

CHAPTER III

METHODOLOGY

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This chapter focuses on the strategy used to conduct the study. For clarity and ease of understanding it has been presented under the following heads.

1. Research Design
2. The Variables
3. Conceptual framework
4. Operational Definitions
5. Selection, Construction and Description of the tool
6. Sample size and Sampling procedure
7. Analysis of data
8. Educational Package

The present study had been carried out in various phases

Phase I. Study of shops selling organic food

Phase II Study of consumers of organic food

Phase III Study of producers (farmers) doing organic farming

Phase IV Quality assessment of organic and conventional food items

Phase V Dissemination of knowledge about organic food.

Phase	Study	Research Design	Tool for data collection
I.	Study of shops selling organic food	Descriptive	Interview
II.	Study of consumers of organic food	Descriptive	Interview
III	Study of producers (farmers) doing organic farming	Descriptive (Qualitative)	Case study through Interview and observation
IV	Quality assessment of organic and conventional food items	Experimental	Record sheet and Evaluation card
V	Dissemination of knowledge about organic food.	Descriptive	Questionnaire

1. Research Design

The Present study was concerned with finding out in detail the buying practices, and the reasons for buying organic food. The study also dealt with the problems that the consumer faced while using organic food and satisfaction derived after consumption of organic food. The study also included laboratory testing for certain selected parameters of organic food and conventional food.

Research design for present investigation was (1) Descriptive design (2) Experiment design.

Descriptive Research Design:

It is concerned with the conditions or relationships that exists, opinions that are held, processes that are going on, effects that are evident, or trends that are developing. It is primarily concerned with the present, although it often considers past events and influences as they relate to current conditions (Best and Kahn, 1983). Since the present investigation aimed to study the buying practices of consumers regarding organic food, problems faced by consumers, shopkeepers and farmers and satisfaction felt on consumption of organic food by consumers, the research design was considered as descriptive.

Experimental Research Design:

Experiment design is a blueprint of the procedures that enable the researcher to test hypotheses by reaching valid conclusions about relationships between independent and dependent variables. It reduces not only bias and increases reliability but will also permit drawing inferences about casualty (Best and Kahn 1983). Since the present study aimed at testing the quality of organic food and conventional food on selected parameters, experimental design was considered appropriate. The quality assessment of Organic food and conventional (non-organic) food was done on selected bio-chemical parameters, sensory parameters, cooking time and shelf life. The quality assessment was done to one item from each of the following food groups i.e. Cereals, Pulses, Roots & tubers, Vegetables, Fruits and Jaggery.

Case Study:

Of the types of descriptive research, case studies are types of qualitative research (**Best and Kahn 2000**). According to **Kothari (2004)** case study is a method of data collection. It is a popular form of qualitative analysis and involves a careful and complete observation of a social unit, be that unit a person, a family, an institution, a cultural group or even the entire community. It is a method of study in depth rather than breadth. The case study places more emphasis on the full analysis of a limited number of events or conditions and their interrelations. The present study was qualitative research through case study as one of its aims was to study in depth various aspects of the farmers doing organic farming. They were located around Vadodara city and were supplying their products to various shops situated in Vadodara. An attempt was made to have a study of the motivational factors leading to adaptation of organic farming, problems faced, crops grown and other relevant aspects.

2. Variables under consideration:

There were two sets of variables selected for the present research. For the descriptive research, the Variables selected for the consumers using organic food were as follows. The consumers of the organic food in the present study were women.

2.1 Variables for descriptive research

2.1.1 Independent Variables:

1. Personal Variables

1. Age of the respondent
2. Education of the respondent
3. Occupation of the respondent

2. Family Variables

1. Type of Family
2. Size of Family
3. Income of Family

3. Situational Variables

1. Time period of Using Organic food

2.1.2 Intervening Variables

These are the variables which act as dependent variable in relation to independent variables but become independent variables in relation to dependent variables of the study. For the present study following were the intervening variables.

1. Reasons for buying organic food
2. Extent of utilization of organic food
3. Extent of problems faced by consumers while using organic food

2.1.3 Dependent Variables

1. Extent of satisfaction felt on using organic food

2.2 Variables for Food Quality Assessment

2.2.1 Independent Variable

1. Organic food product
2. Conventional (Non-Organic) food product
(The term “Conventional food” and “Non organic food” were used interchangeably in the present research)

