

Moderating Factors in Growth of Processed Fruits and Vegetables: An Empirical Study

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Key Words:

1. Processed vegetables and fruits
2. Moderators
3. Western Maharashtra

Abstract

The paper attempts to find out factors that moderate growth of processed vegetables and fruits in select districts of Western Maharashtra. Primary data was collected from marketers of processed fruits and vegetables, consumers, and experts- nutritionists, academicians. The study uses Chi-square test and Paired sample t test for hypothesis testing. Two types of moderators have been identified namely consumer prejudice and the procurement side moderators. Consumer prejudices include existence of preservatives, un-suitable to cooking style and adulteration, difficult to store, lack of variety, difficulty in availability, unhygienic, lack of value for money, limited shelf life and lack of awareness about the processed fruits and vegetables. Procurement side factors include price fluctuations, lack of quality and standardization, lack of storage, irregular supplies and scattered suppliers.

INTRODUCTION

In the 7th plan period, policy makers identified food processing as a viable option for enhancing the contribution of agriculture to the GDP by establishing Ministry of Food Processing Industries (MOFPI). Food processing may be defined as the treatment of food substances in such a manner as to change its properties with a view to preserving it, improving its quality or making it functionally more useful. The food processing industry ranks fifth in the country in terms of total industry output and was estimated to be Rs.1, 44,000 crores. Its share in the GDP was 5.5% and employed about 1.6 million workers. The unorganized sector contributed about 75% of the total output. The industry has started using state-of-the-art modern technology producing many new items such as ready-to-eat food, beverages, processed fruit and vegetable products, marine and meat products. In India, the value addition to food fortification is only 7% compared to as much as 23% in China, 45% in Philippines and 188% in the UK. The following table indicates the steady growth of the food processing sector in India during the three -five year plans

It can be concluded from the above data that food processing sector has been growing steadily and its contribution to the manufacturing sector and to the GDP as

a whole is significant. However food processing industry suffers from many problems. Taxes on processed food in India are among the highest in the world. No other country imposes excise duty on processed food. Further, a distinction is made between branded and un-branded products. The total tax on various processed food is as high as 21 to 30% and includes excise duty, VAT, octroi, entry tax etc. Also, India is the only country that had excise duty on food processing machinery. These issues in combination with other factors made food processing industry very small and unattractive for investments and hence was neglected. In fact, in some areas like fruit and vegetable sector, the present production of processed fruits and vegetables is only 9.4 lakh tonnes against an installed capacity of 21 lakh tonnes. Hence the capacity utilization has been about 45% only leading to very large wastages of fruits and vegetables. The estimated wastages in fruits and vegetables alone was to the tune of about Rs.30,000 crores in the year 2005. Food processing industry has been dominated by the private sector, both, in the organized as well as unorganized industry. Lack of adequate policy support on part of the government has also been a contributor in the slow growth of the industry. Further, a majority of the industry is in the primary processing while the proportion of secondary and tertiary processing has been very low. New product development has lagged significantly due to very low investments in research and development. Financial institutions do not have the capacity to appraise hi-tech export-oriented projects. There are no suitable insurance schemes for such projects, most of which deal in export of

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Table 1: Growth of the food processing sector in India during the three plans

Plan	Period	% growth rate	% contribution to manufacturing GDP
Ninth	1997 - 2002	6.5	6
Tenth	2002 - 2007	9	8
Eleventh	2007 - 2012	13.5	14

perishables. This has led to inadequate investments in food processing. The industry also suffers from other constraints such as non-availability of adequate infrastructure like cold-storage, power shortage, packing and grading centres, quality control and testing infrastructure; inconsistent and irregular supply of raw materials, seasonality of raw materials; shortage of processable varieties of farm produce; high inventory carrying cost; high taxation; high packing cost and consumer perception towards processed food. These are the reasons for a very low share of processing of fruits and vegetables at about 1.7% as against 37% for milk and milk products and 27% for meat and poultry products. Current study attempts to find out the consumer perceptions towards processed fruits and vegetables.

This paper is organized into two parts: the first part consists of a brief literature review and research method and the second part consists of hypotheses testing, data analysis, findings and conclusions and directions for future studies.

