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The Viability of Malunggay (*Moringa oleifera*) and Kalabasa (*Cucurbita maxima*) Veggie Ice Cream

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ABSTRACT

The study aims to determine viability of Malunggay and Kalabasa Veggie Ice Cream business and to present an experience of enjoying ice cream in different ways because of the raw materials used in the product which is vegetables. This will also aim to know the market demand which is the foremost opportunity for the establishment of the MAKA Veggie Ice Cream. Our country's climate and the Filipino lifestyle are factors to increase the demand for ice cream products yearly. This MAKA Veggie ice cream uses a B2B (Business to Business) business model. This analysis also aims to find out about business competitors to improve concepts and create appropriate strategies to market this MAKA veggie ice cream product to predetermined target market. The economic benefits obtained from this business will help the economy by providing job opportunities, helping our farmer producers of malunggay and kalabasa, and increasing our country's income through paying taxes. This MAKA veggie ice cream business also pays attention to support sustainable development goals through environmentally friendly packaging and proper waste disposal carried out according to procedures.

Keywords: Viability assessment, Malunggay and Kalabasa Veggie Ice Cream, Vegetable-based ice cream, Market demand

RATIONALE

Ice cream is a frozen dessert made from dairy products such as milk and cream combined with flavorings and sweeteners such as sugar. In some cases, artificial flavorings and colorings are added instead of natural ingredients. It is considered to be a junk food that children love to eat. Mostly, they eat this kind of food which is high in sugar and fats, the less they like fresh and natural foods like fruit and vegetables.

The interest of the food industry in the development of new products is constantly increasing and becoming more challenging, due to consumers' awareness about healthier foods (Dias et al., 2015). The ice cream industry in the Philippines is composed of only a few ice cream companies who supply ice cream and dairy products in the country.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

The Philippines imports 99 percent of its dairy requirement as domestic production cannot meet the annual demand of 2.9 million metric tons (MT) liquid milk equivalent, according to the National Dairy Authority (NDA) (Mojica-Sevilla, F. (2022).

Ice cream is projected to bounce back strongly from 2022 onwards having started on the path to recovery in 2021. The category is receiving a lot of focus in terms of new product development and innovation, from new flavours and formats to products targeting those with special dietary requirements, such as dairy-free ice cream. The range of dairy-free alternatives is expected to continuously grow in number over the forecast period as people become increasingly familiar with how their diet can affect their health. (DPO International. 2022a).

Plant-based foods have become a popular option for consumers due to their positive impacts on health and resulting changes in lifestyle. To preserve the quality of non-dairy ice cream during distribution and consumption, it is essential to understand its proximate composition and meltdown properties. In this study, cashews, coconut, and bananas were used as raw materials. Cashew milk and coconut cream were prepared separately and mixed at different ratios to make non-dairy ice cream (Matabura, 2023).

Squash (*Cucurbita maxima)* commonly known in the Visayan language as *kalabasa*, have long been used in the Philippines as fleshy vegetables. They belong to the plant family that includes melon and cucumber, come in many varieties. Some varieties of squash also produce edible flowers. While each variety may have a distinct shape, color, size and flavor, all varieties share some common characteristics. Regardless of variety, all parts of the squash are edible, including the flesh, seeds and skin or rind. Like other cucurbits, squash is recognized as an important source of vitamins and minerals just like vitamins A and C; it also contains calcium and iron. It has very low calories, ideal to be a component in the diet plan. These fleshy vegetables are protected by a hard rind and grown in the country throughout the year. (Pears, 2004; Sas, 1984; Dagoon, 2001; Shepherd, 2011; Kubo et.al, 2010).

Pumpkin is a rich source of antioxidants, phenolic compounds, dietary fiber, and minerals. It is also harvested in large quantities around the world. Therefore, the present investigation was undertaken to enhance the nutritional and functional properties of ice creams by fortification of two different varieties of pumpkins – Cucurbita moschata and Cucurbita maxima. Different processes - freeze-drying, boiling, and baking - were applied to pumpkins to compare and determine the optimal processing steps. In doing so, two different concentrations were operated for each application. The health-promoting effects of pumpkins were evaluated, and their effects on the functional and sensory properties of ice creams were determined (Sıçramaz, H., & Ayar, A. 2022).

