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Research Paper

# Development And Analysis of Nutrients, Antioxidant In Muskmelon Seed Powder Incorporated Value Added Products

Science

KEYWORDS : Muskmelon, antioxidant, Organoleptic evaluation

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## ABSTRACT

*In the current study the value added products like cookies and biscuits were prepared by incorporating muskmelon seed flour, Pearl millet and little millet flour. The proximate composition of the various flours blend used for the preparation was using standard method. Organoleptic evaluation was conducted to evaluate the sensory characteristics which include appearance, color, taste, flavor, texture. The muskmelon seed flour incorporated value added products were analyzed for energy, carbohydrate, protein, fat, fiber, moisture, starch, vitamin A , iron and antioxidant which are naturally present in the muskmelon seed is beneficial for human health. For Organoleptic evaluation found that cookies and biscuits were prepared in 15% of the muskmelon seed was highly accepted. In nutrient analysis energy moisture, Vitamin A, iron, starch was found higher in formulated products. The storage life and microbial analysis also assessed by the standard microbiological method. Finally the present study muskmelon seed incorporated value added products were very nutritious, locally available and economically reasonable. We have to create awareness about the formulated value added products to the community.*

## Introduction

Muskmelon(*Cucumis melo)* is a eudicot diploid plant species of interest for its specific biological properties and for its economic importance. It is belonging to the *cucurbitaceae family.* The fruit has a yellow color. The muskmelon seed contain high percentage of lipid 30.6% and protein14.9, crude fiber 23.3%, ash 2.4% carbohydrate19.8%. Protein of the muskmelon seeds appears edible and supplementation with certain amino acids increases the nutritional value of the protein. The concentration of fatty acid varied from trace quantities about 64% linoleic acid, palmitic acid and stearic acid were the principal fatty acids contributing 4.9%, 86.% were saturated respectively of the total fatty acids. Seed proteins were rich in arginine, aspartic acid and glutamic acids while limiting amino acid were methionine and lysine. Muskmelon has a long history as a Chinese traditional medicine. According to the traditional uses, it was prepared rectal suppositories for treating abdominal distention and constipation. It showed dependent acceleration of gastric emptying and also promoting both small intestinal and large intestinal transit activity.

Pearl millet contains 88-91% dry matter, 1.6-2.4%ash, 2.6-4%crude fiber, 2.7 – 7.1% oil, 8.5-15.1% crude protein, 58-70% starch. The percentage of phytate to total phosphorus was found to range from 70-89% in an average of 77%. Digestibility of the essential aminoacids, arginine, threonine, valine, isoleucine, and lysine were higher in pearl millet.

Samai is minor millet consumed in the tribal community in India. It is a good source of energy, protein, phosphorus, iron, B vitamins and dietary fiber due to which it has conferred health benefits**.** Little millet is good source of protein (7.7g/100g), very rich in carbohydrate (67g/100g), fat (4.79g/100g), minerals and vitamins and should be considered as essential for nutritional security.

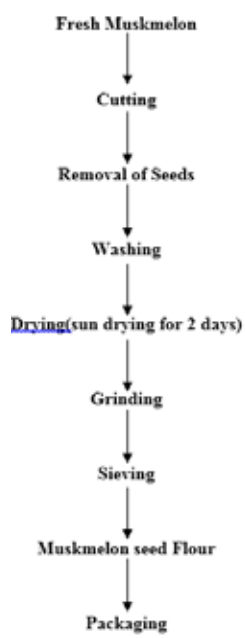
## Materials and Methods

### Materials

Fresh Muskmelon Seed Powder *(cucumis melo)*, Fresh refined wheat flour, Fresh Peral millet flour, Fresh Little millet flour, sugar, butter were obtained from the local market of Coimbatore.

### Processing methods

**Figure I: Flow Chart of Muskmelon Seed Flour Preparation**




### Experimental plan: Cookies

The experimental plan used for the present research is given in Table I, Figure I and II shows the flow chart for preparation of Muskmelon seed and Millet flour.

### Preparation of Muskmelon Seed flour

The muskmelon was cut and removes the seeds. These were cleaned in clean tap water, and placed in a tray and dried by sun drying for about 2 days. The dried Muskmelon seeds was powdered and sifted through a siever and stored in plastic containers with lid (Figure I)

### Preparation of Millet Flour

The millets such as pearl millet and little millet were used for

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making cookie and biscuits. Both the millets are purchased from the local market of Coimbatore. Clean the millets by removing all the waste materials such as dust and stones from it. After cleaning allow the millets to drying about 3 days. The dried millets were grounding into powder in mixie.