2.2.2 Dependent Variables

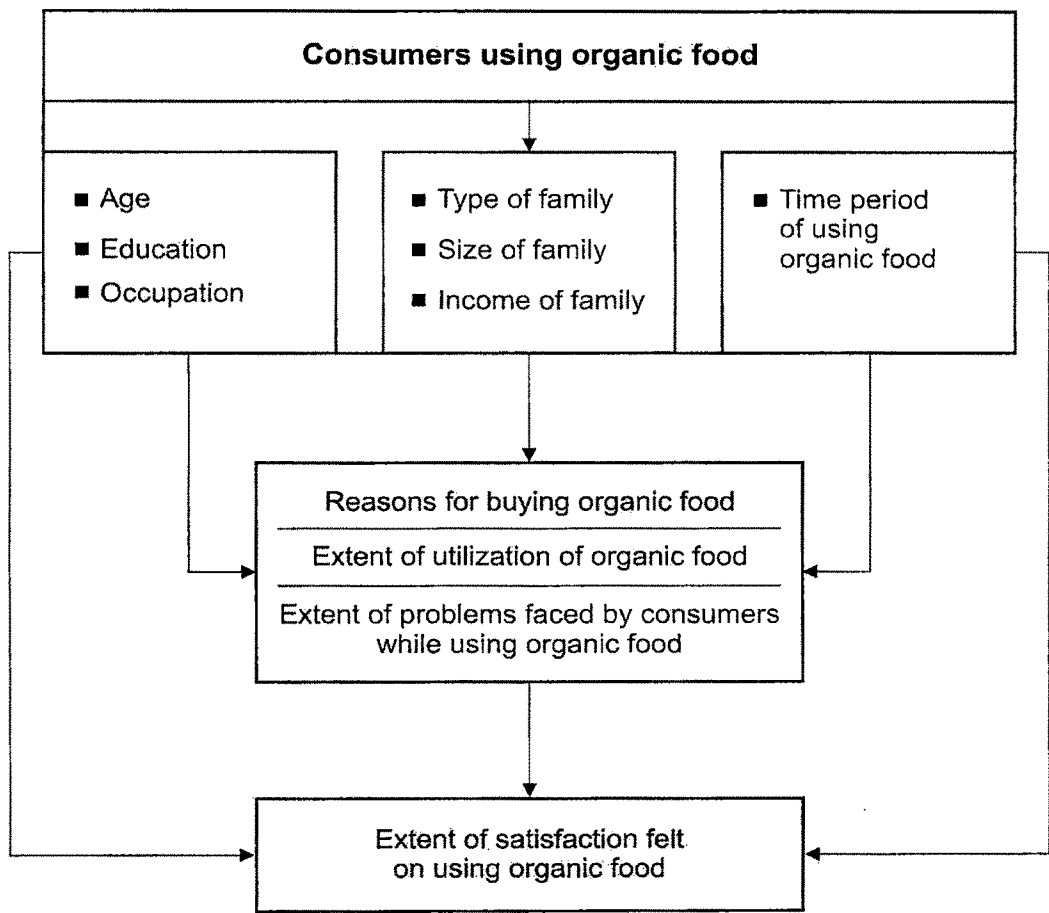
Presence of the following in the food items

1. Pesticides-Organochlorine
2. Fertilizers-Urea
3. Heavy Metals- (Lead, Cadmium)
4. E.coli
5. Nutrients- (Fat, Protein, Carbohydrates, Calories)
6. Moisture content

It was theorized that the content of Pesticides, Fertilizers, Heavy metals, E-coli and Nutrients and the Moisture content in the food items may be influenced by the type of farming method i.e. organic farming method or conventional (non-organic) farming method.

3. Conceptual Framework

Conceptual framework of the descriptive study



Explanation of the conceptual Framework of Descriptive study:

It was theorized that the extent of satisfaction of consumers using organic food may be influenced by their age, education and occupation. The type, size and income of the family may also influence the extent of satisfaction felt on consumption of organic food. The time period of using organic food may also influence the satisfaction regarding organic food. The reasons for buying organic food, extent of utilization of organic food and extent of problems faced by consumers regarding organic food may be influenced by all these factors of the respondents. Extent of satisfaction felt by consumers may also be influenced by reasons for buying organic food, the extent of utilization of

organic food and extent of problems faced by consumers while using organic food.

4. Operational Definitions

4.1 Organic farming: It is a crop cultivation system which avoids use of synthetically compounded fertilizers, pesticides and growth hormones and which incorporates crop rotation, crop residues, farm waste and manual cultivation to maintain soil productivity.

4.2 Organic food: Food which is grown through organic farming, stored and/or processed without the use of synthetic product (Preservatives), chemicals or fertilizers, insecticides or any other pesticides, growth hormones or growth regulators is termed as Organic food.

4.3 Conventional (Non organic) food: Food grown through conventional (non organic) method of farming and stored/processed by using synthetic fertilizers, pesticides, synthetic manure, compost, sewage sludge and other soil inputs is termed as Conventional (Non-organic) food. The term "Conventional" and "Non-organic" food/farming were used interchangeably in the present research.

4.4 Reasons for buying organic food: It is defined as the extent to which various reasons influenced consumers to buy organic food.

This was reflected through summated rating scale where the respondents were asked whether they were influenced to great extent, to moderate extent and to low extent. These responses were given scores of 3 through 1 respectively. Higher scores reflected high extent of influence to buy organic food.

4.5 Extent of utilization of organic food: It is defined as the extent to which the respondents use various groups of organic food.

This was reflected through a summated rating scale where the respondents were asked to state whether they use only organic food, sometimes organic-sometimes conventional or only conventional food items from the various food items listed. These responses were given scores of 3 through 1 respectively. Higher scores reflected high extent of utilization of organic food.

4.6 Extent of Problems faced while using organic food: This is defined as the extent to which the respondents face problems while using organic food.

