ACTA SCIENTIFIC NUTRITIONAL HEALTH

Volume 3 Issue 1 January 2019

Research Article

Development of Roselle Flat Bread in Mauritius

Shane Hardowar*

Deparment of Agricultural Production and Systems, University of Mauritius, Mauritius

***Corresponding Author:** Shane Hardowar, Deparment of Agricultural Production and Systems, University of Mauritius, Mauritius.

Received: September 26, 2018; **Published:** December 04, 2018;

Abstract

Specialty bread which offers its customers a host of delicious and nutritious value-added bread with Roselle is being offered which is new in the market. The enterprise (Smart bread) expects to catch the interest of a regular customer base on its unique roselle bread. The business is customer-oriented and aims to offer high quality bread at a competitive price. The main aim was to analyze the new product development process for an innovative product on the local market. Operational cash-flow forecasts for two consecutive years 2019 and 2020 have been prepared together with a balance sheet as well as profit and loss forecast. An initial investment of Rs 150 000 will be needed with estimated start- up expenses of about Rs 128 110. A gross profit of Rs 314 680 is expected in the first year of operation. The financial analysis shows a positive cash flow in the first year which continues to be positive in the second year.

Keywords: New Product Development Process; Value-Added Bread; Roselle Flat Bread

Introduction

Awareness of high quality 'pan fried flat bread' is on the rise. Today's consumer appreciates the nutritional and sensory benefits that the bread provides. The idea of launching this business cropped up since many years. The original Indian 'thekua' is a traditional homemade cookie of Northern India and Uttar Pradesh [1]. The dough is normally prepared from wheat flour, coconut powder, melted sugar and ghee and is deep fried till reddish brown in colour. The 'tekwa' (Mauritian jargon) which our enterprise is proposing is the same flat bread which is fried in sunflower oil or blended vegetable oil. It is filled with a mixture of dholl and sweet spices that puff up like pillows the moment it is dipped in hot oil. The bread is nutritious and suits well people who are health conscious. It can be stored for 1 week or more when refrigerated. It can be heated in the microwave, oven or even a pan and is the perfect pan fried bread to have with a steaming cup of tea.

Figure 1: 'Pan fried flat bread'. Hardowar [2].

Figure 2: The Roselle fruit. Boodia., *et al*. [3].

Innovation using Roselle

Roselle is used as an ingredient in the production of the bread which is a specialty one. This is unique in Mauritius since no other entrepreneurs are producing it with roselle. Roselle fruits are rich in vitamin C (1.27 mg ascorbic acid/ g of fruit fresh weight) and anthocyanins which play an important role in maintaining human health. Roselle calyces exhibit very high antioxidant capacities mainly due to it high anthocyanins content. It is also valued for its mild laxative effect and its diuretic properties. The aqueous extracts of the roselle plant are also used for treating gastrointestinal disorders, reduce cholesterol level, liver disorders and high blood pressure [3].

Characteristics	Nutrients per 1 roselle fruit
Fruit weight (g)	10 - 12
Calyx weight per fruit (g)	5 - 6
Fruit length (mm)	49 - 52
Fruit diameter (mm)	30 - 33
Seed number per fruit (units)	31 - 33
Water content (%)	88 - 89
Acidity (% citric acid equivalent)	2.8 - 3.1
Pectin content (%)	0.6 - 0.8

Table 1: Characteristics of roselle fruits.

Source: Boodia., *et al*. [3].

In a market system, there is a need for entrepreneurs who through the process of "creative destruction" can displace "conventional production methods or processes, products, market structures and consumption patterns" in order to achieve environmental, social or economic goals in line with the three pillars of sustainable development by producing superior environmental and social products and services [4].

Actually, the enterprise will be the sole producer of the bread on a professional basis and specialization will be sought in that sector to provide the best service to clients. To avoid market saturation of the products, emphasis will be laid on packaging aspect and improving quality by adequate Research and Development. The enterprise expects to invest in International Standard Organization (ISO) certificate in three years. Emphasis will be laid on sustainable development concentrating on the 3 Ps namely planet, people and profit. The oil used in the preparation of the 'pan fried flat bread' will be delivered to an entrepreneur who will make use of the used oil in his business. The project does not have any negative impact on the environment. Purchase of the bread by consumers will be easy since they are already aware of the benefits of Roselle fruits which will be displayed on the punnet.

Research Design and Methodology

New product development analysis was carried out including business analysis, competitive analysis, market analysis, sensitivity analysis and swot analysis. A market survey was also carried out with a sample of 100 consumers.

