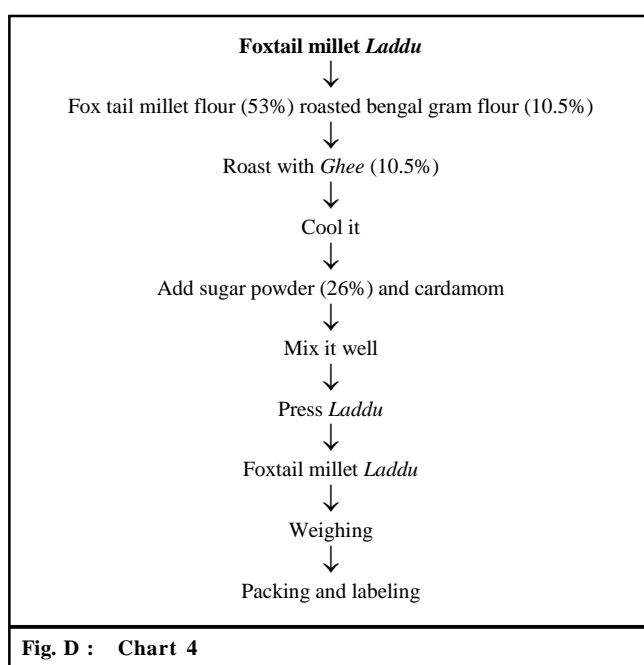
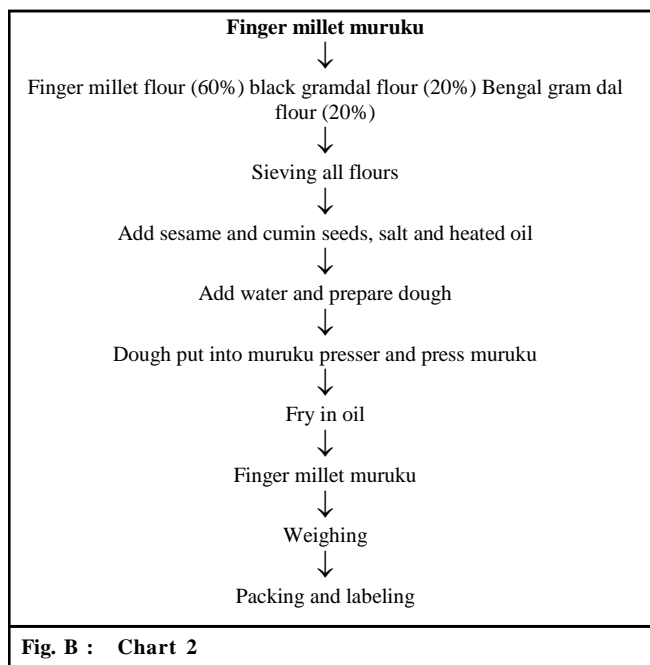
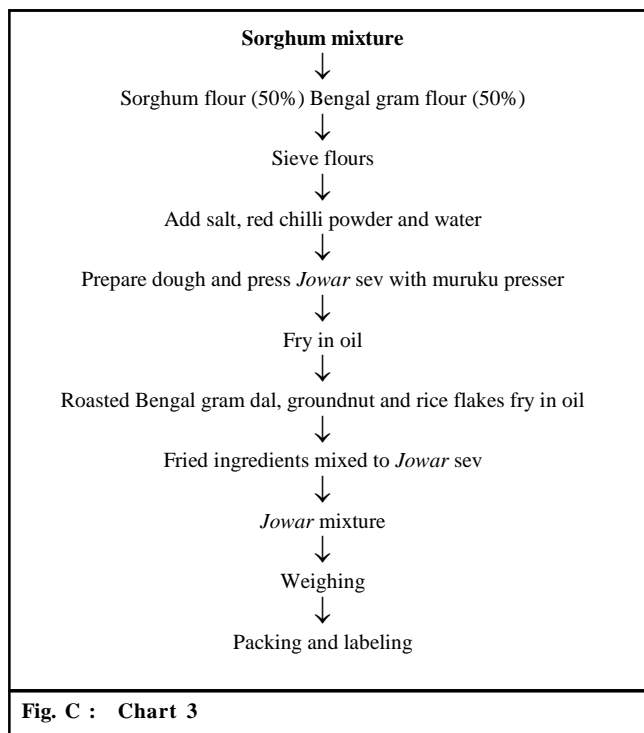
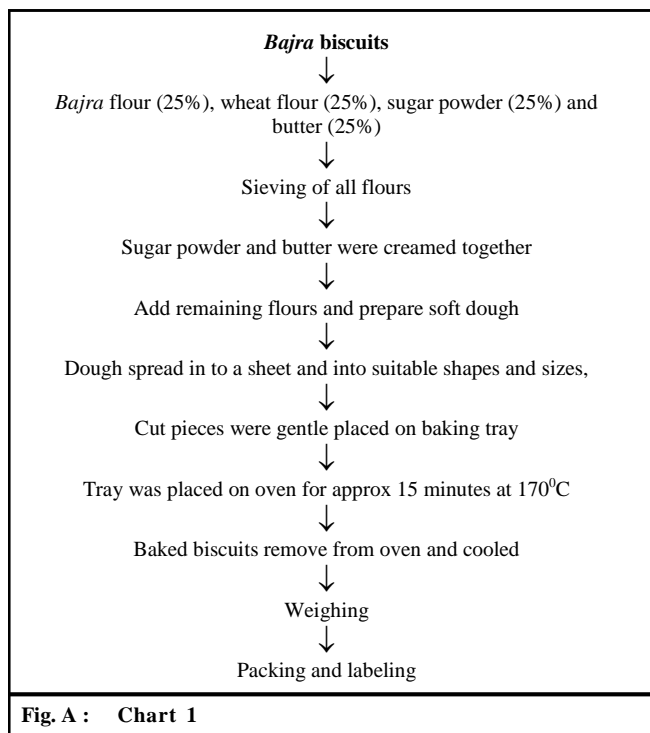
Interactive lectures coupled with hands on experience on preparation of millet biscuits, savouries, muruku and *Laddu* etc., were given to the selected trainees and also sensitized them on nutrition education, importance of value addition in food products, handling of processing and value addition unit, maintaining hygiene while handling food products, labeling, packing, licensing and financial management.