This was reflected through a summated rating scale where the respondents were asked to state whether they face or do not face problems with availability, price, accessibility, taste, appearance and certification of organic food. These responses were given scores of 2 to 1. Higher scores reflected high extent of problems faced while using organic food.

4.7 Extent of Satisfaction felt on using organic food: It is defined as the extent to which the respondents were satisfied after using organic food.

This was reflected through a summated rating scale where the respondents were asked to state whether they are satisfied, undecided or not satisfied with the availability, price, quality, appearance, supply of organic food items from various food groups. These responses were given scores of 3 through 1 respectively. Higher scores reflected high extent of satisfaction felt with the use of organic food.

4.8 Time period of using Organic food: It is defined as the time since which the respondents were exposed to organic food. This was reflected through two categories; less than two year and More than two years.

4.9 Consumers: For the present study the consumer of organic food denotes the person who buys one or the other organic food items, minimum four times in a month since last one year from the time of data collection. In the present study the consumers were women.

4.10 Shopkeepers selling organic food: The person who sells more than 70 % of its items as organic food in his shop.

4.11 Food Quality: Food quality is a composite of those characteristics that affect the degree of acceptability to the consumer. This includes external factors such as appearance, texture, aroma and flavour; factors such as federal grade standards and internal factors such as nutritional content, biochemical, physical, microbial parameters.

For the present study, good food quality was operationally defined as the food which does not contain residues of chemicals from fertilizer, pesticides and

heavy metal like lead and cadmium ; which has more shelf life ; more nutritive value and appropriate sensory attributes like taste, aroma, texture and appearance and sweetness of food and minimum cooking time.

The food quality, in the present study was assessed on the following parameters.

I. Biochemical parameters

(a) Presence of chemical residues (Urea, Lead Cadmium and organochlorine pesticides)

(b) Microbial content : Presence of E.coli

(c) Nutrient content : Presence of Fat, Protein, Carbohydrates and Calories

(d) Moisture content

II. Sensory parameters - attributes like taste, Aroma, texture and appearance and sweetness of food"

III. Coking time

IV. Shelf life

5. Selection, Construction and Description of the tool:

a) For shopkeepers and consumers

Interview schedule was used as an instrument for gathering data from consumers and shopkeepers due to the following reasons.

1. To establish rapport with the respondent in order to elicit correct response and to clarify the issue. This gave a chance to explain the purpose of the study and assure confidentiality of the information provided.
2. Interview gave a chance to observe the things around.
3. To adopt language that is comfortable for the respondent to avoid misinterpretation regarding questions.
4. It gave chance to probe further in to questions.
5. To obtain more information at the time of data collection.
6. To ensure completely filled in data sheets.
7. To safeguard against non return of the data sheets.

b) For the farmers doing organic farming

Case study was used as a method of data collection from farmers due to the following reasons.

1. Case study helps to obtain a real and enlightened record of personal experience which would reveal person's inner strivings, tensions and motivations that drive him to action along with the forces that direct him to adopt a certain pattern of behaviour.
2. It enables the researcher to trace out the natural history of the social unit.
3. It facilitates intensive study of a social unit which is generally not possible if other method of data collection is used.
4. This method is a means to well understand the past of a social unit because of its emphasis of historical analysis.

The case study method adopted in the present research, enabled the researcher to obtain a real and enlightened record of personal experience of the farmers engaged in organic farming.

5.1 Development of the tool

Based on the information collected through review of related literature, an interview schedule was prepared. While preparing the schedule, care was taken to include all such questions that would elicit the information needed to attain the objectives of the study. Two separate interview schedules were prepared. One for the consumers and the other for the shopkeepers.

5.2 Description of the tool

a. Interview Schedule for Shopkeepers

The Schedule for Shopkeepers consisted of 6 Sections

1. Background information regarding shop
2. List of organic food items available in the shop in different seasons.
3. List of producers, manufacturers, farmers from where the organic food is purchased for their shop.
4. Reasons that influenced shopkeepers to sell organic food.
5. Problems faced by shopkeepers while selling organic food.
6. Suggestions given by shopkeepers to government, Non Government Organizations, Manufacturers and farmers.

Section: 1 Background information regarding shop: This section contained various questions regarding the background information of the shop such as name of shop, year in which started, name of the owner, type of organic food selling in their shop and also about their knowledge about certification agency that give certificate to organic food.

Section: 2 Organic food items available in the shop in different seasons: This section contained open-end responses. It has three categories which denotes three seasons like July-Oct, Nov-Feb and March-June. In this section the shopkeepers were asked about various food items available in their shops in different seasons. The food items were also asked belonging to all food groups like cereals, pulses, fats and oil, sugar and jaggery, vegetables, fruits, condiments and spices and Nuts.

Section: 3 Sources for obtaining organic food by the shopkeepers: In this section shopkeepers were asked to give name and addresses of those manufacturers, producers, farmers and food processors from which they purchase organic food for their shop.

Section: 4 Reasons that influenced shopkeepers to sell organic food: This section contained various statements depicting the reasons for selling organic food in their shop. The shopkeepers had to indicate the extent to which they were influenced while deciding to sell organic food in their shop. It was developed by the researcher.