Market research

Primary research: This was important to get information about competitors and customers views about the product. A survey was carried out to get an overview of the sector in the region of Plaines Wilhems. Visits to supermarkets and hypermarkets were carried out to identify competitors.

Secondary research: Consultation of different food magazines, journals and food websites was done.

Result and Discussion

New product development process (Analysis)

Idea generation

The objective of idea generation is to gather as many ideas as possible from internal and external sources. A market survey carried out across the islands revealed that there are very few people engaged in this flat bread preparation. However, none of them prepare it with roselle.

Idea screening

To smooth the filtration process, the product idea is evaluated against the company's objectives. The main objective is to offer the highest quality and value in fried bread with nutritious food contents. The product is safe, nutritious and can be extended to a wide range of people from children to the old people.

Enterprise goals

The Short-term goal is to reach a cost-effectiveness of over Rs 300 000 by end of year 2019 while the Long-term goals are to target many supermarkets, enhance customer loyalty and be recognized as the pioneer in the production and distribution of ready-to-eat roselle flat bread.

The objectives of the enterprise are to;

- Be a regular supplier to supermarkets and later on hypermarkets, hotels and restaurants. The products will be displayed in transparent pun nets with proper labels and value addition.
- Provide a quality and safe food integrating it in the culture of the Mauritian community and also increase the enterprise image.
- Increase production by 3 fold and increase market shares and thus ensuring survival (long term).

Concept testing

The product concept statement developed is as follows: 'The roselle flat bread provides fiber and carbohydrates in a convenient way with very low fat. The product has a higher nutritional content compared to other flour-based breads.

A quantitative research was carried out using personal interviews with a sample of 100 consumers. During interviews, consumers highlighted that they liked the concept and mentioned that the colour of the bread was appealing. They also added that the product has a unique taste with the addition of roselle. The results of market research confirmed the potential of the flat bread.

Business Analysis

The financial plan was prepared for a period of two years: from January 2019 to December 2020. Based on the performance of the company, a second financial plan will be worked out for the next three years after 2020. The initial investment is estimated to be Rs 128 110. A sum of Rs 150 000 has been earmarked as own capital and no loan will be required for the years to come.

Target of 400 breads/day (Year 2019)

Total cost of Raw materials (E1) for one month (computed as 20 days) = Rs 1337 x 20 = Rs 26 740 = Rs 27 000 (rounded Figureure).

	Explanation of Expenses for raw materials	Cost (Rs)	Amount required for 10 'roselle flat breads'	Amount required for 400 'roselle breads'/day	Expenses for 400 roselle breads/day (Rs)
1	Purchase of wheat flour (Australia)	34.49 @ 2.5kg	500g	20kg	276
2	Milk powder	198.99 @ 1kg	20g	800g	159
3	Bicarbonate	9.99 @ 250g	1 pinch (1g)	40g	2
4	Sugar	33.99 @ 1kg	20g	800g	27
5	Salt	8.49 @ 500g	10g	400g	7
6	Yellow Food Colour	8.79 @ 10g	1 pinch (1g)	40g	35
7	Dholl gram (Chana dal)	25.99 @ 500g	125g	5kg	260
8	Aniseed/Fennel seeds	11.59 @ 80g	5g	200g	29
9	Roselle	25 @ packet of 8			12
10	Pure vegetable oil	52.99 @ 1L	250ml	10L	530
	TOTAL				1337

Table 2. Raw materials Cost.

Target of 800 breads/day (Year 2020):

Total cost of Raw materials for one month= Rs 1337 x 2 x 20 = Rs 53 480 (20 days) = Rs 54 000 (rounded Figureure).

Assumption

Business operates on 20 working days per month and Figureures are for commercial production only.

	Explanation of Expenses	Amount of Expenses (Rs)			
		2019 (400 breads per day)		2020 (800/day)	
		Monthly	Yearly	Monthly	Yearly
1	Purchase of raw materials (E1)	27,000	324,000	54,000	648,000
2	Cost of packaging (E2)	9 200	110 400	10 200	122,400
3	Equipment (E3)	23 000*	23 000	NA	NA
4	Safety equipment and stationary (E4)	500	6,000	600	7,200
5	License fees (E5)		5,000		5000
6	Electricity, water and telephone bills (E6)	500	6,000	600	7,200
7	Cooking gas (E7)	660	7,920	660	7,920
8	Wages (+ Bonus-13th month) (E8)	46,000	598,000	56,000	728,000
9	Depreciation charges (E9)	2,000	24,000	2,000	24,000
10	Fuel (E10)	10,000	120,000	15,000	180,000
11	Transport maintenance/repairs (E11)	1 000	12,000	1,500	18,000
12	Insurance premium (E12)		12 000		12,000
13	Marketing and Advertising Costs (E13)	250	3 000	300	3,600
14	Miscellaneous Expenses (E14)	2 000	24 000	2 000	24,000
	TOTAL	**122,110**	**1,275 320**	**143,860**	**1,787 320**

Table 3. Annual expenses (estimated) for 2019 and 2020.