The feasibility of incorporating beta-carotene-loaded solid lipid microparticles (BCSLM) into vanilla ice creams was investigated, through the physico-chemical characterization and evaluation of sensory acceptability of the products products. The BCSLM were produced with palm stearin as the lipid phase, hydrolyzed soy protein isolate as the surfactant, and xanthan gum as the thickener. The results showed similar values of proximate composition, total soluble solids, pH, and overrun for all formulations. On the other hand, colorimetric evaluations showed that the

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindураresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025
ice cream produced with partial substitution of artificial additives by BCSLM containing alpha-

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

tocopherol presented a more intense color, while in the product with non-encapsulated beta-carotene, a fast degradation of carotenoid was confirmed, highlighting the importance of the encapsulation techniques. The results of the sensorial analysis of the products were highly satisfactory and showed that the panelists preferred the ice creams produced with BCSLM containing alpha-tocopherol and with partial substitution of artificial additives by BCSLM containing alpha-tocopherol, confirming the feasibility of incorporating BCSLM into ice creams to reduce the application of artificial dyes to the product (de Lima, et.al., 2016)

The research study conducted by Borro and Gemora (2016) aimed to ascertain the sensory acceptability of squash (Cucurbita Maxima) of varied quantities in baking cake as to appearance, taste, color, texture and general acceptability. A panel of 20 evaluators, purposely picked, from the School of Hotel and Restaurant Services Technology of the West Visayas State University – Janiuay Campus, were utilized as respondents. Formulated in the study were four treatments– three of which used squash at various quantities while as the control variable, one treatment, which contained no squash at all, was used. A modified sensory evaluation score sheet anchored on Five-Point Hedonic Scale was used by the respondents to assess the finished products. Means, ANOVA and Scheffe Test were utilized as the statistical tools. As a whole, results disclosed that baked cakes with no grated squash and 120 grams grated squash were moderately liked by the respondents while those baked cakes with 240 grams grated squash and 380 grams grated squash were liked very much by the respondents. There were significant differences in the level of acceptability of the different treatments as to appearance, taste, color, texture as well as general acceptability.

The study of Prayitno and Rahma (2020) on the types of fruit that are often used in functional foods are pumpkin and red dragon fruit. Pumpkin contains high levels of beta-carotene and proved to be useful in mobilizing iron reserves in the body in haemoglobin synthesis. On the other hand, the ingredients in dragon fruit is almost the same as pumpkin, which contains iron elements that play a role in the formation of blood, namely in the synthesis of haemoglobin. The existence of pumpkin and red dragon fruit can be processed into functional food. One of the functional food products is ice cream. The purpose of the study was to find out the organoleptic quality of pumpkin ice cream that formulated with red dragon fruit. The sensory evaluation on ice cream was carried out by hedonic test.

The physical attributes, antioxidant properties and sensory quality were evaluated of developed pumpkin ice cream products as the study of Peasura, et.al. (2020). Milk-based ice cream containing 25% pumpkin had the highest sensory score compared to bases using coconut milk or soy milk and so was selected for further study. In addition, various added increments of pumpkin mash (0-40%) were expected to increase the health benefits derived from the milk-based ice cream products.

The study of synbiotic ice cream conducted by Ibrahim, et.al. (2021) offers sufficient viable probiotics and value-added nutrients to satisfy health needs. This study aimed to formulate the optimum synbiotic ice cream incorporated with okara (1–3%) and the probiotic, *Lactobacillus plantarum* (ATCC 8014). Results showed a viscous texture was produced when more than 2% okara was added to ice cream. This formulation also minimally caused ice cream to melt for around

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

90 min at a melting rate of 19–76%. Furthermore, ice cream incorporated with okara had an

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

increase in protein content (>5%) and a decrease in fat content (>13%) compared with the control (no okara), indicating that it is a low-fat item. The addition of more than 2% okara increased the viability of *L. plantarum* on day 60. Overall, 1% okara addition showed significant acceptability for potential symbiotic ice cream formulation.

According to the study of Szydłowska, et.al. (2022) investigated the influence of pumpkin cultivar as a fermented semi-product on the selected quality parameters of functional non-dairy frozen desserts, which were prepared using the potentially probiotic strain cultures *L. rhamnosus* Lock 0900 and *L. casei* O14. Microbiological status, pH, sugar and carotenoids content, antioxidant activity, color and sensory quality have been checked. Regardless of the pumpkin cultivar used, the lactic acid fermentation of pulps with selected bacterial strains decreased reducing sugar and total sugars content. Improvement in the antioxidant activity was also observed. The impact of the individual sensory attributes on the overall quality was determined. The overall quality of the investigated pumpkin sorbets was positively driven by the sweet taste, pumpkin flavor, smoothness of texture, and negatively driven by acidic flavor, pungent taste, and bitter taste, verified by PCA method. All of the final products achieved high survival of probiotics (higher than 8.4 log CFU/g) and revealed a good sensory quality (overall quality higher than 8 c.u). The treatments with the cultivar "*Melon Yellow*" of the *Cucurbita maxima* species, were characterized by significantly higher ($p < 0.05$) carotenoids content, total sugars and reducing sugars content and antioxidant activity, measured by two methods. It can be concluded that the pumpkin cultivar and strain culture used for the fermentation affect the count of potentially probiotic bacteria in the final products, the composition of bioactive compounds, antioxidant activity and sensory quality of the functional pumpkin frozen desserts.

Technology of soft ice cream has been developed by Zhexenbay, et.al. (2022) using beet pectin concentrate (BPC) as a functional component. As an additional component of the probiotic action, the probiotic Bifidobacterium, Lactobacillus were introduced in an amount of 0.1 %. The regularities of the influence of BPC on the density and viscosity of prescription mixtures, whipping and resistance to melting of soft ice cream have been established.

