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Economics of Value Added Products of Kodo and Kutki

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ABSTRACT
The present study was carried out to analyse the marketed surplus of kodo and kutki and their value added products covered 120 tribal small millets farmers of Madhya Pradesh. The value addition of the small millets was not found in commercial scale. The majority of tribal farmers were found to prepare various products of kodo and kutki but for their home consumption only. Very few of them found to sell the value added products in weekly (haat) bazar. The value addition in small millets needed to be up scaled by establishing micro/small level industries with capacity building in preparation of a variety of products having wider acceptance at national and international markets. The geographical indicator based small millets products may be prepared to match the international norms/standards by supporting tribal with end to end approach thereby inculcating the entrepreneurial skill among them and creating a brand image of these value-added products at the global level. This will not only create an environment of auto welfare of tribal at one end and State will also be benefitted by generating foreign exchange reserve on the other.

Keywords: Marketing, millets, surplus, VAP.

JEL Codes: D31, H31, H57, J41, M13, M31, M37.

INTRODUCTION

The term millets is used for many small-grained cereals. Millets crops comprise of pearl millets, sorghum, finger millets and small millets namely foxtail millets (Kagani), kodo millets (kodo), proso millets (cheena), banyard millets (sawan) and little millets (kutki). Millets are one of the oldest cultivated food grains known to humans and have been a staple food in Northern Africa for thousandyears and was a staple food in China and India before the popularity of fine cereals like rice and wheat (Klmata, Ashok &Seetharam, 2000). Millets grains have been the food for the traditional consumers and population of lower economic strata in India and Africa and as a feed ingredient in many developed countries (Malleshi, 1997).

These crops have a long history of cultivation of more than 5000 years and grown in many States. Millets are rich in nutrients like vitamins, minerals and essential fatty acids, also have benefits in terms of prevention of degenerative diseases besides their known functions of preventing nutritional deficiency diseases. Being non-glutinous, millets are safe for people suffering from gluten allergy and celiac disease. They are non-acid forming, easy to digest and non-allergenic (Saleh, Zhang, Chen & Shen, 2013). Rao, Nagasampige and Ravikiran (2011) showed that millets are also rich in health-promoting phytochemicals like polyphenols, lignins, phytosterols, phytoestrogens, andphytocyanins. These function as antioxidants, immune modulators, detoxifying agents, etc. and hence protect against age-related degenerative diseases like cardiovascular diseases (CVD), diabetes, cancer, etc.

Amadou, Gounga and Le (2011); Izadi, Nasirpour, Izadi and Izadi (2012) found that millets contained minerals like iron, magnesium, phosphorous and potassium. Finger millet (ragi) is the rich in calcium content, about 10 times that of rice or wheat. Millets are high in fiber and low on calorie. There is an urgent need to reintroduce many of the cereals, millets in our daily diets. In the food industry, cereal grains and plant nutrients are largely used as a major source of dietary nutrients worldwide.

According to FAO estimates the global millet production was estimated at 27.83 million tonnes in 2014.

India is the largest producer (41.04 per cent) followed by Nigeria (11.94per cent). Madhya Pradesh covers 33.4 per cent of the area and contributes 26.6 per cent of the production of small millets in the country. Kodo (70 per cent) and kutki (24per cent) account together 94 per cent of the area of small millets in Madhya Pradesh (The Government of Madhya Pradesh, 2015).

Millet crops are indispensable to rain-fed, tribal and hilly agriculture where crop substitution is difficult. Hence, it has become imperative to enhance the production and productivity of these crops to ensure food and nutritional security not only to people living in harsh and difficult terrains but also in other areas with exploring the possibility of export. Its fiber content is five times that of rice with low-calorie content. Mixed with wheat kodo and protein-rich kutki are good grain substitutes for diabetics. It has 20 per cent less carbohydrate than rice and wheat (Table 1).

In the last two decades their importance as a staple food in Asia declined due to various factors like rising incomes, growing urbanization and government policies favoring the production and consumption of fine cereals like rice and wheat. However, the same factors are driving the demand for these crops in alternative uses like feed (cattle and poultry), starch and alcohol (Rao & Basavaraj, 2015). More than 50 per cent of the millet production is now finding its way to alternative uses as opposed to its consumption only as a staple.

Value addition with different ingredients like chocolate, cocoa powder, nuts, and dry fruits resulted in enhanced incorporation of little millet flour in cookies without adversely affecting the sensory profile (Bharati, Meghana, Naik, & Kamatar, 2011). Value-added products from nutri-cereals finger millet reported that food is consumed in combinations. The synergy between foods with others is vital not for taste and delight of eating but also their high nutritional quality and health benefits. The modern trend for the development of new food products aspires for complementary foods to fulfill the widening gap of food availability and nutritional security (Verma & Patel, 2013).

