

A Case Study: Critical Issues and Financial Constraints of Moringa Processing Operation

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Abstract:

Moringa oleifera, commonly known as malunggay, is a high nutritional and medicinal value. With these, the market for moringa ingredients in global market is increasing because of the change of lifestyle – back to basic / healthy living. The moringa leaves is highly perishable to maintain the quality. In this study the results shows that several processing techniques for the dried moringa leaves. The major issues for the moringa processing are its high costs of investment with a total equipment of Php 1,398,355.00 and labor intensive particularly to destemming procedure – 5 kg per hour. The lack of moringa plantation is one of the constraints for the establishment of the processing as this will hamper the operation. As a results, a small-scale processing facility may be established for lower costs of investment.

Keywords: Moringa, Processing Operation, Investment cost, Critical Issue, Drying

INTRODUCTION

Moringa oleifera, commonly known as malunggay, is a multi-purpose tree. This is a plant with high nutritional and medicinal value. This plant contains over 90 nutritional chemical compounds. With these nutritional compounds, Moringa is said to provide 7 times more vitamin C than oranges, 10 times more vitamin A than carrots, 17 times more calcium than milk, 9 times more protein than yoghurt, 15 times more potassium than bananas and 25 times more iron than [3].

A projected increase of Moringa ingredients in the global market accounting to about Php 561M or equivalent to US\$10.2M by 2027 [2]. This is due to the rising health concerns caused by lifestyle and evolution, there has been a high demand for organic herbal plants and root crops. People are now opting for a healthy lifestyle and organic way of eating and medicine. But since there was a low supply, the raw materials for food supplements and products are being imported from other countries by the manufacturers.

Consequently, demand of high quality moringa ingredients with a quality in which retain its nutritive value. Among the different processing stages, the drying technique are the critical factors that will affect the nutritional qualities of moringa leaves [4]. As moringa leaves are highly perishable and they require processing treatment to prevent post-harvest losses and maintain its nutritional value. This study aimed to identify the critical issues in the processing of moringa and the financial constraint in investment of the processing.

OBJECTIVE OF THE STUDY

General objective of the study is to identify the critical issues in processing of moringa processing.

1. To identify the critical issues in the processing facility
2. To identify the financial constraints in investing to the moringa processing.

A. CRITICAL ISSUES IN PROCESSING OF MORINGA POWDER

A.1 Different Scenario of processing flow for Moringa Powder

In Figure 2 shows several different flow of processing for moringa dried powdered [6]. The moringa leaves were harvested early in the morning and delivered from plantation to processing area. The fresh moringa leaves were initial wash using the stainless basin. Then, removal of leaves from the stem is called destemming. The leaves were washing in secondary washing to remove foreign materials such as dirt and dust. Then, leaves were under go to process of spin drying for the removal of excess water. The air drying on the otherhand requires no energy such as electricity or fuel. The leaves are air dried for 12 hours to remove the excess water. The mechanical drying requires electricity and LPG fuel [6]. The processing used in the study were spin dryer then mechanical drying. The dried leaves were removes when the texture was crispy. Cooling time for 1-2hrs before pulverizing and packaging.

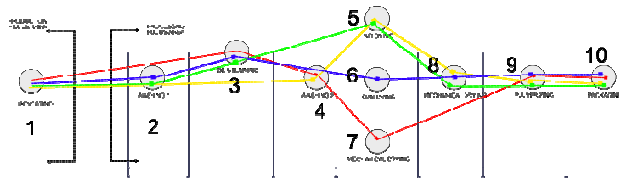


Figure 1. Several scenario of processing from fresh moringa leaves to packaging [Modified Adopted to Chorage C. et. al. (2018)]

A.2 Labor Intensive

In Figure2 shows the manpower rate requirement for each processing from fresh moringa leaves to dried moringa leaves. Based on the data, it shows that the destemming or the separation of leaves from the stem requires the most intensive among the moringa processing with a mean value of 5 kg/hr. With the destemming as labor intensive, there are opportunity for local nearby labor work force for employment as hired personnel during bulk operation.