Due to the high utilization rate of dairy products, enrichment of these products will successfully decrease or prevent diseases related with nutrition deficiencies. Fruits and vegetables in different forms (i.e., fresh, juices, powder, puree, and extract) are excellent sources for the enrichment of dairy products because of their desired taste, color, aroma, fibers, and vitamins content (Salehi, 2021).

The research carried out by Pontonio, et.al, (2022) a gluten and lactose-free plant-based yogurt-like was used as the main ingredient to produce a novel plant-based ice cream. The integrated approach used to investigate the main properties of the novel ice cream demonstrated similar nutritional label between the plant- and milk-based products with the former showing higher protein digestibility and absence of lactose. The lactic acid bacteria fermentation occurring during the yogurt-like production ensured the decrease of the antinutritional compounds of the legume ingredients and the obtainment of suitable technological and sensory characteristics.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Indeed, similar sensory profile with only slight differences in appearance, structure, taste, odor and texture parameters were found for both the plant- and milk-based products. However, structural and technological characteristics of the ice creams were significantly different; indeed, the overrun was higher in the plant-based ice cream, such as hardness, gumminess, and adhesiveness.

The study of Leahu, et.al. (2022) investigated the potential use of dietary fibers (psyllium and pectin fibers added in different proportions of 0–10%) to improve the rheological, textural, and sensory characteristics of vegetable ice cream using vegetable milk (almond and hemp milk). Hemp milk was obtained from the peeled seeds of the industrial hemp plant, which includes varieties of *Cannabis sativa*, which have a low content of the psychotropic substance tetrahydrocannabinol (THC) and are grown for food. The rheological characteristics of the mix and ice cream were determined by using the Haake Mars rheometer. Compared with the control sample, the viscosities of the mix in all samples analyzed were enhanced with the addition of dietary fibers, due to the occurrence of interactions and stabilizations. The viscoelastic modules G′ G″ were determined on ice cream samples at a temperature of −10 °C. The elastic and viscous modulus showed high values with the increase of the addition of 6% dietary fibers. The textural characteristics were assessed by the shear strength of a layer of ice cream at a temperature of −4 °C. Hardness, firmness, and adhesiveness were influenced by the size of their ice crystals, the fat content, and the percentage of dietary fibers added. The sensory analysis of the ice cream showed higher overall scores for the almond milk ice cream, because the sweet taste was appreciated with a maximum score, while the hemp milk ice cream was evaluated for flavor and taste.

Squash has been long known in the country, its cultivation is mostly confined in the backyard scale. Most of the areas devoted to squash production are generally in Ilocos Region, Cagayan Valley, Southern Tagalog, and Bicol. However, the premier provinces producing this crop for semi-commercial scale are Batanges, Laguna, Nueva Ecija, Leyte, and Davao. One of the Apayao's products is the squash which is particularly found in Flora, Apayao.

Malunggay is widely cultivated in the Philippines. It is a promising food source in the country because the tree is in full leaf at the end of the dry season when other foods are made typically scarce. Almost all year round, malunggay leaves are present and readily available for consumption. Moringa Oleifera leaves is used as a traditional medicine in many cultures. Because of its high vitamins A and C, calcium, iron and protein content, it has attracted interest in the modern scientific community. However, most of the studies done are either nutrient analysis or laboratory studies in animals.

The squash and malunggay as an available resource beyond the backyard can be utilized to enhance ice cream as well as a good source of nutrients. It is an intension of the researcher to use accessible and nutritious resources to develop vegetable ice cream which is the MAKA veggie ice cream hence, this study is being conducted.

OBJECTIVES/STATEMENT OF THE PROBLEM

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

This study aims to determine the viability of Malunggay and Kalabasa veggie ice cream. Specifically, the following were answered:

1. What is the market feasibility of MAKA Veggie Ice Cream?
   a. Demand Analysis
   b. Supply Analysis
   c. Supply-Demand Analysis
   d. Marketing Plan

2. Technical Feasibility
   a. Production Process
   b. Materials
   c. Labor
   d. Factory Overhead
   e. Other Operating Costs
3. Management Aspect
4. Financial Feasibility
5. Conclusion and Recommendations

PROCEDURE/METHODS

Procedures (Mashed Squash) 1.
Washed the squash.

2. Sliced the squash. Remove the seeds and peel it with the use of knife or peeler.
3. Boil the squash within 10 minutes.
4. Let it cool. Mash the squash.

Procedures (Malunggay Powder)

1. Harvest malunggay leaves early morning just when the morning dew has dried up.
2. Bundle malunggay leaves and hang upside down in a well-ventilated room. Don't expose it to sunlight.
3. Use brown paper bag to catch the falling leaves.
4. In due time the leaves will fall in the paper bag. When the leaves dried up grind or blend.