Section: 5 Problems faced by shopkeepers while selling organic food: This section contained 28 statements which describes storage problem, acceptability from consumers, high price, lack of distribution channel, less profit margin, and certification. It was developed by the researcher.

Section: 6 Suggestions given by shopkeepers to government, NGOs, Manufacturers and farmers: This section dealt with the suggestions given by the shopkeepers to government, non government organizations, farmers, manufacturers and consumers.

b. Interview Schedule for Consumers

The interview schedule had mostly structured type of questions. The schedule for consumers consisted of 5 sections.

- I. Background information of the respondents
- II. Reasons for buying organic food.
- III. Extent of utilization of organic food.
- IV. Problems faced by consumers while using organic food.
- V. Extent of satisfaction felt on using organic food.

Section:1 Background information of the respondents: This section contained questions regarding the background information of the respondents such as age, education, occupation, family's monthly income, type and size etc. It also contained a scale to indicate the sources of information that they use for gathering knowledge regarding organic food and time period of using organic food. It also contained questions regarding accessibility of consumers to organic food outlet and their knowledge regarding various shops selling organic food in the city.

Section: 2 Reasons for buying organic food: This section contained various statements depicting the reasons for buying organic food for which the respondents had to indicate the extent to which they were influenced while deciding to buy organic food. It was developed by researcher and content validity was established.

Section: 3: Extent of utilization of organic food: This section contained a list of organic food items belonging to various food groups. The respondents were asked to indicate the frequency with which they purchased organic food items. The list was made on the basis of a preliminary survey of all the shops selling organic food in Vadodara city.

Section: 4 Problems faced by consumers while using organic food: This section contained 27 statements which described different areas like availability, price, accessibility, taste, quality and certification of organic food regarding which consumers face problems while using organic food. This was a summated rating scale where consumers were asked to indicate whether they faced or did not face the problem while using organic food.

Section: 5 Extent of satisfaction felt on using organic food: This section contained scale for extent of satisfaction derived by using organic food with reference to its availability, price, quality, taste, appearance and accessibility. It was developed by the researcher and test-retest reliability and validity was established.

5.3 Establishment of content validity of scales:

There were 6 scales prepared by the researcher. They were (i) Reasons for buying organic food, (ii) Extent of utilization of organic food (iii) Problems faced by consumers while using of organic food (iv) Extent of satisfaction felt on using organic food (v) Reasons that influenced shopkeepers to sell organic food (vi) Problems faced by shopkeepers while selling organic food. The content validity of various scales was established. For this purpose the scales were given to a panel of 11 judges from the Faculty of Home Science, Department of Biochemistry, Organic food shopkeepers, NGOs working for organic food and department of Environment Science. They were requested to check the clarity and relevance of the content for each scale. They were also requested to state whether each statement fell in the category under which it was listed. A consensus of 80% among the judges was taken as a yardstick for inclusion of the statement in the final tool. No changes were required to be made in the tool.

Establishment of Reliability

The reliability of the scales was established through test-retest and split half method : For test- retest method the tool was given to the respondents and it was administered to respondents once again after a gap of 21 days. Pearson's Product Moment Formula was applied to find out the correlation in the scores between the two administrations. The reliability values were found to be high for all the scales.

For split half method the scale were divided in to two using odd and even method. The correlation was found between the two halves. Spearman-Brown correction formula was applied to estimate the reliability coefficient for the entire scale. The reliability values were found to be high for the scales.

Sr. No	Scale	Developed by	Reliability	
			Method used	Value
	For Shopkeepers			
1.	Reasons for selling organic food	Researcher	Test-Retest	0.61
2.	Problems faced while selling organic food	Researcher	Test-Retest	0.69
	For Consumers			
1.	Reasons for buying organic food	Researcher	Test-Retest	0.65
2.	Problems faced while using organic food	Researcher	Split half	0.67
3.	Satisfaction felt on using organic food	Researcher	Test-Retest	0.72
	For Educational Package			
1	Knowledge Scale	Researcher	Split half	0.66

6. The Sample and Sampling Procedure

A. Descriptive study:

Convenience sampling method was adopted for data collection. Out of the 7 shops selling organic food (Amidhara, Tazamaza- Ellora park, Oasis, Eco world, Herbal Concepts, Fabindia, Taza Maza-Old Padra Road) in Vadodara city, six shops were selected. The shops selected for data collection kept similar type of green vegetables, Fruits, cereals, spices and oil products and other ready to eat organic food items. Fabindia was not included in data collection as in Fabindia, the nature of food products sold was different. They had more variety of ready to eat products like pickle, jam, chutney and dry fruits, spices only. It also had furniture and furnishings and food was just one section in their shop. Other than these shops there was an Organic food dhaba named "Apana Dhaba" It was serving food made up of organic food ingredients only. Therefore "Fabindia" and "Apana Dhaba" were omitted for the consumer survey.

From these six shops selling organic food 150 consumers were selected on the basis of convenience sampling method. The researcher visited these shops selling organic food at three different times in a week, from 9am to 12 noon, 1pm to 3pm and 4pm to 7pm so as to select the sample of the study.

Those consumers were selected who purchased one or the other organic food items minimum four times in a month since last one year from the time of data collection i.e. February 2007.

