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Development of products and sensory evaluation of maize

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Abstract

Maize has also diuretic properties when taken as a tea and is a component in certain oil, corn oil and syrup. Maize is also very rich in thiamine or vitamin B1, which is necessary for the brain to absorb glucose and to transform that food into energy. The high fiber content prevents constipation and colorectal cancer. The antioxidant betacyanin prevents lung cancer, while lutein prevents age related vision loss. Vitamin C boost immunity and fights infections, while the presence of vitamin E give maize anti- aging properties.

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 obtained for flavor & taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (T0) kheer was found to be fallen under category of "Like Very Much to Like Extremely". The experimental (T1) 9, 9, 9 and 9 obtained maximum for flavor & taste, body & texture, color & appearance and overall acceptability; while control (T0) obtained 7.5, 7.7, 7.5 and 7.6 for flavor & taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (T0) ladoo was found to be fallen under category of "Like Very Much to Like Extremely". The experimental (T1) obtained maximum 7.5, 7.4, 7.5 and 7.5 for flavor & taste, body & texture, color & appearance and overall acceptability; while control (T0) 8.7, 8.4, 8.6 and 8.6 obtained for flavor & taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (T0) paratha was found to be fallen under category of "Like Very Much to Like Extremely". The experimental (T1) 8.7, 8.6, 8.7 and 8.6 obtained maximum for flavor & taste, body & texture, color & appearance and overall acceptability; while control (T0) obtained 7.8, 7.9, 8.7 and 7.8 for flavor & taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (T0) chaat was found to be fallen under category of "Like Very Much to Like Extremely". 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 obtained for flavor & taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (T0) momos was found to be fallen under category of "Like Very Much to Like Extremely".

Keywords: indigenous, ovuliferous, mesoamerica

Introduction

Maize, Also known as corn, is a large grain plant first domesticated by indigenous peoples in Mexico about 10,000 years ago. The six major types of corn are dent corn, pod corn, popcorn, flour corn, and sweet corn. The leafy stalk of the plant produces separate pollen and ovuliferous inflorescences or ears, which are fruits, yielding kernels (often erroneously called seeds). Maize kernels are often used in cooking. Maize or corn (*Zea mays* L.) is an important annual cereal crop of the world belonging to family Poaceae. *Zea* is an ancient Greek word which means "sustaining life" and *Mays* is a word from Taino language meaning "life giver." The word "maize" is from the Spanish connotation "maiz" which is the best way of describing the plant. Various other synonyms like zea, silk maize, makka, barajovar, etc. are used to recognize the plant starch. Maize, scientific name *Zea mays*, also known as corn or mielie / mealie, is one of the most extensively cultivated cereal crops on Earth. More maize is produced, by weight, than any other any grain and almost every country on Earth cultivates maize commercially for a variety of uses. In addition, maize is heavily genetically modified, and the crop has been used as a rallying point by the anti- genetically Modified Organisms (GMOs) community. The exact domestication point for maize is unknown, but it is estimated that the crop is at least 5,000 years old.

The plant was originally domesticated in Mesoamerica, and appears to be related to species of wild grass which still exist in Central American today. People in many English speaking nations know maize as corn. When maize was brought back to Europe, it was called “Indian corn,” maize became ubiquitous in many gardens. In Africa, it is known as mealie. Globally, maize is a staple crop, and many people rely on it as a primary source of nutrition. In addition to playing a major role in the human diet, maize is also used as livestock fodder. Maize is processed to make an assortment of products ranging from high fructose corn syrup to bibfuls, all of which play important roles in human society. Domesticated maize grows to a height of eight feet (2.5 meters). It is typically planted in rows to make it easy to harvest. The crop is also surprisingly vulnerable to pests and drought, given its global importance as a food source.

Nutritional value

A part from satisfying the taste buds of users, maize is also a good source of vitamins, minerals and dietary fiber.