MOTIVATION FOR RESEARCH

Marketing of processed foods in general and that of processed fruits and vegetables in particular is neglected in the Indian context Choo et.al. (2004). Negative consumer perception towards processed food is one moderator of the growth of the same. A study to identify the exact perceptions in terms of different attributes of products would contribute to the extant literature and also provide some insights to the practitioners of food processing industry. This served as a motivation to carry out the current study.

OBJECTIVE

The objective of the study is to identify the moderators of the processed fruits and vegetables from the perspective of the consumers in the Indian context.

LITERATURE REVIEW

As per Choo et.al. (2004) extant literature on processed foods is scant. Particularly in the case of processed fruits and vegetables in the Indian context are sparingly available. Kachru (2006), provided a summary of the growth history of the sector covering role of R&D, recent trends vis-à-vis crop-wise status of agro processing industrialization and problems, export trends, SWOT analysis and thrust areas for future for achieving greater role of this sector in the national economy. The study focused on the operational issues and the problems faced by food processors but did not cover the issues related to consumer and their perceptions toward processed food. Choo et.al. (2004) in their study in the Indian context covering six food categories – meat, fruits and vegetables, dairy products, soft drinks, snacks, cereals and baked products claim that urbanization, industrialization and more women coming into the work force have contributed to the demand for processed food. They assert that increasing Indian consumers' familiarity with the attributes of processed food on the part of food marketers will reduce the likely perceived risk in trying these products. They studied the causal relationships among attitudes, subjective norms, intention to buy and purchase behaviour of processed food using Theory of Reasoned Action (TORA model) and claim that subjective norms positively impact Indian consumers' attitudes toward purchasing new processed foods. They conclude that Indian consumers hold more favourable attitudes, greater intention to buy and actual purchase behaviour when they are more familiar with a processed food product. They also claim that India has recently gained attention of consumer behaviour scholars thereby conceding that research on consumer behaviour in processed foods is scant. Ali and Moorthy (2010) assert that in India, increasing number of consumers prefer high value processed, packaged and branded food products. They identified attributes such as cleanliness / freshness, price, quality, variety, packaging, convenience and non-seasonal availability. They also argue that consumers prefer nearby marketplaces to meet their food requirements. Grocery food items are purchased from nearby grocery shops and

fruits and vegetables are purchased from roadside shops.

SCOPE OF THE STUDY

This study was conducted within two broad boundaries namely product range and geographical coverage for data collection. So far as the product range was concerned, the study covered only processed fruits and vegetables such as cleaned, cut, peeled, packed and ready to cook vegetables and ready for consumption fruits. The geographical boundary was limited to Pune, Kolhapur, Satara and Sangli cities. The geographical boundary was based on convenience as the researcher found it convenient and also affordable to visit these places for data collection. The areas to be covered for data collection were identified with the help of the maps of the said locations.

TYPE OF STUDY

A key defining characteristic of management research is its applied nature (Van De Ven and Johnson, 2006). The purpose of applied research is to provide a solution that has practical relevance to a business, is conducted in the settings of organizations as well as universities and has tight time scales (Saunders et. al. 2011). The current study tried to understand the moderating factors in the growth of processed fruits and vegetables sales which is essentially business oriented problem and is conducted in an academic setting. Thus the study happened to be applied in nature.

RESEARCH DESIGN

The survey research design was adopted for the study. The survey design was used to collect data from consumers, processors and experts. Survey of consumers revealed their attitude towards processed vegetables and fruit and various attributes involved in decision-making. The survey of processors and industry experts revealed their views on the processed vegetable and fruit business and their understanding of the attitude of consumers towards processed vegetables and fruits.

SAMPLING DESIGN

Judgmental sampling technique was used to approach processors and consultants. Consumers were approached with a systematic sampling method.

SAMPLING FRAME

Sampling frame for consumers could not be prepared. Sampling frame for experts and processors was prepared by referring to yellow pages and industrial directory procured from Maharashtra Chamber of Commerce, Industries and Agriculture. Services of information providing agencies such as Just Dial and Ask Me were also used for the purpose.

