A comparative study on production and marketing of brown rice in Kerala and Tamil Nadu

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ABSTRACT

The study was conducted to assess the costs and returns in production and marketing of brown rice in Kerala and Tamil Nadu. Primary data were collected from producers (10 millers) and intermediaries (20 wholesalers/retailers) and hundred consumers of both the states through well-structured interview schedule using simple random sampling. Results revealed that total cost for production of brown rice was higher in Tamil Nadu (Rs 3244.25/q for raw and Rs 3264.25/q for parboiled traditional varieties; Rs 2044.25/q for raw and Rs 2064.50/q for parboiled improved varieties) but processing cost alone was higher in Kerala (Rs 240.20/q and Rs 270.40/q for raw rice in conventional and modern rice mills respectively and additional Rs 20/q for each as cost of parboiling). Net return from one quintal of brown rice was highest in modern rice mills of Kerala for traditional varieties (Rs 1176.60/q and Rs 1179.60/q for raw and parboiled rice respectively) and in conventional rice mills of Tamil Nadu for improved varieties (Rs 1846.75/q for raw rice and Rs 2341.50/q for parboiled rice). Only a little quantity of total paddy processed was converted into brown rice. Also brown rice production in Tamil Nadu was lesser as compared to Kerala. Thus economists, engineers, plant breeders and government have to take joint action to increase marketability of the product.

Keywords: Cost; returns; brown rice; raw; parboiled; conventional; modern

INTRODUCTION

In India rice is a staple food and classified according to the degree of milling as brown rice (BR) and white rice (WR). Brown rice is often referred to as whole rice in which the outer hull is got stripped off. White rice is obtained by removing the bran and germ along with all the incredible nutrients. This causes nutritional imbalance when white rice is consumed alone as staple food despite its composition (about ninety per cent starch in dry solids). In this study brown rice is defined as dehusked whole grain rice with its bran and germ.

Brown rice market can be segmented on the basis of length, type and regions that constitute the key markets (Campbell et al 2009). Brown rice on the basis of length can be segmented into long grain brown rice, medium grain brown rice and short grain brown rice. Based on market information from India brown rice consumers can be divided into traditional rice variety (Kudavazhai, Mappilai Samba, Karthiyanam, Salemsannam and Sixty Karkuruvai) brown rice consumers (fifty numbers) and improved rice variety (Kichadi Samba and White Ponni) brown rice consumers.

Costello et al (2013) made an attempt to analyze different aspects of African rice value chain and its effects on consumers. The aim of the study was achieved by a desk study comprising 300 documents as well as key informants, a field-study component using USAID's value-chain analysis methodology.

Pabuayon and Quilloy (2011) reported that the market chain of brown rice comprised two market intermediaries that included the wholesalers/distributors and the retailers in the selected provinces of Luzon, Phillipines. Value addition in the form of grading/quality

control, re-packing, labeling or delivery to higher level markets was done mainly by those who carried a brand name or sold in established wholesale or retail markets.

Singh and George (1970) defined price spread as the marketing cost incurred and marketing margin earned on the costs in the movement of the produce from the primary source to the ultimate consumer. Dahl and Hammond (1977) referred marketing efficiency as the achievement of minimum cost in the accomplishment of the basic marketing functions of assembling, processing, transportation, storage, distribution and related physical and facilitative activities.

Amrutha (1994) studied the economics of processing paddy into rice, Murmura, Poha and popped rice in Chitradurga and Dharwad districts of Karnataka wherein per quintal fixed cost in large and small rice mills was Rs 16.68 and 25.55 respectively. The variable cost per quintal in rice mill was Rs 477.89 and 655.95 in small and large units respectively.

The cost of paddy processing includes both variable and fixed costs incurred in processing of a quintal of rice. The variable cost includes cost of labour, electricity, packing material, maintenance and storage while fixed cost includes insurance, depreciation, administrative expenses etc. The cost of processing of modern rice mills (non-parboiled) at owner cum trader basis and traditional rice mills (Hullers) at custom hiring basis has been observed.

