



MARKET POTENTIAL FOR NEW COCONUT-BASED HIGH VALUE PRODUCTS

**S R SAMARAJEWA
K D P P GUNATHILAKE
A D SAMARAJEWA**



**COCONUT RESEARCH INSTITUTE
SRI LANKA
February 2003**



Rs. 500/3
22/10/07



**Market Potential for New Coconut-
based High Value Products**

**S R Samarajeewa
K D P P Gunathilake
A D Samarajeewa**

**Coconut Research Institute
Sri Lanka
February 2003**

A. D. Samarajeewa
Research Officer
Coconut Research Institute
Lunuwila.

3882

EXECUTIVE SUMMARY

Virgin coconut oil, virgin king coconut oil, coconut jam, bottled candied coconuts are few of the coconut-based high value products developed in Sri Lanka recently. The project on "*Developing sustainable coconut-based income generating technologies in poor rural communities*" plans to introduce these high value products manufacturing as poverty reduction strategies among the selected rural poor communities. However, the sustainability of this income generating activity by the community certainly depends on the marketability of these coconut-based products. Therefore, the objective of this study was to assess the market potential of these coconut-based high value products among the target consumers. To achieve this objective, a market survey was conducted in the *Chilaw* urban area in Sri Lanka. As a preliminary step, seventy households were randomly selected for the market survey and a free sample of selected coconut-based products were distributed among them. 92% of the respondents of this survey consist of women.

Nearly 89% of the respondents were satisfied with the overall quality of the virgin coconut oil and virgin king coconut oil samples given to them indicating a higher market potential for these products in this area. Taste, smell and color of virgin coconut oil are the most preferred qualities by the respondents. The results show that 68% of the respondents in the sample indicate their willingness to pay for virgin coconut oil even above 100-120 rupees per bottle (750 ml). The primary uses of king coconut oil is notably different from the uses observed for coconut oil. The smell of virgin king coconut oil is the most preferred quality character by the consumers. The supply of king coconut oil in this area is not systematic and therefore, there is a good opportunity for any new producer to produce and market the product. Around 25% of the respondents suggested an addition of medicinal herbs or its extracts to virgin king coconut oil, which enable better therapeutic uses. Nearly 95% of the respondents in the sample show their willingness to buy king coconut oil if it is available in the market. Further, some of the consumers show their willingness to pay for virgin king coconut oil even above the price of virgin coconut oil.

The respondents have used coconut jam as common to other jam types available in the market by consuming it as bread spread. Around 32% of the respondents claimed that the quality of coconut jam is better than that of the other jams available in the market, whereas 37% claimed that it is similar in quality to the other jam types. These responses indicate a greater market potential for coconut jam. Further, 30% of the respondents suggested that the removal of coconut oily taste present in coconut jam would be better. Therefore, there is a need to improve the quality of coconut jam excluding coconut oily taste to attract more consumers. The respondents have used the bottled candied coconut in a number of traditional sweetmeat preparations. Around 70% of the respondents in the selected sample expressed their willingness to buy bottled candied coconuts if it is available for sale.

ACKNOWLEDGEMENT

This study was conducted as a component of the project on "*Sustainable coconut-based income generating technologies for poor rural communities*" funded by the Asian Development Bank (ADB) and coordinated by the International Plant genetic Resources Institute (IPGRI). Authors wish to express their gratitude to Dr. Pons Batugal, Coordinator of the above project for his encouragement to initiate this market survey in a formal way. A special thank is due to Ms. Malani Ranathunga, National Engineering Research and Development Center of Sri Lanka (NERD) who was the inventor of the virgin oil expeller for her valuable assistance during the survey. Authors acknowledge Ms. Thamara Damayanthi of *Kadawatha*, Sri Lanka being an entrepreneurial housewife to take up virgin coconut oil production and providing samples of virgin oils for this market survey. We are also grateful to Dr.(Ms) C Jayasekara, Director of Coconut Research Institute of Sri Lanka for giving us permission and necessary facilities to conduct this study. Finally, authors highly appreciate the genuine and inspiring comments given by all the respondents participated in the market survey, without which this task is impracticable.

TABLE OF CONTENTS

	Page
Executive Summary	i
Acknowledgement	ii
Table of contents	iii
List of tables	v
List of figures	vi
Abbreviations	vii
 Chapter 1	
INTRODUCTION	
1.1	Poverty Reduction through coconut-based interventions 01
1.2	New coconut-based high value products 01
i)	Virgin coconut/king coconut oil 01
ii)	Coconut jam and Bottled candied coconuts 04
a)	Coconut Jam 04
b)	Bottled candied coconuts 05
1.3	Introduction of new coconut-based processed product manufacture in selected communities as a poverty reduction strategy 07
1.4	Objective of the survey 08
 Chapter 2	
MARKET SUYRVEY	
2.1	Selection of the sample for the survey 09
2.2	Descriptive statistics of the selected sample 09
a)	Gender composition of the sample 10
b)	Education level of the sample 10
c)	Types of occupation of the sample 10
d)	Size of the households 11
e)	Age composition of the sample 11
f)	Income level of the sample 12
g)	Expenditure on food 13
h)	Frequency of shopping for food items 14
i)	Consumer choices of shops to purchase food 14

Chapter 3

MARKET POTENTIAL FOR VIRGIN COCONUT OIL AND KING COCONUT OIL

3.1	Virgin Coconut oil	16
	a) Type of uses of virgin coconut oil	16
	b) Consumer Satisfaction on virgin coconut oil	17
	c) Quality preference of virgin coconut oil	17
	d) Type of cooking oil currently use in the households	18
	e) Consumer income and the type of cooking oil used	20
	f) Consumers willingness to pay for virgin coconut oil	21
	g) Per capita cooking oil consumption patterns of the sample	21
	h) Education level and the choice of cooking oil	22
	i) Relationship between the income level and the expenditure on cooking oil	23
3.2	Virgin King coconut oil	25
	a) Use patterns of king coconut oil	25
	b) Existing markets for king coconut oil	27
	c) Consumers' willingness to pay for king coconut oil	27
	d) Suggestions for product quality improvement	29

Chapter 4

MARKET POTENTIAL FOR COCONUT JAM AND BOTTLED CANDIED CCONUTS

4.1	Coconut Jam	30
	a) Jam consumption pattern of the sample	30
	b) Use patterns of coconut jam	30
	c) Consumer satisfaction and quality preferences for coconut jam	31
	d) Consumer willingness to pay for coconut jam	33
	e) Consumer choices of shops for jam purchase	34
4.2	Bottled Candied Coconuts (<i>Bottled Peni-Pol</i>)	34
	a) Use patterns of Bottled candied coconuts	35
	b) Consumer preferences of qualities of bottled candied coconuts	35
	c) Consumers willingness to pay for bottled candied coconuts	36

Chapter 5

CONCLUSION

5.1	Summary	38
5.2	The sample for market survey	39
5.3	Market potential for virgin coconut oil	39
5.4	Market potential for virgin king coconut oil	40
5.5	Market potential for coconut jam	41
5.6	Market potential for candied coconuts	41

LIST OF TABLES

		Page
1.1	Nutritional composition of Coconut Jam	05
1.2	Nutritional properties of candied coconuts	07
2.1	Gender composition of the selected sample	09
2.2	Education level of the selected sample	10
2.3	Relationship between education level and occupation type of the chief householders	11
2.4	Age composition of the sample	12
2.5	Monthly income level of the sample	12
2.6	Changes in the monthly total income and the food budget share of the sample	13
2.7	Relationship between the total number in the households and the food budget share	14
2.8	Frequency of shopping for necessary food items	14
2.9	Relationship between income level and the shopping preferences	15
3.1	Use patterns of virgin coconut oil by the respondents	16
3.2	Consumer satisfaction on virgin coconut oil	17
3.3	Quality preferences of virgin coconut oil by the users	17
3.4	Qualities dislike by the virgin coconut oil consumers	18
3.5	Consumer satisfaction on the quality of coconut oil buy at the market	19
3.6	Consumer awareness of <i>aflatoxin</i> substances present in coconut oil	20
3.7	Frequency of consumer choices of cooking oil use as against the income level	20
3.8	Consumer willingness to pay for virgin coconut oil	21
3.9	Relationship between the education level and the choice of cooking oil	23
3.10	Use patterns of the king coconut oil	26
3.11	Consumer satisfaction on the quality of king coconut oil	26
3.12	Quality preferences of king coconut oil by the consumers	26
3.13	Known markets for purchasing of king coconut oil	27
3.14	Consumers' willingness to buy the king coconut oil	28
3.15	Consumers' willingness to pay for king coconut oil	28
3.16	Consumers' suggestions for product quality improvement	29
4.1	Jam consumption pattern of the selected sample	30
4.2	Use patterns of coconut jam by the respondents	31
4.3	Consumer satisfaction on the quality of coconut jam	31
4.4	Consumer preferences of the quality of coconut jam	31
4.5	Factors not preferred by coconut jam consumers	32
4.6	Consumer suggestions for product development of coconut jam	32
4.7	Consumer willingness to buy coconut jam	33
4.8	Consumer willingness to pay for coconut jam	33
4.9	Relationship between choice of market place and jam consumption pattern	34
4.10	Use patterns of bottled candied coconuts	35
4.11	Qualities preferred by the consumers of bottled candied coconuts	35
4.12	Consumer willingness to buy bottled candied coconuts	36
4.13	Consumers' willingness to pay for bottled candied coconuts	36
4.14	Relationship between the levels of consumer income with the willingness to pay category for bottled candied coconuts	37

LIST OF FIGURES

	Page
1.1 Virgin coconut oil and virgin king coconut oil in bottles	03
1.2 The sequence of activities in virgin coconut oil production	03
1.3 The process of coconut jam manufacturing	04
1.4 Coconut jam as bread spread	05
1.5 Production process of candied coconut or " <i>penipol</i> "	06
1.6 Sweetmeat preparation with bottled candied coconuts	06
2.1 Frequency distribution of the size of households in the sample	11
3.1 Frequency of different cooking oil users in the sample	19
3.2 Changes in the size of the household and average quantity of oil consumption	22
3.3 Monthly income and average quantity of cooking oil consumption by the householders	24
3.4 Relationship between income level and monthly expenditure pattern on cooking oil	24
3.5 Budget share for cooking oil in different income categories	25

ABBREVIATIONS

ADB	- Asian Development Bank
CBO	- Community Based Organization
CPRD	- Coconut Processing Research Division
CRISL	- Coconut Research Institute of Sri Lanka
CWE	- Co-operative Wholesale Establishment
GCE (A/L)	- General Certificate of Education (Advanced Level)
GCE (O/L)	- General Certificate of Education (Ordinary Level)
IPGRI	- International Plant Genetic Resources Institute
NERD	- National Engineering Research and Development Center
WSE	- <i>Wilpotha</i> Women's Savings Effort

Chapter 1

INTRODUCTION

1.1 Poverty Reduction through coconut-based interventions

Poverty reduction in poor coconut growing communities through coconut-based interventions is the main objective of the project on "*Developing sustainable coconut-based income generating technologies in poor rural communities*" funded by the Asian Development Bank (ADB) and coordinated by the International Plant Genetic Resources Institute (IPGRI). The Coconut Research Institute of Sri Lanka (CRISL) implements this pilot project in Sri Lanka. Initially 3 rural poor coconut-based communities located in three districts in Sri Lanka were selected to implement the activities of the project. These selected communities are located in a) *Hettipola* in the *Kurunegala* District, b) *Wilpotha* in the *Puttalam* District and c) *Dodanduwa* in the *Galle* District. There are three strategies with which the project intends to intervene in these communities to enhance the income of the community and thereby to reduce poverty. Those are, i) to enhance the income by introducing high yielding, multi purpose and better adapted coconut varieties, ii) to increase income by producing high value products from all parts of coconut and iii) to increase farm productivity through intercropping and livestock production. This study emphasizes on the second strategy of the project; the introduction of high value coconut products as a poverty reduction tool and highlights the results of the survey on the assessment of the market potential for high valued coconut-based products in specific localities.