UNIT OF ANALYSIS

Following were the units of analysis for the study:

1. Marketers/Processors of fruits and vegetables-Proprietor or Partner of the firm.
2. Consumers- Persons who shop for themselves or their families.
3. Experts- Nutritionists, Academicians.

Approaching Respondents For Data Collection

Marketers/processors and experts were approached in their offices. For the purpose of approaching consumers, the researcher first referred to the maps of Pune, Sangli, Satara and Kolhapur cities for identifying all the geographical areas of the city housing various shopping malls, local sabzimandis and shops so that the sample becomes representative of the population of the said cities. All the malls in the city were selected since their number was relatively small. Prominent sabzimandis in each geographical area were selected depending upon their popularity. Similarly, shops / general stores in each locality that stocked processed fruits and vegetables and were popular were also selected. Systematic random sampling technique was adopted to reach respondents for data collection. Every fifth consumer who visited the malls, shops/general stores and shops in sabzimandis were approached with a questionnaire for a face-to-face contact.

PRIMARY DATA COLLECTION

The survey method for collecting original data, measuring attitude or orientations in a large population is suitable for descriptive purposes (Babbie 2004). Since this descriptive study involves original data collection and studying attitudes of consumers towards processed food, survey method was used for data collection from consumers. Similarly, marketers/processors were also approached with a questionnaire for data collection. Data collection from experts was done using the technique of interviewing as it facilitates probing and provides more insights into the issues under study. One-on-one approach of interviewing

was used. The purpose of data collection was made very clear to all the respondents; this helped in obtaining enthusiastic responses from them. The responses of the interviewees were and the same were submitted to them for their approval. Only after the approval, the noting is used in the study.

SAMPLE SIZE

For a questionnaire having up to 40 questions, a sample size of 300 is good and 500 is very good (Comrey 1973, 1988). The researcher could reach 400 consumers for data collection; however some responses were not complete and some responses were very casual. Together this figure was 37. Thus only 363 responses were used for the study. In case of marketers/processors and experts, the number of respondents was 10 and 5 respectively. This is so because only 10processors and 5 experts agreed to respond. Moreover it was noted that the responses were repetitive and hence it was felt that the size is sufficient.

SAMPLE CONSTITUTION

The sample collected for data analysis had constitution as shown in the following table and 55% of the sample respondents spend in excess of Rs. 800 and above on vegetables and fruits:

Table 2: Sample constitution:Consumers

Employed	111
Homemaker	262
Married	347
Unmarried	16
Family size 1	2
Family size 2	12
Family size 3 -5	239
Family size greater than 5	110
Location:Pune	162
Location:Kolhapur	101
Location:Sangli	50
Location:Ichalkaranji	30
Location:Satara	30

INSTRUMENTS FOR PRIMARY DATA COLLECTION

For survey – The instrument used for survey of consumers was the questionnaire. For the survey of consumers, an undisguised and structured questionnaire was prepared. This questionnaire was divided into two parts: the first part consisted of demographic details of the respondents such as name, occupation, marital status, family size, location and monthly expenditure on fruits and vegetables and the second part consisted of product specific questions. This part had eight questions out of which two were multiple choice type questions, one was an open ended question pertaining to the expenditure incurred by the respondent on processed foods and one question involved rating various product attributes for decision-making in buying fresh and processed fruits and vegetables on a Likert scale in a range of 1 – 5. Thus the questionnaire was a short one and ensured that responding to the same avoided respondent fatigue. The language used for the questionnaire consisted of simple words found in common usage. The attributes of decision-making were identified from the extant literature on buying behaviour of consumers while buying fresh fruits and vegetables and processed fruits and vegetables to create a pool of the same. The study by Baker and Burnham (2001) on understanding the consumer preferences for genetically modified foods, identified brand, freshness, nutrition, price, sweetness and taste as important product attributes, out of which only brand and price were the most important attributes. The study by Nijmeijer, Worsley and Astill (2004) on exploring relationship between food lifestyle and vegetable consumption, identified attributes like quality, organic foods, freshness, novelty and taste. The study by Ali and Kapoor (2010) on buying behaviour of consumers for food products in emerging economy, identified attributes such as cleanliness / freshness, price, quality, variety, packaging and non-seasonal availability. Fandos and Flavian (2006) suggested some product attributes such as texture, flavour, aroma, colour, appearance, natural and carefully prepared products. Drichoutis and Lazaridis (2006) in their study on food purchasing behaviour used price, taste, nutrition, ease of preparation and brand as product attributes to develop a model on food-purchasing behaviour. The attributes stated above were included in the pool of product attributes used for decision-making by consumers. Ad verbatim repetition of attributes was eliminated. Most of the studies cited above were conducted in the foreign context and thus it was necessary to see their relevance in the local context. Also some attributes relevant in the local context needed to be identified. Thus a focus group discussion of consumers was conducted to see if the attribute pool constructed is