Investigator tried to take approximately equal number of respondents from each shop but during the research "Eco World" was closed for renovation purpose and therefore only 6 respondents were contacted of the shop "Eco World" which was situated at Sama Road. "Oasis" was a shop which had less number of consumers and therefore only 14 respondents could be contacted from "Oasis". Whereas "Amidhara", "Taza Maza" and "Herbal Concept" were the shops which dealt with only organic food items and therefore constant flow of consumers were found in these shops. Researcher contacted 30 respondents from Taza Maza (O P Road), 32 respondents from Taza Maza (Ellora Park), 38 respondents from Amidhara and 30 respondents from Herbal Concept. The data were gathered in the month of February 2007 to May 2007.

B. Experimental study

Samples of food items for various tests for experimental study were selected directly from the farm which were doing organic farming since last 5 years. The sample for conventional (non-organic) food items were selected from the neighbouring farms so that the factors like soil condition, climate, irrigation method etc would remain constant to some extent. The samples were collected in the month of January, 2008. The samples of vegetables (Cabbage, Yam elephant, Fenugreek leaves, Coriander leaves, Spinach), fruits (Sapota i.e. chiku and Papaya), rice, red gram dal, jaggery grown through organic and conventional (non-organic) farming process were collected directly from the farms from some of the villages of Vadodara district. It was observed from the literature that many researches had been carried out in foreign countries with respect to food quality of organically grown food and they had found major differences among organically grown food and food grown through conventional (non-organic) process. But very few such researches were carried out in India, especially in Gujarat. Consumers also reported that they found difference in the taste of organically

grown food. Therefore an attempt was made to find out the difference between organic food and non-organic food.

6.1 Food quality assessment

The sample of organic and conventional Cabbage(one from each category), Yam elephant (one from each category), chiku (200 gm), Rice (500 gm), Red gram dal (500 gm) and jaggery (1 kg) were given to the Food and Drug Laboratory for the test where the test for biochemical parameters, microbial content, nutrient content and moisture content were carried out by them.

6.2 Sensory Evaluation Test

For the sensory evaluation test one item from each food group from organic farm and non organic farm was selected. They were Rice, Red gram dal, Yam elephant and Sapota. For this test only those items were selected which could be judged without adding any extra spices and masala. i.e Pure taste of that food item was tasted. These Organic and non-organic food items were just boiled and kept for the evaluation. Quantity and cooking time was constant for both the items. These items were kept in two different bowls. Judges were asked to indicate whether they found any differences in those two same items. The responses were sought in terms of No difference, some difference and completely different. The score of 1 to 3 were ascribed to each of the responses respectively. The various parameters to assess Rice and Red gram dal were size, shape, feeling on touch, aroma, colour, taste and healthy appearance. The parameters used to assess Chiku(Sapota) and Yam elephant were firmness, visual texture, aroma, colour, taste and healthy appearance.

6.2.1 Selection of Judges for sensory evaluation test

Quality is the ultimate criterion of the desirability of any food product to the consumer. Sensory quality is also an important parameter to both producer and consumer. To the producer, since it attracts the consumers and to the consumer, since it satisfies his aesthetic and gustatory sense. Sensory quality is a combination of different senses of perception coming in to play in choosing and eating food. In present study, Healthy appearance, texture, firmness, flavour, aroma, colour, taste, size, shape and feeling on touch were

tested. For sensory evaluation test of organic and conventional (non-organic) food, a panel of judges was selected from the Faculty of Home Science through the "Sensitivity- Threshold test". The "recognition threshold tests" with basic tastes and odours are most frequently employed for panel selection. Sensitivity tests to measure the ability of an individual to smell, taste or feel specific characteristics in food or beverages or pure substances are used in selecting panelist for evaluation in product research and development. It is also used to establish intensity of sensory response of a food or food component. Threshold is defined as a statistically determined point on the stimulus scale at which a transition in a series of sensation or judgment occurs. These tastes are also used where a minimum detectable difference of an additive or of an off flavour are to be established (Ranganna, 2004). The different solution were given to taste to 9 teachers from Department of Food and Nutrition, Department of Home Management, and Department of Clothing and Textile. Those members whose responses matched to the correct responses were selected as final judges. There were 3 teachers ultimately selected to become members of panel of judges for sensory evaluation test.

Procedure for Threshold test:

- One set of cleaned and dried beakers was taken and 1M (Molar) solution of each salt, sugar and citric acid was prepared.
 - Remaining dilutions were made with the help of 1M solution.
- a) **Salt Solution:** For preparing 1 litre of stock solution of salt 5.85 gm of salt was added. Researcher made 4 different dilutions for salt using stock solution of salt. They were arranged in random order. Researcher also added plain water in a container to make 5 solutions to confuse panel members. Nine staff members who were willing to be the judge in the study were given threshold sensitivity evaluation card (Appendix IV). They were asked to taste each and every molar solution of salt and indicate whether the solution was water, very weak, weak, strong and very strong. They were not allowed to re-taste the solution.



