

Consumer preference for quality attributes of rice

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Introduction

Paddy cultivation serves as the major coping strategy for 800,000 families in Sri Lanka. The average paddy productivity has reached to 4.3 t/ha in 2013 while the annual per capita consumption is 116 kg/year (DCSL, 2013). Rice remains as the staple food of the country and the consumers have different preference for different quality attributes of rice through which they derive consumer utility. Hence, it is important to identify the quality attributes of rice preferred by different consumer segments. This information is of vital importance for farmers to enhance the supply catering to the consumer demand. Therefore, the main objective of this study was to identify different rice quality attributes and their levels as valued by the consumer choice.

Methodology

The study was conducted in Gampaha District in 2014 with 63 consumers selected using stratified random sampling. Four quality attributes and three levels per each were selected using focus group discussion. A fractional factorial design (1/3) was used to reduce the full profile. Data was collected using Semi structured pre-tested conjoint questionnaire. The significance of the selected attributes was tested using ANOVA and part-worth utilities were estimated by a logistic regression. The relative importance of each attributes was also calculated.

Empirical model

Consumer preference is non parametric attribute. Conjoint analysis (CA) is the most widely used method to analyse consumer preference. A set of hypothetical products is defined by combining product attributes at various levels. Consumers are asked to evaluate their overall preference rating or ranking of the hypothetical products. The final step of CA involves choosing an appropriate composition model and estimating the buyer's part-worth utilities (Harrison, 1998).

Part-Worth Utility Model

$$U_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_n x_{in} + \epsilon_i$$

where U_i = utility of product i , $\beta_0, \beta_1, \beta_2, \dots, \beta_n$ = part-worth utilities, $x_{i1}, x_{i2}, \dots, x_{in}$ = dummy variables for significant levels of attributes, ϵ_i = error term

Relative Importance (RI)

$$RI = (\text{Utility Range} / \sum \text{utility ranges of all attributes}) * 100$$

Random Utility Theory

Once the data are choice-based, researchers use random-utility models in which the basic idea is the assumption of utility maximization (Hauser and Rao, 2002). The attributes and levels are

described in Table 1. Attributes were selected using focus group discussion. Each selected attributes consist with 3 levels.

Table 1: Description of attributes

		Attributes			
		Degree of Milling	Shape	Tenderness	Price
Levels	Brown	Short Round	Soft	<Rs.60/kg	
	Partially Polished	Long Bold	Average	Rs.60-70/kg	
	Fully Polished	Long Slender	Hard	>Rs 70/kg	

Results and Discussion

Among the Selected 63 rice consumers there was a large portion of female rice consumers (65%) where as a little portion of male rice consumers (35%) were participated for the survey. Most of the consumers (65%) were between the age of 25 – 50 years, 25% of participants were below 25 years and remain 10% was over 50 years old.

When consider about the rice consumption majority (56%) of the sample is consuming rice for all three meals and 44% of consumers consume rice only twice a day. Among the respondents 52% make the decision to purchase rice for their families. The significance of the selected attributes are shown in Table 2.

Table 2: ANOVA Results for quality attributes

Attribute	Degrees of Freedom	Sum of Squares	Mean Sum Squares	F Value	Pr>F
Degrees of Milling	2	1045.25	522.62	96.46	<0.0001
Shape	2	6.81	3.40	0.63	0.53
Tenderness	2	8.43	4.21	0.78	0.46
Price	2	5.13	2.56	0.47	0.62

P=0.05, N=63

According to the results (Table 2), degrees of milling attribute was significant ($p < 0.05$) while shape, tenderness and price attributes were not significant ($p < 0.05$). This indicates that, degree of milling is highly valued by the consumers when they purchase rice. Further, interaction effects were not significant at 95% confidence interval.

According to the results (Table 3), “Brown” and “fully polished” levels were significant while none of the rest of the attribute levels were significant. Consumers have negative preference over brown rice and positive preference for fully polished rice. Once a consumer purchases one unit of brown rice in his consumer basket, the utility is decreased by 1.74 units. On the contrary, fully-polished rice is placed in the market basket his utility is increased by 1.62 units.

Table 3: Part-worth estimates of levels in quality attributes

Attribute	Level	Estimate	Z value	P>Z
Degree of milling	Brown	-1.74	-12.77	0.000
	Partially-polished	0.12	1.13	0.260
	Fully-polished	1.62	11.64	0.000
Shape	Short-Round	0.06	0.56	0.577
	Long-Bold	-0.01	-0.14	0.888
	Long-Slender	-0.04	-0.42	0.577
Tenderness	Soft	-0.13	-1.25	0.211
	Medium	0.05	0.51	0.608
	Hard	0.08	0.74	0.211
Price	< Rs.60/kg	0.05	0.46	0.648
	Rs.60-70/kg	0.07	0.63	0.526
	> Rs.70/kg	-0.02	-1.09	0.526

Pseudo R² = 0.0918. P=0.05, N=66

Relative Importance of Attributes

Table 4: Relative Importance of each attribute

Attribute	Utility Range	Relative Importance (%)
Degree of Milling	3.354	89.3
Shape	0.102	2.7
Tenderness	0.206	5.4
Price	0.094	2.4

The most important attribute among the selected, is degree of milling. Consumers do not pay much attention on other quality attributes of rice: shape, tenderness, and price in this particular consumer segment.

Conclusions

The study revealed that, degree of milling is the most important factor while the shape, tenderness and price of rice were not significantly affecting consumer choice in this market segment. Since this consumer segment is from urban profile, consumer choice has become price insensitive. They pay more attention over rice processing in making a purchasing decision. Consumers have negative preference for brown rice and positive preference for fully polished rice. Although, shape of the grain, tenderness of cooked rice, and price attributes were not significant, testing the same with different consumer segments while incorporating differently selected attributes may shed lights on estimating consumer preference more coherently.

References

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