comprehensive. The focused group consisted of 15 members; 6 were males and 9 were females. The discussion lasted for about 1 hour. Although many attributes were repetitive, a few new product attributes emerged: easy to store, time-saving, purity, different or unpleasant odour, shelf-life and availability with local vendor. The pool was discussed with 3 experts (De Vellis 2003). All the experts opined that novelty would be included in a broader term variety, availability would include non-seasonal availability, cleanliness is included in the term hygiene and sweetness is a part of taste. Therefore the attributes such as novelty, non-seasonal availability, cleanliness and sweetness were removed from the pool of attributes for the study. Quality as an attribute appeared vague and hence was removed from the pool. Organic food as an attribute was used in the context of food lifestyle and was thus not relevant in the current study. Hence organic food as an attribute was also removed from the pool. It has been an experience of the consumers in India that processed food has an odour different from that of the fresh food; no aroma has however been experienced and hence aroma was replaced by different odour. Attributes like texture, natural and carefully prepared products, appearance and colour were also felt out of context and

hence removed from the pool. With this, the researcher finally included brand, freshness, easy to store, variety, availability, hygiene, value for money, shelf life, taste, flavour, easy to cook, time saving, availability with local vendor, packaging, purity, nutritional value, different or unpleasant odour, existence of preservatives to develop the questionnaire. Questionnaire for the marketers/processors were divided into two parts. The first part dealt with the simple details of the processing firm like its name, experience and product. The second part dealt with information pertaining to reasons for slow growth of processed fruits and vegetables in India, category of processed fruits and vegetables that are relatively more popular, rating of product attributes, rating factors moderating the acceptance of processed fruits and vegetables, provision of shelf space by retailers to processed fruits and vegetables and suggestions to expand the market for processed fruits and vegetables in India. All questions with an exception were multiple choice questions whereas the one on suggestions for market expansion was an open ended one. Thus both the questionnaires had only a small number of questions. Brevity of questionnaires ensured no respondent fatigue, minimum time demands on respondents and enthusiastic response from

the respondents.

For interview: Interviews experts were conducted for data collection. Instrument used for the purpose was the schedule. The schedule for experts included 8 questions only. These questions sought answers to reasons for slow growth of processed foods in India, ranking of product attributes, ranking raw material related hurdles, nutritional value of processed fruits and vegetables, usage of preservatives in processed fruits and vegetables, compliance to international standards in processing, positioning of processed fruits and vegetables to augment primary demand and suggestions to expand the market for processed fruits and vegetables. 7 questions out of 8 were multiple choice questions whereas the last one on suggestions to expand the market was an open ended one. Thus the questionnaire had only a small number of questions. Brevity of schedule ensured no respondent fatigue, minimum time demands on interviewees and enthusiastic response from them.

Pilot-Testing Of The Questionnaire And Schedules

All instruments were pilot-tested to gauge the suitability of words for correct understanding by the respondents and interviewees, spontaneity of flow, completeness in terms of questions to be asked and option answers, repetitive questions, length of questions, number of questions etc. The schedule for processors was tested with 3 processors and the questionnaire for consumers was tested with 20 consumers. Only minor modifications were required in the instruments and same were done before proceeding for full-scale data collection.