In the modern days where life is at a fast pace with the time very valuable to every person, instant food play an important role. Instant food means simple, fast and convenient food which is easy and fast to prepare besides being hygienic, free from microbial contamination and also convenient to eat. Previously human beings used to have his food lavishly and slowly, the present trend changed the habits to foods which are simple and easy to digest. Hence, the existence of these foods fulfilled all the needs of the modern human being. Traditional south Indian breakfast foods viz., adai, pittu, idiyapam, kali, roti, and kesari were selected. Instant mixes of these traditional products with the incorporation of small millets were standardized. Looking to the nutritional importance of small millets and their value added products the present study was undertaken to analyse the marketed surplus of kodo and kutki and their value added products in Madhya Pradesh.

METHODOLOGY

Two districts having the highest area under the selected crops in the State, that is, Dindori and Madla for Kodo and Chhindwara and Dindori for kutki were selected for the study. One block from each selected districts. As such Ghughari and Shapura from Mandla and Dindori, for kodo and Tamiya and Sahapura from Chhindwara and Dindori for kutki were selected for the study based on the highest area under these crops. A list of all the villages in these selected blocks where the concentration of area was found to be more under these crops was prepared and one village was chosen randomly. Further, the number of villages nearby selected village was considered for collection of primary data to fulfill the requirement of the desired sample size. The study was based on primary tribal small millets comprised of 30 each kodo and kutki growers chosen randomly from the sample villages. The primary data were collected using pretested interview schedule by survey method for 2015-

Table 1. Nutrient composition of small millets as compared to other cereals

Crop / Nutrient	Protein (g)	Fat (g)	Fiber (g)	Minerals (g)	Iron (mg)	Calcium (mg)	Calories (kcal)
Pearl millet	10.6	4.8	1.3	2.3	16.9	38	378
Finger millet	7.3	1.5	3.6	2.7	3.9	344	336
Foxtail millet	12.3	4.0	8.0	3.3	2.8	31	473
Kodomillet	8.3	3.6	9.0	2.6	0.5	27	309
Little millet	7.7	5.2	7.6	1.5	9.3	17	207
Barnyard millet	11.2	3.9	10.1	4.4	15.2	11	342
Sorghum	10.4	3.1	2.0	1.6	5.4	25	329
Prosomillet	12.5	2.9	2.2	1.9	0.8	14	356
Rice	6.8	2.7	0.2	0.6	0.7	10	362
Wheat	11.8	2.0	1.2	1.5	5.3	41	348

***Source: http://earth360.in/web/Millets.html*,http://dacnet.nic.in/millets/all_indiaapy_trend.htm.**

16. The data were analysed by using descriptive statistical tools such as averages, percentages, etc.

RESULTS AND DISCUSSION

Marketable and marketed surplus, disposal of marketed surplus in different months of a year, value added products and constraints in marketing and value addition of kodo and kutki werean alyzed.

Marketable and Marked Surplus

Marketable and marketed surplus of kodo and kutki obtained from an acre of land was analysed (Table 2). It was observed that on an average the produce of kodo and kutki was estimated to be 2.77 and 2.71 quintal per acre taking into account the quantity 0.14 and 0.12 quintal per acre in the preceding year. Out of which an average farmer consumed about 40 per cent to the total production of both the crops. It was found that the farmers kept 5.42 and 3.69 per cent and 0.72 and 0.55 per cent of total production for seed and animal feed in the case of kodo and kutki, respectively. The wastage was found to be 1.81 and 3.95 per cent of total production in the case kodo and kutki, respectively. Based on the analysis, the marketable surplus was found to be more than a marketed surplus. Out of total production, marketable and marketed surplus were found to be about 56 and 51 per cent respectively across both the crops by an average farmer in the area.

Disposal Pattern of Marketed Surplus

Disposal pattern of a marketed surplus of kodo and kutki during the different months 2015-16 is presented in Table 3. It was observed from the data that an average producer sold 78.30 and 72.14 per cent of marketed surplus of kodo and kutki in peak period of September 2015 to March 2016 at an average price of ₹18.71 and 19.47 per kg The remaining 21.70 and 19.47 per cent was sold during the lean period (April 2016 to August 2016) at average price ₹22.36 and 23.40 per kg. The average price of kodo and kutki was found to be ₹20.23 and 21.11 per kg which varied from ₹15 to 24 per kgand ₹7 to 25 per kg. This indicated the inverse relationship between price and quantity of kodo and kutki sold in the market.