1.2 New coconut-based high value products

Coconut derives a range of marketable products that can be produced from various parts of the palm. The kernel is the most precious raw material for a number of valuable coconut-based product manufacturing. Copra, coconut oil, desiccated coconut are the most traditional value added coconut products in Sri Lanka for centuries of time. However, the recent market trends shows that there is a reduction in demand for these traditional coconut-based products. Meanwhile, a range of non-traditional coconut-based value added products has emerged in the domestic as well as international markets recently. They are the outcomes of the recent research and development activities by both the public and private sector. The following section describes several new coconut-based processed products that are developed in Sri Lanka recently.

i) **Virgin coconut/king coconut oil**

Coconut oil is well known and is the major edible oil use in Sri Lanka. It is generally obtained by drying the coconut meat using different methods and then extracting the oil from granulated dried kernel with high pressure by mechanical press called "oil expelling". Coconut oil in its purest form is water-white in color, with distinct coconut flavor and aroma and with free fatty acids content ranging from 0.05-0.08% (as oleic) without

undergoing the chemical refining process. However this type of oil is not available in the commercial market due to various shortcomings present in the traditional copra making process. These shortcomings are listed as follows;

- ◆ Use of coconut shell as fuel for kiln and there are lot of poly-aromatic hydrocarbons generated and most of them are carcinogenic
- ◆ Copra is not fully dried or properly stored and there are chances of fungus to grow including *Aspergillus* spp. which are producing carcinogenic toxins called "Aflatoxins"
- ◆ In traditional method it needs a large space for copra making and storage
- ◆ Use of low grades copra for oil expelling needs lot of purification or refining.

The traditional oil extraction method involves pressurizing and heating and thus the generated oil is yellowish to pale brown in color. Further, the excess heat generated in this expelling system deteriorates the nutritional properties of coconut oil, especially vitamins. However, several coconut oil producing companies in Sri Lanka make white coconut oil using a chemical refining process, which also lead changes in the natural properties of the oil. The other common method of coconut oil production in Sri Lanka is the wet processing method, generally practiced in households. This process also uses heat and the resulted oil is yellowish in color. Hence there is a timely need to develop alternative oil expelling methods, which generate pure coconut oil with preserved qualities and properties.

Presently there is a trend for chemically free, high quality coconut oil. This type of coconut oil is termed as "Virgin coconut oil" by both producers and consumers. However, the industry has not yet set up any quality standards on the said product. The virgin coconut/king coconut oil manufacturing is a novel process, which is a deviation from the traditional oil expelling methods. Virgin coconut oil is the naturally processed product from fresh coconut meat or its derivative (coconut milk and fresh residue), which has not undergone any further processing such as refining. It is colorless with free fatty acids content below 1% (as oleic) and peroxide value of < 10meq iodine/kg of oil.

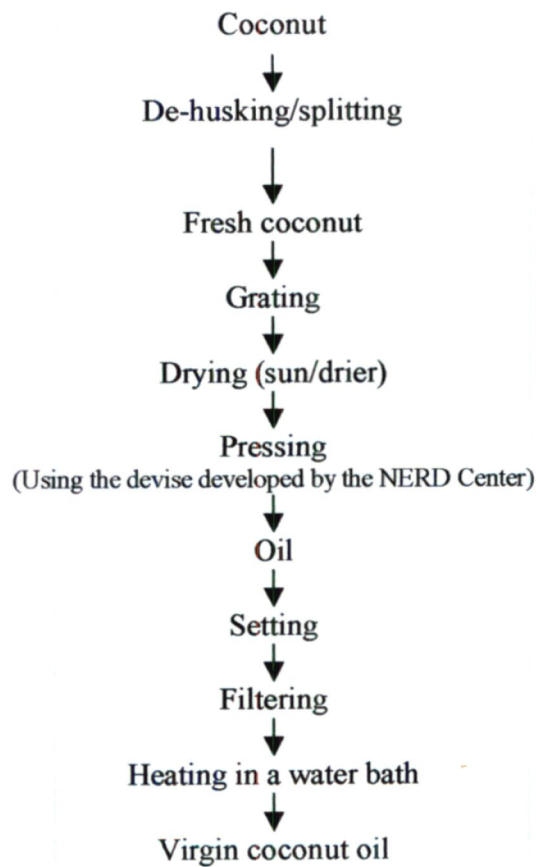
In contrast to the traditional oil expelling methods, virgin coconut oil can be produced either from the processing of fresh coconut meat, coconut milk or coconut milk residue. The National Engineering Research and Development Center in Sri Lanka (NERD Center) has introduced domestically used hand-operated device, which extract virgin coconut oil from grated fresh coconut (fresh dry process). In addition to this devise, they have developed a system for industrial use, including a power operated scraper, a rotary drier and a hydraulic expeller etc. The virgin oil production process needs coconut scrapings dried in the sun for two hours to reduce moisture to 10-12%. The devise is used to press the dried scrapings to expel pure oil, which is then heated in a water bath to conserve color and all the natural properties of coconut oil. The resulted oil is transparent in color and has therapeutic values in comparison to the coconut oil expelled through traditional methods. The press cake, which is the residue after extracting oil is rich in protein and dietary fiber and can be utilized for coconut milk extraction and for preparation of various types of sweet-meats like *Thala guli*, *Rulang aluwa* etc. Coconut milk extracted from the press cake

has low amount of fat and can be used for curry making. Hence, this system is efficient as there is low wastage of coconuts.

Figure 1.1 Virgin coconut oil and virgin king coconut oil in bottles



Figure 1.2: The sequence of activities in virgin coconut oil production



The cost of production of the virgin coconut oil is relatively higher due to the small-scale production capacity with the designed machine. It is expected to fetch a higher market price for this oil as it has new potential uses in comparison to the bulk coconut oil available in the market.

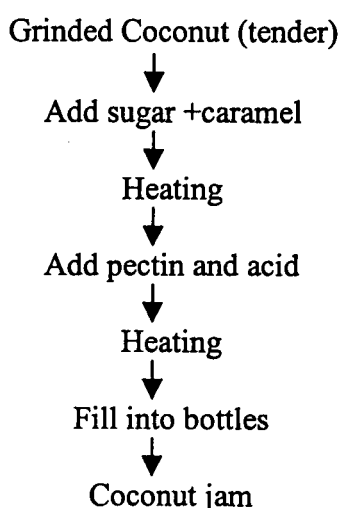
ii) Coconut jam and Bottled candied coconuts (Bottled *Peni-pol*)

The Coconut Processing Research Division (CPRD) of the CRISL, engaged in research and development on coconut-based processed products. CPRD has developed two new products namely, coconut jam and bottled candied coconuts (*peni-pol*) as outcomes of recent research and development activities. The quality of these two specific products was tested in the laboratory and has made refinements to the production technology. Further, the results of the consumer taste panels on the acceptability of these food items showed satisfactory results. These products can be manufactured in both domestic and industrial levels as the process need not much sophisticated machinery and equipment. Hence, the production technology of these products needs to be introduced to the entrepreneurs who wish to venture into new businesses for production and marketing of these novel coconut-based processed products.

a) Coconut Jam

Most Sri Lankans are familiar with jam prepared with various fruits but not with coconuts. Coconut jam has high-energy value compared to other fruits jams. So this product is especially suitable for children. Coconut jam is prepared by cooking coconut with sugar and pectin to a very thick consistency. This jam can be used like other jams and has specific coconut taste.

Figure.1.3. The process of coconut jam manufacturing



Coconut jam does not contain any chemical preservatives and artificial colorings and can be kept for about six months without changing its sensory properties. Cost of production of 220g of coconut jam (one jam bottle) is about Rs. 25.00. The nutritional composition of coconut jam is given in table 1.1.

Figure 1.4: Coconut jam as bread spread



Table 1.1: Nutritional composition of Coconut Jam

Nutrients	Quantity (%)
Moisture	12
Fat	9.55
Protein	0.91
Minerals	0.35
Fiber	2.60
Carbohydrate	73.7

b) Bottled candied coconuts (Bottled *Peni-pol*)

Candied Coconuts or "*Penipol*" is a coconut-based product basically consists of coconuts with caramelized sugar or treacle, salt and a few selected spices. This is used as an ingredient and sweet filler in the preparation of sweet foods like "*Laveria*", "*Imbul Kiribath*", Pancake, "Coconut Cake", "*Helape*" etc. However, homemade candied coconuts cannot be kept for more than two days because of rancidity development and microbial spoilage. Realizing the fact, the CPRD has developed a bottling technique to preserve candied coconuts for about one year without refrigeration. In this process, candied

coconuts is prepared by mixing and heating of coconut scrapings with hot treacle or caramelized sugar solution, salt and spices, and filling into bottles and subsequent pasteurization in a boiling water bath after sealing. The flow diagram of processing steps is given in figure 1.4. The cost of production of one bottle (500 g) of candied coconut is about Rs 50-60. This preparation is ready to serve and may have an export potential especially for expatriate Sri Lankan community in Europe and Middle East.