Hypothesis: Following hypotheses were formulated for the current study:

Hypothesis 1

Null Hypothesis: Slow growth of processed fruits and vegetables is independent of consumer prejudice towards processed fruits and vegetables

Alternate Hypothesis: Slow growth of processed fruits and vegetables is dependent of consumer prejudice towards processed fruits and vegetables

Hypothesis 2

Null Hypothesis: Slow growth in processed fruits and vegetables is independent of consumer awareness about

processed fruits and vegetables.

Alternate Hypothesis: Slow growth in processed fruits and vegetables is dependent on consumer awareness about processed fruits and vegetables.

Hypothesis 3

Null Hypothesis: There is no significant difference in the consumer perceptions towards fresh fruits and vegetables and processed fruits and vegetables in respect of attributes such as freshness, easy to store, variety, availability, hygiene, value for money, shelf life, taste and flavor.

Alternate Hypothesis: There is a significant difference in the consumer perceptions towards fresh fruits and vegetables and processed fruits and vegetables in respect of attributes such as freshness, easy to store, variety, availability, hygiene, value for money, shelf life, taste and flavor.

TESTING OF HYPOTHESES

Hypothesis 1

Null Hypothesis: Slow growth of processed fruits and vegetables is independent on consumer prejudice towards

processed fruits and vegetables

Alternate Hypothesis: Slow growth of processed fruits and vegetables is dependent of consumer prejudice towards processed fruits and vegetables.

Chi-square test is used to test this hypothesis, for the data on choice of fruits and vegetables i.e. whether raw or cut and the reasons for the choice of raw fruits and vegetables. Chi-square is being used since the data for the above two variables is in the categorical scale.

Pearson value $0.044 < 0.05$ and hence the null hypothesis is rejected and alternate hypothesis is accepted. Also, the Phi and Cramer's V value is $0.44 < 0.05$. Hence it is concluded that the slow growth in processed fruits and vegetables is due to the consumer prejudice towards processed fruits and vegetables.

The above conclusion is corroborated by the opinion of expert and marketer respondents. Consumer perception has been ranked as the second most important issue responsible for the slow growth of processed fruits and vegetables by 70% respondent marketers and 60% respondent experts.

Table 3 : Preference vegetables * Reasons for choice Crosstabulation

Preference vegetables * Reasons for choice Crosstabulation
Count

		Reasons for choice				Total
		Convenience	Availability	Location	Hygiene	
Preference vegetables	Cut vegetables	14	23	9	20	66
	Raw vegetables	70	128	53	46	297
Total		84	151	62	66	363

Source: SPSS Output

Table 4: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.092 ^a	3	.044
Likelihood Ratio	7.331	3	.062
Linear-by-Linear Association	4.004	1	.045
N of Valid Cases	363		

Source: SPSS Output

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.27

Hypothesis 2

Null Hypothesis: Slow growth in processed fruits and vegetables is independent of consumer awareness about processed fruits and vegetables.

Alternate Hypothesis: Slow growth in processed fruits and vegetables is dependent of consumer awareness about processed fruits and vegetables.

Chi-square test is used to test this hypothesis, for the data on marketers opinion slow growth of fruits and vegetables processing and the variable of lack of awareness amongst consumers. Chi-square is being used since the data for the above two variables is in the categorical scale.

Pearson value is $0.007 < 0.05$. Also the Phi value and Cramer's V is $0.007 < 0.05$. Hence we reject the null hypothesis and accept the alternate hypothesis that slow growth in processed fruits and vegetables is dependent on

the consumer awareness about the processed fruits and vegetables.

Hypothesis 3

Null Hypothesis: There is no significant difference in the consumer perceptions towards fresh fruits and vegetables and processed fruits and vegetables in respect of attributes such as freshness, easy to store, variety, availability, hygiene, value for money, shelf life, taste and flavor.

Alternate Hypothesis: There is a significant difference in the consumer perceptions towards fresh fruits and vegetables and processed fruits and vegetables in respect of attributes such as freshness, easy to store, variety, availability, hygiene, value for money, shelf life, taste and flavor.

