

Consumer's Choice as a Function of Consumption Practices for Indigenous Functional Foods

DR. MOOL CHAND
Associate Professor in Commerce
Dronacharya Govt. College,
Gurgaon (Haryana)

Abstract: Consumption practices of the various functional food products were assessed by the interviewing consumers with the structured questionnaire. Focus group discussion revealed various function foods commonly consumed in the research locale. There were different groups of products found to be consumed like namely *curries/dhals*, sweets, drinks, medicinal foods, *Chutneys* and others. It appeared that under different circumstances food choices vary and are influenced significantly by consumer's consumption patterns including socio-economic restrictions. Scenario analysis based on various consumer practices affecting the choice as the most promising food for innovation.

Keywords: Traditional Functional Foods, Health Foods, Dietary Practices, Consumption Practices, Food Innovation & Convenience.

Introduction:

The functional foods market has been growing with a rapid pace as there has been increase in the non-communicable diseases. New products are continuously launched, making intense competition. Consumers have more choices available and thus, products need to be developed considering what consumers desire (Linnemann *et al* 2006). IN this row, consumer awareness of the functional foods or in general any food is also important as per the selection of the product is concerned (Brown *et al* 2011). Consumer acceptance has been referred to as the significant point in the success factor for functional foods and the top priority for further research. Therefore, studying and understanding consumer's practices and consumption pattern related to functional foods is essential to develop products showing good consumer

acceptance. In order to develop successful functional food products, companies try to gain deeper understanding of how consumers interact with the products at various levels of the food network. Techniques like structured interview and focus group discussion are useful in this getting an in depth details of the consumers behaviors which is of intense use at stage of new product development.

Consumer choices for food are inclined by the perception of food characteristics, food preferences, food awareness, accessibility and affordability (Siró *et al.*, 2008). Therefore, it is of utmost importance to know these factors that influence consumer's choice. This study aims to identify these factors and their interrelation with each other.

In the present study, diverse indigenous functional foods in northern

India were used as they are an significant constituent in the diet, rich in health promoting components and culturally accepted. Function foods are known in many forms in terms of types of food product likes sweets, curries etc with diverse consumption and processing patterns. Diversity in function food products gives consumers a variety of choice to choose from depending on the sensory liking, accessibility and affordability. The diet and consumption pattern in Indian is very varied and undocumented (Vijayaraghavan *et al*, 2008). This kind of field interview based research (Agarwal, *et al*, 1999) is better then the literature based consumption pattern analysis (Gronowska-Senger *et al* 1998).

This research targets to reflect different aspects of functional food consumption practices and to conceptualise its marketing strategies taking into consideration the food consumption pattern with its associated influencing factors, to enable a critical evaluation of various issues pertaining to functional food industry in India. The results of this study will perhaps facilitate health professionals and policy makers to systematically inform the consumers about the positive effects of functional foods and its components. Furthermore, results will help out marketing professional and product developers (van Kleef *et al*, 2005) in preparing suitable model for the consumer's practices of functional food and can interpret into suitable new functional food products.

2. Methods:

2.1 Research area:

Haryana, one of the states situated in northern India, which harbors a high level of local biodiversity, was selected as the locale for the research described in this research. The food consumption patterns of the local population include diverse foods based on cereals, milk, fruits, vegetables and legumes (Manu and Khetarpaul, 2006). Indigenous foods have traditionally provided nutritionally balanced food to the northern Indians. The traditional food system includes many indigenous functional foods like curd, *chavanprash*, *amla*, tomato, *gund ke laddu* and many more. People here come from varied age group, caste, race, literacy and financial background. Apart from being the traditional state there are many urbanized cities of world level which will provide consumer of varied advanced functional foods like breakfast cereals, functional drinks, medicated food. Due to availability of wide variety of consumer and involvement of various functional foods in the consumption pattern this state suited as the research locale for this research.

2.2 Demographic details of the respondents:

The 250 respondents were selected for the study from different cities (Bhiwani, Rohtak, Hisar, Bahurgarh and Gurgaon) of Haryana including rural (50 %) and urban consumer (50 %), included 50 % males

and 50 % females of different ages and economic background. Amongst the respondents 25.0, 25.0, 33.0 and 17.0 % were aged from 8-19, 20-35, 36-50 and above 50 years, respectively. Out of these 71.1 % were married. In terms of education status uneducated, primary level school education, secondary level school education and high level school education were selected in equal percentages. Similarly equal percentages were taken for the occupations including farmers, house wives, civil servants, businessmen and school students. Apart from these factors included for keeping diversity in the respondents other factors like caste, origin, marital status etc were also considered depending on the results of focus group discussion.