Value Added Products

The economics and value added products related were analysed separately for kodo and kutki and presented in Table 4. The most common value added products laddu and chakli were found to be prepared and

Table 2. Marketable and marketed surplus of kodo and kutki

(q/acre)

Particulars	Kodo		Kutki	
	Quantity	Per cent	Quantity	Per cent
Total production	2.77	100.00	2.71	100.00
The stock of the previous year	0.14	5.05	0.12	4.43
Self-consumption	1.12	40.43	1.11	40.96
Kept for Seed next Year	0.15	5.42	0.10	3.69
Used as animal feed	0.02	0.72	0.015	00.55
Wastage	0.05	1.81	0.08	2.95
Marketable surplus	1.57	56.68	1.52	56.09
Marketed surplus	1.43	51.62	1.40	51.66

Table 3. Disposal of marketed surplus during different months, 2015-16

Particulars	Quantity (kg)	Quantity sold (Per cent)	Average price (₹/kg)	Per cent change to average price
Kodo				
Total	1.43	100.00	20.23	0.00
Average	0.12			
Peak period(September to March)	1.12	78.32	18.71	-7.51
Lean period (April to August)	0.31	21.68	22.36	10.51
Kutki				
Total	1.40	100.00	21.11	0.00
Average	0.12			
Peak period (September to March)	1.01	72.14	19.47	-7.75
Lean period (April to August)	0.39	27.86	23.40	10.85

marketed in weekly haat bazar. A farmer invested₹150.40 and 104.00 and received ₹59.60 and 56.00 as net profit respectively for laddu and chakli per kg from kodowhereas investment of₹186.38 and 113.11 brought a net profit of₹89.62 and 66.89 from laddu and chakli from kutki (Table 4). This indicated that by preparing value added products not only the income of the farmers was found to increase but at the same time the employment was also generated.

Constraints in Value Addition and Marketing of Small Millets

The constraints in value addition and marketing of small millets reported by the producers, extension workers and scientists of Krishi Vigyan Kendra during the investigation are presented in Table 5.

It was observed from the results that change in the consumption habits among the urban households coupled with time consuming and tedious procedure of food

Table 4. Economics of value added products of kodoandkutki

(₹/kg)

Particulars	Laddu		Chakli	
	Value	Per cent to the total	Value	Per cent to the total
Kodo				
Processed Kodo	13.50	9.00	12.00	11.54
The mixture of other grains (Rice, pulse, suji, etc.)	0.00	0.00	14.40	13.85
Sugar	15.40	10.27	0.00	0.00
Liquid material (Ghee/Milk/Water)	76.50	51.00	2.00	1.92
Other material(dry fruits/Spices)	12.00	8.00	50.00	48.08
Labour charges	25.00	16.67	18.00	17.31
Subtotal	142.40	94.93	96.40	92.69
Transportation cost	8.00	5.33	8.00	7.69
Total cost	150.40	100.00	104.00	100.00
Selling price	210.00		160.00	
Net profit	**59.60**		**56.00**	
Kutki				
Kutki (processed)	13.30	7.14	12.25	10.83
Mix other (Rice, pulse, suji, etc.)	0.00	0.00	15.36	13.58
Sugar	14.08	7.55	0.00	0.00
Liquid material (Ghee/milk/water)	54.00	28.97	2.00	1.77
Other material (dry fruits/spices)	72.00	38.63	57.50	50.84
Labour charge	25.00	13.41	18.00	15.91
Manufacturing cost	178.38	95.71	105.11	92.93
Transportation cost	8.00	4.29	8.00	7.07
Total cost	186.38	100.00	113.11	100.00
Selling price	276.00		180.00	
Net profit	**89.62**		**66.89**	

Table 5. Constraints inefficient marketing of value addition of kodoandkutki

Constraints	Ranking
Change in the consumption habits among the urban households coupled with the time consuming and tedious procedure of food preparation making utilization difficult	I
Lack of advanced and cost-effective processing technologies for entrepreneurship development	II
The comparatively poor shelf life of miller based products	III
Lack of remunerative price for the produce and marketing facilities	IV
Lack of suitable extension and development support for the production of value added products of millets in the state	V

preparation making utilization difficult, lack of advance and cost-effective processing technologies for entrepreneurship development, comparatively poor shelf life of miller based products, lack of remunerative price for the produce and marketing facilities and lack of suitable extension and development support for production of value added products of millets were the foremost constraints in marketing and value addition of kodo and kutki in the state.

CONCLUSIONS

The majority of tribal farmers were found to prepare various products of kodo and kutki for their home consumption only. Very few of them sold the value added products in weekly (haat) bazar. The products were prepared from organically produced small millets by the tribal community, the value addition in small millets needed to be up scaled by establishing micro/small level industries with capacity building in preparation of a variety of products having wider acceptance at national and international markets. The marketing channels should be developed to increase the sales of the value added products and expanded to other areas. The policy should be drawn to include millets in the mid-day meals programme scheme, at least twice in a week (Agepati, 2014). In this way, geographical indicator based small millets products may be prepared to match the international norms/standards by supporting tribal with end to end approach thereby inculcating the entrepreneurial skill among them and creating a brand image of these value added products at the global level. This will not only create an environment of auto welfare of tribal at one end and State will also be benefitted by generating foreign exchange reserve on the other.

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