

Development and Processing of Instant Mango Pulihora Mix and Its Shelf Life Studies

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ABSTRACT

Formulation of instant Raw Mango Pulihora Mix with incorporation of dried raw mango powder. On various trails of instant raw mango pulihora mix to make convenient pre mix which is easy to prepare instantly, and rich in Vitamin C (Ascorbic acid) .Since Mango (*Mangifera indica*) is one of the most seasonal fruit of tropical and subtropical countries .By drying mango into fined powder form it can be used throughout the year and asses the physio chemical properties for the product. In the present studies has been conducted on three various trails changing the ratios of the ingredients. Based on the sensory evaluation and nutritive value trail 2 is the best suitable product in the various aspects such as sensory, nutritive value, cost analysis and shelf life studies.

Keywords: Sensory, Nutritive values, Cost analysis, Shelf Life studies.

I. INTRODUCTION

The mango fruit (*Mangifera indica*) is one of the most important seasonal fruits of tropical and subtropical countries. Since industrial capacities for the processing of highly perishable mangoes into storable products are limited due to seasonal over-production of the fruits, drying of excess and partially defected mangoes is a promising preservation technique, meeting the processing requirements of small- and medium-size producers.

Raw mango (*Mangifera indica*) is known as King of fruit and Pride of garden and choicest fruit of Hindustan, its posse's good amount of citric acid and malic acids along with other nutrients. Raw green mangoes are mainly use in the processing of pickles, chutneys, and dehydrated powders .Dehydration of raw mangoes is carried out in India households or at cottage scale and in some traditional practices by

mixing with salt add turmeric. The dehydrated mango powder is known as amchur and is categorized under spices for various reasons such as its applications in spice mixes for various snack /chat foods ,and is generally used as an acidulated in place of tamarind in the Northern America.

Mango (*Mangifera indica*) fruits contain about 85-g water/100-g solids and are highly perishable. Dehydration to low moisture content can extend the shelf life. Conventional drying methods are normally time and energy consuming and hence most often uneconomical. Cabinet and Solar drying has been suggested by many researchers as a pre-treatment for reducing the high water content of fresh fruits and vegetables before further processing

II. MATERIALS AND METHODS

In the present study standardization and development of Instant raw mango pulihora mix i.e. raw mango and other ingredients were collected aseptically from local super markets and analyzed for physio-chemical and sensory parameters. The entire methodology adopted for the current study is presented as follows:

1. Research design
2. Market survey
3. Consumer survey
4. Selection of raw mangoes and various ingredients
5. Physicochemical analysis
6. Sensory analysis
7. Cost analysis

