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Efficacy & development of products by incorporating cinnamon for weight loss and diabetes

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Abstract
The objective of present investigation was Efficacy& Development of Products by Incorporating Cinnamon for Weight Loss and Diabetes refer to cinnamon based products for treatment of high weight and diabetic patients. In view of the facts regarding nutritional quality of cinnamon (ICMR, 2010) was made to develop acceptable cinnamon based products for weight loss and diabetic patients. Develop cinnamon was used for development of standardized products i.e. Tea Halwa, Cake, Biscuit and Lachcha Paratha. The organoleptic evaluation of products was done by using score card method (9-Point Hedonic Scale). The result of cinnamon based products, for Tea Halwa, Cake, Biscuit and Lachcha Paratha (T1) were best in all treatments in case of all sensory attributes. The overall acceptability of experimental (T1) cinnamon Tea Halwa, Cake, Biscuit and Lachcha Paratha were 8.8, 9.0, 8.6, 8.9 and 8.6, respectably.

Keywords: Cinnamon, spices, type 2 diabetes mellitus

1. Introduction
Cinnamon is a spice obtained from the inner bark of several trees from the genus Cinnamomum that is used in both sweet and savory foods. The term "cinnamon" also refers to is mid-brown color. While Cinnamomum Verum is sometimes considered to be "true cinnamon", most cinnamon in international commerce is derived from related species, which are also referred to as "cassia" to distinguish them from "true cinnamon".

1.1 Flavor, aroma, and taste
The flavor of cinnamon is due to an aromatic essential oil that makes up 0.5 to 1% of its composition. It is of a golden-yellow color, with the characteristic odour of cinnamon and a very hot aromatic taste. The pungent taste and scent come from cinnamaldehyde (about 90% of the essential oil from the bark) and, by reaction with oxygen as it ages; it darkens in color and forms resinous compounds.

1.2 Food uses
Besides use as flavoring and spice in foods, cinnamon-flavored tea, also flavored with cardamom, is consumed as a hot beverage in Bangladesh, India, and Pakistan.

1.3 Cinnamon and Obesity
In these days overweight and obesity is found as one of the most common problem in the world and many people are searching for natural ways to cure this ailment but among most other natural products and spices, this honey and cinnamon have been found to be useful in this process of weight loss. It also regulates blood sugar levels that fight against obesity and insulin resistance (treats Type 2 Diabetes) as they trend to overeat and fat first accumulates around waist and finally it becomes difficult to lose weight. It is a powerful antioxidant and rich in manganese, fiber, calcium and iron which provides all the necessary ingredients to lose weight and also cleanse the colon and digestive system to clear the fat content in the body.

1.4 Cinnamon and Diabetes
Diabetes is a chronic metabolic disorder. It is an increase in India. The multicenter ICMR study showed a prevalence of 2.5% in urban and 1.8% in rural population above the age of 15 years.

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Cinnamon can lower blood glucose levels therefore should be taken with care in case one is already using anti-diabetic medicines which lower blood sugar. Cinnamon is rich in antioxidants and essential oils. It can help reduce obesity related risks like cardiovascular diseases, diabetes etc.

2. Objectives
➢ Standardization and development of cinnamon based products.

3. Materials and method
The present investigation entitled "Efficacy& Development of Products by Incorporating Cinnamon for Weight Loss and Diabetes" was carried out to standardize cinnamon and its products. The study was conducted in department of food and nutrition, faculty of home science, KNIPSS Sultanpur.

Justified, judicious and scientific methodological consideration is indispensable for any investigation to deduce meaningful interferences concerning the objectives of the study. The study design reflects to the logical manner in which units of the study are assessed and analyzed for the purpose of drawing generalizations. Thus, with the view of available resources, the best procedures for taking correct observation should be first sorted out in a logical manner so that unbiased interference can be drown. This chapter delineates information pertaining to the research design and methodological steps used for investigation. The research procedure has been distinctly described as under in the following heads:

3.1 Procurement of material.
3.2 Processing of raw material.
3.3 Development of cinnamon based products.
3.4 Sensory evaluation.
3.5 Calculating nutritive value.
3.6 Statistical analysis.

3.1 Procurement of material
For the present investigation material i.e. cinnamon was produced from the local market of Sultanpur city. The procuring was done in single a lot to avoid variation compositional differences so that the quality differences should be ruled out.
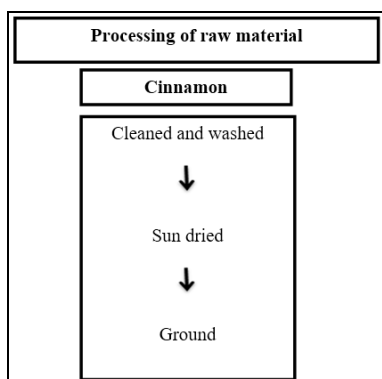
3.2 Processing of raw material

Fig 1: Flow chart of processing of raw material.

