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Mushroom Consumer Behaviour: Dimensions and Measurement Model

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ABSTRACT

Mushrooms are known world over for their nutritional and medicinal importance. Even as the mushroom production and consumption are on the rise in rest of the world, India witnesses a lukewarm response in its growth. The mushroom consumer behaviour though is scarcely studied in India, is of considerable value to mushroom producers and people involved in mushroom marketing and processing. , the present study was envisaged to develop a scale to assess the mushroom consumption behaviour covering five major dimensions influencing the mushroom consumption by following psychometric technique using normalised rank approach. Based on the study, the Mushroom Consumer Behaviour Index (MCBI) was developed for application in mushroom consumer behaviour research. Among the five dimensions of the scale, the Situational dimension assumed highest scale value (5.93) followed by Dietary preferences (4.98), Economic dimension (4.62), Psychological dimension (4.25) and lastly the Social dimension assuming the least value (4.09). The scale developed will find utility for analysing the mushroom consumption behaviour across different regions and different sections of the society and to draw suitable conclusions by the researchers and the policy makers.

Key words: Mushroom consumption, Consumer behaviour, Dietary preference, Socio-psychological dimension and Psychometric measurement.

Mushrooms are widely appreciated all over the world for their nutritional and medicinal properties since ancient times. Mushrooms are significant for having low fat, high proteins, high vitamins, several minerals (Phosphorous and Potassium) and trace elements (Selenium). Mushrooms contain substantial amount of dietary fibres and are unlimited source of bioactive molecules and valuable enzymes with around 126 therapeutic effects (Wasser, 2010 and Badalyan, 2012). Mushrooms are proven to have immune modulating, antioxidant, genoprotective, antitumor, hypocholesterinemic, antidiabetic, hepatoprotective and other medicinal properties (Badalyan, 2000, Wasser, 2010 and Badalyan, 2012).

Global mushroom industry has seen a rapid growth with the production increasing more than 25-fold during the last 35 years (from about 1 billion kg in 1978 to 27 billion kg in 2012) whereas, the human population has grown 1.7 times during the same period (Royse, 2014). On the contrary, in spite of varied agro-climate conditions together with abundant agriculture residues and cheap labour, the mushroom production and in turn their consumption in India is insignificant compared to global levels. With the conspicuous growth of mushroom production only in recent years, India produces little more than 100,000 tonnes of fresh mushrooms. The per capita mushroom consumption of 30 g per annum in India is also

very less compared to 4000 g in western countries (Wakchaure, 2011).

Since, each single step in marketing is formulated to satisfy the consumer, the consumer behaviour analysis is considered cornerstone of the marketing research. Critical understanding of consumer behaviour is key to the formulation of strategies for efficient marketing, targeting the unreached consumers, broadening the product base, designing of new products with desired quality, packaging and delivering the products in time.

The mushroom consumer behaviour though is scarcely studied in India, is of considerable value to mushroom producers and people involved in mushroom marketing and processing. Further, the multiplicity of factors influencing the mushroom consumption makes its study challenging and fascinating for the researchers and academicians. Hence, the present study was envisaged to develop a scale to assess the mushroom consumption behaviour covering all the major dimensions influencing the mushroom consumption.

MATERIALS AND METHODS

The methodology in developing the procedure to measure the mushroom consumer behaviour is adopted from the behavioural measurement procedure suggested by Guilford (1954). The detailed steps followed in the methodology are explained under the steps listed below.

Step 1. Identification of dimensions and item writing: The 'mushroom consumer behavour' was identified as a variable which would serve as the basis to assess the level of mushroom consumed by the consumers. The underlying assumption is that, higher score on mushroom consumer behaviour scale will result into higher level of mushroom consumption. Based on a thorough review of literature and consultation with experts in the field of mushroom science, extension, food science and nutrition research, five dimensions and statements to explain each of the dimensions were identified. The five dimensions (D_{1-} $D_{5)}$ are; social, psychological, economic, dietary and situational dimensions. Relevant subcomponents were written under each of these dimensions to bring forth the variability in the mushroom consumption behaviour among the respondents of the study. It is apt here to mention the basis of finalizing the dimensions and statements of mushroom consumption behaviour through a brief review of studies on consumer behaviour.