Paired sample t test is used to test this hypothesis on the data obtained from the consumer respondents towards fresh fruits and vegetables and processed fruits and

Table 5: Symmetric Measures

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.149	.044
	Cramer's V	.149	.044
N of Valid Cases		363	

Source: SPSS Output

Table 6: Chi-square Tests

Chi - Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.000 ^a	2	.007
Likelihood Ratio	10.008	2	.007
Linear-by-Linear Association	7.788	1	.005
N of Valid Cases	10		

Source: SPSS Output

a. 5 cells (83.3%) have expected count less than 5. The minimum expected count is .20.

Table 7: Symmetric measures**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	1.000	.007
	Cramer's V	1.000	.007
N of Valid Cases		10	

Source: SPSS Output

vegetables in regards to the above mentioned attributes.

The sig. values for all attributes except freshness and Taste are $0.00 < 0.05$ and hence the null hypothesis is rejected for the attributes. Sig. value for freshness is $0.286 > 0.05$ hence the null hypothesis for the attribute 'freshness' is accepted. Sig. value for attribute taste is $0.073 > 0.05$ and hence the null hypothesis for the attribute 'Taste' is also accepted.

It can be concluded from the above that consumer perceptions towards fresh (raw) fruits and vegetables differ from the perceptions towards processed fruits and vegetables in respect of attributes like easy to store, variety, availability, hygiene, value for money, shelf life and taste.

ANALYSIS OF DATA

Data collected through the questionnaires / schedules and analyzed in terms of counts, ranks or percentages. The same are presented as follows:

Analysis Of The Data Collected From The Consumers

Following were the observations and analyses of the data collected from the consumers:

- Local vendors are preferred by 72% of the respondents, super markets are preferred by 11% respondents, grocery shops are preferred by 5% respondents and weekly bazaars are preferred by 12% of respondents for purchase of vegetables and fruits
- The reasons of availability and convenience for purchase from a specific agency account for 65% of the respondents surveyed.
- Raw vegetables and fruits are preferred by 82% of the consumer respondents while only 18% prefer cut

vegetables and fruits.

d.33% of the respondent gave 'not fresh' as the reason, 25% gave 'not healthy' as the reason for not preferring cut vegetables. Non availability was the reason for 12% respondents, 7% gave the reason 'not suitable to cooking style', while for 5% of respondents, 'adulteration' was the reason for not preferring cut vegetables.

e.Pickles, ready to eat soups, fresh juices and cut vegetables are the types of processed items purchased by the consumer respondents.

Analysis From The Data Collected From The Marketers / Processors Of Processed Fruits And Vegetables

Following were the observations and analyses of the data collected from the marketers / processors of processed fruits and vegetables:

- The factors that are important for the lack of growth of processed vegetables and fruits were ranked by the respondents. Lack of awareness, consumer perceptions, fluctuating prices of raw materials and lack of standardization were found to be the top four issues. Lack of awareness was ranked as number one while consumer perceptions was ranked as number two by 70% of respondent marketers. Fluctuating prices were ranked as number three by 50% respondents while lack of standardization was ranked as number four by 70% respondents.
- Marketer respondents rated hygiene, availability with local vendors, push by local vendor and purity significant issues as purchase determinants of processed fruits and vegetables.
- The major moderators in the acceptance of processed fruits and vegetables in India were identified as awareness, freshness, pricing and perceptions about preservatives.
- The major issues in the procurement of raw materials for

Table 8: Paired samples statistics**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Freshness FVF	4.62	362	.607	.032
	Freshness PVF	2.85	362	1.374	.072
Pair 2	Easy to store FVF	3.68	362	1.008	.053
	East to store PVF	3.27	362	1.404	.074
Pair 3	Variety FVF	4.02	362	1.073	.056
	Variety PVF	2.71	362	1.120	.059
Pair 4	Availability FVF	4.13	362	1.024	.054
	Availability PVF	2.78	362	1.314	.069
Pair 5	Hygiene FVF	3.57	362	1.064	.056
	Hygiene PVF	3.12	362	1.306	.069
Pair 6	VFM FVF	3.93	362	.939	.049
	VFM PVF	3.02	362	1.355	.071
Pair 7	Shelf Life FVF	3.59	362	1.076	.057
	Shelf Life PVF	2.92	362	1.245	.065
Pair 8	Taste FVF	4.24	362	.840	.044
	Taste PVF	2.77	362	1.252	.066
Pair 9	Flavour FVF	3.88	362	1.174	.062
	Flavour PVF	2.84	362	1.231	.065

processing were identified as price fluctuations, quality and standardization, storage, irregular supplies and scattered suppliers. Other issues like transport, payment terms and better price realization by growers were not considered to be significant.