	Explanation of Expenses	Cost (Rs)	Amount required (Yearly expenses)	Amount required for 400 pan fried bread/day	Amount of Expenses/ day (Rs)	Amount of Expenses per month (20 days)
1	Cost of packaging (E2)	460 @ 100 punnets		100 punnets	460	9 200
2	Cost of expiry date labeling equipment and stickers (E3)	1000	1 000			
3	Multifax machine (E3) (1 unit)	6000/unit	6 000			
4	Mobile phones (E3) (2 units)	1500/unit	3 000			
5	Crates (E3) (10 units)	500/unit	5 000			
6	Resiglas water tank (E 3) (1 unit)	5000/unit	5 000			
7	Pan, moulinex, recipient (E3)	3000	3 000			
3	Safety items and stationary (E4)		6 000			500
4	Transport maintenance/repairs [E11]		12 000			1 000
5	Fuel [E10]	500/day	120 000			10 000
6	License fee	5000	5 000			
7	Electricity, water, telephone bills [E6]	500/month	6 000			500
8	Cooking gas (2 units) [E7]	660/month	7 920/year			660
9	Insurance premium [E12]		12 000			1 000
10	Depreciation charges [E9]		2 000			2 000
11	Wages and Salaries (incl bonus-13th month) [E8]	46 000/month	598 000			46 000
12	Marketing and Advertising Costs [E13]		3000			250

Table 4: Explanation of expenses (2019).

Months	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
A. Income/ Receipts/Cash Inflows												
Balance		141890	161780	181670	201560	221450	241340	261230	281120	301010	320900	340790
Income from sales	120000	120000	120000	120000	120000	120000	120000	120000	120000	120000	120000	120000
Own capital	150 000											
TOTAL INCOME (A)	270 000	261 890	281 780	301670	321560	341450	361340	381230	401120	421010	440 900	460790
B. Expenses/ Payments/Cash Outflows												
Raw Materials (E1)	27 000	27 000	27 000	27 000	27 000	27 000	27 000	27 000	27 000	27 000	27 000	27 000
Packaging (E2)	9 200	9 200	9 200	9 200	9 200	9 200	9 200	9 200	9 200	9 200	9 200	9 200
Equipment (E3)	23 000											
Safety items and Stationary (E4)	500	500	500	500	500	500	500	500	500	500	500	500
Licence Fees (E5)	5 000											
Electricity, Water, Telephone (E6)	500	500	500	500	500	500	500	500	500	500	500	500
Cooking gas (E7)	660	660	660	660	660	660	660	660	660	660	660	660
Wages (E8)	46 000	46 000	46 000	46 000	46 000	46 000	46 000	46 000	46 000	46 000	46 000	92 000
Fuel (E10)	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000
Transport maintenance and repairs (E11)	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Insurance premium (E12)	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Marketing and Advertising Costs (E13)	250	250	250	250	250	250	250	250	250	250	250	250
Miscellaneous Expenses (E14)	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000
TOTAL EXPENSES (B)	126 110	98 110	98 110	98 110	98 110	98 110	98 110	98 110	98 110	98 110	98 110	144110
Ending Cash/ Net cash Flow (A-B)	143890	163 780	183 670	203560	223 450	243340	263230	283120	303010	322900	342790	316 680

Table 5: Cash Flow Forecast for the Year ending December 2019.

Months	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
A. Income/ Receipts/Cash Inflows												
Balance		91 140	187280	283420	379560	475700	571840	667980	764120	860260	956400	1052540
Income from sales	240000	240000	240000	240000	240000	240000	240000	240000	240000	240000	240000	240000
TOTAL INCOME (A)	240000	331 140	427280	523420	619560	715700	811840	907980	1004120	1100260	1196400	1292540
B. Expenses/ Payments/Cash Outflows												
Raw Materials (E1)	54 000	54 000	54 000	54 000	54 000	54 000	54 000	54 000	54 000	54 000	54 000	54 000
Packaging (E2)	10 200	10 200	10 200	10 200	10 200	10 200	10 200	10 200	10 200	10 200	10 200	10 200
Safety items and Stationary (E4)	600	600	600	600	600	600	600	600	600	600	600	600
Licence Fees (E5)	5 000											
Electricity, Water, Telephone (E6)	600	600	600	600	600	600	600	600	600	600	600	600
Cooking gas E7)	660	660	660	660	660	660	660	660	660	660	660	660
Wages (E8)	56 000	56 000	56 000	56 000	56 000	56 000	56 000	56 000	56 000	56 000	56 000	112000
Fuel (E10)	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000
Transport maintenance and repairs E11)	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500
Insurance premium (E12)	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Marketing and Advertising Costs (E13)	300	300	300	300	300	300	300	300	300	300	300	300
Miscellaneous Expenses (E14)	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000
TOTAL EXPENSES (B)	146 860	141 860	141 860	141 860	141 860	141 860	141 860	141 860	141 860	141 860	141 860	197 860
Ending Cash/ Net cash Flow (A-B)	93 140	189280	285420	381560	477700	573840	669980	766120	862260	958400	1072540	1094680