Schiffman and Kanuk (2007) define consumer behaviour as "the behavior that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs". The early economists like, Nicholas Bernoulli, John von Neumann and Oskar Morgenstern, were among the first to examine the basis of consumer decision making behaviour (Richarme, 2007). Their early work approached the topic from an economic perspective, as it focused on purchasing behaviour (Loudon and Della Bitta 1993). The most prevalent model from this perspective is 'Utility Theory' which proposes that consumers make choices based on the expected outcomes of their decisions. Consumers are viewed as rational decision makers who are only concerned with self-interest (Schiffman and Kanuk 2007, Zinkhan 1992).

According to the marginal utility theory developed by classical economists, the consumer buy those goods which will give him highest utility or maximum satisfaction at relative prices Marshall, 1920; Smith, 1937). It is an accepted view among the economists of this school that, man as a rational individual makes his rational decisions based on economic considerations. For a rational consumer, the law of diminishing marginal utility and the law of equimarginal utility are the guiding factors to affect his consumption behaviour. In this

background, the consumer's mushroom purchasing behavioural response to the changes in price of mushrooms and other competitive vegetables was aimed to be elicited in the economical dimension. However, contemporary research on Consumer Behaviour considers a wide range of factors influencing the consumer, and acknowledges a broad range of consumption activities beyond purchasing. These activities commonly include; need recognition, information search, evaluation of alternatives, the building of purchase intention, act of purchasing, consumption and finally disposal. This more complete view of consumer behaviour has evolved through a number of discernable stages over the past century in light of new research methodologies and paradigmatic approaches being adopted.Hence, the mere classical economical dimension is insufficient to account for all the consumer behaviour of a mushroom purchaser. The attitude of consumer towards the mushrooms, knowledge on diverse varieties of mushrooms and their health benefits assumes much significance in this context. The multiattribute attitude models of Ajzen and Fishbein (1980) and conjoint analysis of Green and Carmone (1970) explain such preferences or otherwise among the consumers. Considering this, the psychological and dietary preference dimension statements were framed to elicit the response.

Furthermore, with rare exceptions that incorporate the effects of social influence into the multi-attribute attitude model, the typical psychological treatment does little to place brand preferences into the social context that includes ongoing interpersonal activities and shared symbolic meanings (Holbrook, 1995). The sociological perspective in consumer research has considered the interpersonal context in which consumption activities are embedded (Soloman, 1983; Reingen et al., 1984). The sociological concepts view consumer products as overt marks of social status where people define and display the self-concepts they wish to communicate to themselves and to others to reflect their identities (Belk et.al., 1982; Soloman, 1983; Kehret and Yalch, 1984). The sociological dimension statements of mushroom consumption behaviour were framed from this perspective.

Notwithstanding the four dimensions of mushroom consumption behaviour discussed above, the factors such as availability or non-availability of quality and fresh mushroom varieties at more and more accessible market places with regularity will either act as constraints or engendering factors for mushroom purchasing and consumption behaviour. Hence, the relevant statements on situational dimensions were finalized to arrive at an integrated approach to the empirical assessment of mushroom consumption behaviour.

Step 2. Relevancy weightage: All the statements under 5 dimensions were subjected to experts' rating on relevancy of each of the statement, regarding its utility to measure a particular dimension of mushroom consumer behaviour. The experts were asked to indicate the relevancy on a Likert's scale of five point continuum. The continuum ranged from most relevant (MR) to not relevant (NR) with 5 and 1 score respectively: The 'relevant' (R), 'somewhat relevant' (SWR) and 'least relevant' (LR) were assigned the values of 4, 3 and 2 respectively. Fifty five experts out of the 130 experts identified responded to the relevancy analysis. The procedure followed for calculating relevancy weightage is given below.

$$RW = \frac{MR*5 + R*4 + SR*3 + LR*2 + NR*1}{\text{Maximum possible scores} * \text{No of Judges}}$$

Statements rated as relevant with a relevancy weightage (RW) of 0.70 or more (worked out on the basis of summated scores of all the judges for all the statements) were considered for the next step. The finalised statements after relevancy analysis under

different dimensions are presented as annexure.