Madhappa (2000) examined the marketing channels and margins in rice marketing in northwestern Tamil Nadu based on the data obtained from 26 market functionaries and 100 rice farmers. Results revealed that every marketing channel identified in the study brought a fair share to the rice producers. Also it was pointed out that organized marketing channels were not efficient in reducing the margin of intermediaries though those were efficient in reducing marketing costs.

Ramu (2013) conducted a study on the efficiency of paddy marketing system in Chittur Taluk of Kerala with matrix ranking technique, price spread method and Shepherd's formula as analysis tools. Four marketing channels were identified among which channel 1 was found to be more efficient due to lower marketing cost, less price spread and higher producer's price.

Several studies have already been conducted on brown rice and most of these are technical in nature focusing on the health advantages of brown rice over white rice but there is no or very little information on production and marketing of brown rice in India. Hence the specific objective of this study was to identify the relevant aspects in production and marketing of brown rice which remained almost as an untouched area of research.

METHODOLOGY

Among the southern states, Kerala and Tamil Nadu were purposefully selected for the study considering highest possible consumption of brown rice. Because of the authenticated data limitation three districts each in Kerala and Tamil Nadu were purposively selected based on trade source information on brown rice consumption. Therefore universe of the study was brown rice producers, consumers and intermediaries in the selected districts of Kerala and Tamil Nadu.

In order to study the costs and returns in production and marketing a sample of ten producers (millers) was selected and interviewed through structured schedule. To fulfil the objectives simple random sampling technique was employed. The schedule was designed to cover the aspects such as general profile of the respondents, quantity of product handled, costs and returns realized by them under different cases etc.

Costs and returns at successive stages of processing and marketing of brown rice were worked out. Normal percentage analysis was used as the tool to find the percentage contribution by each component in total at each stage.

RESULTS and DISCUSSION

Out of the five rice mills sampled from Kerala, three were conventional and two were modern. Similarly five rice mills were sampled from Tamil Nadu and all were conventional. Average installation capacity per hour of modern rice mills was found to be five to six times higher than that of conventional rice mills but conventional rice mills in both the states had more or less same installation capacity.

Working time per annum in modern rice mills was found to be nearly three to three and a half hour

greater than that of conventional rice mills. Thus average output from modern rice mills per year was almost double or even greater than that of conventional rice mills.

Out of total paddy processing per annum 2.2 per cent was converted into brown rice in conventional and 2.5 per cent in modern rice mills of Kerala. In Tamil Nadu only 0.5 per cent of the annual capacity processed was converted into brown rice (Table 1).

Cost of processing per quintal of paddy processed to raw brown rice in Kerala amounted to Rs 240.20 for conventional rice mill unit and Rs 270.40 for modern rice mill unit. Similarly in Tamil Nadu that cost amounted to Rs 224.95 for conventional rice mill units. Parboiled brown rice processing cost amounted to Rs 262.70 per quintal of paddy processed for conventional rice mill unit and Rs 290.40 for modern rice mill unit in Kerala. Similarly the cost for conventional rice mill unit in Tamil Nadu amounted to Rs 244.95 (Table 2).

Data given in Table 3 exhibit that net return per quintal on production of traditional variety of raw brown rice was found to be highest in modern rice mills of Kerala (Rs 1176.60) followed by conventional rice mills of Tamil Nadu (Rs 1111.75) and conventional rice mills of Kerala (Rs 1080.00). On the other hand net return per quintal on production of traditional variety of parboiled brown rice was found to be highest in modern rice mills of Kerala (Rs 1179.60) followed by conventional rice mills of Tamil Nadu (Rs 1141.75) and conventional rice mills of Kerala (Rs 1137.30).