Figure 1.5: Production process of candied coconut or "penipol"

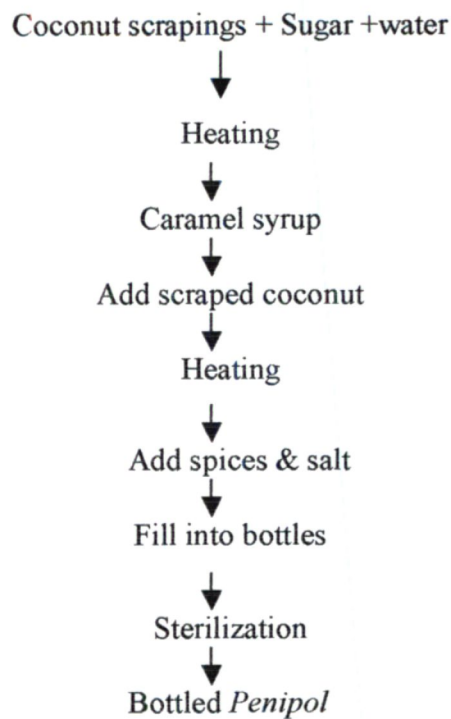


Figure 1.6: Sweetmeat preparation with bottled candied coconuts



Since candied coconuts contain whole coconut kernel, this is rich in dietary fiber and energy and also it is enriched with vitamin E. This product is free from pathogenic and spoilage microorganisms and safe for human consumption. Hence it is good for both adult and children. Nutritional properties of the product are shown in table 1.2.

Table 1.2. Nutritional properties of candied coconuts

Nutrients	Quantity (%)
Moisture	27.68
Fat	21.54
Protein	2.59
Fiber	1.3
Minerals	0.6
Carbohydrate	46.89

1.3 Introduction of new coconut-based product manufacturing as a poverty reduction strategy in selected rural communities

The project plans to introduce the proposed coconut-based products manufacturing to one of the rural poor communities. The *Wilpotha* women's community has been selected for this purpose. This community has already organized under the Community Based Organization (CBO) named "Women's Savings Effort" (WSE). This CBO is already engaged in coconut bract handicraft making as the main income generating activity. The project has done a preliminary investigation on the market potential of the bract handicrafts made by the CBO. The results of this study showed that the existing bract handicraft products needs further improvements in quality and also there is a market potential for new designs as well. Also they need new market linkages too. These improvements are being made with the assistance of resource persons and the project team. Meanwhile, the virgin coconut oil processing and other several new coconut-based food product manufacturing will be introduced to this community as new income generating strategies. The NERD center has developed a hydraulic jack operated machine using the same principle to extract coconut oil at medium scale and this machine will be installed at *Wilpotha* Community center. The project will fund this event, as one of the objectives of the project is to assist the poor community to produce coconut-based products for income generation. In addition, other specified new high value coconut products, i.e. coconut jam and candied coconuts can be introduced in the community, based on the assessment of the marketability of the products.

The marketability of any new product is an important factor. Also this information is vital for the survival of the enterprise and to make profits for the manufacturer. However, the acceptance of the product in the society may associate with several attributes, which depends on the satisfaction of the consumer, who consumes the product. The consumer

acceptance of the product is one of the major factors in marketing of the new product and to earn profits to the manufacturer.

1.4 Objectives of the survey

Once the virgin oil production and other coconut-based product manufacture begin by the WSE, it needs to be marketed to earn profits. Also the marketability of the products is vital for continuous running of the production process and thereby enhancing the incomes of the community. The sustainability of this income generating activity of the project certainly depends on this factor. Hence, this survey is one of the preliminary steps to investigate the marketability of selected coconut-based processed products, which are going to be produced by the WSE. Therefore, the objective of this study was to assess the marketability of the selected value-added coconut-based products among the target consumers. The specific objectives are to evaluate the consumer acceptability and preferences of the selected new coconut-based products, i.e., virgin coconut oil, virgin king coconut oil, coconut jam and bottled candied coconuts for better marketability and for product development.

Chapter 2

MARKET SURVEY

2.1 Selection of the sample for the survey

Simple random sampling was done to select a representative sample for the study. The sample location was confined to the *Chilaw* urban area covering a two-kilometer radius around the center of the *Chilaw* town. *Chilaw* is located 80 kilometers north to the capital city of Colombo. This survey location was specifically selected, as *Chilaw* is the closest urban area to the WSE and it was assumed that when the community starts the production of new coconut-based products, one of the major potential markets would be *Chilaw* urban area.

Seventy households were randomly selected for the market survey. Two of the four types of coconut-based product samples, i.e., i) virgin coconut oil ii) virgin king coconut oil iii) coconut jam and iv) bottled candied coconuts were distributed among these households. Only two types of coconut-based products were given for each household for easy recalling of the quality characters of the products. The respondents were given a one-weeks time to consume the product. After one weeks time, enumerators re-visited each household to get the responses of the consumers on the coconut-based products given to them. The information was collected using a pre-tested structured questionnaire. The next section describes the important socio economic characteristics of the selected sample.

2.2.Descriptive statistics of the selected sample

a) Gender composition of the sample

Table 2.1: Gender composition of the selected sample

Sex	No. of Respondents	Percentage	Chief House holder	Percentage
Male	5	8	55	87
Female	58	92	8	13
Total	63	100	63	100

Source: Market survey for new coconut-based products, 2003

Only 63 households were finally selected for the survey and for further inferences. Seven households were removed from the sample due to incompleteness or irrelevant responses obtained during the interview schedule. 92% of the respondents of this survey consist of women even though 87 % of the households are headed by males. The male respondents were mainly engaged in the income generating activities and could not meet during the survey time. However, the women respondents were assumed to be more knowledgeable

on the household food consumption patterns and food expenditure rather than the male chief householder. Therefore, the information obtained from the housewives in the survey is assumed to be accurate and precise.

b) Education level of the sample

Table 2.2 gives the details of the education level of the selected sample. The general Certificate of Education /Ordinary Level (GCE O/L) and Advanced Level (GCE A/L) educators were the dominant group in the selected sample. Majority of the chief householders had their education up to GCE (A/L) whereas majority of housewives had their education up to GCE (O/L). Three graduates were also found in the selected sample but none of the postgraduate holders were included. Also one diploma holder was found among the housewives. Based on these facts, the sample can be classified as an educated group.

Table 2.2: Education level of the selected sample

	Education Level				
	Primary	GCE O/L	GCE A/L	Diploma	Basic Degree
Chief householder	8	22	31	0	2
Housewife	6	29	21	1	1
Total	14	51	52	1	3

Source: Market survey for new coconut-based products, 2003

c) Types of occupation of the sample

Majority of the chief householders (24) do their own businesses as the main income generating activity. There were 11 government servants and 5 semi-government servants in the sample, while 9 chief householders work in private companies. Table 2.3 gives the relationship between education level and the type of occupation.

The chief householders who have got their education up to GCE (A/L) dominate in every employment category and it is relatively higher in the own business occupation category. Similarly, a majority of the chief householders who got their education up to GCE (O/L) do their own businesses for income generation.

Table 2.3: Relationship between education level and occupation type of the chief householders

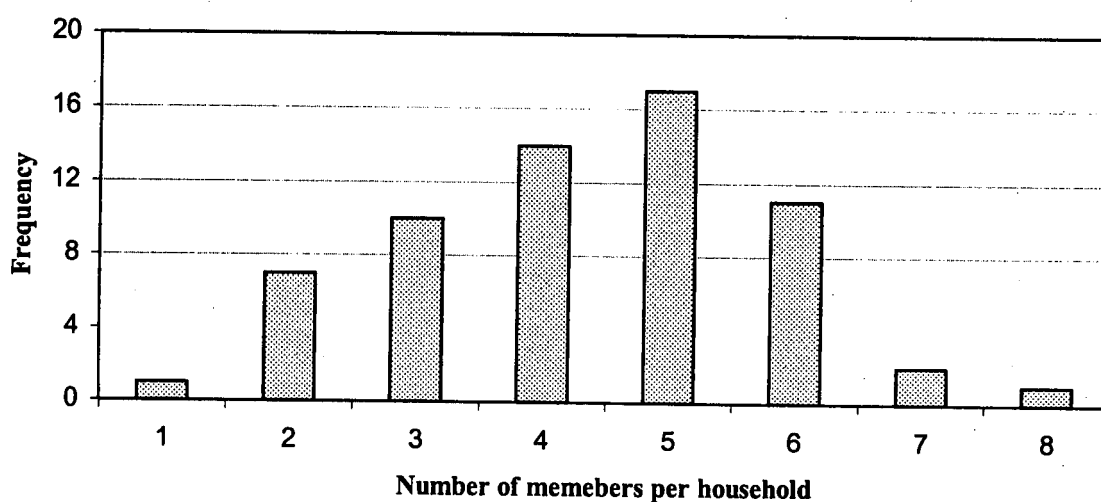
Education Level	Occupation type			
	Government	Semi-Government	Private company	Own business
Primary	1	-	1	4
GCE O/L	2	2	3	7
GCE A/L	7	2	5	13
Diploma	-	-	-	-
Basic Degree	1	1	-	-
Total	11	5	9	24
Percentage	17	8	14	38

Source: Market survey for new coconut-based products, 2003

d) Size of the households

The size of the households included in the survey varies from one person to eight persons per household. The total number of persons covered in the survey is calculated as 274. A higher number of households (17) consist of 5 members. However, the average number of members per household is accounted as 4.

Figure 2.1: Frequency distribution of the size of households in the sample



Source: Market survey for new coconut-based products, 2003

e) Age composition of the sample

The following table gives the age composition of the chief householders and the housewives of the sample.

Table 2.4: Age composition of the sample

Age category	Chief householders		Housewives	
	Frequency	Percentage	Frequency	Percentage
Less than 35 years	6	10	9	16
35 – 45 years	8	13	19	33
45-55 years	29	46	21	36
More than 55 years	20	32	9	16
Total	63	100	58	100

Source: Market survey for new coconut-based products, 2003

Majority of the chief householders (46%) and the housewives (36%) in the sample were in the age category of 45-55 years. Also 32% of the chief householders were more than 55 years old. In comparison to this situation most of the housewives (69%) in the sample were in between the age category of 35 to 55 years. Hence, the housewives are a relatively younger group than the chief householders in the sample.

f) Income level of the sample

The total sample of the survey was categorized into 4 sections based on the monthly total household income in Sri Lankan rupees, i.e., i) monthly income less than 5000, ii) monthly income between 5000-10,000, iii) monthly income between 10,000-20,000 and iv) monthly income more than 20,000.

