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ORGANOLEPTIC AND NUTRITIONAL ASSESSMENT OF HEALTHY COOKIES DEVELOPED USING PEANUT AND SOYBEAN FLOUR

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ABSTRACT

Different types of value added cookies were prepared by incorporate peanut and soybean flour at different levels (10-30%). The developed products were evaluated for sensory attributes by using nine point hedonic rating scale and nutritional composition of products was assessed by using standard method. The highest score for overall acceptability was obtained by 20 percent peanut and 30 percent soybean cookies. The developed peanut – soybean cookies was found to be highly nutritious in term of protein, calories and iron.

Keywords: *Peanut Soybean Cookies, Nutritional Composition, Protein, Sensory Evaluation.*

Introduction

Good nutrition is a basic requirement for optimum health. Health and nutrition are the most contributory factors for human development. Nutrition may be defined as the science of food and its directly related to the health. Along with the progress of science and technology, it become clear to human that the need of food is necessary for survival as well as for growth and development. all the nutritious elements found in food protein, fats, carbohydrates, minerals, vitamins help in the growth and development of human beings and give them strength. A human gets proper nutrition from the food is called good nutrition. It is necessary for energy, growth and development, boost immune system and mental efficiency. Good nutrition means maintaining a nutritional status that enables us to grow and enjoy good health (WHO 1988).

Children are the wealth of any nation as they constitute one of the important segment of the population. Adequate nutrition is essential for growth and development, poor nutrition is leading to death of the children so that good health and nourishment are important factor in the child's growth and development.

"Today's children are the future of tomorrow" children with good health in their life are key to the sustainable development of any country. India has the largest number of children in the world and most of the children are suffering from malnutrition. mostly young children are affected by serious form of malnutrition. It not only affected the physical development but also affected the mental, social and intellectual development of the children.

Children needs the right foods at the right time to growth and development to their full potential. unfortunately, sometimes it is difficult to make children eat healthy food. Due to unhealthy eating habits are found in children, their health affected and they become victims of malnutrition, which is one of the serious health problem of children at present era. Therefore, it is important that we choose such plant based food for children which are helpful to their growth and development. Some plant based food are rich in many nutrients such as protein, carbohydrates, fats and lipids, fibers, vitamins and minerals.

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In recent years many research has been devoted to the utilization of oilseed protein as an edible source of protein for human as well as animal consumption. Soybean and peanut are among the major oilseeds in the world. India is one of the largest producer of oilseeds in the world and acquire an important position in Indian agricultural economy.

The peanut (Arachis hypogaea L.) also known as groundnut, goober, monkey nut, is a legume crop grown mainly for its edible seeds. It is rich in essential nutrients such as calories, vitamin B, vitamin E, dietary minerals like as manganese, magnesium, phosphorus, dietary fibers, polyunsaturated and monounsaturated fats.

Soybean (Glycine max) is not only a green product but also a medicine as well as complete food for a human being. It is also annual legumes of a pea family. It is rich in protein, fats, vitamins, minerals, and a great amount of fibers. We can develop many food products from plant based foods that can improve the health of children.

Material and Methods

Preparation of Peanut-Soybean Cookies of Raw Materials

Many ingredients for the development of nutritional supplement such as raw peanuts, soybean seeds, wheat, sugar, milk powder, fats etc. that were procured from local market of Aligarh, Uttar Pradesh, India.

To Prepare the Flour

Raw peanut, soybean seed and wheat were purchased and checked for any damage or infestation, Peanut were de-shelled, roasted and de-skinned. Soybean and Peanut were ground separately and obtained in powder form.

Development and Standardization of Healthy Peanut-Soybean Cookies

The cookies were developed and standardized at different levels in which ingredients such as peanuts and soybean flour, wheat flour, sugar and oil were used. The nutritional cookies were prepared in the food laboratory of department of Food & Nutrition, Institute of Home Science, Bhimrao Ambedkar University Agra, Uttar Pradesh. Peanut-soybean nutritional cookies was standardized with different levels (10%, 15%, and 20%) of peanut flour and also standardized with different level (10%, 20% and 30%) of soybean flour. These products were prepared using standardized ingredients and recipes.

Table 1: Standardized Ingredients used for Preparing Different types of Cookies

Ingredients	Control G1	G2	G3	G4
Peanut flour	-	10	15	20
Soybean flour	-	10	20	30
Wheat flour	50	30	20	10
Sugar	20	20	20	20
Milk powder	20	20	15	10
Fat	10	10	10	10

Table 2: Standardized Recipe used for Preparing Different Types of Cookies

- Sift the flour and other dry ingredients in a bowl.
- Fat and sugar till light and fluffy (by beat).
- Mix smoothly batter and flour and give the round shape.
- Bake at 160 to 180 C for 20 minutes.