Nutritional Information – Vitamins

Vitamin	Amount per 100 grams
Vitamin A	310 IU
Vitamin B1(Thiamine)	0.085mg
Vitamin B2(riboflavin)	0.085mg
Vitamin B6	0.071mg
Vitamin C	7.3mg
Vitamin E	0.11mg
Vitamin K	0.5mcg
Niacin	1.9 mg
Folate	54 mg
Pantothenic Acid	1.036mg

Maize Nutrition Value- Minerals

Mineral	Amount per 100 grams
Potassium	250 mg
Phosphorus	90 mg
Magnesium	37 mg
Calcium	4 mg
Zinc	0.72 mg
Iron	0.52 mg
Selenium	0.2 mg

Abida Ali, *et al* (2016) ^[1] studied that Starch isolated from the rice (Jhelum and Kohsar) and corn (PS-43 and Shalimar-maize) is beneficial for their physico-chemical and morphological properties. Physico-chemical properties such as composition, water and oil absorption capacity, swelling power, syneresis, freeze–thaw stability and light transmittance showed significant differences among the starches. Amylose contents of starches separated from the Jhelum and Kohsar rice cultivars and PS-43 and Shalimar-maize corn cultivars were 6.33%, 4.90%, 7.52% and 8.09%, respectively. The granular size varied from 5.2 to 5.9 μm for rice starches and 11.4–12.0 μm for corn starches. Transmittance value of gelatinized pastes from all starches progressively decreased up to the 2nd day during refrigerated storage, except Kohsar rice starch which lost its clarity significantly up to 3rd day of storage. The pasting property revealed peak, breakdown and setback viscosity which were in the range of 2479–3021 cP, 962–1713 cP and 1293–2003 cP respectively Banziger, M, *et al* (2008) ^[3] analyzes consumers’ awareness and attitudes towards yellow maize products in Zimbabwe and suggests intervention strategies that will ensure increased production and consumption of the crop, which is rich in pro-vitamin A to

prevent the incidence of vitamin A deficiency prevalent among vulnerable groups. Data from 360 randomly selected rural and urban households show that yellow maize is known to all but few are aware of its nutritional qualities or consume it. Rich in oils, carotenoids and fructose, yellow maize easily undergoes chemical changes to produce unacceptable organoleptic properties (or bad taste) if poorly handled during importation. These two factors were responsible for it being perceived inferior to white maize by consumers. Quality assurance during importation can improve consumer confidence but a long-term strategy will be to vigorously promote domestic production of yellow maize varieties rich in high levels of β -carotene that meet the preferences of consumers. nutritional education can potentially promote yellow maize consumption, especially if targeted at low income households. Domestic production and consumption of yellow maize will decrease vitamin A deficiency among vulnerable groups and improve food insecurity through reduced grain prices and increased incomes for farmers.

Objective

- To standardize and develop the products using maize.
- Organoleptic evaluation of developed products.

Materials and Method

The present investigation entitled “standardization and development of maize based products was carried out to standardize and its maize 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 drawn. 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:

Procurement of material

For the present investigation material e.g., maize 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.

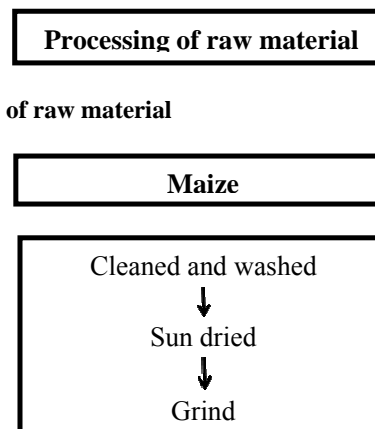


Fig 1: Flow chart of processing of raw material.

Processing of maize

This material was subjected to cleaning, washing and drying in the following manner.

Cleaning and washing

Maize was washed with tap water and then rinsed with water to remove dirt, dust and other adhering impurity.

Drying

maize was spread on polythene sheet in shade and covered with 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 maize was converted into powder separately through grinder and sieved to get uniform powder.

Development of maize based products:

The best acceptable powder was used for product development as follows:

Sensory evaluation of developed

Standardization of the developed products was carried out through organoleptic evaluation. Developed products were evaluated for their sensory characteristics like color, flavor, texture and overall acceptability by selected 10 panel member.

Selection of panel members

Threshold test was use for selection of panel members. Convenience, experience, knowledge, willingness, interest and sincerity on the part of panel members were also considered. Thus, ten members were enlisted in the panel comprised of staff members of the college of home science, KNIPSS.

Preparation of score

For assessing acceptability of samples, a score card was developed on the basis of certain qualities looked for in food preparation such as color, aroma, appearance, texture, test and overall acceptability. Nine point hedonic rating scale rating

(Appendix-A) provided to judges for scoring.