Figure III shows the flow chart for the preparation of cookies and Table I shows the different combination of Muskmelon Seed flour, millet Flour and refined wheat flour for the cookies preparation

**Figure II : Flow Chart for Millet Flour Preparation**


**Figure III: Flow Chart for the Preparation for Cookies**

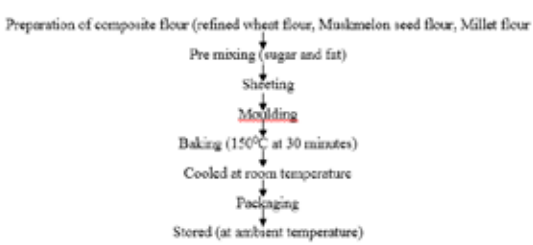


**Table I: Different Combinations of Muskmelon Seed flour, Millet flours, and refined wheat flour for cookies and biscuits**

| VARIATIONS | COOKIES | | | | BISCUITS | | | |
|---|---|---|---|---|---|---|---|---|
| | Wheat flour | Pearl millet flour | Little millet flour | Muskmelon seed flour | Wheat flour | Pearl millet flour | Little millet flour | Muskmelon seed flour |
| $V_0$ | 40 | 30 | 30 | - | 40 | 30 | 30 | - |
| $V_1$ | 30 | 30 | 30 | 10 | 30 | 30 | 30 | 10 |
| $V_2$ | 35 | 25 | 25 | 15 | 35 | 25 | 25 | 15 |
| $V_3$ | 40 | 20 | 20 | 20 | 40 | 20 | 20 | 20 |

**Experimental plan : (biscuit)**
The experimental plan used for the present research is given in Table I. Figure I and II shows the flow chart for the preparation of muskmelon seed and millet flours. Figure IV shows the flow chart for the preparation of biscuit. Table II shows the different combination of muskmelon seed flour, millet flour and refined wheat flour for biscuit preparation

**Result and discussion**
**Sensory evaluation**
Organoleptic evaluation of the incorporation of different variations of muskmelon seed flour value added products were evaluated and compared with control products which prepared from 100% refined wheat flour

The result indicates that the percentage score of cookies containing 15 % muskmelon seed, 25 % pearl millet flour, 25% little millet flour were found to be most acceptable. At 65% level of incorporation, all the attributes scored highest level namely appearance, color, texture, flavor, taste. The nutritional quality of the developed products was enhanced due to the addition of muskmelon seed flour. Furthermore the sensory evaluation table II depicts that highest amount of muskmelon seed flour can be incorporated at 15%, variation II got high score, the best regarding all sensory attributes in biscuits.

**Table II: Sensory Attributes of Value Added Products containing muskmelon seed flour**

| Value added products | Muskmelon seed flour | Sensory attributes | | | | |
|---|---|---|---|---|---|---|
| | | appearance | Colour | taste | flavour | texture |
| Cookies | Control | 4.21 ±0.694 | 4.0± 0.725 | 4.597± 0.786 | 4.052±0.759 | 4.052±0.759 |
| | $V_2$ 35:25:25:15 | 4.421±0.748 | 4.926± 0.595 | 4.978± 0.590 | 4.105±0.789 | 4.210±0.766 |
| biscuits | Control | 4.105±0.640 | 4.105± 0.640 | 4.210± 0.694 | 3.947±0.998 | 3.789±1.004 |
| | $V_2$ 35:25:25:15 | 4.526±0.595 | 4.526± 0.595 | 4.578± 0.590 | 4.105±0.787 | 4.210±0.766 |

Data indicated that the percent score of the cookies an biscuit 25% pearl millet flour, 25% little millet flour 15% muskmelon seed flour added were found to be more acceptable. So variation II was scored high than other samples.

**Physico – chemical composition of value added products containing muskmelon seed flour**
During the present investigation no significant different was found in the presence of moisture content, was observed on increasing the incorporation of muskmelon seed flour in the variation. This was because of present study the formulation was based on different percent of muskmelon seed flour, wheat flour and millet flours blend. Muskmelon seed has a lower moisture content but high starch and fiber content.

The moisture content of control and the sample cookies was between the ranged of 3.2 to 3.82 g/100. The energy and carbohydrate content of control and the sample cookies was between the ranged of 477.41 to 480.38 Kcal/ 100g and 64.1 to 65.67 g/10 .The vitamin A content of control and the sample cookies was between the range 98.66 to 104.9 µg/100 g . The iron content of control and the sample cookies was between the ranges. The iron content of the control and sample cookies was between the ranges of 15 to 15.97 ppm/100g. But the starch and fiber content of the control and

Sample cookies were between the range of 33 to 36.4 g/100g and 0.96 to 1. 4 g/100g. The fat content is ranged from 19.99 to 20.74.