III. EXPERIMENTAL PROCEDURE

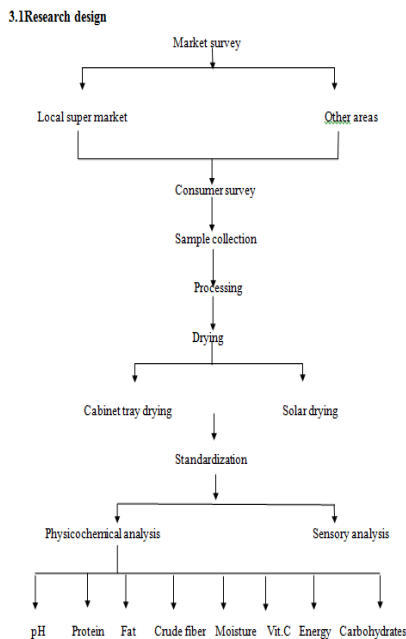


Figure 1: Experimental Research design

3.3 MANGO POWDER PROCESSING FLOW CHART

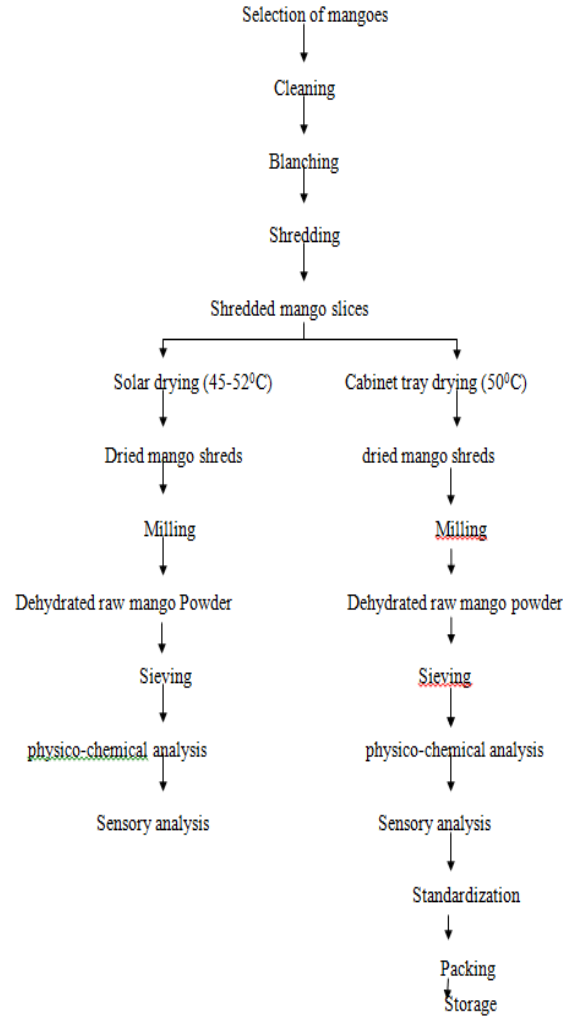


Figure 2

IV. STANDARDIZATION OF PRODUCT

Standardization of Ingredients (Table-1)

Various trails were carried out to standardize the product. Based on the subjective evaluation, the trail that scored the maximum for all the sensory attributes and overall acceptability was selected as the best standard sample and was chosen for product development further

Table 1

S.No	Ingredients	Trail I	Trail II	Trail III
1	Mango powder	35	40	45

2	Salt	10	6.5	7
3	Turmeric	1.8	2	3.5
4	Red chilli powder	3	5	5
5	Black gram	3	10	8
6	Red chillies	10	5	4
7	Ground nuts	10	7	6
8	Mustard	5	5	3
9	Cumin	04	5	4
10	Bengal gram	9	5	6
11	Dried curry leaves	3	3	3
12	Asafoetida	0.2	0.5	.3
13	Sugar	5	6	5
	TOTAL	100	100	100

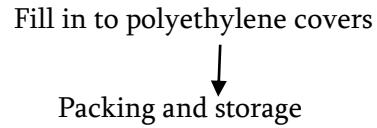
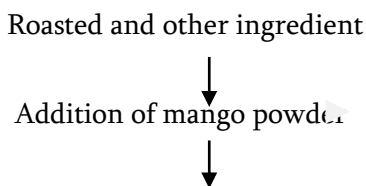
Procedure

The ingredients (Mango Powder) were weighed according to the quantities given in table. Salt, turmeric, sugar, asafoetida, red chilli powder, roasted chick pea, ground nut, mustard, DE husked Bengal gram, curry leaves was added to the mango powder. The above mixture was blended for uniform distribution of particles. The Above trails prepared instant phulihora mix was carried for sensory evaluation & Nutritive Value

Processing of instant mango pulihora mix

The roasted ingredients and other ingredients were added to the mango powder and mixed thoroughly, filled in to Polyethylene covers and sealed the covers by using laboratory scale sealer

Preparation of instant mango pulihora mix flow chart



V. RESULTS AND DISCUSSION

The major aim of the present study was development of Instant mango pulihora mix which is rich in vitamin-C and fiber content. The results which was obtained is presented under the following sub heads

- 5.1 Standardization of product
- 5.2 Sensory Evaluation of product
 - 5.2.1 Sensory score of the instant raw mango pulihora mix
- 5.3 Nutritive values of Instant raw mango pulihora mix
- 5.4 Packaging

ORGANOLEPTIC EVALUATION OF VARIOUS TRAILS ON INSTANT MANGO PULIHORA MIXES (Figure-3)

