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S. Mathangi Sudarsan
M.Phil. Research Scholar,
Department of Home Science,
Mother Teresa Women's
University, Kodaikanal, Tamil
Nadu, India

S. Geethanjali Santhanam
Assistant Professor,
Department of Home Science,
Mother Teresa Women's
University, Kodaikanal, Tamil
Nadu, India

Development, analysis and standardization of ready – to - cook horse gram idly mix powder

S. Mathangi Sudarsan and S. Geethanjali Santhanam

Abstract

Developments in Science and Technology have paved way for the sophisticated life of human beings. Physical work is totally reduced because of the new inventions. Due to this many are facing health issues at early age. Also, living a luxury life is possible if both husband and wife work together to meet the expenses. Hence less effort is taken to prepare healthy food at home. After facing the health consequences because of the living style, many of them started thinking of changing to a healthy diet. It is decided to identify a food which gives all necessary nutrients at least cost, easy to prepare and at least time. IDLY is one of the common food item consumed by Indians. An attempt is made in replacing the raw materials used in traditional IDLY. Horse gram which is considered to be the highly nutritive millet is used. Three different compositions are prepared and tested for its nutritive properties.

Keywords: Development, analysis, standardization of ready – to - cook horse, mix powder

1. Introduction

Horse gram is one of the inexpensive sources of protein, calcium and iron. Simple processing such as soaking and roasting of horse gram were done to reduce the anti-nutritional factors. This legume was commonly used by farmer community and low income group people due to its unacceptable taste and flavour in earlier days. But now, it can be consumed as whole, dehulled, splits, canned, boiled, roasted or ground into flour which occupied a very important place in human diet in many developing countries. Horse gram is not only having good nutritional profile but also occupies a prominent role both in traditional and modern medicine. It has the potential of controlling diabetes.

The horse gram legume is nutritionally superior when compared to other legumes. Rice and wheat are designated as nutritious cereals. Ready to cook idly mix was developed from horse gram legumes and rice flour along with black gram dhal flour and fenugreek flour. The term 'ready to cook' means wherein some of the ingredients are premixed. It is simple, convenient, easy and fast to prepare. Ready to cook horse gram idly mix food provide an easy and readily available homemade option. Horse gram idly mix is a convenient food item that is made with a fermented batter derived from rice or horse gram and black gram dhal. Idly is liked by all age groups, soft in texture therefore is suitable even for old people and children. However, as it is prepared by using rice, horse gram and black gram dhal it is essential to convert the ready to cook horse gram idly mix into nutritious idly with enhanced content of nutrients by value addition, so that, it can be used as nutritional supplement in addition, to the daily diet. The present study was carried out to develop nutritionally and evaluate horse gram legume based convenience mix under the following objectives.

The above information has promoted the investigator to draw out the specific objectives for the study. They are

1. To develop and standardize the ready to cook horse gram idly mix
2. To determine the acceptability of formulated the ready to cook horse gram idly mix
3. To analyze the nutrient content of the ready to cook horse gram idly mix
4. To analyze the storage stability of the ready to cook horse gram idly mix
5. To analyze the microbial content of the ready to cook horse gram idly mix

Correspondence

S. Mathangi Sudarsan
M.Phil. Research Scholar,
Department of Home Science,
Mother Teresa Women's
University, Kodaikanal, Tamil
Nadu, India

2. Materials and Methods

The selections of ingredients for the development of horse gram idly mix powder product were based on availability, nutrient content and their cost. The basic ingredients were selected from the entire basic group containing Rice (40gm), Horse gram (35gm), Black gram dal (25gm) as a base. The other ingredients included like salt (to taste) and fenugreek (2gm). Three different varieties of horse gram idly mix powder (Sample A, Sample B and Sample C) were prepared.