2.3 Focus group discussions:

To take stock of the different functional food processed and consumed by rural and urban society, focus group deliberations with 15-20 test subjects were conducted in each rural and urban area. Focus groups consisted of at least one commercial and one household processor of each functional food, along with female, male, children and elderly people as consumers of functional foods. Group participants were informed about the purpose of the focus group discussion. Participants were asked to freely interact with each other on the given topic. Theme for the focus group discussions was the number and type of functional food, difference between functional foods and health foods, products commonly

processed and consumed. Participants were asked to sort products into groups and to identify the main characteristics of each group formed. The probes used for the discussion were household/commercial products, sweets and snacks. Key points commented about the functional food products were recorded. During the discussions many functional foods were identified. The outcome was also used to validate and develop the interview questionnaire.

2.4 Interviews with structured questionnaire:

In total 250 respondents participated individually in this test. A cross sectional survey of consumers was conducted using a structured questionnaire. The questionnaire was framed into different sections to collect data about consumer knowledge of various functional foods. Questions were planned to assemble both qualitative data through multiple choice questions and quantitative data through open questions. Pre-testing and finalizing of the questionnaire was done on the basis 15 experimental interviews and appropriate modifications were made. The questionnaire was in English, and was translated in the local language (Hindi) or dialect (*Haryanvi*) when required during interview. The objective of this fraction of the research was explained and described to each respondent before the dialogue. Data was taken personally by administering the interview agenda to the respondents.

2.5 Statistical analysis:

Data were analyzed using descriptive statistics (mean, frequencies and percentages). All statistical analyses were performed with PASW Statistics (Version 18.0.2) IBM Co. USA.

3. Results:

3.1 Description of the functional food products

The focus group discussion with the consumer indicated various functional foods consumed with various intentions. Table 1 presents a brief description of the functional foods and their ingredients. They were classified into six groups, namely curries/*dhals*, sweets, drinks, medicinal foods, *Chutneys* and others. Curries and *Dhals* are spiced of vegetables or split legumes, with thick soup-like consistency, commonly consumed with cereal products like rice and chapattis (Indian flat bread). Sweets include two products like *laddu*, prepared with ghee (clarified butter oil) and sugar along with flour by shallow frying. *Khichadi* product each have distinctive characteristics and thus were combined as a category of other products. Sprouts are germinated mung bean grains eaten as such or fried to be used in salads. *Khichadi* is prepared by cooking split mung beans with white rice. *Sattu* is a summer drink made with the roasted cereal flour and mixed in cold water with sugar. *Rabdi* is a cereal-curd based fermented drink. *Lassi* is butter milk. *Chavanprash* is a medicinal preparation with thick paste like consistency consumed

in low amounts. *Amla murabba* is a fruit preserve with sugar syrup.

3.2 Consumer dietary practices:

The interview data depicting consumer practices for consumption of function foods are given in Table 2. *Dhals*, *Suhanjane ki sabji*, and *khichadi* were consumed by the respondents mainly at lunch and dinner, whereas *drinks like Sattu, lassi and rabid* were consumed mainly at tea time. *Dhals*, sweets, *khichadi*, *ankurit dhal* and *wadi* were consumed any where and there is no specific time for their consumption. *Chavanprash* and *amla murabba* are the medicinal products consumed similarly with no specific time of consumption, These products are consumed with the perception of health promoting properties. Sprouts are thought to consume at lunch, dinner mainly but many consumers also showed their interest of consumption at any time. Thus sprouts proved to be a product of convenience in this case. *Pudina and Dahiya Chutney* is surprisingly consumed at the tea and coffee time. Deeper cross questioning on the consumption pattern of the *chutneys* revealed that these are the accompanied products for the various types of snack consumed during the tea time, which creates a situation and reasons for their consumption at the tea time. Similarly sweets are also the accompanied products and thus consumed with the tea and coffee at the drink time. However, some consumers like to consume them at any time.