Procedures (Squash and Malunggay Ice Cream)

1. Put the mashed squash and powdered malunggay in a bowl and all other ingredients then mix together.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

2. Blend the mix ingredients using ice cream blender.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

3. Put ice cream on a container. Freeze it for one (1) day.

Raw Materials Used
All-purpose cream
White sugar
Condensed milk
Boiled mashed squash
Malunggay powder

RESULTS AND DISCUSSIONS

Company Vision and Mission Statement:

Vision: To be one of the industry's leading veggie ice cream producers, providing nutritious and high-quality products in the country.

Mission: To provide customers with the best veggie ice cream selection, reasonable prices, the utmost convenience, and high-quality service resulting in a pleasurable and memorable experience.

Table 1: Product/Service Information

Product/Business Name:	Description/ Unique features that distinguishes it from competing products	Selling price/unit
Primary business activity/ies:		
1. MAKA Veggie Ice Cream	MAKA Veggie Ice Cream is a frozen product made of Malunggay and Kalabasa and other ingredients.	P120.00

I. Market Feasibility

A. Demand Analysis

- Are there similar products/services in the market? Yes o If yes, list them Selecta Ice Cream, Nestle Ice Cream, Magnolia Ice, Cream, Creamline Ice Cream, Aice Ice Cream, Big Scoop Ice Cream, Geno's Ice Cream

- Are there available substitutes of your product/service? Yes
- Is your product/service easy to copy or replicate? No

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindumaresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

- Who is your target market, how many are they and what is the estimated demand?

The target market are family members, more importantly the mothers since they are the frequent buyers of ice cream for their family. Another target market are the teen agers since the teenage market most likely love ice cream. Adults, college students, employees, and seniors who enjoy the fun of eating ice cream. Both the low and high income earners are also our target market.

Table 2: Computation of Estimated Demand

	A	B	C	= A X B X C
Target Market	Population	% of Market who is willing & able to buy	Average purchase (in a month)	Estimated Demand in units per month
Primary Market:				
1. Male	95,943	5%	4	19,189
2. Female	89,720	5%	4	17,944

B. Supply Analysis

- Are there direct competitors in your target market? Yes o If Yes, list them down? Selecta Ice Cream, Nestle Ice Cream, Magnolia Ice Cream
  - What are their strengths? Wide varieties of products and flavors, creative and attractive advertising campaigns, respected brand name

C. Supply-Demand Analysis

- Is there still unsatisfied demand after deducting the supply which the company can fill? Yes
- *How many units is estimated to be sold per month on the average? 1,820 units*

Table 3: Computation of Estimated Sales (in units)

	A	B	C = A – B	D	C X D
Target Market	Estimated Demand in units per month	Estimated available supply	Unmet Demand (in units)	Estimated market share (%)	Estimated Sales (in units)

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindumaresearch.com/
Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Primary Market:					
1. Male	19,189	384	18,805	5%	940
2.Female	17,944	359	17,588	5%	879

D. Marketing Plan

- What is the most appropriate marketing strategy to inform/persuade/capture your target market per product?
  - Advertising?

Social Media Advertisement is very effective because the very available in the society. It is also free of charge and reaches a wide range of market.

Word of Mouth is the process of encouraging target customers to communicate about the product with other peop le who are a part of their social networks, such as friends and family. It will provide qualified leads since target customers trust their friends and family's words.

Print Ad Advertisement like printing of tarpaulins and brochures.

  - Sales Promotion?

Discounted product is possibly the most popular type of promotion. Make sure the discount is attractive.

Free Shipping makes it hassle free. Incorporate shipping cost into the product.

Buy More, Save More entices the target customers to buy more the product.

Holiday Promotions target customers always like to spend more during holidays, making it the perfect opportunity to sell the product.

  - Other Marketing strategies? Personal (face-to-face) Selling

- How much would these cost in a year? P24,000.00
- Will you allow returns or exchange of your products? Yes, returns or exchange of the product creates customer security.

Technical Feasibility

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindураresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

- Is your technology already protected in terms of Intellectual Property?

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindumaresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

INTELLECTUAL PROPERTY (IP) STATUS

TYPE OF IP	IP APPLICATION NO.	DATE FILED	DATE GRANTED
UM	2/2023/050179	March 1, 2023	On progress

o *How much does it cost?* *P4,605.60 for filing fee and first publication fee made on March 3, 2023*