3.2.1 Processing of cinnamon
The material was subjected to cleaning, washing and drying in the following manner.

Cleaning and washing
Cinnamon was washed 1-2 times with tap water and then rinsed with water to remove dirt, dust and other adhering impurity.

Drying
Cinnamon was spread on polythene sheet in shade and covered by muslin cloth to protect from foreign particles at room temperature at 27±3°C for 2-3 days till they become brittle.

Powder making
The dried cinnamon was converted into powder separately through grinder and strained to get uniform powder.

3.3 Development of cinnamon based products
The powder was used for product development as follows:

A: Cinnamon tea
Tea is a beverage prepared by pouring boiling water over dry processed leaves. India is a largest producer and consumer of black tea in the world (2012). It is the cheapest beverages in the world after water.

Table 1

Ingredients	Amount	
	Controlled	Experimental
Cinnamon powder	-	5g.
Honey	5g.	5g.
Water	1 cup	1 cup

Method
- Added the cinnamon powder to cup.
- Poured the boiled water in cup honey and stirred well.

B: Halwa
Halwa is a popular Indian snack food consisting of small pieces. Apple Halwa is very beneficial for the health and prevents many diseases.

Table 2:

Ingredients	Amount	
	Controlled	Experimental
Cinnamon powder	-	5g.
Brown sugar	5g.	5g.
Apple	250g.	250g.
Vanilla essence	8 drops	8 drops
Butter	25g.	25g.
Almond	10	10
Water	1 cup	1 cup

Method
- Melted the ghee or butter in a kadai or saucepan.
- Added the apples and fried them for 4-5 minutes.
- When they get soft and browned, added 1 tbsp. water.
- Lowered the heat and cooked the apples & uncovered for 15 minutes till they merge and thicken.
- Mashed the apples with spoon and stirred frequently to avoid the mixture from getting burnt.
- Added the sugar &Continue to stirred and cooked till the whole mixture becomes one and starts to pull away from the bottom of the pot.
- Raised the heat and kept on stirring.
- Added cinnamon powder and vanilla powder or vanilla extract. Mixed these and continue to stir, When the mixture becomes translucent around the edges and it becomes difficult to remove the spoon, removed the kadai or saucepan from the fire.
- Added chopped dry fruits or raisins and cook for a further 2 minutes.

4. Result and discussion

The data were collected on different aspects per plan were tabulated and analyzed statistically. The result from the analysis presented and discussed chapter in the fallowing sequence.

4.1 Calculation of nutritive value of cinnamon.
4.2 Organoleptic evaluation of cinnamon based products.
4.1 Calculation of nutritive value of cinnamon

Table 3: 100g. Of ground cinnamon contain

Nutrients	Total
Energy	261 Calories
Fat	3.19g
Carbohydrates	79.85g
Fibres	54.3g
Protein	3.89g

The nutritive value of cinnamon was calculated with the help of "Food Composition Table" given by ICMR (2010).Table shows that the total energy, protein, fat and CHO. Value of most acceptable cinnamon was 261kcal, 3.89g.3.19g and 79.85, respectability.

4.2 Organoleptic evaluation of cinnamon based products.
- Flavor and taste.
- Body and texture.
- Color and appearance.
- Over all acceptability.

Table 4.2.1: Organoleptic evaluation of cinnamon tea.

Product	Flavor& taste	Body \ texture	Color & appearance	Overall acceptability
T0(controlled)	7.4	7	7.2	7.6
T1(experimental)	8.8	8.3	8.3	8.8

Table 4.2.1 shows that the experimental (T1) obtained maximum 8.8, 8.3, 8.3 and 8.8 for flavor & taste, body & texture, color &appearance and overall acceptability; while control (T0) 7.4, 7, 7.2 and 7.6 for flavor &taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the experimental (T1) Tea was found to be fallen under category of "Liked Very Much to Liked Extremely".
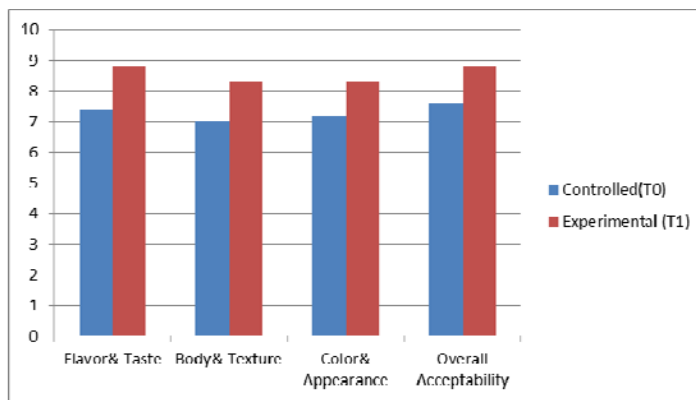