As per the location of the consumption is concerned, *Dhals*, *Suhanjane ki sabji* and *Raita* are consumed primarily at home. Similarly sweets like Whole mung *dhal laddu* and *Gund ke laddu* are consumed at home. Deeper analysis of the issue showed that these are the non-commercial products, primarily prepared at home with few exceptions, thus leading to their consumption at home. However, in case of *Pudina and Dahiya Chutney* results depicts that they are consumed majority at streets, again as found that these are accompanied products, thus consumed with the street snacks like *pakore*, *samosa* etc widely available with the street vendors. In case of the drinks *sattu* and *radbi* are consumed at home but there is no specific place for consumption for the *lassi*. The main reason for the is that *sattu* and *radbi* are the non-commercial products and prepared at home, thus main location of consumption comes to be home. However, *lassi* is a house hold products which is equally famous at the commercial products and thus consumers enjoy the drinks at many places. *Kichadi*, *sprouts*, *Chavanprash* and *amla murabba* are the house hold names and consumed at home.

In case of the temperature of the products at the time of consumption, Split mung bean *dhal* and *Suhanjane Ki sabzi* are consumed hot with the cereal products. Whereas, *raita* is a cold products consumed with the cereal products. In case of sweets both the *laddus* are consumed mainly hot but few consumers like them to consume cold as well. *Pudina and Dahiya*

Chutney are consumed cold with the warm or hot snacks. In case of the functional drinks products like *sattu* and *lassi* both are relished by the consumers as cold products. Similarly, *radbi* is a cold products consumed with cut vegetable particularly onions. However, few consumers also like to consume it warm. *Chavanprash* and *amla murabba* are consumed cold by almost 100 to 98 % of the consumers. As per the *Kichadi* and *sprouts* are concerned they are consumed warm but in case of sprouts few consume it as cold products as well.

Frequency of consumption is another important factor for consideration for the marketing of the products. In case of the function foods under study, curries and *dhals* have the highest frequency of consumption in terms of amount and weekly consumption. Most of the other products are consumed as snacks which do not constitute to the relative amount of consumption. In case of *Dhals*, *Suhanjane ki sabji* and *Raita*, *Dhals* and *Raita* are consumed weekly. However, *Suhanjane ki sabji* being seasonal product is consumed only during the season of availability. Whole mung *dhal laddu* and *Gund ke laddu* both are found to be seasonal products that too in the winters. Similarly, the frequency of consumption data for the products like *sattu* and *rabid* shows that they too are seasonal products particularly consumed in the summers. *Lassi* is a monthly consumed product. In case of *Kichadi*, *sprouts*, *Chavanprash* and *amla murabba* there is no such pattern and are

consumed through out the year with the weekly consumptions.

Accompanied foods consumed with the functional foods also have a marketing opportunity. As the accompanied foods will have an impact on the nutritional properties of the functional foods and thus needs to be considered. In case of the products under study, *Dhals*, *Suhanjane ki sabji* and *Raita* are consumed with the staple products. Whole mung *dhal laddu* and *Gund ke laddu* are consumed as such as well with the drinks like tea and coffee. *Pudina and Dahiya Chutney* are consumed with the snacks like *samosa*, *pakore* and *kachories*. In case of drinks *sattu* is consumed as such. However, *lassi* and *rabdi* both are consumed as such and also with the stable foods. As per *Kichadi*, *sprouts*, *Chavanprash* and *amla murabba* are concerned, *sprouts*, *Chavanprash* and *amla murabba* are consumed as such and *Kichadi* can be accompanied with various hot, cold drinks as well as staple products.

Pre-consumption

processing is another aspect which seems important in terms of the packaging of the products which indirectly affects the marketing potential of the products. *Dhals* and *Suhanjane ki sabji* are required to be warm before the consumption where as there is no such requirement in case of the *Raita*. In case of the Sweets few consumers like to warm the products but others consume *laddus* as such. *Rabdi* is warmed before consumption by few consumers. In cases of *Pudina and Dahiya Chutney* no requirement of the pre-processing. Similarly in case of the *sattu*

and *lassi* there is no pre-processing required. *Chavanprash* and *amla murabba* are also not pre-processing before the consumption and consumed as such. In case of *Kichadi*, *sprouts*, preprocessing is warming, but many consumers also liked to consume it as such.

Table 1. Description of functional food products and summary of their preparations.