Table 2.5: Monthly income level of the sample

Monthly income category (Rs)	Frequency of households	Percentage
Less than 5000	6	10
Between 5000-10,000	28	44
Between 10,000-20,000	21	33
More than 20,000	8	13
Total	63	100

Source: Market survey for new coconut-based products, 2003

Note: One US \$ equals 96 Sri Lankan rupees (February,2003)

Only 10% of the sample obtain a monthly household income less than Rs.5000 and can be considered as the low-income group. Around 33 % households that obtain a monthly income of Rs.10, 000 to 20,000 can be considered as the middle level income earners, whereas 13% of the sample earns Rs.20, 000 or more and considered as the high-income group. It is clear that more than 80% of the sample earns an income beyond the national average per capita income (around Rs.6600 per month) in Sri Lanka. The income level is an important factor that influences the purchasing power of the consumer. Based on the

collected information, it was assumed that the selected sample for the market survey is a suitable consumer group to evaluate the marketability of the new coconut-based products. The specific coconut-based products use in the market survey are not supposed to be necessary commodities and those who have a higher purchasing power and quality conscious would prefer to buy these products.

g) Expenditure on food

Information was collected on food expenditure per total household in the selected sample. The expenditure on food was obtained by asking the respondents about the proportion of food cost from the total monthly household income. The following table gives the changes in food cost in each income category.

Table 2.6: Changes in the monthly total income and the food budget share of the sample

	Food budget share * (frequency)				
	10 -25%	25 -50%	50-75%	>75%	100%
Less than 5000	-	3	2	1	-
Between 5000-10,000	2	5	16	3	2
Between 10,000-20,000	1	7	12	1	-
More than 20,000	2	3	3	-	-
Total	5	18	33	5	2
Percentage	8	29	52	8	3

* Proportion of food expenditure from total monthly income

Note: One US \$ equals 96 Sri Lankan rupees (February, 2003)

Source: Market survey for new coconut-based products, 2003

The expenditure share on food is an indicator of the wealth of the selected consumer group. The lesser the food expenditure share of the total income, the richer the person to be. The highest percentage of the sample (52%) expends 50-75% of their monthly total income on food, irrespective of the income level. Another 29% of the sample expends 25-50% of their income on food. Hence, 81% of the sample expends 25-75% of their monthly income on food. Around 8% of the sample only expends 10-25% of the income on food and can be considered as the wealthiest group in this sample. None of the respondents claimed that he/she expends less than 10% of the income on food. However, the food budget share also depends on the total number of persons in each household. The following table gives the relationship between the total number of householders against the food expenditure share.

Table 2.7: Relationship between the total number in the households and the food budget share

Total number in the household	Food budget share				
	10-25%	25-50%	50-75%	>75%	100%
1	-	-	-	1	-
2	-	4	2	1	-
3	3	4	3	-	-
4	-	5	8	-	1
5	1	3	12	1	-
6	1	1	7	2	-
7	-	-	1	-	1
8	-	1	-	-	-
Total	5	18	33	5	2
Percentage	8	29	52	8	3

Source: Market survey for new coconut-based products, 2003

h) Frequency of shopping for food items

The sample was categorized into 6 groups according to their shopping frequency for the basic food needs. The following table gives the pattern of shopping frequency of the sample.

Table 2.8: Frequency of shopping for necessary food items

	Frequency of Shopping					
	Daily	Twice a week	Weekly	Biweekly	Monthly	Irregular
Total	9	4	24	5	20	1
Percentage	14	6	38	8	32	2

Source: Market survey for new coconut-based products, 2003

It is clear that the weekly and monthly shoppers are more frequent in the selected sample. Also 14% of the respondents were found who are doing daily shopping. A high tendency for weekly shopping for food items can be considered as a positive factor for marketing of new coconut-based products as there is a higher possibility for the consumer to recognize the product and subsequently to buy it when they make regular visits to the market place.

i) Consumer choices of shops to purchase food

The consumer's choices among the market stalls around the town are important in building the market linkages. Hence, the respondents were asked to rank the shops of preference to

purchase general food items during the market survey. This further takes into consideration of their current shopping destinations too. However, the shopping preferences would be different with the income category. The following table gives the relationship between the income level and the shop preferences.

Table 2.9: Relationship between income level and the shopping preferences

Income category	Frequency							
	First choice of shops				Second choice of shops			
	Super market	CWE*	Grocery store	Other	Super market	CWE*	Grocery store	Other
< 5000	1	1	4	-	-	1	-	-
5000-10000	5	11	8	4	1	3	5	4
10000-20000	4	10	7	-	-	2	6	-
>20000	6	2	-	-	-	2	4	-
Total	16	24	19	4	1	8	15	4

* Co-operative Wholesale Establishments

Source: Market survey for new coconut-based products, 2003.

The low-income earners, who earn less than 5000 rupees per month, prefer other places (means no regular place) for shopping for their food. The income earners of more than Rs.5000 and Rs.10000 prefer Corporative Wholesale Establishment (CWE) to purchase their food items as the first choice. However, the high-income earners prefer super markets for their food purchasing. Therefore, there is a high potential of introducing the new coconut-based products in these two marketing establishments.

The market potential for specific new coconut-based products was evaluated based on these basic socio economic information of the selected sample. The respondents were given a free sample of new coconut-based products for consumption. Then their comments, responses etc. on the products were collected using the structured questionnaire. Chapters 3 and 4 describe the results of the market survey for specific coconut-based products.

Chapter 3

MARKET POTENTIAL FOR VIRGIN COCONUT OIL AND KING COCONUT OIL

3.1. Virgin Coconut oil

The respondents who were given a free sample of virgin coconut oil were re-visited after one-weeks time to get their responses on the product. The responses were collected in a structured questionnaire by the enumerators by having an interview schedule with each respondent.

a) Type of uses of virgin coconut oil

Three major uses of virgin coconut oil were identified among the respondents in the survey, i.e., use for tempering of food, deep-frying of food and for hair application. Coconut oil is the major cooking oil use in Sri Lanka though many other substitute oils are available in the market. People believe that coconut oil has therapeutic values and uses are ranging from medicinal to religious activities in domestic households. Table 3.1 gives the use patterns of virgin coconut oil among the respondents in the selected sample of the study.

Table 3.1: Use patterns of virgin coconut oil by the respondents

Uses	First choice	Second choice	Total
Tempering of food	22	-	22
Deep frying of food	1	3	4
Hair application	5	7	12

Source: Market survey for new coconut-based products, 2003

Most of the respondents have used the given oil sample for tempering of food especially vegetables or potatoes. Only one respondent have used it for deep-frying of fish. Comments made by several respondents indicated that the sample amount of virgin coconut oil given to them was inadequate for deep-frying and therefore they could not practice it. Apart from these two uses, hair application of oil was preferred by many of the respondents.

b) Consumer Satisfaction on virgin coconut oil

The consumers of virgin coconut oil were asked whether they were satisfied with the oil sample that was given to them. The responses were ranked as satisfied, not satisfied or moderate responses. Table 3.2 gives the frequency of consumer satisfaction on virgin coconut oil.

Table 3.2: Consumer satisfaction on virgin coconut oil

	Frequency	Percentage
Satisfied	25	89
Not Satisfied	1	4
Moderate response	2	7

Source: Market survey for new coconut-based products, 2003

Based on the consumer insights, nearly 89% of the respondents were satisfied with the overall quality of the virgin coconut oil sample given to them. Only one respondent was found who was not satisfied with the sample, whereas 2 respondents were not certain about their views on the satisfaction and ranked as moderate responders. The consumers expressed their views on the pureness of the oil and inquiries were made where to buy this virgin coconut oil. Therefore there is a high potential of introducing the virgin coconut oil in this market area for consumer uses.

c) Quality preferences of virgin coconut oil

The respondents were asked to rank the qualities of the oil sample according to their choice. Table 3.3 gives the consumer choices on quality characters of the virgin coconut oil.

Table 3.3: Quality preferences of virgin coconut oil by the users

Preferred quality	First preference	Second preference	Total
Taste	8	-	8
Smell	10	2	12
Color	10	12	22
Organic product	-	1	1
Nutritional value	-	5	5

Source: Market survey for new coconut-based products, 2003

Taste, smell and color of the virgin coconut oil are the most preferred qualities by the respondents. Color and smell are unique to the virgin coconut oil in contrast to the bulk coconut oil available in the general market. Especially color was the most preferred quality by the users and it can be regarded as an important factor in marketing of virgin coconut oil. The smell and the taste are added advantages too.

The consumers were asked whether they found any quality, which is not preferred with the sample. The following table gives the details of consumer dislikes.

Table 3.4: Qualities dislike by virgin coconut oil consumers

Quality dislike	Frequency
None	26
Taste	1
Smell	1

Source: Market survey for new coconut-based products, 2003

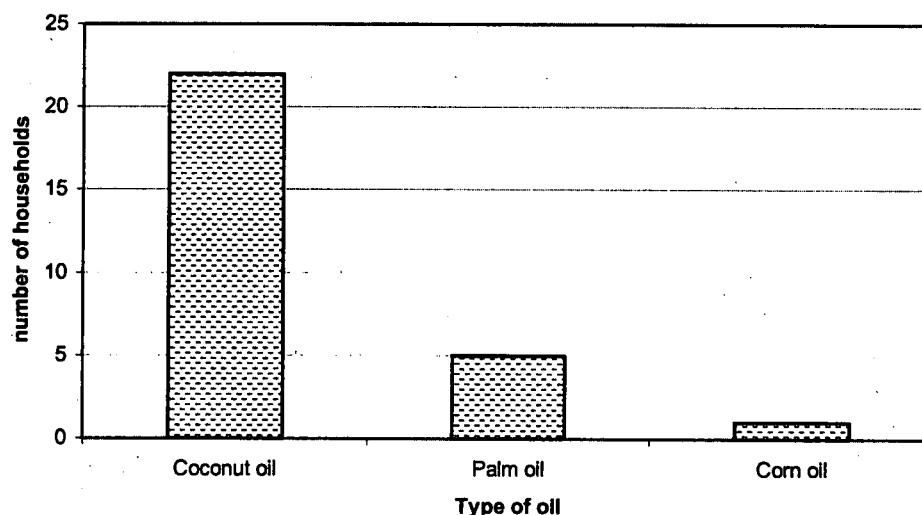
According to the results, majority of the respondents did not mention that they dislike any of the quality character in the given sample. Hence, maintained quality for virgin coconut oil is an important factor to gain consumer satisfaction and subsequently to achieve a better marketability for the product.

d) Type of cooking oil currently use in the households

Coconut oil is the favored oil consumed in the households of the selected sample. Palm oil and corn oil are the other two types of oil found to be used by several households. However, still there is a greater opportunity for the coconut oil producer to produce and market coconut oil even though there are many substitute oils available in the market. Figure 3.1 below shows the pattern of different types of cooking oil users in the sample.