2.1 Preparation of Idly Mix

Processing of Horse gram powder

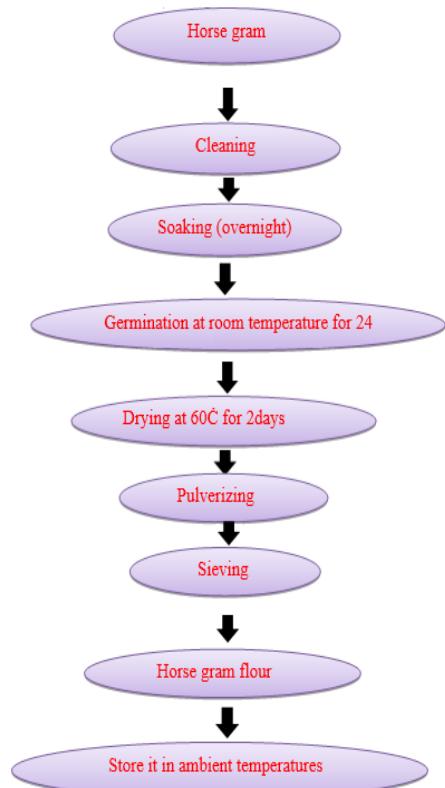


Fig 1

2.2 Preparation of Rice powder

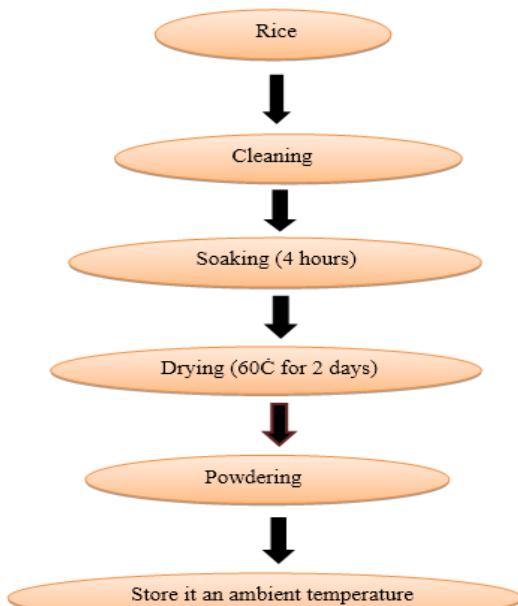


Fig 2

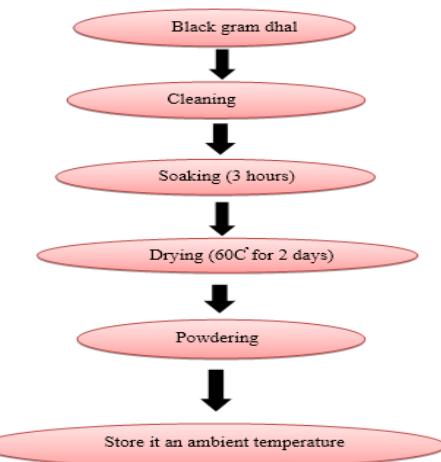


Fig 3

2.3 Standardization of Idly Mix

Table 1

Ingredients	Control	Sample A	Sample B	Sample C
Rice	75 G	50 G	40g	40g
Black Gram Dhal	25 G	25g	25g	25g
Horse Gram	---	20g	30g	35g
Fenugreek	2 G	2g	2g	2g
Salt	To Taste	To Taste	To Taste	To Taste

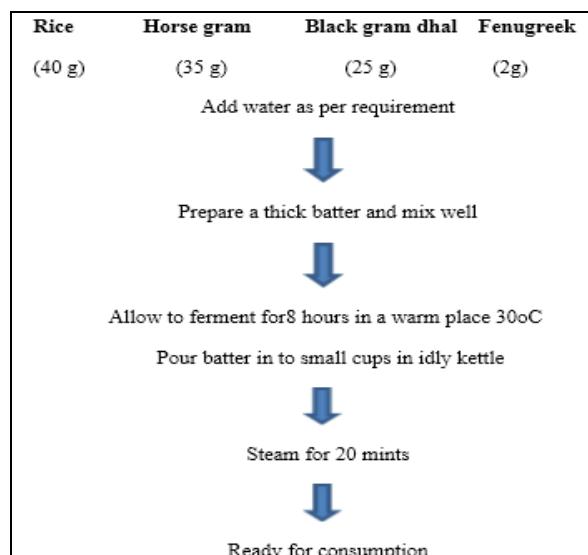


Fig 4

2.4 Organoleptic Evaluation

When the quality of a food product is assessed by means of human sensory organs, the evaluation is said to be sensory or subject or organoleptic. Sensory quality is a combination of different senses of perception coming into play in choosing and eating a food. Appearance, Flavour and mouth feel decide the acceptance of the food (Srilakshmi, 2012).The value added convenient product along control was given to panel members for organoleptic evaluation. Ten panel members, including the researcher, were used for assessing the acceptability of the value added, horse gram flour incorporated convenient product.

2.5 Microbial Analysis

Microbial count was carried out in Ready to cook horse gram idly mix at 15 days interval. The developed product was packed in high density polyethylene (p_1), aluminium foil (p_2) and plastic container (p_3) for a period of 30days. For this study, the proportion of flour are homogenized, serially diluted in appropriate dilutes, plated in a suitable agar agar medium, incubated at an appropriate temperature for a given time, after which all visible colours are counted by the use

of electronic counter (jay, 1996). The numbers of microbes are tested by SPC (Standard Plate Count) method. The agar agar is used for fungal counts. The incubation time for nutrient agar plate is 24 hours and that of plate is 24 hours.