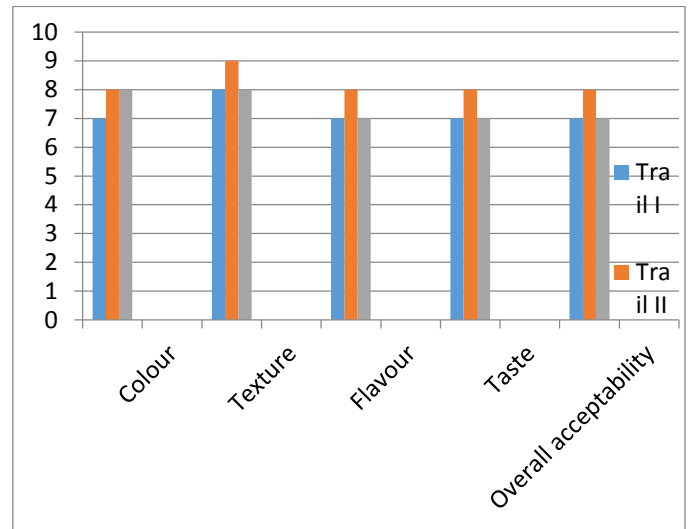
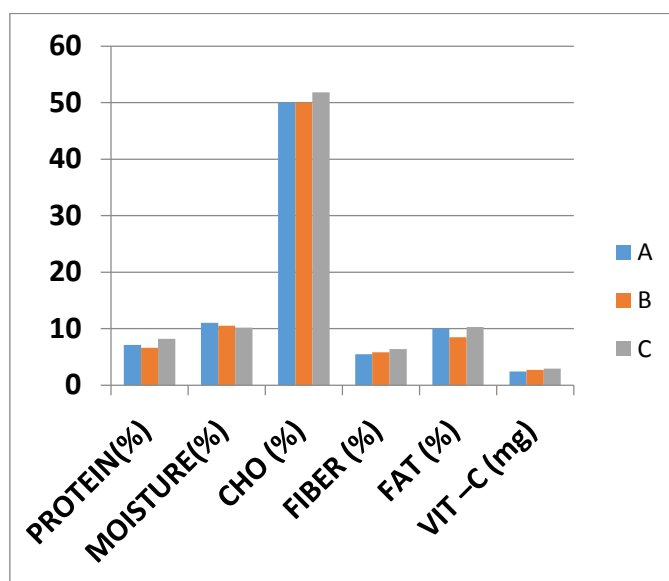


Figure 3

Table 2

Parameters	TRAIL I	TRAILII	TRAIL III
Energy Kcal	318.4	322.5	332.7
Moisture %	11	10.5	10.2
Protein %	6.4	6.6	6.8
CHO mg	48	50	52
pH	4.3	4.6	4.8
Fibre %	5.5	5.8	6.1
Fat %	8.3	8.5	8.7
Vitamin-C mg	2.4	2.7	2.9



Nutritive value calculation (Table-2 , Figure-3)

Figure 3

Shelf life Studies –Trail II (Table-3)

Table 3

Parameters	Control	Day 0	Day 30	Day 60	Day 90
Moisture %	8.50	10.5	10.68	10.72	10.88
Protein %	13.27	6.6	6.57	6.58	6.6
CHO mg	45	50	50	51	51
pH	4.3	4.6	4.5	4.6	4.5
Fibre %	5.4	5.8	5.6	5.7	5.7
Fat %	18.21	8.5	8.4	8.5	8.4
Vitamin-C mg	NA	2.7	2.5	2.6	2.5

COST ANALYSIS (Table-4)

Table 4

S.No	Ingredients	%	Cost Per Kg	1kg per Product
1	Mango Powder	40.00	300.00	120.00
2	Salt	6.50	9.00	0.59
3	Turmeric	2.00	98.00	1.96
4	Red chilli	5.00	90.00	4.50
5	Black gram	10.00	75.00	7.50
6	Mustard	5.00	40.00	2.00
7	Cumin	5.00	140.00	7.00
8	Bengal gram	5.00	75.00	3.75
9	Asafoetida	0.50	150.00	0.75
10	Curry leaves	3.00	120.00	3.60

11	Sugar	6.00	34.00	2.04
12	Chilli powder	5.00	110.00	5.50
13	Ground nut	7.00	100.00	7.00
				166.19

VI. CONCLUSION

IMPM was acceptable for nearly six months.

Rich in protein, fiber & Vitamin-C.

It can be stored at room temperature by using polyethylene as packaging material.

Mix not only contains mango powder, also contains other ingredients which have health benefits.

TRAIL II has good nutritional composition than TRAIL I and TRAIL III.