When there are cheap substitute-cooking oils are available in the market, there is a general tendency for the consumer to shift their preferences towards these substitutes. In addition, the views associated with blood cholesterol formation by coconut oil consumption are one of the negative factors associated with coconut oil milling industry. Considering these facts, the coconut oil users in the sample were asked whether they satisfy with the product, which they currently buy at the market. The following table gives the details on the consumer satisfaction on coconut oil they currently buy at the market.

Figure 3.1: Frequency of different cooking oil users in the sample



Source: Market survey for new coconut-based products, 2003

Table 3.5: Consumer satisfaction on the quality of coconut oil they currently buy at the market

	Frequency	Percentage
Satisfied	14	50
Not satisfied	11	39
Moderate response	3	11

Source: Market survey for new coconut-based products, 2003

It is clear that nearly 40 % of the coconut oil users in the sample were not satisfied with the quality of oil they currently buy at the market though they used to consume it. They complained about various unsatisfactory qualities of coconut oil at the market such as rancidity, color and taste changes etc. Therefore, there is a higher opportunity to introduce a quality coconut oil like virgin coconut oil to the market to cater the consumer needs in effective manner.

In Sri Lanka coconut oil is generally sold in bulk without any brand name and quality notifications. There are evidences that the bulk coconut oil available at the market contains *aflatoxins* like substances beyond the recommended rates, which is harmful to human health. *Aflatoxins* are resulted by fungi and grow on the surface of rotten copra that is used in coconut oil manufacture. Yet, there is no authority responsible for preventing these oils to sell in the general market. The consumer identifies the quality of coconut oil available in the market by smell, taste or other sensible quality character and decides the

consumption. The survey intended to find out whether the consumers are aware of the *aflatoxin* substances that can be present in the coconut oil bought at the market. The results show that majority (57%) of the respondents were unaware of this situation, irrespective of their education level.

Table 3.6: Consumer awareness of *aflatoxin* substances present in bulk coconut oil

	Frequency	Percentage
Aware	12	43
Not aware	16	57

Source: Market survey for new coconut-based products, 2003

e) Consumer income and the type of cooking oil used

There are reports that affluent consumers have changed their cooking oil consumption patterns by shifting their preferences towards other vegetable oils. The affordability of costly vegetable oils attributed by the higher income level of the consumer may associated with the other factors like low quality of coconut oil available in the market, the cholesterol phobia etc. Keeping those factors in mind the authors tried to evaluate whether the consumer's income level is an important factor in deciding the type of cooking oil consumed in the household. Table 3.7 gives the type of cooking oil use against the income level of the respondents in the sample.

Table 3.7: Frequency of consumer choices of cooking oil use as against the income level

Income category	Type of cooking oil used		
	Coconut oil	Palm oil	Corn oil
< 5000	2	2	
5000-10000	10	2	
10000-20000	9	1	1
>20000	1	2	

Source: Market survey for new coconut-based products, 2003

Note: One US \$ equals 96 Sri Lankan rupees (February, 2003)

The number of other edible oil users is not considerable in each income category. The sample indicated a higher preference for coconut oil, irrespective of the income level. However, there is a tendency that the low-income earners shifted their oil use pattern towards palm oil. This may be due to the fact that there is a relative lower market price for palm oils and it is affordable by the low-income earners in the sample. Also, there are indications that the high-income earners of the sample to shift their cooking oil preferences towards palm and corn oils, suggesting coconut oil is an inferior commodity for their use.

Further, this can be linked with the quality characters of coconut oil available in the market too. The un-satisfactory nature of the quality of coconut oil available in the market may be the cause for them to shift their cooking oil choices. In addition, many types of vegetable oils present in the market with recognized brand names and assured quality characters may act as promoting factors for the consumer to buy them. Therefore, virgin coconut oil producers have the opportunity to make a competition in the edible oil market by implementing some of the market promotion strategies like, brand naming, quality classification, attractive packaging with keeping quality etc.

f) Consumers willingness to pay for virgin coconut oil

Price of the product is the most important factor in marketing, which directly influence the demand of the product. However, the price of a product depends on the cost of production. The production cost of a bottle (750 ml) of virgin coconut oil is around 100-120 rupees. The improvement of the machinery and increasing of the scale of production would certainly reduce the production costs in future.

The respondents were asked whether they would buy the virgin coconut oil at a fixed price of Rs.120 per bottle, which was calculated based on the production costs. The frequency of responses were tabulated and given in the table 3.8 below.

Table 3.8: Consumers' willingness to pay for virgin coconut oil

Willingness category	Frequency	Percentage
Buy at even above the fixed price	19	68
Buy at or lower the fixed price	9	32
Not like to buy	0	0

* Fixed price based on the cost of production of a liter of coconut oil

Source: Market survey for new coconut-based products, 2003

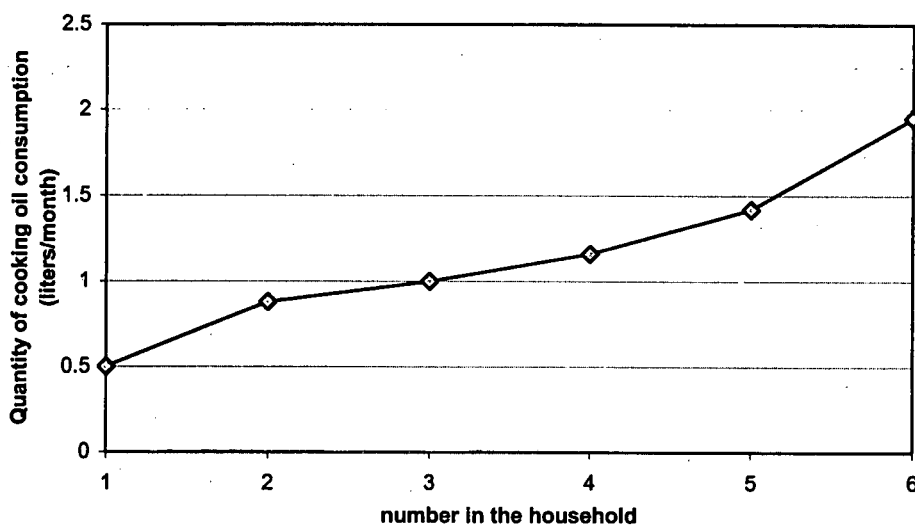
The results show that 68% of the respondents in the sample indicate their willingness to pay for virgin coconut oil even above the fixed price. This group is the higher potential consumers that would be available in the market for virgin coconut oil. The non coconut oil consumers also indicated their willingness to buy virgin coconut oil if it is available in the market, by realizing the pureness and the nutritional value of the product. This clearly shows the potential marketability of the product in the domestic market. None of the respondents refuse the idea of purchasing of the product, whereas 32% of the respondents considered a lower price for them to purchase the product. Hence, there is a greater opportunity to produce virgin coconut oil and create a market for it. However, further improvements of the machinery that can reduce the production costs by changing the scale of production needs to be considered and it would be a rewarding investment too.

g) Per capita cooking oil consumption patterns of the sample

The total quantity of monthly cooking oil consumption was recorded during the survey. Then the per capita oil consumption was calculated by dividing the total quantity by the number of persons living in the household. The quantity of cooking oil consumption was plotted (figure 3.2) against the size of the household to examine possible relationships between the size of the household and the quantity of cooking oil consumption.

The scatter-plotted diagram (figure 3.2) shows that there is a positive relationship between the quantities of cooking oil consumption with the size of the household. It is clear that when the size of the household getting larger there is a higher potential for cooking oil consumption.

Figure 3.2: Changes in the size of the household and average quantity of oil consumption



Source: Market survey for new coconut-based products, 2003

h) Education level and the choice of cooking oil

The relationship between the education level and the choice of cooking oil was evaluated to examine the possible correlation of consumers' knowledge on the choice of cooking oil for their consumption. It is a known fact that coconut oil is a vegetable oil and none of the plant-originated oil contains blood cholesterol-forming substances. However, most people are of the view that the coconut oil is bad for health due to cholesterol forming substances present in it. Hence, the choice of cooking oil and the education level of the chief householders and housewives were separately evaluated to get an idea of this fact. The following table gives the details.

Table 3.9: Relationship between the education level and the choice of cooking oil

Education level	Chief householder			Housewife		
	Choice of cooking oil			Choice of cooking oil		
	Coconut oil	Palm oil	Corn oil	Coconut oil	Palm oil	Corn oil
Primary	3	1	-	3	2	-
GCE O/L	9	1	-	10	-	-
GCE A/L	9	3	1	7	3	1
Diploma	-	-	-	-	1	-
Basic Degree	1	1	-	1	-	-

Source: Market survey for new coconut-based products, 2003

Similar pattern of choices between the chief householder and the housewife can be observed. The preferences are more towards coconut oil in both respondents category irrespective of the education level. The GCE (A/L) educators are dominant in the sample and showed a clear choice on coconut oil as the major cooking oil for household consumption. This pattern of choices clearly shows that there is a high potential for marketing of coconut oil in the *Chilaw* urban area.

i) Relationship between the income level and the expenditure on cooking oil

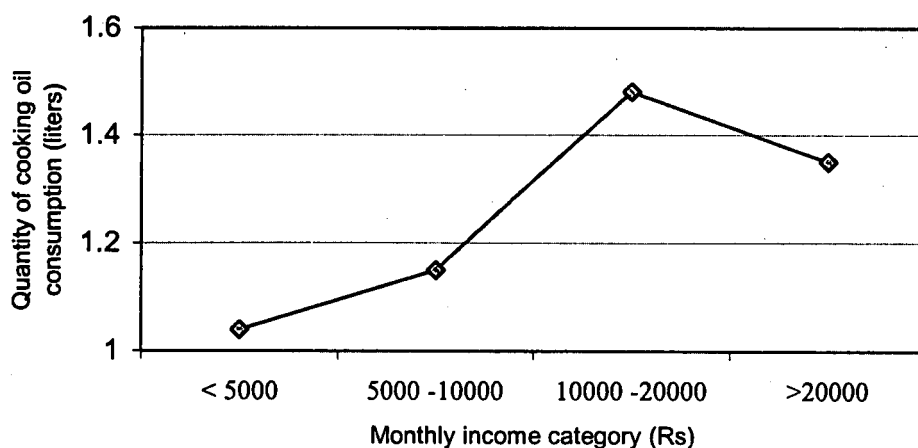
The budget share on cooking oil consumption was obtained by calculating the proportion of monthly expenditure on cooking oil from the total monthly income of the household. The budget share on cooking oil is one of the important factors to gain an understanding of the market potential of virgin coconut oil in the considered market area. If the consumers spend relatively a higher budget share on cooking oils that is a positive factor for marketing of the product. Figure 3.3 gives more details on this.