Plate 1 : Salt solution for threshold test

b) Sugar Solution: For preparing 1 litre of stock solution of sugar 34.2 gm of sugar was added. Researcher made 4 different dilutions for sugar using stock solution of sugar. One container having plain water was added to the series to make a total of 5 containers. This was done to confuse panel members. All the members were asked to taste each and every molar solution of sugar and indicate whether the solution was water, very weak, weak, strong and very strong. They were not allowed to re-taste the solution. The responses were to be noted on the evaluation card provided to them by the researcher (Appendix IV).



Plate 2 : Sugar solution for threshold test

c) Citric Acid Solution: Molecular weight of citric acid ($C_6H_8O_7$) is $12(6)+1(8)+16(7) = 192$ gm For preparing 1 litre of stock solution of citric acid 21.01 gm of citric acid was added. The same procedure was followed for tasting and judging the sensitivity of staff members for the taste.



Plate 3 : Citric acid solution for threshold test

6.2.2 Final Panel members for the Sensory Evaluation Test

3 out of 9 teachers whose responses were correct were selected to form the panel of judges for the sensory evaluation test.

6.3 Method of Cooking and cooking time

To find out difference in cooking time of food grown organically and non-organic food, all the food items in equal quantity were cooked on medium flame on gas burner. From each food group one such item was selected which could be tasted without adding any spices and masala through sensory evaluation test. The same amount of (150grams) Rice, Dal and Yam elephant were cooked separately in the same pressure cooker using equal amount of water(150ml) for cooking. Equal amount of water (200ml) was used in the bottom of the pressure cooker. Time was noted when the gas was turned on/off. Thus the cooking time was assessed. The results were reported for the total time required by different food items to be cooked. The cooking quality of selected food also was assessed by the panel of judges.

6.4 Shelf life test

For the assessment of shelf life the samples of food items were selected directly from the farm and were kept at room temperature in the month of February, 2008. The food items selected were Cabbage, Fenugreek leaves, Spinach, Coriander leaves, Yam Elephant, Chiku (Sapota) and Papaya.

Everyday all the samples were observed and photographs were taken. Shelf life test was carried out just to check the freshness of the food items. Physiological loss or moisture content were not measured before and after the test.

7. Data Analysis

The procedure used to analyse the data were categorization, coding, tabulation and statistical analysis.

7.1 Categorization

Data related to age, employment, income and education of consumers etc were categorized for further analysis.

- i. **Age of Consumers:** Age was measured in terms of numbers of years completed by the respondents (Women consumers) at the time of data collection. Based on the obtained information, it was then categorized on the basis of equal intervals as follows.
 - a) Less than 35 years
 - b) 36 years to 50 years
 - c) 51 years or more
- ii. **Education of the Consumers:** Formal education attained by the respondents was categorized as follows.
 - a) Illiterate
 - b) SSC pass
 - c) Graduate
 - d) Post Graduate
- iii. **Employment of the Consumers:** It was categorized according to gainful employment of the respondents at the time of data collection.
 - a) Non-Employed
 - b) Employed
- iv. **Total Monthly income of the family:** It referred to the monthly income of the family acquired from various sources. It was categorized as
 - a) Less than Rs.20,000
 - b) Rs.20,001 to Rs. 40,000
 - c) Rs.40,001 and above

- v. **Total number of family members:** The number of family members staying together under one roof at the time of data collection was categorized as follows.
- a) 1 to 2 members
 - b) 3 to 4 members
 - c) 5 or more members
- vi. **Total number of children in the family:** It referred to the number of children in the family among various age group at the time of data collection. It was categorized as
- a) Below 12 years
 - 0 to 2
 - 3 to 5
 - b) 12 years to 19 years
 - 0 to 2
 - 3 to 5
 - c) Above 19 years
 - 0 to 2
 - 3 to 5
- vii. **Time period of using Organic food:** This referred to the number of years since the respondents had started using organic food from the time of data collection. It was categorized as
- a) Less than 2 years
 - b) More than 2 years
- viii. **Reasons for buying organic food:** Under this section, various reasons for buying organic food were listed. The respondents were asked to indicate to what extent those reasons influenced them to buy organic food. The responses were sought in terms of "To a great extent", "To some extent", and "To low extent". The score of 3 through 1 were ascribed to each of the responses respectively, which depicted the extent to which the reasons influenced them for buying organic food. The possible range of score was divided into three categories having almost equal interval of numbers (i) 17 – 28 (ii) 29 – 39 (iii) 40 - 51 which depicted low , moderate and high extent of influence respectively.

Extent of Influence of reason**Score**

- a) To a low extent 17 to 28
- b) To a moderate extent 29 to 39
- c) To a great extent 40 to 51

ix. **Extent of utilization of organic food:** In this section a list of various food items available in each of the following food group were identified and listed. Various food groups were (i) vegetables (ii) Fruits (iii) Nuts (iv) Cereals (v) Pulses and legumes (vi) Fats, oils and oil seeds (vii) Condiments and spices (viii) Sugar and jaggery and (ix) Ready to eat items . The respondents were asked to mention the items that they generally buy from the shops selling organic food. The responses were sought in terms of "Only organic whenever available", "Sometimes organic- Sometimes conventional" and "Only Conventional food items". The score of 3 through 1 were ascribed to each of the responses respectively, which depicted the respondent's extent of utilization of organic food. The possible range of scores was divided into three categories having almost equal interval of numbers for each of the food groups.