Table 1. Sample characteristics of conventional and modern rice mills

Component	Kerala		Tamil Nadu (n= 5)
	Conventional rice mill (n= 3)	Modern rice mill (n= 2)	
Average installed capacity/h (q)	5	30	6
Average number of working days/annum	240	250	240
Number of shifts/day	1	2	1
Duration of each shift (h)	4.5	8	5
Number of working hours/annum	1080	4000	1200
Annual capacity processed (q/annum)	5400	120000	7200
Brown rice processing/annum (q)	120 (2.2%)	3000 (2.5%)	36 (0.5%)

Table 2. Cost of processing of paddy into raw and parboiled brown rice

Component	Cost of per quintal of paddy processed (Rs)		
	Kerala		Tamil Nadu
	Conventional rice mill (n= 3)	Modern rice mill (n= 2)	Conventional rice mill (n= 5)
Power fuel and water	101.05 (42.07)	86.39 (31.95)	96.75 (43.01)
Salaries	24.50 (10.20)	5.41 (2.00)	19.48 (8.66)
Administrative cost	2.40 (1.00)	13.11 (4.85)	2.27 (1.01)
Interest on fixed capital	32.88 (13.69)	47.78 (17.67)	19.75 (8.78)
Interest on working capital	72.68 (30.26)	108.16 (40.00)	80.40 (35.74)
Depreciation on buildings @ 5%	2.88 (1.20)	2.73 (1.01)	2.72 (1.21)
Machineries equipment @ 10%	3.80 (1.58)	6.81 (2.52)	3.58 (1.59)
Total cost for raw rice	240.20 (100)	270.40 (100)	224.95 (100)
Parboiling cost	22.50 (8.56)	20.00 (6.89)	20.00 (8.16)
Total cost for parboiled rice	262.70 (100)	290.40 (100)	244.95 (100)

Figures in the parentheses are percentages to the total

Table 3. Returns on production of traditional variety of raw and parboiled brown rice (cost of per quintal of paddy processed in Rs)

Component	Kerala		Tamil Nadu
	Conventional (n= 3)	Modern (n= 2)	Conventional (n= 5)
Raw material cost	2250.00	2250.00	3000.00
Processing cost for raw rice	240.20	270.40	224.25
Other cost	20.00	20.00	20.00
Total cost for raw rice	2510.20	2540.40	3244.25
Processing cost for parboiled rice	262.70	290.40	244.25
Total cost for parboiled rice	2532.70	2560.40	3264.25
Head recovery rate (%)			
Raw rice	70	72	71
Parboiled rice	72	73	72
Price per kg (at farm gate)	50	50	60
Brown rice			
Raw	3500.00	3600.00	4260.00
Parboiled	3600.00	3650.00	4320.00
Broken and others			
Raw	90.00	120.00	96.00
Parboiled	70.00	90.00	86.00
Gross return			
Raw rice	3590.00	3720.00	4356.00
Parboiled rice	3670.00	3740.00	4406.00
Net return/q			
Raw rice	1080.00	1176.60	1111.75
Parboiled rice	1137.30	1179.60	1141.75