The middle level income earners (Rs.10, 000-20,000 per month) in the sample are the highest cooking oil consumers. Also the cooking oil consumption pattern of the high-income earners, who earns a monthly income of more than 20,000 rupees, is notably higher than the first two categories of lower income earners in the sample. Considering these patterns, it is clear that the middle level income earners and the high-income earners would be promising group of consumers for virgin coconut oil. Further, the following figure shows how the monthly expenditure patterns on cooking oil consumption change in each income category.

When the average monthly income rises up to Rs.20,000 there is a steady increase of the monthly expenditure on cooking oil. However, the higher income group tends to reduce their expenditure on cooking oils. They may have shifted to other substitute sources instead of cooking oil. However, the trend of expenditure on cooking oil by each of the income group shows that they are a more potential group, for which a target market for

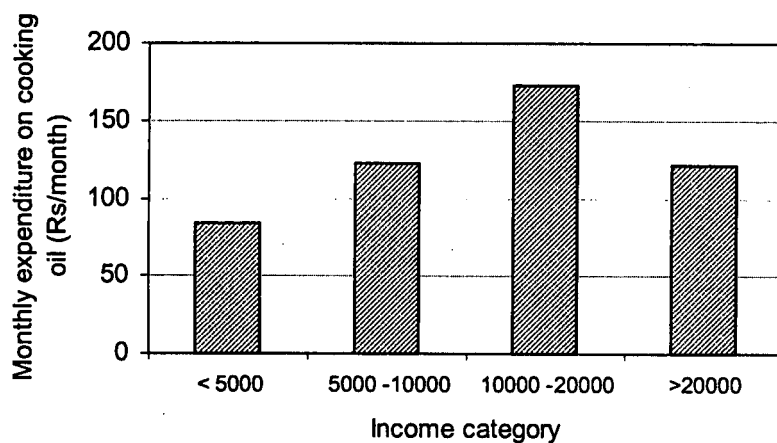
virgin coconut oil can be created. The following figure further explains the change in budget share for cooking oil in each income category.

Figure 3.3: Monthly income and average quantity of cooking oil consumption by the householders



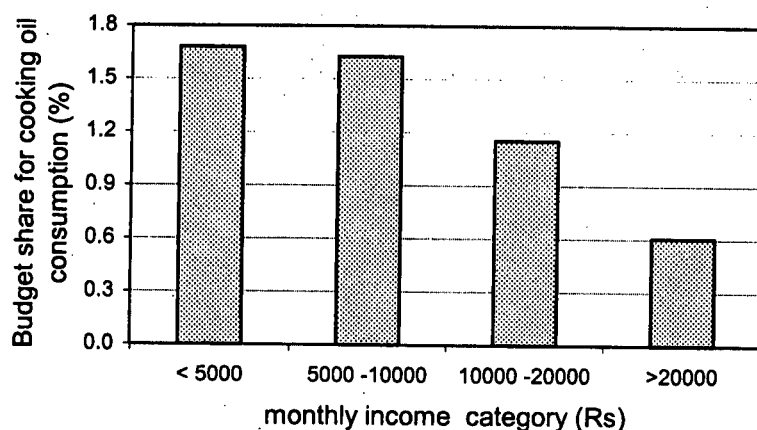
Source: Market survey for new coconut-based products, 2003

Figure 3.4: Relationship between income level and monthly expenditure on cooking oil



Source: Market survey for new coconut-based products, 2003

Figure 3.5: Budget share for cooking oil in different income categories



Source: Market survey for new coconut-based products, 2003

Generally there is an inverse relationship between the food expenditure share and the income level. Figure 3.5 also shows that this phenomenon is true for the selected sample indicated by the distribution of the bar chart. However, there is a slight difference in the budget shares can be observed between the monthly income groups of less than 5000 and 5000-10000 rupees.

3.2. Virgin King coconut oil

The composition of king coconut oil is slightly different from that of coconut oil. Also the uses of king coconut oil is different from that of coconut oil too. Most people consider that the king coconut oil has some medicinal and therapeutic properties and hence utilize in specific situations. Further, it is a costly commodity as it is not freely available in the market. Most people used to prepare king coconut oil at home using traditional methods.

The market survey tried to evaluate whether there is any market potential for king coconut oil in this market location. The production procedure for virgin king coconut oil is same for virgin coconut oil. If there is a market potential for this high value coconut-based product in this market area, the community can produce it and it is a possible venture that makes more incomes to the participants of the community. Therefore, during this market survey the consumers' responses for virgin king coconut oil were collected and evaluated and present in the next section.

a) Use patterns of king coconut oil

The respondents were asked what are the uses they have made with the given sample of virgin king coconut oil for them. The following table gives the use patterns of oil samples.

Table 3.10: Use patterns of the king coconut oil

Type of use	Frequency	Percentage
Hair application	18	86
Temper of food	6	29
Frying of food	1	5

Source: Market survey for new coconut-based products, 2003

The results show that the uses of virgin king coconut oil is notably different from the uses observed for virgin coconut oil. A majority of the respondents has used it for hair application, believing that it has therapeutic values. However, some of the respondents tried the same uses of virgin king coconut oil as similar to virgin coconut oil. The respondents were evaluated on their satisfaction on the quality of virgin king coconut oil. Table 3.11 gives the details.

Table 3.11: Consumer satisfaction on the quality of king coconut oil

	Frequency	Percentage
Satisfied	19	90
Not satisfied	1	5
Moderate response	1	5

Source: Market survey for new coconut-based products, 2003

The results show that 90% of the respondents were satisfied with the virgin king coconut oil sample that was given to them. Then the respondents were asked to rank their preferences on the quality characters of the sample. The following table gives the quality preferences of the king coconut oil ranked by the respondents.

Table 3.12: Quality preferences of king coconut oil by the consumers

Quality character	Frequency		Total
	First choice	Second choice	
Taste	4		4
Smell	11	3	14
Color	2	10	12
Nutrition value	1	1	2

Source: Market survey for new coconut-based products, 2003

The smell of virgin king coconut oil is the most preferred quality character by the consumers in the sample. Also its color was another preferred factor by them. Hence, smell and color of virgin king coconut oils can be considered as important quality attributes that attract the consumers for the product. Also these qualities are added advantages in marketing of the product. Therefore, the producers must maintain these qualities of the product as the production process goes on to achieve better market opportunities.

b) Existing markets for king coconut oil

The existence of market places for selling of king coconut oil was examined during the market survey to evaluate the marketing potential of this new coconut-based high value product in this area. The respondents were asked whether they already know any place to buy king coconut oil. The following responses were obtained and tabulated in the table 3.13.

As the results indicated, a majority of respondents was not aware about a market place to buy king coconut oil. The best alternative they found was to prepare it at home. Around 10% of the respondents have found alternative market places through personal contacts to purchase king coconut oil. This implies that the supply of king coconut oil in this market area is not regular and systematic. Therefore, a good opportunity is ahead for any new producer to supply adequate amount of king coconut oil in this market.

Table 3.13: Known markets for purchasing of king coconut oil

Market	Frequency	Percentage
Unknown	12	57
Pharmacy	0	0
<i>Ayurvedic</i> ^a dispensary	0	0
Home preparation	7	33
Other source	2	10

^a Place, where traditional medication is practiced

Source: Market survey for new coconut-based products, 2003

c) Consumers' willingness to pay for king coconut oil

The respondents were asked whether they would like to buy virgin king coconut oil if it is available in the market. The responses were recorded and tabulated to evaluate the possible marketability of the product. Table 3.14 below gives the details of the consumers' willingness to pay.

Nearly 95% of the respondents in the sample show their willingness to buy king coconut oil. Around 62% of the respondents indicated their willingness to buy it without any

restriction and can be considered as the highest potential consumer group for virgin king coconut oil. However, some of the consumers (24%) express their willingness to pay for king coconut oil depending on the price and another 10% of the consumers willing to buy depending the quality of oil. Only 5% of the respondents rejects the idea of purchasing king coconut oil from a market place suggesting that they can prepare it at home when a need arises. Based on these evidences, there is a potential for producing and marketing of virgin king coconut oil in the selected market area. Also the respondents were asked the price they would like to pay for the product and the responses obtained were tabulated in the table 3.14 below.

Table 3.14: Consumers' willingness to buy the king coconut oil

	Frequency	Percentage
Willing to buy	13	62
Depends on price	5	24
Depends on quality	2	10
Not like to buy	1	5

Source: Market survey for new coconut-based products, 2003

The price of the virgin king coconut oil was calculated based on the production costs. It was around 120-130 rupees per bottle (750 ml) of oil, which is relatively a higher amount compared to the current market price of coconut oil. However, people are aware that king coconut oil is a rare commodity and fetch a higher price than coconut oil. The respondents were informed the price of virgin king coconut oil and asked how much they would like to pay a liter of oil. The results are given in table 3.15.

Around 28% of the respondents show their willingness to pay for virgin king coconut oil above the specified price. However, a majority of the respondents either consider paying at the specified price or at a lower rate. Hence, it is a necessary factor to lower the costs of production as possible and make available virgin king coconut oil at a lower rate at the market that can be affordable by all types of consumers. It is an important factor, as virgin king coconut oil has to compete in the market and a relatively low market price would attract the consumer for this new coconut-based product.

Table 3.15: Consumers' willingness to pay for king coconut oil

	Frequency	Percentage
Like to buy at fixed price ^b	10	56
Like to buy above the fixed price	5	28
Like to buy below the fixed price	3	17

^b - Rs.100-120 per bottle (750 ml) of oil

Source: Market survey for new coconut-based products, 2003

d) Suggestions for product quality improvement

One of the major concerns of the market survey was to obtain consumers' suggestions on product development. Manufacturing of products while catering to the consumer needs and preferences is a vital factor to create a better market demand for the product. Hence, a priority was given to obtain the respondent's views on the product development of virgin king coconut oil. The following table shows consumers' ideas on product quality improvement.

Table 3.16: Consumers' suggestions for product quality improvement

Suggestion	Frequency	Percentage
None needed	12	50
Fragrance addition	4	17
Herbal addition	6	25
Leave coconut smell	1	4
More color	1	4

Source: Market survey for new coconut-based products, 2003

According to the results, around 50% of the respondents expressed their satisfaction on the present quality of virgin king coconut oil and suggested no further improvements are needed. However, 25% of the respondents suggested an addition of medicinal herbs or its extracts would be better, whereas 17% claimed for a fragrance addition to the oil. Only one consumer commented on the colorless nature and preferred more color. However, majority of the respondents preferred the present color of the sample, which is colorless and therefore to add more color to the product can be ignored.