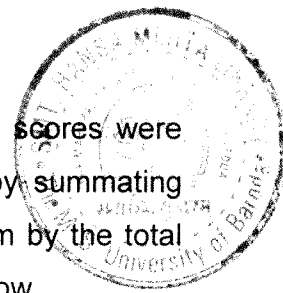
Sr.No.	Category of Organic food item	Scores of extent of use		
		Low extent	Moderate extent	High extent
1.	Vegetables	30 to 50	51 to 70	71 to 90
2.	Fruits	14 to 23	24 to 32	33 to 42
3.	Nuts	4 to 6	7 to 9	10 to 12
4.	Cereals	12 to 19	20 to 27	28 to 36
5.	Pulses and legumes	11 to 18	19 to 26	27 to 33
6.	Oil	4 to 6	7 to 9	10 to 12
7.	Condiments and Spices	10 to 16	17 to 23	24 to 30
8.	Sugar and Jaggery	3 to 4	5 to 6	7 to 9
9.	Ready to eat food items	5 to 8	9 to 12	13 to 15
10.	Extent of utilization of all organic food items	93 to 154	155 to 216	217 to 279

- x. **Problem faced while using organic food:** This section was developed by the investigator and its validity was duly established. It contained various areas where respondents faced problem with the use of organic food. The responses were sought in terms of “yes” and “No” indicating whether they faced or did not face the problem. The score of 2 was ascribed to “Yes” and one to “No”. The scores were summated and the possible range of scores were divided into three categories having equal interval of numbers.

<u>Extent of Problem</u>	<u>Score</u>
a) To a low extent	27 to 35
b) To a moderate extent	36 to 44
c) To a great extent	45 to 54

- xi. **Satisfaction felt on using organic food:** This section was developed by the investigator. It contained various aspects of satisfaction with the use of organic food like availability, price, appearance, taste, quality and supply of organic food items. The respondents were asked to indicate their extent of satisfaction for various aspects for various food groups. The responses were sought in terms of “Satisfied”, “Undecided” and “Not satisfied” which were ascribed scores of 3 through 1. The possible scores were divided into three categories having equal interval of numbers which depicted their low, medium and high extent of satisfaction in various areas as mentioned below.

Sr. No.	Various aspects	Possible score reflecting extent of satisfaction		
		Low extent	Moderate extent	Great extent
1.	Availability	8 to 13	14 to 19	20 to 24
2.	Price	8 to 13	14 to 19	20 to 24
3.	Taste	8 to 13	14 to 19	20 to 24
4.	Appearance			
	(a) Colour	8 to 13	14 to 19	20 to 24
	(b) Texture	8 to 13	14 to 19	20 to 24
	(c) Size	8 to 13	14 to 19	20 to 24
	(d) Freshness	8 to 13	14 to 19	20 to 24
5.	Quality	3 to 4	5 to 6	7 to 9
6.	Quantity / Supply	8 to 13	14 to 19	20 to 24
7.	Extent of Satisfaction on total scale	68 to 113	114 to 159	160 to 204



xii. **Weighted Mean Scores (Intensity Index):** Weighted mean scores were calculated for each of the scale as well as for each item by summing scores of all the respondents on an item and dividing the sum by the total number of respondents. A list of those scores is presented below.

Sr. No	Scale	Range of Continuum	Responses	Ascribed score	Range of Weighted mean scores
1	Reasons for buying organic food	1 -3	<ul style="list-style-type: none">To great extentTo some extentTo low extent	3 2 1	1 to 1.9 Low 2.0 to 3.0 High
2.	Extent of use of organic food	1- 3	<ul style="list-style-type: none">Only organicSometimes organic-Sometimes conventionalOnly conventional	3 2 1	1 to 1.9 Low 2.0 to 3.0 High
3.	Problems Faced with the use of organic food	1-2	<ul style="list-style-type: none">YesNo	2 1	1 to 1.5 low 1.5 to 2 high
4.	Satisfaction felt on using organic food	1-3	<ul style="list-style-type: none">SatisfiedUndecidedNot Satisfied	3 2 1	1 to 1.9 Low 2.0 to 3.0 High

Coding: Code numbers were given to each answer then the information from each questionnaire were transferred on a coding sheet.

Tabulation: The data were transferred from coding sheet into a tabular form to give a clear picture of findings.

Statistical Analysis: The data were analyzed employing descriptive as well as relational statistics.

Descriptive Statistics: The data were presented in frequencies, percentage, mean and standard deviation.

Relational statistics: Analysis of Variance, t test and Co efficient of Correlation and Paired t test were carried out to test the hypotheses postulated for the study.

Food quality assessment: Results of various tests done in the laboratory were reported in a tabular form.

Findings of Shelf life: Photographs were taken everyday and observation were reported showing shelf life of various food items.

Findings of Cooking time: Results were reported in tabular form

Findings of Sensory Evaluation test: Results were reported in tabular form

8. Educational Package on “Organic food”

To disseminate knowledge about organic food an educational package was developed. It consisted of a lecture supported with PowerPoint presentation, and a Booklet. The package was introduced to the female students of Faculty Of Family and Community Sciences, however it could be used on any other target group after establishing its efficacy. The knowledge test administered before and after the exposure to educational package helped to establish the efficacy of the package. The details are presented here.