| Food group | Name of the Food Product | Main ingredients | Unit operations involved |
|--------------------|------------------------------|---|------------------------------------|
| Curries/dhals | Split mung bean <i>dhal</i> | Split mung bean, red chili powder, salt, cumin seeds, vegetable oil, turmeric powder, garam masala, tomato, onion, coriander leaves garlic and water | Soaking and pressure/open cooking |
| | <i>Raita</i> | Curd, salt and spices | Mixing and beating |
| | <i>Suhanjane Ki sabzi</i> | <i>Moringa oleifera</i> , red chili powder, salt, cumin seeds, vegetable oil, turmeric powder, garam masala, tomato, onion, coriander leaves garlic and water | Open cooking |
| Sweets | Whole mung <i>dhal laddu</i> | Whole mung bean, sugar, nuts and ghee | Crushing and flour roasting |
| | <i>Gund ke laddu</i> | Whole wheat flour, powdered sugar, ghee and nuts | Milling, mixing and flour roasting |
| Chutneys | <i>Pudina Chutney</i> | <i>Pudina</i> (Mint) leaves, spices and water | Mixing and grinding |
| | <i>Dhaniya Chutney</i> | Coriander leaves, spices and water | Mixing and grinding |
| Drinks | <i>Sattu</i> | Roasting wheat flour, sugar, water and salt | Roasting of flour and mixing |
| | <i>Lassi</i> | Curd, sugar, salt/ spices | Churning |
| | <i>Rabdi</i> | Cereal flours, curd/butter milk | Fermentation and soaking |
| Medicinal products | <i>Chavanprash</i> | Salt and red chili powder, mango powder, coriander seed powder, ghee, nuts, medicinal plant parts | Cooking, soaking and mixing |
| | <i>Amla murabba</i> | <i>Amla</i> fruits, sugar and water | Sugaring, boiling |
| Others | <i>Kichadi</i> | White rice and split mung bean, rice, ghee, water and salt | Soaking and open cooking |

Sprouts

Whole mung bean and water

Soaking and germination

Table 2. Consumer practices for consumption of functional food products.

| Food group | Name of the Food Product | Time of consumption | | | Location of consumption | | | Temperature during consumption | | Frequency of consumption | | | Accompanying foods | | | | Pre-consumption processing | | | |
|---------------|--------------------------|---------------------|---------------|---------|-------------------------|-------------|--------|--------------------------------|------|--------------------------|--------|---------|--------------------|------------|------------|--------------|----------------------------|---------|----------|--------------|
| | | Tea time | Lunch/ Dinner | Anytime | Home | Retail shop | Street | Any where | Warm | Cold | Weekly | Monthly | Seasonally | Hot drinks | Cold foods | Staple foods | None | Warming | Roasting | Not required |
| Curries/dhals | Split mung bean dhal | 8 | 230 | 12 | 250 | 0 | 0 | 0 | 235 | 15 | 156 | 74 | 20 | 0 | 34 | 216 | 0 | 250 | 0 | 0 |
| | Raita | 12 | 200 | 38 | 230 | 18 | 12 | 0 | 0 | 250 | 140 | 73 | 37 | 0 | 0 | 225 | 25 | 2 | 0 | 248 |
| | Suhanjane Ki sabzi | 5 | 200 | 45 | 250 | 0 | 0 | 0 | 245 | 5 | 8 | 7 | 235 | 0 | 0 | 237 | 13 | 250 | 0 | 0 |
| Sweets | Whole mung dhal laddu | 141 | 15 | 94 | 245 | 5 | 0 | 0 | 90 | 160 | 16 | 9 | 225 | 144 | 0 | 0 | 106 | 160 | 0 | 90 |
| | Gund ke laddu | 150 | 10 | 90 | 241 | 9 | 0 | 0 | 95 | 155 | 20 | 25 | 205 | 150 | 0 | 0 | 100 | 95 | 0 | 155 |
| Chutneys | Pudina Chutney | 140 | 71 | 39 | 70 | 32 | 145 | 3 | 0 | 250 | 49 | 189 | 12 | 34 | 16 | 150 | 0 | 0 | 0 | 250 |
| | Dhaniya Chutney | 130 | 85 | 35 | 33 | 45 | 167 | 5 | 0 | 250 | 36 | 196 | 18 | 45 | 23 | 182 | 0 | 0 | 0 | 250 |