VII. REFERENCES

- [1]. Abonyi, B. I. (2000). Evaluation of Refractance Window drying method for fruits and vegetables-MS Thesis. Pullman: Washington State University
- [2]. Akhtar, S., S. Mahmood, S. Naz, M. Nasir and M.T. Sultan. 2009. Sensory evaluation of mangoes
- [3]. Akinpelu, D.A. 2001. Antimicrobial activity of *Anacardium occidentale* Bark. 72: 286
- [4]. American Public Health Association, Washington, DC
- [5]. Amin, M., U.M. Aman, M.S. Mazhar, U.D. Islam, M.S. Khalid and A. Saeed. 2008. Mango fruit
- [6]. Anonymous. 1992. Compendium of Methods for the Microbiological Examination of Foods.
- [7]. Compendium on postharvest operations. Rome' FAO (INPhO).(Chap. 20, sec. 2.8, <http://www.fao.org/inpho/compend/allintro.htm>).
- [8]. Dey ,A.,& Mukerjee,R.(1999). Fractional factorial plans.
- [9]. De la Cruz Medina, J., & Garcia, H. S. (2003). Mango: Post-harvest operations. In D. Mejia, & B. Lewis (Eds.),
- [10]. Evans, E. A. (2008). Recent Trends in World and U.S. Mango Production Trade, and Consumption. University of Florida. Gainesville, Florida: Food and Resource Economics Department. Evans, E. A. (2008). Recent Trends in World and U.S. Mango Production Trade, and Consumption. University of Florida. Gainesville, Florida: Food and Resource Economics Department.
- [11]. FAO (2002) Mango – Post Harvest Operations, INPhO post harvest compendium, Food and Agricultural Organizations of United States, 54-55.
- [12]. Chavasit, V., Pisaphab, R., Sungpuag, P., Jittinandana, S., & Wasantwisut. desapping in relation to time of harvesting. Pakistan Journal of Botany, 40(4): 1587-1593.
- [13]. .Dahade RS & Khedkar DM , Dehydrated raw mangoes for preparation of amchur powder , Indian Food Packers, 34(3) (1980) 43-49
- [14]. Kaushik V and Nath N (1992). Effect of cooking procedure and variety on acceptability of unripe
- [15]. Maneepun S and Yuchalad M (2004). Developing processed mango products for international markets. Acta Horticulture, 64(5): 93-105. Mango beverage. Journal of Food Science and Technology, 29(2): 127-129.
- [16]. Mehta GL & Tomar Mc. Dehydrated and utilized of raw mangoes, Indian Food packer 36(6) (1982) 75.
- [17]. New S Market Opportunities for Mango Growers, Kenya Horticultural Development Program 2004 – 2010, Sponsored by USAID, February 2010. Available on-line

- through, [www.kilimo.go.ke/kilimo_docs/mango_conference/market.41\(6\):2821-2829](http://www.kilimo.go.ke/kilimo_docs/mango_conference/market.41(6):2821-2829).
- [18]. Nanjundaswamy AM, Shetty GR and Saroja S (1976). Studies on the production of newer products from mango. *Indian Food Packer*, 30(5): 95-108.
- [19]. Nigam S, Bhatt DK and Jha A (2007). Different product of mango: the king of fruits. *Processed Food Industry*, 10 (9): 32-40.
- [20]. Ponting J.D., Walter, G.G., Forrey, R.R., Jackson, W.L., 1966. Osmotic dehydration of fruits. *Food Technol.* 20, 125-128.
- [21]. Robertson and JR Lupien (Eds) *Using Food Science and Technology to Improve Nutrition and Promote National Development*, International Union of Food Science and Technology, 2008; 6: (on-line publication).
- [22]. www.iufost.org/publications/books/documents/Mercer_1.pdf. Website accessed November 27, 2012.
- [23]. Siddappa GS and Ranganna S (1961). Strained Baby Foods – Part II-Drying of strained Mango pulp and Mango Custard. *Food Science*, 10(2): 37-38.
- [24]. Subbiah K (M.Sc. Horti. thesis). (1961). Indian agricultural research institute. New Delhi, India
- [25]. Usha K and Anand JC (1981). Quality aspects of commercial raw mango powder (amchur). *Journal of Food Science and Technology*, 18(5): 208-210.
- [26]. AOAC. (1998). *Official methods of analysis*. Washington, DC, USA: Association of Official Analytical Chemists.
- [27]. ASAE (2001). Moisture relationships of plant-based agricultural products. ASAE Standard D245.5 Dec. 01.
- [28]. Brett, A., Cox, D. R. S., Trim, D. S., Simmons, R., & Anstee, G. (1996). Practical aspects of processing. In G. Anstee (Ed.), *Producing solar dried fruit and vegetables for micro- and small-scale rural enterprise development* (pp. 1 – 30). Kent' NRI Publications.
- [29]. Britnell PM (1991). The development of structured mango products. *Acta Horticulturae*, 291: 554-562.