Table 6: Cash Flow Forecast for the Year ending December 2020.

Period	2019	2020
Revenue		
Capital investment	150 000	Nil
Returns from sales	1 440 000	2 880 000
Total Expenses	1 590 000	2 880 000
Raw Materials (E1)	324 000	648 000
Packaging (E2)	110 400	122 400
Equipment (E3)	23 000	NA
Safety items and Stationery (E4)	6 000	7 200
Licence Fees (E5)	5 000	5000
Electricity, Water, Telephone (E6)	6 000	7 200
Cooking gas (E7)	7 920	7 920
Wages (E8)	598 000	728 000
Depreciation charges (E9)	24 000	24 000
Fuel (E10)	120 000	180 000
Transport maintenance and repairs (E11)	12 000	18 000
Insurance premium (E12)	12 000	12 000
Marketing and Advertising Costs (E13)	3 000	3 600
Miscellaneous Expenses (E14)	24 000	24 000
TOTAL	1 275 320	1 787 320
Gross Profit	314 680	1 092 680

Table 7: Profit and Loss Account/Budget Forecast for the year ending 2019 and 2020.

Income from sales

Revenue forecast

Monthly production of tekwa (2019)	8000
Mass of 1 punnet	4 breads
Number of punnets	2000
Selling price per punnet	Rs 60
Monthly expected revenue	Rs 120 000

Table 8

Break-even Analysis (Year 2019)

Break-even price = Total costs/Expected output

Total costs (fixed + variable costs) = Rs 1 275 320

Output per year = 96 000 units of bread = 24 000 punnets

Break-even price = Rs 1 275 320/24 000 punnets = Rs 53 which represents the output price our company needs to just cover all costs at the given output level (Income from sales has been computed based on the number of punnets sold). This represents the price necessary to cover all costs at the given output.

Cost of production = Total cost/ Yield= 1 275 320/96 000= Rs 13.30 (average cost of producing one unit of bread).

Sensitivity Analysis (Year 2019)

In case there is a 20% increase in raw material prices, what is the likely risk?

Raw materials actual cost= Rs 324 000

Raw materials actual cost (with 20% increase in prices)

= Rs 324 000+ Rs 64 800

= Rs 388 800.

Total Cost = Rs 1 275 320+ Rs 64 800

= Rs 1 340 120

Hence, Gross Profit= Rs 1 590 000- Rs 1 340 120 = Rs 249 880 (meaning a decrease from Rs 314 680 to Rs 249 880).

Technical Development

Market needs

It is important to establish the acceptability of the new bread with Roselle. A consumer survey with 100 consumers was undertaken. It was established that the bread gained a much higher level of acceptance than other similar types of breads.

Market testing

Market testing provides the opportunity to identify marketing strategy weaknesses. As a market strategy, the enterprise will boost its effort through proper planning, organization and control to develop a different value- added product that offers unique benefits. It will have superior marketing effort through quality, fast delivery and good after sales service with affordable prices. Long term relationships with customers will be created by creating trust in the product. The products will be exhibited during cooperative fairs and entrepreneurs' fairs regularly.

Marketing Mix

Emphasis will be laid on

Product

- Quality product is designed for the public at large.
- Innovation with Roselle.
- The product range.

Place

- Located in a strategic place and nearby big commercial centers and shopping malls.

- Establishment of a dominant presence in the area in order to create entry barriers to other competitors.
- Product will be sold to clients via supermarkets and hypermarkets.
- It will be transported quickly to its point of sales via a pick- up van.

Price

- As pricing strategy, the product will be priced competitively with the prevailing stuffed bread and other fried or filled breads reflecting the high quality of the bread. The lowest price is not a good policy.