| | | | | | | | | | | | | | | | | | | | | |
|--------------------|---------------------|----|-----|-----|-----|----|----|----|----|-----|----|-----|-----|----|----|-----|-----|-----|---|-----|
| Drinks | <i>Sattu</i> | 3 | 3 | 244 | 250 | 0 | 0 | 0 | 0 | 250 | 2 | 5 | 243 | 0 | 0 | 0 | 250 | 0 | 0 | 250 |
| | <i>Lassi</i> | 5 | 8 | 237 | 78 | 48 | 79 | 45 | 0 | 250 | 23 | 187 | 40 | 0 | 0 | 199 | 51 | 0 | 0 | 250 |
| | <i>Rabdi</i> | 78 | 67 | 105 | 216 | 0 | 0 | 34 | 57 | 193 | 5 | 78 | 167 | 0 | 0 | 163 | 87 | 78 | 0 | 172 |
| Medicinal products | <i>Chavanprash</i> | 30 | 34 | 186 | 250 | 0 | 0 | 0 | 0 | 250 | 45 | 98 | 107 | 0 | 0 | 0 | 250 | 0 | 0 | 250 |
| | <i>Amla murabba</i> | 36 | 56 | 158 | 242 | 3 | 2 | 3 | 16 | 234 | 45 | 102 | 103 | 0 | 0 | 0 | 250 | 0 | 0 | 250 |
| Others | <i>Kichadi</i> | 29 | 198 | 23 | 245 | 0 | 5 | 0 | 89 | 161 | 76 | 87 | 87 | 71 | 23 | 89 | 67 | 163 | 0 | 87 |
| | <i>Sprouts</i> | 16 | 129 | 105 | 236 | 0 | 14 | 0 | 95 | 155 | 34 | 45 | 171 | 0 | 0 | 0 | 250 | 105 | 0 | 145 |

4. Discussion:

The various consumption practices affecting the consumer choice for that products indicates that the might be equally important but the importance of each factors is relative to the priority of the marketing and packaging strategies. To get the clear picture of the issue, the factors were ranked relative to each other and ranked were summed to get the relative rank considering all the factors. This indicates that in certain circumstances food choice is influenced more by social-economic restrictions.(Hoeffling and Strack, 2010). Table 3. Shows the relative ranking for the various factors affecting the consumer's choice for the functional foods.

Ranking data, do not give a clear picture of the consumer choice and needs more in depth analysis. However, when few scenarios were taken and were give more weightages compared to others, the analysis shows that the Frequency of consumption and temperature of the products might be the potential factors playing significant role in the consumer choice. However, this type of analysis is subjective in nature and more objective analysis is recommended before concluding the significant factors for the consumers in terms of the functional foods under study. Moreover, this analysis is relative analysis and only implies in relation to the products listed.

Table 3. Product ranking for factors affecting consumer choices influencing the overall acceptance potential of the product

| Factors affecting consumer choice | Curries/dhals | | | Sweets | | Chutneys | | Drinks | | | Medicinal products | | Others | |
|--|----------------------|-------|--------------------|-----------------------|---------------|----------------|-----------------|--------|-------|-------|--------------------|--------------|---------|---------|
| | Split mung bean dhal | Raita | Suhanjane Ki sabzi | Whole mung dhal laddu | Gund ke laddu | Pudina Chutney | Dhaniya Chutney | Sattu | Lassi | Rabdi | Chavanprash | Amla murabba | Kichadi | Sprouts |
| <i>Time of consumption</i> | 6 | 6 | 7 | 4 | 3 | 1 | 1 | 7 | 6 | 2 | 4 | 3 | 1 | 1 |
| <i>Location of consumption</i> | 1 | 7 | 1 | 3 | 3 | 7 | 8 | 1 | 6 | 5 | 1 | 2 | 1 | 1 |
| <i>Temperature during consumption^B</i> | 2 | 8 | 1 | 3 | 1 | 5 | 5 | 5 | 5 | 3 | 4 | 3 | 2 | 1 |
| <i>Frequency of consumption^A</i> | 1 | 1 | 11 | 10 | 9 | 1 | 1 | 7 | 2 | 5 | 3 | 2 | 1 | 1 |
| <i>Accompanying products</i> | 9 | 7 | 7 | 9 | 9 | 9 | 8 | 1 | 5 | 4 | 1 | 1 | 2 | 1 |
| <i>Pre-consumption processing</i> | 13 | 7 | 12 | 10 | 8 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 2 | 1 |
| <i>Overall ranking score</i> | 32 | 36 | 39 | 39 | 33 | 24 | 24 | 22 | 25 | 22 | 14 | 12 | 9 | 6 |
| <i>Frequency of Scenario (A X 2)</i> | 34 | 44 | 40 | 42 | 34 | 29 | 29 | 27 | 30 | 25 | 18 | 15 | 11 | 7 |
| <i>Temperature during consumption Scenario (B X 2)</i> | 33 | 37 | 50 | 49 | 42 | 25 | 25 | 29 | 27 | 27 | 17 | 14 | 10 | 7 |

5. Conclusion:

In the end it can be concluded that there are many factors which contribute to the final consumer choice in case of the functional foods, however, the consumer practices pertaining to the functional foods are also important factors. Amongst the consumer practice factors frequency and consumption seems to have potential influencing nature.

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