3. Result and Discussion

Sensory Evaluation of Ready to Cook Horse Gram Idly Mix Powder

Table 2

Characteristics	Sample-A	Sample-B	Sample-C
Appearance	4.6 ± 0.54	4.4 ± 0.54	4.6 ± 0.54
Flavour	4.6 ± 0.54	4.8 ± 0.44	5 ± 0
Colour	4.6 ± 0.54	4.6 ± 0.54	5 ± 0
Texture	4.2 ± 0.44	4.6 ± 0.54	4.6 ± 0.54
Taste	4.4 ± 0.54	4.4 ± 0.54	5 ± 0

It is clear from the above table that the formulated product Sample-C gained a higher score than the other two formulations. Out of three formulations, Sample-C was scored as the best with the overall mean score of 5±0. Sample A and Sample B were scored the overall mean

acceptability score of 4.4 ± 0.54 and 4.4 ± 0.54 respectively. Hence, Sample C Ready to Cook Horse Gram Idly Mix was chosen for further storage studies.

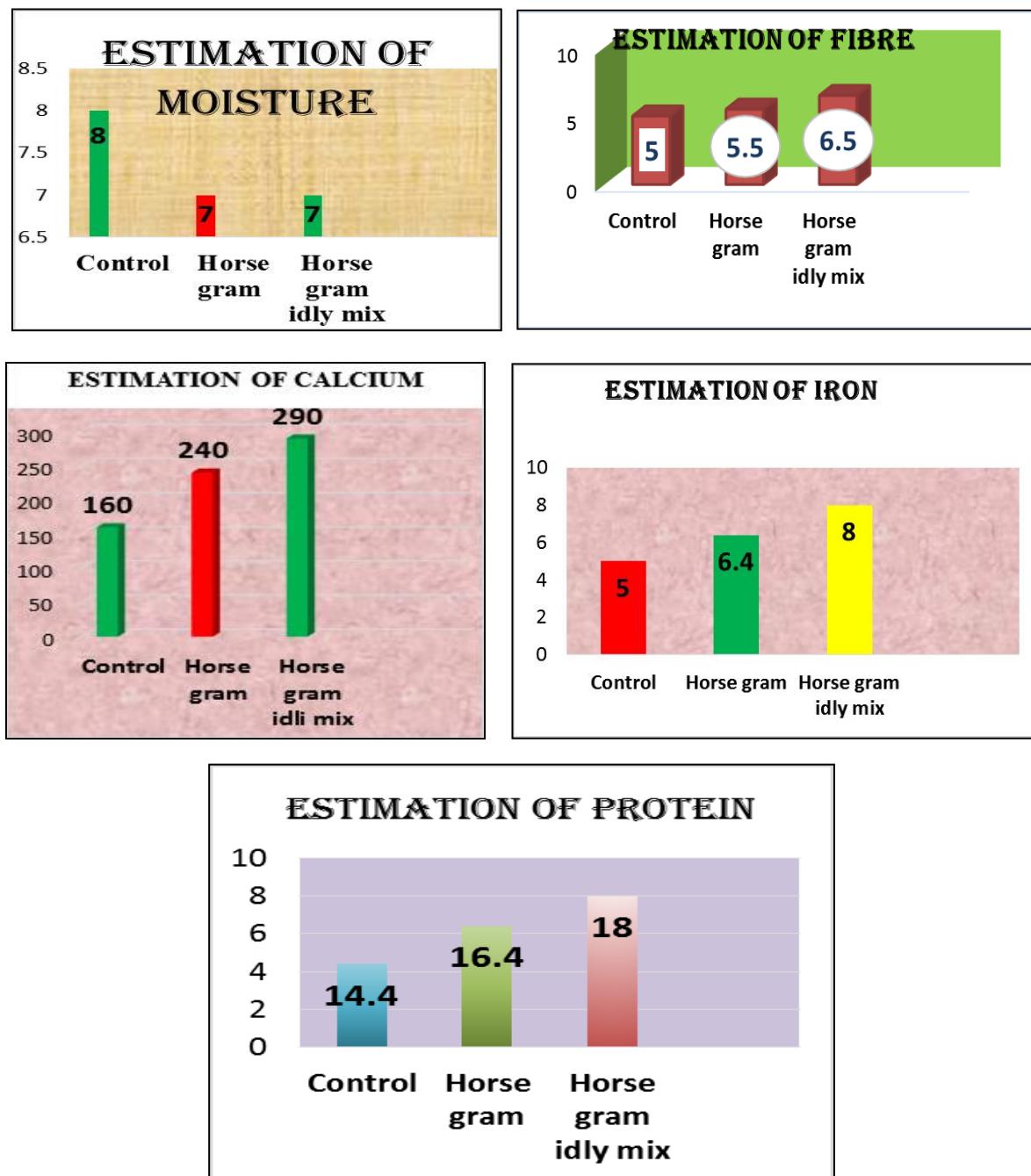


Fig 5: Nutrient Evaluation of the Horse Gram Incorporated Ready To Cook Idly Mix

3.1 Nutrient Evaluation of the Horse Gram Incorporated Ready to Cook Idly Mix

Table 3

Nutrient	Control	Horse Gram	Sample-C
Moisture	8 %	7%	7%
Ash	2 %	2.4 %	3.4%
Ascorbic acid	1 mg	1.2 mg	1.5mg
Protein	14.4 g	16.4g	18.0g
Carbohydrate	133.3 g	160 g	170.2g
Iron	5.0 mg	6.4 mg	8.0mg
Phosphorus	160 mg	290 mg	355mg
Calcium	160 mg	240 mg	290 mg
Fiber	5g	5.5g	6.5g
Antioxidant Activity	29.17 %	37.5 %	41.67%

The above table revealed that nutritive value of sample C scored higher than that of control

3.2 Estimation of antioxidant activity

Table 4

Sample	Value (%)
Control	29.17
Horse gram powder	37.5
Horse gram idly mix powder Sample C	41.67

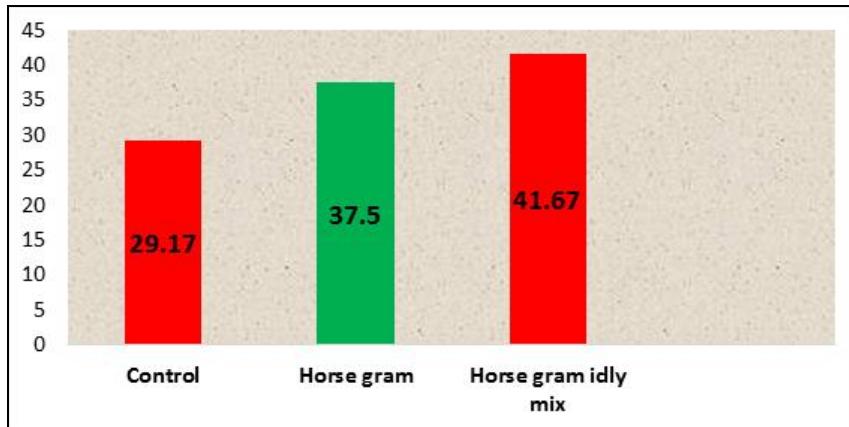


Fig 6: Estimation of antioxidant activity

3.3 Microbial analysis of ready to cook horse gram idly mix powder

The microorganisms commonly found are bacteria. The microbes present in the product were analyzed at 15 days and 30 days interval

storage period at room temperature. During the analysis, it was found out that the products had very low amount of microbes. So, it is safe for the consumption.