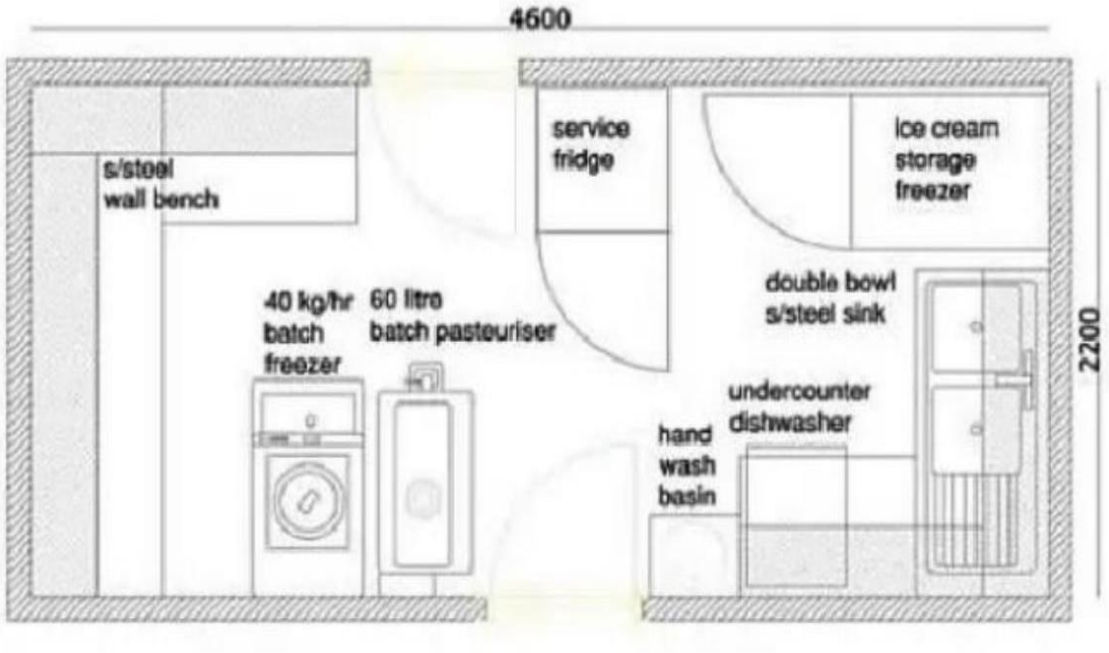
• What are possible improvements, developments or iterations that your technology can undergo? Product innovations like additional vegetables.

Table 4: Products/Services/Technologies Potential

Products/Services/Technologies	Future possible improvements or iterations	Estimated Research and Development Cost
1. MAKA Veggie Ice Cream	*Additional vegetables*	*10,000.00*

A. Production Process

- Present the plant or production layout.



- What is the maximum production capacity in units? 300 units
- How is production scheduled?

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://minduraresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Time	Activity

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindumaresearch.com/
Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

8:00 – 9:30 a.m.	Sanitation of equipment's & preparation of ingredients
9:31 – 12:00 a.m.	Making the MAKA veggie ice cream
1:01 – 2:00 p.m.	Packaging
2:01 – 3:00 p.m.	Freezing the ice cream
3:01 – 5:00 p.m.	Cleaning the equipment and checking the inventory for the next production.

Production Machinery and Equipment

- Are the required Machinery and Equipment locally available? Yes
- *List the required equipment needed to produce the product/service*

Table 5: Production Fixed Assets List

Equipment/Machinery/ Furniture and Fixtures	A	B	C = A X B	D	E = C/D
	Cost per Unit	Quantity	Total Cost	Est. useful life	Annual Depreciation
1. Ice Cream Machine	150,000	2	300,000	10	30,000
2. Electric Mixer6,500	35,000	1	35,000	10	3,500
3.Ice Cream Freezer	35,000	5	175,000	10	17,500
4.Air Condition (Split Type)	45,000	2	90,000	10	9,000
5.Laptop	65,000	1	65,000	5	13,000
6.Printer	25,000	1	25,000	5	5,000
7.Cash Register	65,000	1	65,000	10	6,500
TOTAL					84,500

B. Materials

- Is the supply raw materials readily available and accessible? Yes
- Is it seasonal? No
- Is the price of raw materials stable or dependent on other factors? The price of raw materials are not stable because of inflation.
- Will the price changes be significant enough to affect your product or service price/s? No.

Table 6: Computation of Direct Materials Cost component of Product

Raw Materials	Unit of measure	Quantity	Cost/Unit	Cost Allocation
1.All Purpose Cream	500 ml	2	80.00	160.00
2. White Sugar	.20 kg	1	86.00	17.20

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindunaresearch.com/
Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

3.Condensed Milk	300 ml	1	70.00	70.00
4.Boiled Mashed Squash	.40 kg	1	35.00	14.00
5.Malunggay Powder	.20 kg	1	10.00	2.00
Direct Materials cost allocation per unit or yield of product/service				210.70

Note: For products that are produced in large batches, the yield can simply be divided by the number of units produced from each batch to arrive at the cost of materials per unit.