Chapter 4

MARKET POTENTIAL FOR COCONUT JAM AND BOTTLED CANDIED COCONUTS

4.1 Coconut Jam

Coconut jam is a new-coconut based product produced from the coconut kernel. Though many other fruit jam and marmalade types are already available in the market, people are unfamiliar of the name of coconut jam. During the survey, a brief description on the quality and the production process of coconut jam was given to the recipients. The respondents were given a quality assurance of coconut jam sample highlighting the fact that it was a product of the CRISL. The responses of the consumers were collected after one-week period after sample distribution. The next section presents the consumers' views on the quality of coconut jam and the details of the market potential of the product.

a) Jam consumption pattern of the sample

The general jam consumption pattern of the sample was observed during the survey and table 4.1 gives the details.

Table 4.1. Jam consumption pattern of the selected sample

	Frequency	Percentage
Regular consumers	22	56
Occasional consumers	17	44
Non consumers	0	0

Source: Market survey for new coconut-based products, 2003

Based on these evidences, 56% of the respondents are regular jam consumers, whereas the rest 44% being occasional consumers. None of the non-jam consumers were found in the sample. Hence, it was assumed that the selected sample is ideal to obtain the responses on coconut jam.

b) Use patterns of coconut jam

The use patterns of coconut jam were enumerated to evaluate different uses made by the respondents. Table 4.2 shows the use patterns.

Table 4.2: Use patterns of coconut jam by the respondents

Type of use	Frequency	Percentage
As a whole desert	4	11
As a bread spread	32	84

Source: Market survey for new coconut-based products, 2003

According to the results, the respondents have used coconut jam as common to other jam types available in the market by consuming it as bread spread. In addition, several households used it as a whole desert where there were small children. The consumer satisfaction on this new product was evaluated in the survey and the following table gives the details on this aspect.

c) Consumer satisfaction and quality preferences for coconut jam

Table 4.3: Consumer satisfaction on the quality of coconut jam

Response	Frequency	Percentage
Quality is better than other jams	12	32
Quality is similar to other jams	14	37
Satisfy with further improvements	12	32
Not satisfy	0	0

Source: Market survey for new coconut-based products, 2003

Nearly 32% of the respondents who received coconut jam claimed that the quality of the jam sample is better than that of the other jams available in the market, whereas 37% claimed that it is similar in quality to the other jam types. Further, another 32% of the respondents expressed that though they satisfy with the existing quality of the coconut jam it can be further improved. Hence, there is a great opportunity for the coconut jam producer to consider about product development for better marketability as revealed by the consumer preferences during this market survey. The following table gives the consumer preference ranking of the quality characters of coconut jam.

Table 4.4: Consumer preferences of the quality of coconut jam

Preferred quality	First choice	Second choice	Third choice	Total
Taste	25	-	-	25
Smell	1	13	-	14
Color	-	5	10	15
Texture	1	2	-	3

Source: Market survey for new coconut-based products, 2003

The taste of coconut jam is the most preferred quality character by the respondents in the selected sample. Hence, the taste of coconut jam has been accepted by a majority of consumers and would be an important attribute in marketing of this new product. The color and the smell are equally important characters too. The respondents were asked whether there was any factor they dislike in coconut jam and following responses were obtained.

Table 4.5: Factors not preferred by coconut jam consumers

Factor dislike	Frequency	Percentage
None	15	35
Coconut oily taste	20	47
Copra taste	2	5
Texture	3	7
Color	2	5
Coconut oil smell	2	2

Source: Market survey for new coconut-based products, 2003

The consumers have indicated valuable information to be considered by the producers of coconut jam for product development. Nearly 47% of the respondents did not prefer the coconut oily taste present in coconut jam. Therefore, there is a need to improve the quality of coconut jam excluding coconut oily taste to attract more consumers for the product. Around 35 % of the respondents claimed that they dislike none of the quality factors. The texture, color and smell of coconut jam can be considered as satisfactory as negligible responses were obtained for these factors.

As coconut jam is a newly formed product, the survey planned to obtain consumers' views and suggestions on quality improvements. The consumers' comments were collected and tabulated in order to use them effectively in the product development process of coconut jam. The following table presents the users' comments on product development.

Table 4.6: Consumer suggestions for product development of coconut jam

Suggestion	Frequency	Percentage
None needed	16	36
Free of coconut oily taste	13	30
Addition of fruit taste	4	9
Texture to be more thicker	6	14
Improvement in color	4	9

Source: Market survey for new coconut-based products, 2003

Again the removal of coconut oily taste has become an important suggestion for product development of coconut jam. Also 14% of the respondents suggested that the texture to be thicker. However, addition of fruit taste or color improvements are again can be considered as negligible.

d) Consumer willingness to pay for coconut jam

The consumers were asked whether they would like to buy coconut jam if it is available in the market. The responses obtained for this factor is tabulated in table 4.7 below.

Table 4.7: Consumer willingness to buy coconut jam

	Frequency	Percentage
Willing to buy	37	95
Not willing to buy	2	5

Source: Market survey for new coconut-based products, 2003

The responses obtained here clearly shows that the consumers like to buy coconut jam in the market. Hence, there is a greater opportunity for the coconut jam producer to introduce the product in this market area and make profits by selling it.

Then the consumers' willingness to pay for coconut jam relative to the other jam types available in the market was evaluated. The calculated price for coconut jam was around 60-70 rupees per 450 grams of jam depending on the costs of production. This price is relatively a lower price in comparison to the other fruit and marmalade jam available in the market and this was informed to the respondents in advance. The respondents were asked whether they would like to pay for coconut jam above, at or lower the other regular jam types that can already buy in the market. The following responses were obtained.

Table 4.8: Consumer willingness to pay for coconut jam

Willingness to pay category	Frequency	Percentage
Willing to pay at other jam price	14	38
Willing to pay at below the other jam price	22	59
Willing to pay at above the other jam price	1	3

Source: Market survey for new coconut-based products, 2003

Based on the results, majority (59%) of the respondents in the sample considered a relative lower price for coconut jam than that of other jam types in the market. This is an important

revealing to be considered by the producers for better marketing of coconut jam. A relative lower market price would certainly attract the consumer for coconut jam by shifting the jam choices towards coconut jam. The coconut jam producer can undoubtedly achieve this advantage, as the coconut is the major input for coconut jam manufacture, and it is available at low costs in comparison to the other fruit types.

e) Consumer choices of shops for jam purchase

The relationship between the respondent's choices of market place with the jam consumption pattern was evaluated to get an understanding on the development of the market linkages in the future. Table 4.9 gives the details on this.

Table 4.9: Relationship between the choice of market place and jam consumption pattern

Choice of market	Regular consumers	Occasional consumers	Total	Percentage
Super markets	7	2	9	23
CWE*	8	8	16	41
Grocery stores	5	5	10	26
Other	2	2	4	10

* Co-operative Wholesale Establishment

Source: Market survey for new coconut-based products, 2003

As revealed by the results, the CWE was the highest potential target market for coconut jam to be sold. However, the super markets and other grocery stores in the *Chilaw* town are equally important market places for coconut jam. These identified market places would definitely contribute for the establishment of marketing linkages for coconut jam and subsequently make the industry's survival.

4.2 Bottled Candied Coconuts (*Bottled Peni-Pol*)

Candied coconuts are commonly used as a filling or as an ingredient for a variety of confectionaries and other sweetmeats prepared at home. However, bottling of candied coconut with assured keeping quality is a new idea and thus become a new coconut processed product in a way. This market survey tried to evaluate whether this product has a market potential in this market area by examining the consumers' responses on the product. The next section presents the observations collected from the recipients of the bottled candied coconuts.

a) Use patterns of Bottled candied coconuts

The respondents were re-visited after one week's time of the sample distribution, to obtain their responses on the product. The following table gives the use patterns observed by the enumerators.

Table 4.10: Use patterns of bottled candied coconuts

Type of use	Frequency	Percentage
<i>Helapa</i> ¹ making	4	10
<i>Levariya</i> ² making	13	32
Pan Cake making	14	35
As a sweet meat	3	8
Addition to milk rice	4	10
Coconut cake making	2	5

¹ & ² are two types of traditional sweet meats prepared at homes

Source: Market survey for new coconut-based products, 2003

The respondents have used bottled candied coconut sample in a number of traditional sweetmeat preparations. *Levariya* and pancake were the two most common sweetmeats prepared by the respondents using candied coconut. Also there were several other uses as milk rice preparations, coconut cakes etc.

b) Consumer preferences of qualities of bottled candied coconuts

The consumers were asked to rank the qualities they prefer of the bottled candied coconuts sample that was given to them and the table below gives the details of this ranking.

Table 4.11: Qualities preferred by the consumers of bottled candied coconuts

Preferred quality	First choice	Second choice	Total	Percentage
Taste	21	-	21	60
Color	2	7	9	26
Smell	-	5	5	14

Source: Market survey for new coconut-based products, 2003

The taste of bottled candied coconuts is the highly preferred quality by the respondents. However, color and smell were other important quality characters that were preferred by the consumers of the selected sample. Hence, the maintained qualities of taste, color and smell are important factors for bottled candied coconuts to make it a marketable commodity in the future.

c) Consumer willingness to pay for bottled candied coconuts

Since bottled candied coconuts is a new design of an existing product, the knowledge on the consumer willingness to buy this product would be an important factor, for any producer who wishes to carry on manufacturing of the product. Hence, the recipients who has tasted and used the product were asked whether they would like to buy this product if it is available in the market. The following responses were obtained and tabulated in table 4.12 below.

Table 4.12: Consumer willingness to buy bottled candied coconuts

Category	Frequency	Percentage
Like to buy at the market	21	70
Prefer make it at home	9	30

Source: Market survey for new coconut-based products, 2003

According to the results around 70% of the respondents in the selected sample expressed their willingness to buy bottled candied coconuts if it is available for sale in the market. Their willingness to pay for the product was evaluated relative to a fixed price around 70 rupees per 450 grams of candied coconuts, which was calculated based on the production costs. This price information was given to the consumers in advance to get their responses. The responses were obtained based on three categories of willingness to pay, i.e. a) willing to pay at the fixed price (Rs.70 per bottle contain 450 g, b) willing to pay at above the fixed price and c) willing to pay at below the fixed price. The frequencies of the responses were tabulated and given in table 4.13.