The moisture content of control and the sample cookies was between the ranged of 3 to 3 g/100. The energy and carbohydrate content of control and the sample cookies was between the ranged of 442 to 450 g/100g an 60.6 to 64.62g/100g .The vitamin A content of control and the sample cookies was between the range 97.4 to 101.3µg/100 g. The iron content of control and the

sample cookies was between the ranges. The iron content of the control and sample cookies was between the ranges of 13.65 to 14.97 ppm/100g. But the starch and fiber content of the control and sample cookies was between the range of 1.4 to 1.88 g/100g and 33.7 to 34.2 g/100g. The fat content is ranged from 18.02 to 18.4 g/100g

The fiber and starch content of cookies and biscuit increases significantly, due to higher fiber content of muskmelon seed flour and millet flours.

**Table III: Nutrient Analysis of Formulated Products**

| SI NO | PARAMETERS | COOKIES | | BISCUITS | |
|---|---|---|---|---|---|
| 1 | | CONTROL | VARIATION | CONTROL | VARIATION |
| 2 | ENERGY(Kcal) | 477.41 | 480.38 | 442.9 | 450.66 |
| 3 | CARBOHYDRATE(g) | 64.1 | 65.67 | 60.6 | 64.62 |
| 4 | PROTEIN(g) | 5.89 | 7.76 | 6.4 | 7.0 |
| 5 | FAT (g) | 19.99 | 20.74 | 18.02 | 18.4 |
| 6 | MOISTURE (g) | 3.2 | 3.82 | 3.0 | 3.0 |
| 7 | FIBER (g) | 0.98 | 1.4 g | 1.4 | 1.88g |
| 8 | IRON (mg) | 15.00 | 15.97 | 13.65 | 14.97 |
| 9 | VITAMIN A (µg) | 98.66 | 104.9 | 97.4 | 101.3 |
| | STARCH (g) | 33.0 | 36.4 | 337 | 34.2 |

**Conclusion**

The study was undertaken to enhance the nutritional characteristics of value added products with the incorporation of muskmelon seed powder. The muskmelon seed was incorporated with the wheat flour at different level and selected for study of their acceptability. Energy, carbohydrate, protein, fat, moisture, starch, fiber, vitamin A. iron and antioxidant and sensory attributes like appearance, color, taste, flavor, and texture were analyzed by standard methods.

o Organoleptic evaluation of the incorporation of different variations of muskmelon seed flour value added products were evaluated and compared with control sample.

o The Organoleptic evaluation of cookies was found that V2 had highly mean score in acceptability,appearance(4.421±0.748) ,color(4.926±0.595),taste(4.578±0.590),flavor(4.105±0.789),texture (4.210±0.766)than V1 and V3.

o The Organoleptic evaluation of the biscuits found that the V2 had highly mean score acceptability appearance (4.526±0.595), color (4.526±0.595), taste (4.978±0.590), flavor (4.105±0.787),texture(4.210±0.766) than V1 and V3

o In the analysis the nutrient content of the control and the sample cookies was between ranged of (3.2 to 3.82 g/100g. the energy and carbohydrate content of control and experimental cookies was between the range of 477.41 to 480.38 Kcal/ 100g and 64.1 to 65.67 g/100g . the vitamin A content of control and experimental cookies was between the range of 98.66 to 104.9 µg/100 g .the iron content of the control and the sample cookie was between the range of 15 to 15.97 ppm/100g.but the starch and fiber content of the control and experimental cookies was between 33 to 36.4 g/100g and 0.96 to 1,4 g/100g.the entire test sample and maximum value for the muskmelon seed incorporated cookies when compared to the sample

o In the analysis of nutrients, the moisture content of control and the sample cookies was between the ranged of 3 to 3 g/100. The energy and carbohydrate content of control and the sample cookies was between the ranged of 442 to 450 g/100g and 60.6 to 64.62g/100g .The vitamin A content of control and the sample cookies were between the ranges 97.4 to 101.3µg/100 g. The iron content of control and the sample cookies was between the ranges. The iron content of the control and sample cookies was between the ranges of 13.65 to 14.97 ppm/100g. But the starch and fiber content of the control and sample cookies was between the range of 1.4 to 1.88 g/100g and 33.7 to 34.2 g/100g. The fat content is ranged from 18.02 to 18.4 g/100g

o The antioxidant content of the cookies and biscuit is ranges about 2.2 g and 2.5 g respectively.

o Cookies and biscuits are stable till 30 days of the storage

o The total cost of the cookies and biscuits estimated to Rs.15

o The microorganism totally tested is bacteria and fungi. The microbes present in the product were analyzed during the storage period at room temperature. After the analysis, it was found that the product had no microbes. So it is safe for human consumption In the recent years, the development and evaluation of functional foods to target populations has increased considerably among food scientists and technologists. Muskmelon is a one such fruit rich in nutrients and its seed is very rich in protein, fiber. In this study, value added products were incorporated in muskmelon seed flour at different levels. The mixed flour was studied for its development, nutritional and physical parameters. The result obtained could be very valuable in decision making for industries that want to take nutritional advantage of muskmelon seed as alternative or supplement to cereal flour. The seed flour could be useful in the manufacture of highly nutritious biscuits and cookies.

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