C. Labor

- Do you need manpower with specialized skills or qualification? Yes o If yes, are there available supply? Yes
- How much is the direct labor rate per hour? P62.5
- How many production staff is needed? Four
- How many hours is needed to produce 1 unit of your product/service? Four hours

Table 7: Computation of Direct Labor Cost component of Product

Production Process	Personnel Assigned	A	B	C = A X B
		Number of hours	Direct Labor Rate per hour	Cost Allocation
Process of Smashed Squash	1	1	62.5	62.5
Process of Malunggay Powder	1	1	62.5	62.5
Mixing of Smashed Squash, Malunggay Powder, and other ingredients	1	1	62.5	62.5
Packaging and labeling	1	1	62.5	62.5
Direct Materials cost allocation per unit or yield of product/service				

Will you engage part-time or emergency workers (for seasonal production)? o If yes, how often and how many is required?
It depends on the volume of production if it is needed a part-time workers during seasonal production or maybe to render an overtime of the current employees to meet the number of required production. o *How much would it cost? Higher computation of hourly rate.*

- *Aside from employees directly engaged in the production process, what are other employees you need to run the business?*

Table 8: Administrative Personnel Salaries

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindumaresearch.com/
Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Position	Number of personnel	Monthly Salary	Total Salary per month	Employee Benefits
1. Marketing Manager	1	15,400.00	184,800.00	15,400.00
2.Cashier/Saleslady	1	13,200.00	158,400.00	13,200.00
3.Ice Cream Maker	1	13,200.00	158,400.00	13,200.00
4.Delivery Driver	1	12,100.00	145,200.00	12,100.00
Total			646,800.00	53,900.00

D. Factory Overhead

- *How much is the overhead cost per unit of product?* 70.23

E. Other Operating Costs

- What other Fixed Assets are required to run the business?

Table 9: Fixed Assets for Administration

Equipment/Machinery/ Furniture and Fixtures	A	B	C = A X B	D	E = C/D
	Cost per Unit	Quantity	Total Cost	Est. useful life	Annual Depreciation
1.Refrigerated Delivery Truck	1,300,000	1	1,300,000	10	130,000
2.Ice Cream machine	150,000	2	300,000	10	30,000
3.Electric Mixer	35,000	1	35,000	10	3,500
4.Ice Cream Freezer	35,000	1	35,000	10	3,500
5.Air Condition (Split Type)	45,000	1	45,000	10	4,500
6.Laptop	65,000	1	65,000	5	13,000
7.Printer	25,000	1	25,000	5	5,000
8.Cash Register	65,000	1	65,000	10	6,500
TOTAL					

- *What are other costs necessary to run the business? How would they be allocated to the production and administrative activities?*

Table 10: Other Operating Costs per Month

Other Operating Costs	A	B	C	D = A X B	E = A X C
	Estimated cost	% Allocation to Production	% allocation to administration	Cost allocation to production	Cost allocation to administration
Rent of space	5,000.00	100%		5,000.00	
Electricity	8,000.00	100%		8,000.00	

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

Water	2,000.00	100%		2,000.00	
Repairs & maintenance	5,000.00	100%		5,000.00	
Supplies	2,000.00	100%		2,000.00	

Logistics & Travel	16,000.00	100%		20,000.00	
Telecommunications	500.00	100%		500.00	
Representation	1,000.00		100%		1,000.00
Taxes and permits	25,000.00		100%		25,000.00
Marketing	2,000.00		100%		2,000.00
Other Expenses	1,000.00		100%		1,000.00
Depreciation	196,000.00		100%		96,000.00
TOTA L				42,500.00	125,000.00

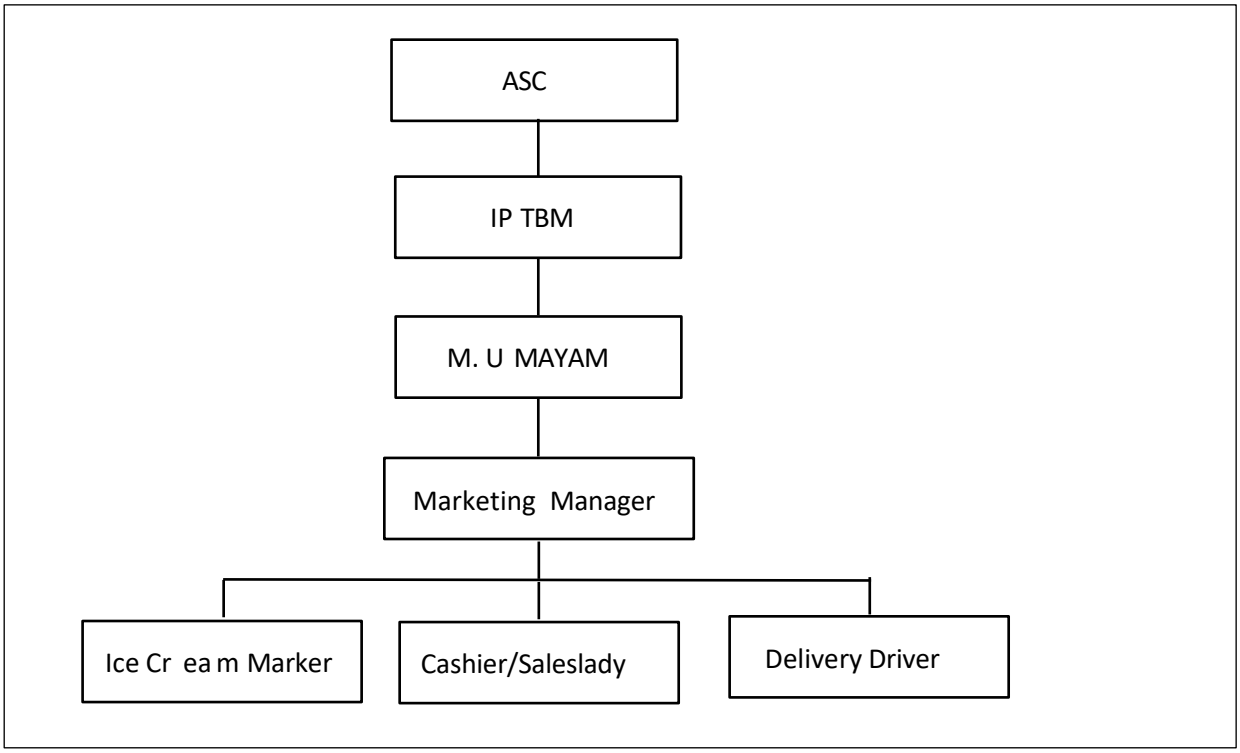
• How is your production waste disposed? Waste should be handled or disposed of properly so that it will not affect people's health. Waste will be sent to a landfill, sewer, or septic tank.