e. 100% of the marketer respondents said adequate shelf space is provided to processed fruits and vegetables by retailers.

f. Marketer respondents opined that customer education by government/Food processing association on a mass scale to change the negative perceptions about processed vegetables and fruits being stale and low in nutritional value, creating awareness about hygiene, purity, freshness and preservatives will help to enhance the market for processed fruits and vegetables.

g. Cold storage facilities with subsidized power, back end of the supply chain needs to be enhanced for consistent quality supplies, improving packing quality and cost reductions by marketers/manufacturers, and motivating more process industry to grow through zero taxation are some of the other measures that will help to increase the market for processed fruits and vegetables.

Analysis Of The Data Collected From The Experts Of Processed Fruits And Vegetables

a. Expert respondents ranked the issues of lack of awareness amongst consumers, consumer perceptions, pricing and supply chain management as the top four issues respectively responsible for the slow growth of processed fruits and vegetables in India.

b. Expert respondents rated the issues of awareness,

Table 9: Paired samples correlations**Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	Freshness FVF & Freshness PVF	362	-.056	.286
Pair 2	Easy to store FVF & East to store PVF	362	-.400	.000
Pair 3	Variety FVF & Variety PVF	362	-.222	.000
Pair 4	Availability FVF & Availability PVF	362	-.280	.000
Pair 5	Hygiene FVF & Hygiene PVF	362	-.382	.000
Pair 6	VFM FVF & VFM PVF	362	-.199	.000
Pair 7	Shelf Life FVF & Shelf Life PVF	362	-.150	.004
Pair 8	Taste FVF & Taste PVF	362	-.094	.073
Pair 9	Flavour FVF & Flavour PVF	362	-.259	.000

freshness, perceptions about preservatives, pricing, and nutritional value as the most important issues respectively for the acceptance of processed fruits and vegetables by the consumers.

c. Quality and standardization, and storage were rated as the most important issues in the procurement of raw materials for processing of fruits and vegetables.

d. 100% of respondent experts opine that nutritional value is higher in processed fruits and vegetables as compared to fresh (raw) fruits and vegetables.

e. 100% of respondent experts opine usage of preservatives is high in processed fruits and vegetables.

f. 100% of respondent experts opined that Indian food processing industry does not adhere to international standards in processing.

g. 80% respondent experts opine that 'Availability anytime and anywhere' and 20% opined that 'Better quality' should be used as the positioning strategy for processed fruits and vegetables.

CONCLUSIONS AND DIRECTIONS FOR FUTURE STUDIES

It is concluded that the slow growth in processed fruits and vegetables is due to the consumer prejudice towards processed fruits and vegetables. These prejudices include processed fruits and vegetables are not healthy due to existence of preservatives, not suitable to cooking style and are adulterated, they are not easy to store, there is lack of variety, they are not easily available, they are not hygienic, they do not offer value for money and have limited shelf life. Consumer awareness about the processed fruits and vegetables is also responsible for the slow growth of processed fruits and vegetables. Hence to

promote processed fruits and vegetables, it is necessary to include messages that address these prejudices. Messages should also project the advantages of processed fruits and vegetables. As there is a separate ministry for processed foods, the ministry may advertise and create awareness of the processed foods and focus on its advantages in the interest of the industry (as is done in case of eggs). The procurement side moderators include price fluctuations, lack of quality and standardization, lack of storage, irregular supplies and scattered suppliers. The ministry should also play an active role in building infrastructure for processed foods industry. Future studies may be conducted for measuring the customer satisfaction with processed fruits and vegetables. These studies will help deepen the markets for processed fruits and vegetables.

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