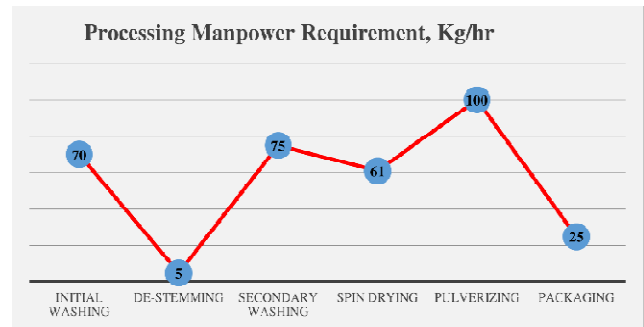


Fig. 2. Rate of processing manpower requirement

A.3 Equipment

In Table 1 shows the lists of the equipment that were used to process the moringa leaves. The following equipment were provided by partner government agency and through the university research fund. Among these lists, the mechanical drier, vegetable washer and pulverizing equipment were highest investment costs amounting to Php 550,000.00 ,Php 453,600.00 , Php 312,805.00 , respectively. With these three (3) equipment total amount 94% of the investment cost of equivalent to Php 1.316 M. Nonetheless, several equipment such as moisture meter, laboratory analysis, and water treatment system to further improve the processing of moringa.

TABLE I
LISTS OF PROCESSING EQUIPMENT

No.	Equipment	Investment Costs
1	Stainless Basin	Php 25,600.00
2	Multi-purpose vegetable washer	Php 453,600.00
3	Spin Drying	Php 5,350.00
4	Mechanical Cabinet Dryer	Php 550,000.00
5	Pulverizer Equipment	Php 312,805.00
6	Foot sealer	Php 25,000.00
7	Weighing Scale	Php 26,000.00
	Total	Php 1,398,355.00

B. FINANCIAL CONSTRAINTS IN INVESTING IN MORINGA PROCESSING FACILITY

B.1 High Investment Costs

The initial investment for the equipment to produced dried moringa leaves were Php 1,398,355.00. The processing equipment were only be acquired because of the government support. Hence, a model for small scale processing such that local farmers enterprise is recommended for further study to lower equipment specification and lower investment costs.

B.2 High Labor Requirement

In Figure 2 shows the rate of manpower requirement as destemming is the labor intensive among its process. The benefits for hiring labor to this operation is one of its advantages to the community. However, because of this, the operation costs will be high because of labor intensive. model for small scale such that local farmers. There will be also cases that lack of manpower whenever peak season of farm worker may experience.

B.3 Lack of Fresh Moringa Leaves as Raw Materials to Processed as Moringa Powder

According to the MAO – Gabaldon Municipal Agricultural Office, local farmers do not plant moringa in large scale. The farmers plant only in their backyard. This indicates that there will be limited supply of raw materials for the processing of dried moringa powder. However, the NEUST Gabaldon Campushave already started its 3,000 trees moringa plantation. With its research and extension function. There will be opportunity for promotion of moringa farming in the local nearby community.

CONCLUSION

Moringa oleifera commonly known as malunggay is a high nutritional and medicinal value. With these, the market for moringa ingredients in global

market is increasing because of the change of lifestyle – back to basic / healthy living. The moringa leaves is highly perishable to maintain the quality several processing method techniques were established.

In this study the results shows that several processing techniques for the dried moringa leaves. The major issues for the moringa processing are its high costs of investment and labor intensive particularly to destemming procedure. Also, a constant source of supply for raw materials – fresh leaves is highly essential for the processing of moringa leaves. Moreover, a business model for small scale or house hold scale equipment can be further study to have lower costs.

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REFERENCES

- [1] Chorage C. et. al. (2018) Processing of Moringa Oleifera Leaves to Develop Powder for Consumption: A Review. International Journal of Science and Research (IJSR) ISSN: 2319-7064 ResearchGate Impact Factor (2018): 0.28 | SJIF (2019): 7.583 retrieved on September 30, 2022 at <https://www.ijsr.net/archive/v9i5/SR20507123148.pdf>
- [2] Data Birdge. Retrieved on September 30, 2022 at <https://www.databridgemarketresearch.com/reports/global-moringa-ingredients-market>
- [3] Gopalkrishnan, et. al. (2016). Moringa oleifera: A review on Nutritive Importance and its Medicinal Application. Food Science and Human Wellness. Volume 5, Issue 2, June 2016, Page 49-56. <https://doi.org/10.1016/j.fshw.2016.04.001>
- [4] Gragasin, M. B. et. al (2019). Quality of Dehydrated Moringa Oleifera Leaves Using Cabinet Dryer. Asian Journal of Postharvest and Mechanization. Vol 2. No. 2 2019. ISSN:2546-1346
- [5] MAO. 2022. Gabaldon Municipal Agriculture. Interview.
- [6] Medina, M. R.(2022). System Process Documentation of Processed Moringa Leaves as Affected by Different Drying Parameters in Nutritional Quality of Processed Malunggay leaves. Unpublished
- [7] Medina, M. R., Morales, R.Z. (2020). Agricultural Input, Research, Development and Processing Facility for Herbal Plants. Unpublished.