III. Management Aspect

• What is the form of ownership of the Company? Partnership • Present the Organizational Chart of the Company

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindu raresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025



- Present the total manpower requirement of the company

Table 11: Summary of employees

Position	Number of Employees
Marketing Manager	1
Cashier/Saleslady	1
Ice Cream Maker	1
Delivery Driver	1
TOTAL	4

- Present the functions and qualifications or all employees.

Table 12: Function and Qualification of All Personnel

Personnel	Functions/Responsibilities	Basic Qualifications

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

1. Marketing Manager	Responsible in market research, understand the trends and customer preferences, create marketing strategy and budgets, oversee the creation of marketing materials and content, and perform all other relevant tasks essential for increasing the business's sales.	A bachelor's degree in marketing, business, advertising or another related field. Master in Business Administration or Business Management is preferred. Trainings related to marketing.
2. Ice Cream Maker	Responsible for meeting quality standards and deadlines for products. Check stock levels and report deficiencies in products or raw materials. Keep the worksite clean to avoid hazards from chemicals and fragile products.	Bachelor's degree in Food Service and Management or related fields. Trainings in related field.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

3. Cashier/ Saleslady	Collect payments whether in cash or credit. Records all daily sales. Provide information regarding prices and aftersales services and ways in which the customers can be obtained. Assist customers in making decisions regarding suitable purchases based on their specific likes. Lead customers through the payment process by assisting to the cashier with discount information and markdowns. Other duties include keeping track of inventory. Oversee the cleanliness of the marketing office.	A bachelor's degree in Accountancy or related field. Trainings in related field.

4. Delivery Driver	Deliver the product to different addresses and through different routes. Follow routes and time schedule. Load, unload, prepare, inspect and operate a delivery vehicle. Complete logs and reports. Follow DOTr regulations and safety standards.	A bachelor's degree in business administration or related field. Must have professional driver's license.

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindduraresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

• *What are the employee benefits to be provided? PhilHealth, SSS, 13th Month pay, (Bonus – this will depend on the availability of budget)*

• What are the basic employee policies?

1. Operating hours will be from 9:00 a.m. to 6:00 p.m.
2. Leave of absence should be filed three days before the planned absence. However, in the event of unexpected absence/s employee should notify the immediate supervisor the reason for absence within the day.
3. Any employee should not leave the workplace except when upper management instructed him/her to do so or a specific duty requires it.
4. Salaries and wages will be given every 15th and 30th day of the month.
5. No work no pay.
6. Every employee will be paid based on the fixed rate/amount for specific position given by the administration.
7. All employees should diligently perform duties assigned to them and meet the working standard requirements.
8. Employees should wear proper uniform.
9. Employee who destroys/ loses any of the item or equipment his/her salary will be deducted or pay for the amount damaged/loss.
10. An employee shall be considered habitually tardy if he incurs tardiness, regardless of the number of minutes, 10 times a month for at least two months in a semester or at least 2 consecutive months during the year.

IV. Financial Feasibility

A. Present the major assumptions that will have financial implications

1. Company policies:

• Will you sell on credit? Yes o If yes, what are the credit terms? The company will extend credit to customers if they meet its threshold criteria for the granting of credit. The basic form of credit is a maximum credit of P10,000, with no security interest. The maximum credit can be expanded with the approval of the manager. In situations where a customer's ability to repay is in question, a personal, corporate, or bank guarantee may be required. All terms are net 30 days, with no exceptions if a longer payment term is requested.

• Will you provide for product warranty? Yes
• Will you allow sales returns and sales allowances? Yes

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

2. Product/Service pricing

- Is the price of your product appropriate? Yes

3. Funding requirements

a. Fixed Capital o This is the fund required to acquire all the fixed assets and their installation costs, if any.

b. Working Capital o This is the fund to acquire initial raw materials and supplies which will later be replenished by the cash flow from operations

c. Other Pre-Operating expenses o This is the other expenses necessary in readying the business for operations such as regulatory expenses (business permits, licenses, clearances, etc.), recruitment and training of staff, etc.