Step 3: Calculating scale values for dimensions of performance analysis based on judges rating: It is apparent that, all the five dimensions will not contribute equally towards the mushroom consumption behaviour. Hence, the variation in contribution of each dimension of the mushroom consumption behaviour must be represented by assigning different weightage to each of the dimension. Hence, the judges' rating was sought to obtain the scale values for each dimension of the entrepreneurial behaviour. The experts were asked to rank the dimensions of mushroom consumption behaviour in the order of importance as perceived by them. The ranks given by selected 45 judges were converted into rank values by using the formula,

$$Ri = (n - r_i + 1)$$

Where, R_i is the rank value, n is number of items ranked and r_i is the rank given by the expert for each dimension. The centile position values (P) were arrived for each rank by the normalization of ranks approach using the formula

$$P = \frac{(Ri - 0.5) * 100}{n}$$

Where, R_i= the rank value and n= number of things ranked. The deduction of 0.5 from the rank value is simply to get the middle of the area for the dimension so ranked.

P is essentially a centile value and represents the area under the normal distribution below the median of the interval assigned to the object. From the normal curve tables we find corresponding z values to represent linear distances from the mean on the base line. Since z values are awkward numbers to use, we make a liner transformation to values of a convenient type (Guilford, 1954). Analogous to the procedure suggested by Hull (1928), 'C' values of 4-6 were assigned in a linear order from lower to higher rank values.

The procedure followed in arriving at the scale values for all the 5 dimensions of mushroom consumption behaviour is presented in Table 1.

Step 4: Schedule development and Scoring: For all the relevant statements, the questionnaire was prepared to elicit

Table 1. Frequency of ranks by judges and deriving scale values.

Ranks	Rank values	D1	D2	D3	D4	D5	P	C
1	5	2	5	4	8	26	90.00	6
2	4	7	9	12	11	6	70.00	6
3	3	14	7	10	11	3	50.00	5
4	2	13	12	7	9	4	30.00	4
5	1	9	12	12	6	6	10.00	4
	Σf_{ji}	45	45	45	45	45		
	$R_j = \Sigma f_{ji}$ C	212	215	222	229	247		
	$R=R_j/\Sigma f_{ji}$	4.71	4.78	4.93	5.09	5.49		
	R_c=(2.357*R)-7.01	4.09	4.25	4.62	4.98	5.93		

appropriate variability for mushroom consumption behaviour. Responses for each of the statement were obtained on a four point continuum of 'Most agree', 'agree', 'somewhat agree' and 'not agree' for each of the statement.This instrument was pre-tested with 30 respondents from outside the study area to ascertain its ability to measure the intended construct.

Step 5: Calculating mushroom consumption behaviour Index (MCBI): The mushroom consumption behaviour Index was calculated for all the respondents.The mean score (Raw score / maximum possible score) obtained by each respondent for different dimensions was multiplied with the scale values of respective dimension. The summation of values obtained for all the dimensions gives the composite index measuring the mushroom consumption behaviour of consumers. The formula used in arriving at MCBI values for mushroom consumers is given below.

$$MCBI = \frac{\sum_{i=1}^{5} \frac{Actual\ score\ of\ D_i \cdot scale\ value\ of\ D_i}{Max.score\ of\ D_i} X\ 100}{\sum Scale\ value\ of\ D_i}$$

A conceptual model representing the mushroom consumer behaviour index is presented in figure 1.

Testing for reliability and validity: Pilot test was conducted for a sample of 30 mushroom consumers to test the reliability and validity of scale.

Testing for reliability: The coefficient of equivalence (split-half method) was employed to measure the reliability of the scale.

The coefficient of equivalence is the correlation between scores on parallel forms (P and Q) of the test, administered with a minimal time lag between testing. The responses for the odd (P) and even numbered items (Q) were obtained and the scores of both sets were used to calculate coefficient of correlation (r).

$$r_{(P)(Q)} = \frac{(X_P)(X_Q)/N - (X_P)(X_Q)}{(S_P)(S_Q)}$$

The correlation coefficient value for split-half method was 0.821, suggesting high reliability of the scale.