Sensory Evaluation of Nutritional cookies

The developed nutritional cookies were organoleptically evaluated by expert panel of 10 judges from the department of Food & Nutrition, Institute of Home Science, Agra. The judge was served each preparation with a control sample and three experimental or test samples. control sample was prepared by wheat flour and its free from soybean and peanut flour. The test sample were prepared by supplementing with peanut and soybean with wheat flour. The samples were coded to avoid any biased judgment. Each cookies was tested in triplicate and mean score were calculated. Judges were asked to score the sample for colour, appearance, texture, flavor and overall acceptability using a score card of nine point hedonic rating scale.

Nutritional Evaluation of Nutritional Cookies

Developed products were nutritionally evaluated for their proximate composition like moisture, protein, carbohydrates, fats and lipids, fibers, ash, energy. Carbohydrate content of the developed cookies was determined by subtracting the total value of proximate composition from 100.

Statistical Analysis

The data was analysed with help of statistical tool like as mean score. To test significant difference between the control sample and test samples SED and T-test was applied for the acceptability of products.

Result and Discussion

Organoleptic Evaluation

The nutritional cookies were developed using different ingredients such as peanut and soybean flour, wheat flour, oil and as sugar as common ingredients. The developed cookies good for young children health and growth, development because it has rich in protein content and good amount of energy. Four samples of nutritional cookies were prepared using peanut and soybean flour at different levels.

The average organoleptic score obtained for nutritional cookies are given in **Table- 3.** The incorporation was done at different levels and the G4 test sample (peanut 20% and soybean 30%) level was most acceptable in terms of nutritional and binding capacity. Control sample G1 was prepared by wheat flour, no addition of peanut and soybean was called control sample. Nutritional cookies G4 obtained the highest scores among the three cookies with respect to colour, apperence, texture, flavor, and taste. The highest score for overall acceptability of 8.4 was obtained by nutritional cookies G4. Statistical significant difference was found among the three cookies. The mean score obtained for colour was highest for G4 cookies 8.4 among the three cookies. Although overall acceptability was statistically significant at level ($p<0.05$) but G4 cookies scored highest.

Table 3: Organoleptic Evaluation of Nutritional Cookies using Peanut and Soybean Flour N= 10

Products	Parameters					
	Colour	Appearance	Texture	Mouth Feel	After Taste	Overall Acceptability
G1(control)	5.3	3.8	2.7	3.6	3.1	3.9
G2	4.0	4.1	3.2	3.8	3.4	4.5
G3	4.4	3.8	3.3	2.5	3.3	3.9
G4	8.4	7.4	7.2	7.0	7.1	8.4

Significant at 5% level ($p<0.05$) NS= not significant
G1- Control sample (0% Incorporation), G2-10% Peanut,10% Soybean Flour, G3- 15% Peanut, 20% Soybean, G4- 20% Peanut, 30% Soybean.
Most Acceptable level of supplementation in comparison to control sample.

Proximate Composition

Addition of peanut and soybean flour showed significant increase in protein and fibre and decrease in composition to raw peanut is given in Table-4.

Table 4: Nutritive Composition of Raw Peanuts and Soybean Seeds (per 100 g)

Nutrients	Raw Peanuts	Soybean Seeds	Peanut-Soybean Flour
Moisture (g)	6.9	10.1	8.29
Energy (Kcal)	598	539	496.29
Protein (g)	16.27	38.47	41.12
Carbohydrates (g)	18.97	23.77	22.78
Fats (g)	48.96	19.68	15.39
Fibers (g)	8.9	7.98	12.42

Cookies

The proximate composition of test and control samples are given in Table- 3. It was observed that the moisture content of the test sample G4 (peanut 20% and soybean 30%) of flour to be 21.13% while 26.15% of moisture content was observed in the control sample. The protein content of test sample G4 has been greatly increased from 10.29% for control to 19.82% for test sample. Fat content in test sample G4 has been decreased from 23.66% for control sample to 19.66% for test sample. The fibre content of the test sample G4 was 7.39% whereas for control it was 1.96%. The value of ash in the test sample G4was observed 6.91% and 3.03% for control sample.

Table 3: Proximate Composition of Developed Nutritional Cookies (DW basis)

Product	Moisture (%)	Protein (%)	Fat (%)	Fibre (%)	Ash (%)	Carbohydrates (%)
Control	26.15	10.29	23.66	1.96	3.03	41.08
Acceptable	21.13	19.82	19.66	7.39	6.91	26.66
t-value	0.92^{NS}	1.99	20.87	0.28^{NS}	0.99^{NS}	2.19
Significant at 5% level ($p<0.05$) NS = Not significant.						

Conclusion

All the products were found to be organoletically acceptable at 10-30% level prepared with peanut and soybean flour but the test sample G4 was highly acceptable. The developed test samples were compared with control sample and developed nutritional cookies G4 was found to be high in protein and carbohydrates with good amount of fibres. Hence, it is recommended that plant based foods are good in terms of sensory attributes, rich in nutrients, and inexpensive and have not ill effects on children health. The value added nutritional products using peanut and soybean flour can be supplemented to the community and children to improve their nutritional status.

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