The following prices are suggested

Pan fried bread	Price (Rs)	Price of Competitors (other than pan bread) (Rs)
Pack of 4 (ordinary)	60.00*	59.99 - 75.00
Pack of 4 (with roselle)	60.00*	NA

Table 9: Price of a punnet with 4 'pan fried flat bread'.

*Price includes packaging cost.

Promotion

The marketing strategy is to create brand awareness as follows:

- Promotional strategy with attractive coloured pamphlets and leaflets, which will indicate the benefits of the product as they will be freely distributed to create awareness of the product and enterprise.
- Improvement in Marketing through direct contact with potential customers.
- Promotional tools comprising sensory tasting panels and degustation sessions.
- A unique product will be presented through high quality punnets which will be superior to the lower quality polystyrene ones available on the market. This is essential in creating the enterprise's brand image and reinforcing its difference with competitors.
- Products will be delivered on site to retailers, supermarkets and hypermarkets.

Competitive analysis

There are no real competitors. However, immediate competitors are those entrepreneurs engaged in 'faratas', 'paans' and 'dholl puris' production.

Compared to competitors, the products have a competitive advantage in the following areas for the following reasons

Factor	Proposed business	Strength	Weakness	Competitor A	Competitor B
Products	Unique	Unique taste	Nil	Colour not attractive	Taste not good Appearance not appealing
Price	Rs 60 punnet	Competitive price	Expect slow start	Rs 12 unit	Rs 10 unit
Quality	Very good	Unique	Nil	Poor, oily cake	Poor, hard texture
Service	-Packaging -On shelves	On-time delivery			
Reliability	Reliable product	Shelf -life can be extended by refrigerating Raw materials and ingredients accessible			
Appearance	Appealing Sensory attributes Attractive punnets with labels (nutritive information)			Not appealing	Not appealing
Sales Method	Rapid On-time delivery Direct sales	Quick access to market	Only one saleman		

Table 10: Competitive Analysis.

The enterprise is going to target the working people that is about 300, 000 people on the island. Later on, the island of Rodrigues will be targeted. This can be categorized as a niche market. Based on a survey carried out, approximately 3 people out of 4 said they were interested in buying the bread which represents a market share of 75%.

Commercialization

Assuming that the market testing is positive, full scale production will start in 2019. The main marketing management task will be the development of a detailed marketing plan. The plan is designed taking into consideration the market situation, product situation, competitive situation, distribution situation and the macro-economic environment.

The marketing objectives are

- To sell 8000 units per month in 2019 and generate Rs 120,000 every month.
- To achieve a reasonable gross profit margin.
- To maintain and where opportunity occurs, expand the market.
- To respond quickly to changing needs of potential customers.

Target customers are office workers, both professional and non-professional, covering a wide range of ages and income levels. The company expects to enjoy a high degree of repeat business. Consumers would buy more bread if they know of its importance and its availability. The company targets the health-conscious and the weight-conscious customers by offering a fat free, healthy product with ingredients such as skimmed milk and roselle. The enterprise will have a sale of 8000 units per month in the first year and targeting 16 000 units in the second year through marketing efforts and geographic distribution.

Swot Analysis

Strengths	Weaknesses
○ Food preparation knowledge and experience. ○ Quality product with good label design and packaging. ○ Knowledge of HACCP. ○ Industry knowledge and understanding. ○ Production site close to retailers.	○ Indirect Competitors (dholl puri, faratas).
Opportunities	**Threats**
○ Product differentiation. ○ Increasing demand for nutritious products as people are more health conscious. ○ Customer demands and shopping trends are shifting. ○ Emphasis laid on nutritive aspect.	○ Copying of our products.

Table 11

Conclusion

The model for new product development process involves a sequence of steps which is crucial in determining the likely success or failure of an enterprise. The objective of these steps is to avoid failure of the product by continually reviewing the prospects for the new flat bread. The quality and innovation with roselle are the competitive advantages of the flat bread. The key characteristics of the new bread with roselle appear to have relative advantage over alternative products. Consumers found the colour of the bread appealing and mentioned that the product has a unique taste with the addition of roselle. The results of market research confirmed the potential of the flat bread. It was established that the bread gained a much higher level of acceptance. The financial analysis shows a positive cash flow in the first year which continues to be positive in the second year. Hence, it shows business growth and survival.

Bibliography

1. https://en.wikipedia.org/wiki/Thekua
2. Hardowar S. “Own collection” (2018).
3. Boodia N., *et al.* “Roselle Production” (2005).
4. Schaltegger S and Wagner M. Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions. “Business Strategy and the Environment” 20 (2011): 222-237.

Volume 3 Issue 1 January 2019
© All rights are reserved by Shane Hardowar.