Fig 2: Mean overall acceptability of Tea

Table 4.2.2: Organoleptic evaluation of Halwa

Product	Flavor& taste	Body \ texture	Color & appearance	Overall acceptability
T0(controlled)	7.5	7.7	7.5	7.6
T1(experimental)	9.0	9.0	9.0	9.0

Table 4.2.2.shows that the experimental (T1) obtained maximum 9, 9, 9 and 9 for flavor &taste, body& texture, color& appearance and overall acceptability; while control (T0) obtained7.5, 7.7, 7.5 and 7. 6 for flavor &taste, body &texture, color& appearance and overall acceptability respectively. This indicated that the experimental (T1) Halwa was found to be fallen under category of "Liked Very Much to Liked Extremely".
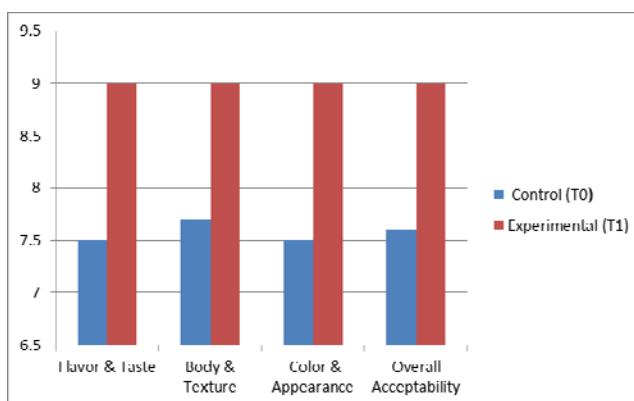

Fig 3: Mean overall acceptability of Halwa

5. Summary & conclusion

Cinnamon bark is used as a spice. It is principally employed in cookery as a condiment and flavoring material. It is also used in many dessert recipes, such as apple pie, doughnuts, and cinnamon buns, as well as spicy candies, coffee, tea, hot cocoa, and liqueurs. Cinnamon is loaded with antioxidants, it has anti-inflammatory properties, and cinnamon may cut the risk of heart disease. It is also increased HDL (good) cholesterol and reduces total cholesterol, LDL. Cinnamon lowers blood sugar levels and it has a powerful anti-diabetic effect. Cinnamon may have beneficial effects on neurodegenerative disease. It may be protective against cancer and helps fight bacterial and fungal infections. Cinnamon may help fight the HIV virus and also help for weight loss. It is helpful for weight loss.

The present investigation entitled "Efficacy& Development of Products by Incorporating Cinnamon for Weight Loss and Diabetes was carried out to standardize cinnamon and its products with two objectives:-

➢ To standardize and develop the product.

The experimental work was carried out in the department of Food & Nutrition, Faculty of Home Science, KNIPSS Sultanpur. To standardize and develop the cinnamon based products required different materials like cinnamon, brown sugar, apple etc. were used in the experiment would be purchased from the local market of Sultanpur.

In view of the facts regarding nutritional quality of cinnamon (ICMR, 2010) was made to develop acceptable cinnamon based products for weight loss and diabetic patients.

a) Experimental (T1) Tea obtained maximum 8.8, 8.3, 8.3 and 8.8 for flavor &taste, body & texture, color &appearance and overall acceptability; while control (T0) 7.4, 7, 7.2 and 7.6 obtained for flavor &taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (To) Tea was found to be fallen under category of "Liked Very Much to Liked Extremely".

b) Experimental (T1) Halwa 9, 9, 9 and 9 obtained maximum for flavor &taste, body& texture, color& appearance and overall acceptability; while control (T0) obtained7.5, 7.7, 7.5 and 7. 6 for flavor &taste, body &texture, color& appearance and overall acceptability respectively. This indicated that the control (To) Halwa was found to be fallen under category of "Liked Very Much to Liked Extremely".

The developed products were given to the panel of 10 judges; products were tested for Flavor &taste, body & texture, color & appearance and overall acceptability. The organoleptic evaluation of products was done by using score card method (9-Point Hedonic Scale). The result of cinnamon based products for Tea, Halwa (T1) were best in all treatments in case of all sensory attributes.

The highest average score for all acceptability were found in experimental products made by developed cinnamon based were mostly accepted by panel member.

6. Recommendation
- Development of products using cinnamon.
- Nutrient analysis of cinnamon and its products.
- Intervention of cinnamon based products to weight loss and diabetes.

7. Limitations of the study
- The study is carried out for short period so that time and other resource are limited to an extent.
- The sample size of this study was restricted and area of study was limited to KNIPSS, Faculty of Home Science Sultanpur.
- It was a sensory evaluation which has responded information with-out any alternative.

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