Processing and value addition:

The aim of processing and value addition of millet was to convert the grains into convenient food and to make the product nutritionally superior, to market easily and having a shelf life of minimum one month. Accordingly four products *viz.*, biscuits, savouries, muruku and *Laddu* with finger millet, sorghum, *Bajra* and foxtail millet were selected for preparation and marketing. The flow chart of the same has been given in chart 1, chart 2, chart 3 and chart 4. The selected products were assessed for nutrient composition by computation method using 'Nutritive Value of Indian Foods' (Gopalan *et al.*, 2004).

Establishment of processing unit:

To bring systemization and regular production, there is a need for establishment of their own processing unit for preparation of millet based products. Hence, a plan was developed for establishment of processing unit with minimum necessary machineries.



Packaging and labeling:

Packaging serves as a silent sales man. To promote the products and to get better market opportunity, farm women were supported for development of attractive and suitable packaging with nutrition label.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Socio-demographic profile:

The socio-demographic profile of the farm women selected for skill development training on processing and value addition of millets is presented in Table 1. The age profile indicated that majority of farm women belonged to the age group of 26-35 years (52%) followed by 21-25 years (32%). With respect to literacy, 57.3 per cent of women were educated upto high school level followed by primary education level (32%) and only 10.7 per cent were illiterates. The occupation pattern indicated that majority (65.3%) of them were farm labour followed by housewives (34.7%). Majority of these women were having two children (53.3%) and the family size was 2-4 members (62.7%). The results also showed that 76 per cent of families were nuclear.

Nutrient composition of value added products:

The nutrient composition of millets value added products *viz.*, Bajra biscuits, finger millet muruku, sorghum mixture and foxtail millet Laddu was calculated and given in Table 2. The nutrient content of the products which were promoted through these interventions ranged from 60.1- 67.08g of carbohydrates, 5.52-15.6g of

protein, 2.18-21.6g of fat, 19.25-248.4 mg calcium and 2.54-4.7 mg iron. Nutritional values are at par with the study conducted by Yenagi *et al.* (2010) on nutrient composition of ethnic and novel foods from minor millets.

Establishment of processing and value addition unit:

After acquainting with processing, preparation of value added products and packing, two trainees Mrs. Thajwarsulthana and Najimunnisha from Piler, and one trainee Mrs. M. Faridha from Kalikiri came forward to take up processing and value addition to millets as an entrepreneurial activity. Under technical guidance of KVK, Kalikiri and with the financial support of DWCRA, they established two small scale processing and value addition units in their vicinity. They hired rented rooms for establishment of the units and then they purchased and installed the necessary equipment's *viz.*, bakery oven, weighing scale and sealing machine. KVK assisted them in procuring this equipment, installation and handling. Home scientist of KVK regularly supervised and monitored the quality of the end products ensuring use of good quality raw material, oils etc. KVK, Kalikiri