Table 4

S. No	Name of the sample	Microbes	Microbial load at room temperature								
			Storage Period (days)								
			Polyethylene			Aluminum foil			Plastic container		
1.	Control	Bacteria	TFTC	TFTC	TFTC	TFTC	TFTC	2×10^{-3}	TFTC	3×10^{-3}	6×10^{-3}
2.	Horse gram	Bacteria	TFTC	TFTC	TFTC	TFTC	TFTC	1×10^{-3}	TFTC	2×10^{-3}	4×10^{-3}
3.	Horse gram idly mix	Bacteria	TFTC	TFTC	TFTC	TFTC	TFTC	1×10^{-3}	TFTC	2×10^{-3}	7×10^{-3}

TFTC – Too few to count

4. Conclusion

Major objectives of the Study were to formulate ready to cook horse gram idly mix and Study the nutritive Component, Sensory Characteristics of the horse gram idly mix and the Shelf life of the horse gram idly mix. The result of this Study indicates that horse gram idly mix powder is rich in Protein, Calcium, Vitamin-C, Antioxidant and Phytochemicals.

Horse gram is rich source of protein, Fiber, calcium and Anti-Oxidant. The nutrient content such as Fiber, Calcium, Vitamin C, Iron, Phosphorus, were comparatively high when compared to control. The developed ready to cook horse gram idly mix was highly acceptable at 100 per cent incorporation level and stored in High

Density Polyethylene (P_1), aluminum foil (P_2) and plastic container (P_3) for a period of 30days. The shelf life of the horse gram idly mix was one month and microbial load was within the safer limit in all the packaging materials Thus horse gram –idly is palatable, nutritious and relatively inexpensive food. Horse Gram Idly Mix increased the protein content and it would not affect the acceptability of the product. Thus horse gram is a good substitute for convenience mix and product which enhances the nutritive value. Further studies are to be carried out for the control of diabetes by consuming horsegram IDLY.

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