Further, Spearman-Brown Prophecy formula was employed to know the reliability of the test of the original length from the values of split-half reliability.

$$r_{xx} = \frac{2r_{hh}}{1+r_{hh}}$$

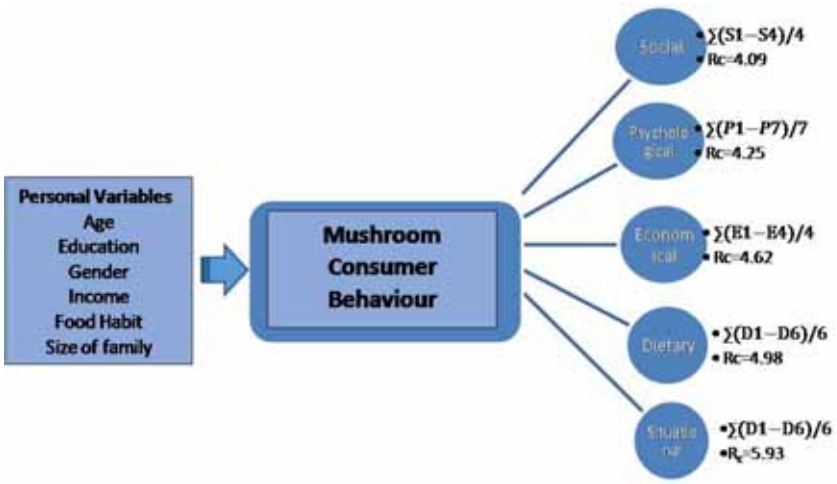

Fig. 1. A conceptual model representing mushroom consumer behaviour index

where, r_{hh} is the split-half reliability coefficient and r_{xx} is the estimate of the reliability of a test of the full length. The r_{xx} value was 0.902suggesting the high reliability of the full length of the scale.

Testing for Validity: Validity of the scale was ensured by analysing content validity and construct validity. Since, the items were based on extensive review of literature (Step 1 of scale development methodology) and relevancy analysis by the judges, the content validity was ascertained. The construct validity was ascertained by seeing the correlation coefficient of the dimensions of the construct MCBI. All the correlation coefficients were more than 0.70 indicating high construct validity.

RESULTS AND DISCUSSION

The five dimensions and the related statements were chosen based on thorough review of literature as presented before. Though, all the dimensions will have bearing on the mushroom consumer behaviour, the collective decision of all the experts over the highest influencing dimensions was represented through scale values for all the dimensions. Among the five dimensions of the scale, the Situational dimension assumed highest scale value (5.93) followed by Dietary preferences (4.98), Economic dimension (4.62), Psychological dimension (4.25) and lastly the Social dimension assuming the least value (4.09).

The scale values among the five selected dimensions are separatedthough by small differences, helps yielding a meaningful variability among the respondents' mushroom consumer behaviour. It can be said that, situational factors starting from availability, accessibility, hygiene, packaging etc play a major role in deciding the consumer behaviour. Non availability of mushrooms in the market will make other dimensions unwarranted. The implications of this dimension can be far reaching if the policy framers can consider the importance of situational dimensions in impacting the mushroom consumer behaviour.

Once the situational dimension issues are addressed, the consumerism, tastes and preferences comes into play. In the context of rational economic decisions made by the consumer, the economic dimension follows underlying the utility theory. The psychological dimension is about, being aware about the importance of mushroom in the diet pattern. In the consensual opinion of the experts, psychological and social dimensions influence least among the five on the mushroom consumer behaviour. The scale is amenable for modifications (such as either three or five response categories in place of four adopted in the original study) to suit to the researcher's situations without compromising the reliability and validity of the instrument.

CONCLUSION

Considering the void in the mushroom consumer behaviour research, the present study was taken up to develop the scale to measure the mushroom consumer behaviour by psychometric method. Since, the scale developed was found to have higher validity and reliability, it can be used across different regions and sections of the society in the field of marketing and consumer behaviour research.

The scale developed will find utility for analysing the mushroom consumption behaviour across different regions and different sections of the society and to draw suitable conclusions by the researchers and the policy makers. A closer look at the responses obtained on the statements listed under five dimensions by any researcher will help him understand the consumer and market dynamics and to posit the strategies accordingly by the mushroom entrepreneurs or to formulate the training content to the stake holders.

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