Variables	Category	Number	Percentage
Age	21-25Years	24	32
	26-35 Years	39	52
	36-40 Years	12	16
	Illiterates	08	10.7
Education	Primary	24	32
	High School/above	43	57.3
Occupation	Housewife	26	34.7
	Labour	49	65.3
Type of family	Nuclear	57	76
	Joint	18	24
Family size	2-4 members	47	62.7
	5-7 members	28	37.3
Number of children	One	07	9.3
	Two	40	53.3
	Three and above	28	37.4

Products	Protein (g)	Carbohydrates (g)	Fat (g)	Calcium (mg)	Iron (mg)
Bajra biscuits	5.52	60.1	21.6	19.25	2.7
Finger millet muruku	13.34	67.08	2.18	248.4	4.16
sorghum mixture	15.6	66.2	3.75	40.5	4.7
Foxtail millet Laddu	8.32	65.4	13.1	25.5	2.54

Table 3 : Income generated from production and marketing of value added finger millet products

Products	Production cost (Rs./kg)	Selling price (Rs./kg)	Net profit (Rs./kg)	Sales/month (kg)	Profit/month (Rs.)
<i>Bajra</i> biscuits	89	200/-	111	95-100kg	10,545-11,100
Finger millet muruku (Chakli)	97	200/-	103	115-120kg	11,845-12,360
Sorghum mixture	103	200/-	97	110-115kg	10,670-11,155
Foxtail millet <i>Laddu</i>	107	240/-	133	90-95kg	11,970-12,635
				Total Earnings/month (Rs.)	45,030-47,250

assisted the entrepreneurs to do registration of their unit with a brand name under Food Safety and Standards Authority of India 2006. The units were registered with brand names “AROGYA MILLET FOODS”(FSSAI Reg. No. 20116020000285) and “STAR HEALTHY SNACKS” by the three entrepreneurs. KVK also lend a hand in designing and printing of colourful labels and packing for different products produced by these entrepreneurs facilitating better marketing opportunities.

Marketing of the value added products:

Initially the products produced by these women were sold under the brand name of KVK, Kalikiri during agricultural exhibitions organized by Acharya N.G Ranga Agricultural University, Guntur and department of Agriculture in different locations. After creating a platform for these products, the products were placed in provision stores in Kalikiri, Piler, Super markets in Tirupati and wholesale shop in Nandyal of Kurnool district. An exclusive outlet for sale of these products is also opened in the vicinity of KVK for meeting the local demand. In addition to the regular market avenues, the value added products are being supplied to KVK, Kalikiri and RARS, Tirupati and other institutions for distributing the same as snacks to the participants of training programmes and other official meetings. On an average, about 350 kg of various millet based products are being produced and sold per month ensuring a net profit of Rs. 40,000-45,000/-.

Economics of value addition to millets:

On the basis of one year data, the economic analysis of the four products viz., *Bajra* biscuits, finger millet muruku, sorghum mixture and foxtail millet *Laddu* are presented in the Table 3. It is depicted from the table that the monthly sales are around 95-100kg *Bajra* biscuits, 115-120 kg finger millet muruku (Chakli), 110-115 kg sorghum mixture and 90-95 kg foxtail millet *Laddu* earning monthly net profit of Rs.10,545-11,100 from *Bajra* biscuits, Rs. 11,845-12,360 from finger millet

muruku (Chakli), Rs. 10,670-11,155 from sorghum mixture and Rs.11,970-12,635 from foxtail millet *Laddu*.

Thus, a small intervention made by KVK, Kalikiri in convergence with DRDA resulted in a sustainable income generation for poor rural women and enhanced their livelihood standards. Incidentally, the annual consumption of raw material by these value added units annually is around 1000 kg of finger millet, 800 kg of foxtail millet, 900 kg of jowar and 400 kg of *Bajra* thereby creating market for rainfed farmers of the region. This process can raise the income of farmers and will provide incentive for improving their management practices towards higher farm productivity. The income of the farmers can be enhanced by increasing production, value addition, and better marketing options. An efficient value chain by linking small and marginal farmers to these value added units will enhance the net returns for both the parties mutually.

Conclusion:

The interventions of Krishi Vigyan Kendra played a strategic role in increasing self-confidence among farm women in undertaking small scale food processing and value addition unit at their village level and reaching the market in urban area. The consolidated initiation of farm women on processing and preparation of value addition to millets is a new way of self-reliance practice. The entrepreneurship activity focusing the millet products has not only generated the additional employment and enhanced income of the families but also saved the farm families from hunting of work to earn livelihood. Further availability of millet products help in enhancing its consumption which in turn improve the nutritional intake of the consumers.

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