Table 4.13: Consumers' willingness to pay for bottled candied coconuts

Willing to pay category	Frequency	Percentage
Like to pat at fixed price	18	64
Like to pay above the fixed price	1	4
Like to pay below the fixed price	9	32

Source: Market survey for new coconut-based products, 2003

Based on these evidences, the majority of the respondents in the sample expressed their willingness to pay at the specified price for a bottle of candied coconuts. However, a considerable number of respondents expressed their view that they would like to pay below the specified price. This information is valuable to the producer to adjust the market price of bottled candied coconuts accordingly, which can be affordable by a majority of consumers in the market. The following table gives the detail on how the income level of

each of the respondent varies with the amount of willingness to pay for bottled candied coconuts.

According to the results, majority of the consumers preferred paying at the fixed price for bottled candied coconuts, irrespective of their monthly income level. Also some of the respondents preferred to pay a lower price, whereas consumers' willingness to pay a price above the fixed price is negligible. This indicates that the producer should be more careful to maintain the price of bottled candied coconuts around the prescribed range including all the costs of production and marketing to make it attracted by the prospective consumers. Many respondents were anticipated that their family members who are living in abroad could utilize the product if it is available in the market.

Table 4.14: Relationship between the levels of consumer income and the willingness to pay category for bottled candied coconuts

Income category (Rs/month)	Willing to pay category		
	At fixed price	Above the fixed price	Below the fixed price
< 5,000	1	0	2
5000-10,000	7	0	5
10,000-20,000	8	1	2
>20,000	2	0	0
Total	18	1	9

Source: Market survey for new coconut-based products, 2003

Chapter 5

CONCLUSION

5.1 Summary

Poverty reduction in poor coconut growing communities through coconut-based interventions is the major objective of the project on "*Developing sustainable coconut-based income generating technologies in poor rural communities*". Increasing of incomes of the participants of the project by producing of high value coconut-based products is identified as one of the promising strategies to achieve this objective.

Coconut derives a range of marketable products that can be produced from various parts of the palm. A range of non-traditional coconut-based value added products have emerged in the domestic as well as international markets as the outcomes of the recent research and development activities by public and private sectors. The virgin coconut oil, virgin king coconut oil, coconut jam, bottled candied coconuts are few of the coconut-based high value products that has been developed in Sri Lanka recently.

The project plans to introduce above-specified coconut-based product manufacturing to one of the rural poor communities selected to implement the project activities. The *Wilpotha* women's community has been selected for this purpose. This community is mainly consist of women participants and assumed that the production of these coconut-based products is more suitable to be carried out by women.

However, the sustainability of this income generating activities of the project by the community certainly depends on the marketability of these products. Therefore, the objective of this study was to assess the marketability of the selected value-added coconut-based products among the target consumers. The specific objectives were to evaluate the consumers' acceptability and preferences of the selected new coconut-based products, i.e., virgin coconut oil, virgin king coconut oil, coconut jam and bottled candied coconuts for better marketability and for product development.

To assess the marketability of above coconut-based high value products, a market survey was carried out in the *Chilaw* urban area in Sri Lanka. This location for the market survey was specifically selected, as *Chilaw* is the closest urban area to the *Wilpotha* community and it was assumed that this area is one of the major potential markets for these coconut-based products.

Seventy households were randomly selected for the market survey and a free sample of coconut-based products were distributed among these households. The enumerators revisited each household to get the responses of the consumers on the coconut-based products given to them allowing one weeks time to consume the product. The relevant information was collected using a pre-tested structured questionnaire.

5.2 The sample for market survey

Only 63 households were finally selected for the survey due to incompleteness or irrelevant responses obtained during the interview schedule. 92% of the respondents of this survey consist of women and assumed to be more knowledgeable on the household food consumption patterns and food expenditure rather than the male chief householder. Majority of the chief householders in the sample had their education up to GCE advanced level whereas majority of housewives had their education up to GCE ordinary level. Hence, the sample can be classified as an educated group. Majority of the chief householders do their own businesses as the main income generating activity. The average size of the households in the sample is accounted as 4 members per household. Majority of the chief householders (46%) and the housewives (36%) in the sample were in the age category of 45-55 years. Only 10% of the sample obtains a monthly household income less than Rs.5000 and around 33 % households earn Rs.10, 000 to 20,000, whereas 13% of the sample earns Rs.20, 000 or more and considered as the high-income group. Based on this basic socio economic information, it was assumed that the selected sample for the market survey is a suitable consumer group to evaluate the marketability of the new coconut-based products.

A highest percentage of the sample (52%) expends 50-75% of their monthly total income on food. Another 29% of the sample expends 25-50% of their income on food. None of the respondent claimed that he/she expends less than 10% of the income on food. The weekly and monthly shoppers are more frequent in the selected sample. Also 14% of the respondents were found who are doing daily shopping. The low-income earners prefer irregular places for shopping for their food. The income earners of more than Rs.5000 and Rs.10000 prefer CWE, whereas the high-income earners prefer super markets for their food purchasing. Hence, the CWE and the supermarkets are potential market places for development of marketing channels for coconut-based high value products.

5.3 Market potential for virgin coconut oil

Most of the respondents have used the virgin coconut oil sample for tempering of food especially vegetables or potatoes and for hair application too. Nearly 89% of the respondents were satisfied with the overall quality of the virgin coconut oil sample given to them showing higher market potential for this product in this area. Taste, smell and color of the virgin coconut oil are the most preferred qualities by the respondents. Coconut oil is the favored oil consumed in the households in the selected sample and few palm oil and corn oil consumers were found too. However, nearly 40 % of the coconut oil users in the sample were not satisfied with the quality of oil they currently buy at the market though they used to consume it. Hence, there is a great opportunity for the coconut oil producer to produce and to market coconut oil even though there are many substitute oils available in the market. Unfortunately, a majority (57%) of the respondents were unaware that *aflatoxin* like substances can be present in deteriorated coconut oil.

There is a tendency that the low-income earners to shift their oil use pattern towards palm oil, as it is available at relatively lower cost. Further, there are indications that the high-income earners of the sample to shift their cooking oil preferences towards vegetable oils, suggesting coconut oil is an inferior commodity for them. However, the virgin coconut oil producers have the opportunity to make a competition in the edible oil market by implementing some of the market promotion strategies like, brand naming, quality classification, attractive packaging with keeping quality etc. The results show that 68% of the respondents in the sample indicate their willingness to pay for virgin coconut oil even above 100-120 rupees per bottle (750 ml) of oil. None of the respondents refuse the idea of purchasing of the product, whereas 32% of the respondents considered a lower price for them to purchase the product. This clearly shows the potential marketability of the product in the domestic market.

There is a positive relationship between the quantities of cooking oil consumption and the size of the household. The middle level income earners (in the range of Rs.10, 000-20,000 per month) in the sample are the highest cooking oil consumers. Also the cooking oil consumption pattern of the high-income earners is notably higher than the lower income earners in the sample. It is clear that the middle level income earners and the high-income earners would be promising group for virgin coconut oil. When the average monthly income rises up to Rs.20, 000 there is a steady increase of the monthly expenditure on cooking oil.

5.4 Market potential for virgin king coconut oil

The uses of king coconut oil is notably different from the uses observed for coconut oil. Application on hair was the dominant use though some of the respondents have tried the same uses as in case of coconut oil. The results show that 90% of the respondents were satisfied with the quality of virgin king coconut oil sample that was given to them. The smell of virgin king coconut oil is the most preferred quality character by the consumers in the sample and also color was another preferred factor. These can be considered as added advantages in marketing of the product and the producers must be cautious to maintain these qualities of the product as the production process goes on.

A majority of respondents were not aware about an existing market place to buy king coconut oil and the best alternative they found was to prepare it at home. The supply of king coconut oil in this market area is not regular and systematic and therefore, a good opportunity is lying ahead for any new producer to take up the production and supply adequate amount of king coconut oil in this market area.

Around 50% of the respondents suggested that no further improvements are needed for virgin king coconut oil. However, 25% of the respondents suggested an addition of medicinal herbs or its extracts would be better, whereas 17% claim for a fragrance addition to the oil. Nearly 95% of the respondents in the sample show their willingness to buy king coconut oil if it is available in the market. Only 5% of the respondents rejects the idea of

purchasing king coconut oil from a market place suggesting that they can prepare it at home when need arises. Around 28% of the respondents show their willingness to pay for virgin king coconut oil above the specified price of Rs.120 per liter of oil. However, a majority of the respondents either consider paying at the specified price or at a lower rate. Hence, it is a necessary factor to lower the costs of production as possible and make available virgin king coconut oil at a lower rate at the market that can be affordable by all types of consumers. Based on these evidences, it is clear that there is a potential for producing and marketing virgin king coconut oil in the selected market area.

5.5 Market potential for coconut jam

The respondents have used coconut jam as common to the other jam types available in the market by consuming it as bread spread. Nearly 32% of the respondents who received coconut jam claimed that the quality of the jam sample is better than that of the other jams available in the market, whereas 37% claimed that it is similar in quality to the other jam types. Another 32% of the respondents expressed that though they satisfy with the existing quality of the coconut jam it can be further improved. Hence, there is a great opportunity for the coconut jam producer to consider about product development for better marketability.

The taste of coconut jam is the most preferred quality character by the respondents in the selected sample. The color and the smell are equally important characters too. Nearly 47% of the respondents did not prefer the coconut oily taste present in coconut jam. Also 14% of the respondents suggested that the texture to be thicker could be considered as an improvement. Therefore, there is a need to improve the quality of coconut jam excluding coconut oily taste to attract more consumers for the product. Around 35 % of the respondents claimed that they dislike none of the quality factors.

95% of the jam consumers in the sample like to buy the product in the market. However, a majority (59%) of the respondents in the sample considered a relative lower price for coconut jam than that of other jam types in the market. According to the results, the CWE was the highest potential target market for coconut jam to be sold. However, the super markets and other grocery stores in the *Chilaw* town are equally important market places for coconut jam.

5.6 Market potential for bottled candied coconuts

The respondents have used the bottled candied coconut sample in a number of traditional sweet meat preparations and *Levariya* and pancake were the two most common sweet meats prepared. The taste of bottled candied coconuts is the highly preferred quality by the respondents and also color and smell were other important quality characters. Around 70% of the respondents in the selected sample expressed their willingness to buy bottled candied coconuts if it is available for sale in the market. A majority of the respondents in the sample expressed their willingness to pay about Rs.70 for a bottle of candied coconuts

(450 g). However, a considerable number of respondents expressed their view that they would like to pay below this price. This indicates that the producer should be more careful to maintain the price of bottled candied coconuts around the prescribed range including all the costs of production and marketing.