n: Number of units sampled

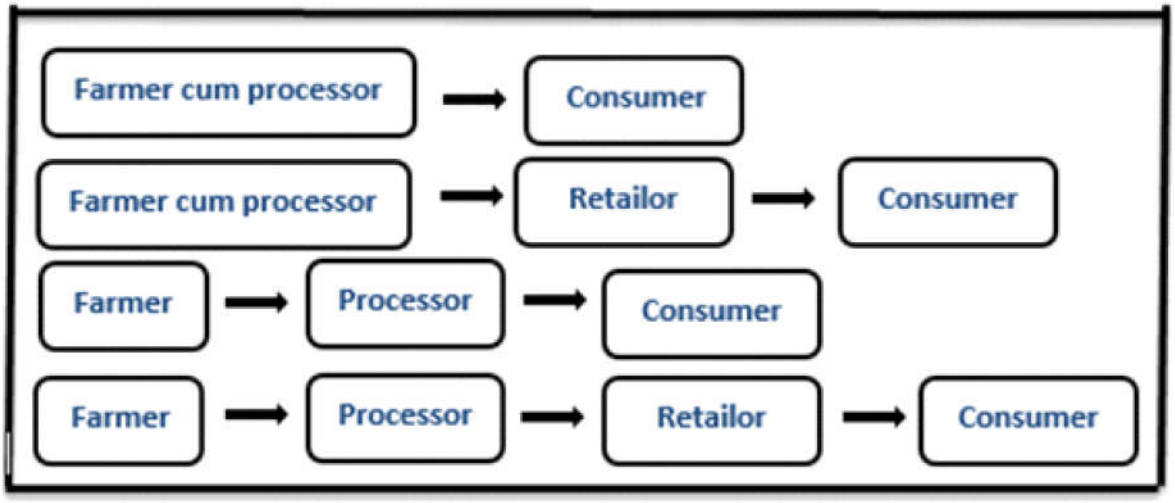

Fig 1. Marketing channels for brown rice

Net return per quintal on production of improved variety of raw brown rice was found to be highest in conventional rice mills of Tamil Nadu (Rs 1846.75) followed by modern rice mills of Kerala (Rs 1747.60) and conventional rice mills of Kerala (Rs 1629.80). Similarly net return per quintal on production of improved variety of parboiled brown rice was found to be highest in conventional rice mills of Tamil Nadu (Rs 2341.50) followed by modern rice mills of Kerala (Rs 1830.00) and conventional rice mills of Kerala (Rs 1797.30) (Table 4).

Table 4. Returns on production of improved variety of raw brown rice (amount per quintal of paddy processed in Rs)

Component	Kerala		Tamil Nadu
	Conventional (n=3)	Modern (n=2)	Conventional (n=5)
Raw material cost	1600.00	1600.00	1800.00
Processing cost for raw rice	240.20	270.40	224.25
Other cost	20.00	20.00	20.00
Total cost for raw rice	1860.20	1872.40	2044.25
Processing cost for parboiled rice	262.70	290.40	244.25
Total cost for parboiled rice	1882.70	1910.40	2064.50
Head recovery rate (%)			
Raw rice	68	70	69
Parboiled rice	72	73	72
Price per kg (at farm gate)			
Raw rice	50	50	55
Parboiled rice	50	50	60
Brown rice			
Raw	3400.00	3500.00	3795.00
Parboiled	3600.00	3650.00	4320.00
Broken and others			
Raw rice	90.00	120.00	96.00
Parboiled rice	80.00	90.00	86.00
Gross return			
Raw rice	3490.00	3620.00	3891.00
Parboiled rice	3680.00	3740.00	4406.00
Net return/q			
Raw rice	1629.80	1747.60	1846.75
Parboiled rice	1797.30	1830.00	2341.50

n: Number of units sampled

Specific marketing channels identified for brown rice marketing are given in Fig 1.

CONCLUSION

It has been inferred from the estimation of costs and returns that there were three major components of raw brown rice processing costs which comprised interest on working capital, interest on fixed capital and power fuel and water charges. Power fuel and water charges were the largest cost component for conventional rice mills in brown rice milling process. But for modern rice mills this component was interest on working capital.

Though gross returns on production of traditional variety of brown rice was found highest in Tamil Nadu followed by returns for modern mills in Kerala, the net return per quintal was found highest in modern rice mills of Kerala followed by conventional rice mills of Tamil Nadu. Tamil Nadu had higher production cost compared to Kerala though here processing cost was too low. Head recovery rate was found highest in modern rice mills. In case of improved varieties though the pattern of both gross returns and net return was found similar, it was highest in conventional rice mills of Tamil Nadu followed by modern rice mills and conventional rice mills of Kerala. Head recovery rate for improved varieties of brown rice was found lower than that of traditional varieties.

Survey data revealed that only a very little quantity of total available paddy (less than three per cent) was processed into brown rice. Even then the product was suffering from lack of demand. This reveals that though brown rice is a high value product with irreplaceable amount of health benefits it needs better market positioning to capture consumer acceptance for which economists, engineers, plant breeders and above all government have to take prime consideration. Also more number of modern rice mills has to be established with newer technologies to reduce processing cost and better techniques to extend the shelf-life of the product.

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