8.1 Development of the educational package

The title of educational package was “Organic food: Good for you good for nature”.

- a) Power point presentation was made so that researcher could explain various aspects of organic food and it would help to make their understanding better.
- b) Booklet was developed consisted of same content. This was prepared and distributed for their future reference. The educational package was developed in English language.
- c) Content of educational package was as follows.
 - Definition of organic food
 - Fundamental principles of organic farming
 - Advantages of organic food
 - Advantages of organic farming
 - Myths related to organic farming/food
 - Levels of organic content in food
 - Difference between organic food and conventional (non organic) food.

- Impact of conventional food (non organic) food on health
- Information about shops selling organic food in Vadodara city
- Shopping tips

An attempt was made in the present study to judge the efficacy of the educational programme prepared by conducting pre test and post test. To establish effectiveness of educational package, questionnaire was prepared as an instrument to collect the data. While preparing the questionnaire, care was taken to include all such questions that would help to disseminate knowledge regarding organic food. It included various aspects related to organic food viz. definition of organic food, pesticide residue, frequency of buying organic food, price, availability, appearance, shelf life of organic food, sensory attributes, health aspects etc. Questionnaire had two sections.

- I. Background information of consumers
- II. Knowledge regarding Organic food

Section I Background information of the respondents

This section contained questions regarding the background information of the respondents such as age, education, type and size of family, knowledge about shops in Vadodara city and frequency of buying organic food.

Section II Knowledge regarding food

This section contained 40 statements which described different aspects like availability, price, appearance, definition of organic food, health aspects, pesticides content etc. This was a summated rating scale where consumers were asked to indicate whether the statement was correct or incorrect.

8.2 Description of the package

Power Point presentation was consisted of 30 slides. It included information related organic food, organic farming, fundamental principles of organic farming, advantages of organic food, myths related to organic food, details of shops selling organic food and food items available in the shops selling organic food.

Booklet on organic food consisted of various information related to organic food. It included advantages of organic food, myths related to organic food, fundamental principles of organic food, impact on health of non organic food and information of shops selling organic food in Vadodara city.

8.3 Establishment of content validity of educational package

The knowledge scale, booklet and presentation were prepared by the researcher. The content validity was established. For this purpose whole educational package was given to panel of 8 judges from the Faculty of Family and Community Sciences. They were requested to check the clarity and relevance of the content of the package. A consensus of 80% among the judges was taken as a yardstick for inclusion of items finally in the educational package.

8.4 Establishment of Reliability of questionnaire

Pre-testing of the tool was conducted. To establish reliability of the knowledge scale split half technique was used, the score of 2 to 1 were ascribed to each statement which depicted their extent of knowledge regarding organic food. The reliability value was 0.68. This shows the instrument had high reliability value.

8.5 Sample and Sampling procedure

The educational package was developed and tested on the future homemakers. Students of Second year and Third year were selected from the department of Home Management, Faculty of Family and Community Sciences by convenience sampling method assuming that they had some basic level of knowledge.

8.6 Administration of educational package

Undergraduate students from department of Home Management, Faculty of Family and Community Sciences were gathered in Seminar room. They were asked to fill the questionnaire. Once filled questionnaires were collected, a lecture along with a power point presentation on organic food was delivered. The same questionnaire was administered again and was asked to fill. This

was done to find out whether there was any change in the knowledge level of the respondents regarding organic food through the educational programme and also to check the efficacy of the educational programme prepared.



Plate- 4 Undergraduates for Educational programme on organic food

8.7 Data Analysis of educational package:

The procedure used to analyze the data was categorization, coding, tabulation and statistical analysis.

8.7.1 Categorization:

Data related to age, education, type of family etc were categorized for further analysis.

i) Age of the respondents: Age was measured in terms of numbers of years completed by the respondents at the time of data collection. Based on the obtained information, it was then categorized as follows

- a) 18 to 20 years
- b) 21 to 23 years
- c) 23 and above

ii) Type of family: It referred the type of family.

- a) Joint
- b) Nuclear

iii) Knowledge regarding organic food: This section was developed by the investigator and its validity was duly established. It contained various aspects of organic food. The responses were sought in terms of "Correct" and "Incorrect" indicating whether the statement is correct or not. The score of 2 was ascribed to correct and 1 to incorrect statement. The score was summated and the possible range of scores were divided into three categories having equal interval of numbers.

<u>Extent of Knowledge</u>	<u>Score</u>
a) To a low extent	40 to 53
b) To a moderate extent	54 to 67
c) To a great extent	68 to 80

8.7.2 Statistical Analysis: The data were analyzed employing descriptive as well as relational statistics

8.7.2.1 Descriptive Analysis: The data were presented in frequencies, percentage, mean and standard deviation.

8.7.2.2 Relational Analysis: Paired t test was performed to test the effectiveness of the educational package. Paired t test was used to compare two paired values (such as in a before-after situation) where both observations were taken from the same or matched subjects (Kothari, 2004).