- How much is the total funding requirement for the proposed technology? P3,651,200.00 o Will the company avail of loans? No

4. Future Projection Considerations

a. What is the possible increase in demand (or sales) in the next 5 years? 5% increase every year

b. What are the possible increase in expenses in the next 5 years? Raw materials, salaries, business permits and licenses

c. Will the company expand operations or acquire additional fixed assets in the next 5 years? Yes

d. Will the company offer new products/services or variants in the next 5 years? Yes

e. Will the company hire more employees in the next 5 years? Yes

5. Accounting Policies. What are the policies to account for the major accounts? E.g. Computation of Depreciation: Estimated useful lives, salvage value, depreciation method. The company should follow the policies in terms of computation of depreciation and useful lives of equipment.

Table 13: Projected Income Statement

GLOBAL JOURNAL OF BUSINESS, INNOVATION AND ENTREPRENEURSHIP (GJBIE)
https://mindumaresearch.com/

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

APAYAO STATE COLLEGE
MAKA Veggie Ice Cream
Projected Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5
Gross Sales/Revenue	3,168,000.00	3,326,400.00	3,492,720.00	3,667,356.00	3,850,723.80
Less: Sales Returns and Allowanc	31,680.00	33,264.00	34,927.20	36,673.56	38,507.24
Cost of Sales	1,446,244.80	1,518,557.04	1,594,484.89	1,674,209.14	1,757,919.59
Net Sales / Revenue	1,690,075.20	1,774,578.96	1,863,307.91	1,956,473.30	2,054,296.97
Other Income	-	-	-	-	-
Total Income	1,690,075.20	1,774,578.96	1,863,307.91	1,956,473.30	2,054,296.97
Less: Operating Expenses					
Salaries	646,800.00	679,140.00	713,097.00	748,751.85	786,189.44
Employee Benefits	99,360.00	104,328.00	109,544.40	115,021.62	120,772.70
Rent	60,000.00	63,000.00	66,150.00	69,457.50	72,930.38
Electricity	96,000.00	100,800.00	105,840.00	111,132.00	116,688.60
Water	24,000.00	25,200.00	26,460.00	27,783.00	29,172.15
Repair and Maintenance	60,000.00	63,000.00	66,150.00	69,457.50	72,930.38
Supplies	24,000.00	25,200.00	26,460.00	27,783.00	29,172.15
Logistics and Delivery	192,000.00	201,600.00	211,680.00	222,264.00	233,377.20
Telecommunications	6,000.00	6,300.00	6,615.00	6,945.75	7,293.04
Representation	12,000.00	12,600.00	13,230.00	13,891.50	14,586.08
Taxes, Licenses and Permits	25,000.00	26,250.00	27,562.50	28,940.63	30,387.66
Marketing	24,000.00	25,200.00	26,460.00	27,783.00	29,172.15
Other Expenses	12,000.00	12,600.00	13,230.00	13,891.50	14,586.08
Depreciation (Administrative)	196,000.00	205,800.00	216,090.00	226,894.50	238,239.23
Total Operating Expenses	1,477,160.00	1,551,018.00	1,628,568.90	1,709,997.35	1,795,497.21
Net Income	**212,915.20**	**223,560.96**	**234,739.01**	**246,475.96**	**258,799.76**

CONCLUSION AND RECOMMENDATIONS

This section presents conclusions and recommendations in the following:

For socio-economic aspect people loved ice cream but some people can't eat ice cream because of health reasons. With this, the researcher came out with an idea to innovate ice cream to make it healthy and suitable in all ages. It will assist in solving unemployment within the locality where the business is located. It will provide additional income to the people and help alleviating their standard of living in the community. The influence of buying habits of the customers may contribute to the good performance of the company since consumers have their other choices of ice cream and it should always be available in the market.

Submission: August 15, 2025 Accepted: September 30, 2015 Publication: October 30, 2025

The commercialization of the technology benefits the environment. First, social environment in solving unemployment within the locality where the business is located. It will provide additional income to the people and help alleviating their standard of living in the community. Second, in economic environment the influence of buying habits of the customers that may contribute to the good performance of the company since consumers have their other choices of ice cream and it should always be available in the market. Third, technological environment, the uses of local raw materials to produce malunggay and kalabasa ice cream will definitely benefit the community in terms of production. Fourth, physical environment have a substantial impact on the way customers feel towards the company. The area facilities should be clean and well-decorated. It can help the customers assure of quality of the product and build trust in the company. And fifth, political-legal environment the benefits that the government may derive from the amount of tax that will be generated from the commercialization of the technology.

After considering all the areas of the Feasibility Study, the proposed business venture in the commercialization of MAKA Veggie Ice Cream is feasible. The raw materials are always available in the province and the product is healthy since the main ingredients are made from malunggay and kalabasa.

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