Method of evaluation

The processed samples were served to the panelists separately in similar containers with different codes for sensory evaluation. Care was taken to conduct the evaluation in an undisturbed environment as the environment may distract or influence the evaluation of judge.

Calculation of nutritive value of developed maize products

The nutritive value of the most acceptable maize products was calculated by using food composition table given by ICMR (2010).

Statistical analysis

Observations collected on the various aspects of the study have been statically analyzed (Appendix-B).

Formula

Average= n/N *100

Where,

n= total number of observation.

N= sum of the observation.

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 in the chapter in the following sequence.

Organoleptic evaluation of maize based products.

Calculation of nutritive value of developed products.

Organoleptic evaluation of maize based products

- Flavor and taste.
- Body and texture.
- Color and appearance.
- Over all acceptability.

Table 1: Organoleptic evaluation of sweet corn kheer-

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 1 shows that the experimental (T1) product obtained maximum 8.8, 8.3, 8.3, and 8.8for flavor &taste, body & texture, color &appearance and overall acceptability; while control (T0) sample obtained 7.4, 7, 7.2 and 7.6 for flavor

&taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (To) kheer was found to be fallen under category of “Like Very Much to Like Extremely”.

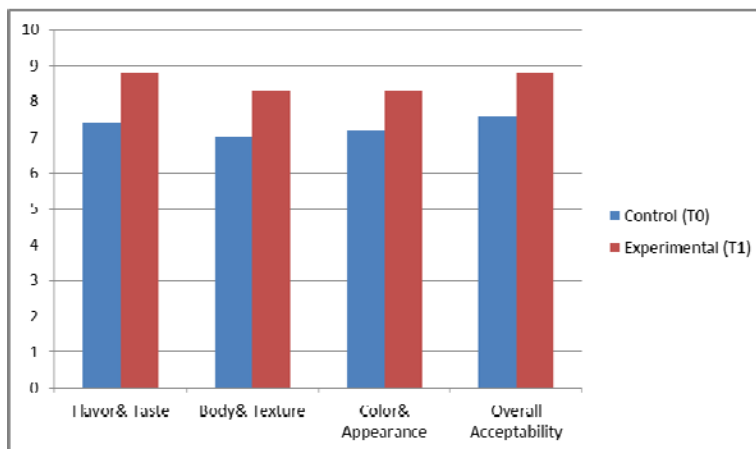


Fig 1: Mean overall acceptability of kheer

Table 2: organoleptic evaluation of maize laddoo-

Product	Flavor& taste	Body \ texture	Color & appearance	Overall acceptability
T0(controlled)	7.5	7.7	7.5	7.6
T1(experimental)	9	9	9	9

Table 2 shows that the experimental (T1) 9, 9, 9 and 9 obtained maximum for flavor & taste, body & texture, color & appearance and overall acceptability; while control (T0) obtained 7.5, 7.7, 7.5 and 7.6 for flavor & taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the control (T0) laddoo was found to be fallen under category of “Like Very Much to Like Extremely”.

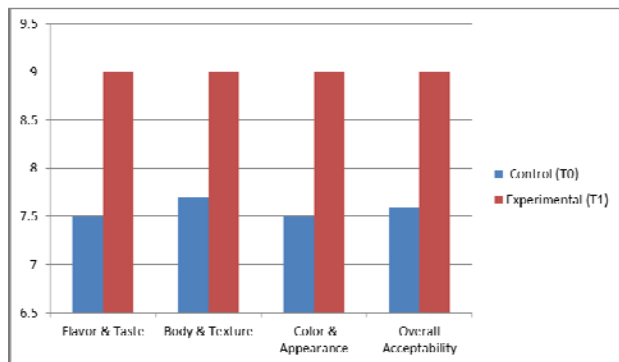


Fig 2: Mean overall acceptability of laddoo

Conclusion

Maize is an excellent source of protein and vitamins. The developed products were given to the panel of 10 members. Products were selected for flavour and taste, body and appearance, color and texture and overall acceptability. The organoleptic evaluation of products was done by using score card (9 point hedonic scale). The results of maize based products for Kheer Laddu Paratha Chaat Momos T0 and T1 was best in all of respondent in case of all sensory attributes.

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