ORGANOLEPTIC EVALUATION OF RECIPES BASED ON DIFFERENT VARIETIES OF MAIZE

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ABSTRACT

Among the food grains, maize is utilized in more diversified ways than any other cereal. In this research total six product of three maize genotypes *i.e.* local (Malan), composite (Pratap Makka 5) and hybrid (HQPM 5) were formulated in which three were ready-to-eat (biscuit, khakhra and sev) and another three were ready-to-cook (pasta, seviyan and papadi). All the products were organoleptically evaluated using nine point hedonic scale and were found to be acceptable in the form of ready to eat and ready to cook products. However Malan had better acceptability for ready-to-cook *i.e.* pasta, seviyan and papadi while Pratap Makka 5 was found to be best for ready-to-eat *i.e.* biscuit, khakhra and sev products.

INTRODUCTION

Maize is also known as "queen of cereals" because of very high yield potential (Gangaiah, 2012). In India, Madhya Pradesh ranks first in the production area (13.51 per cent), producing 14.57 per cent of maize, followed by Andhra Pradesh, Karnataka, Rajasthan, Uttar Pradesh and Gujarat. Different researchers have worked with different maize varieties and it has been reported that these varieties usually differ in their sensory characteristics (Vyn and Tollenaar, 1998). Different chemical, physical, morphological characteristics and genetically composition affects the physiological, physico-chemical, rheological, textural and thermal qualities and properties of the grain thus affecting the sensory and nutritional characteristics of a cooked product (Bolade, 2010). Thus the present study was undertaken to characterize the local, composite and hybrid maize varieties grown in the area on the basis of sensory qualities. This will be useful in selecting the appropriate variety for product formulation and end use suitability.

RESEARCH METHODOLOGY

In present investigation two types of products were selected i.e. ready to eat (biscuit, khakhra and sev) and ready to cook (pasta, seviyan and papadi). Selected maize varieties were procured from the Department of Agronomy, Rajasthan College of Agriculture, MPUAT, Udaipur (Rajasthan) and other in-gredients like wheat flour, sugar, spices, milk and its products etc. were bought from the local market. In present investigation two types of products were developed *i.e.* ready to eat (biscuit, khakhra and sev) and ready to cook (pasta, seviyan and papadi). For getting an acceptable product from maize, several trials were conducted. Modification of the common products was done mainly in the ingredients. The basic ingredient was replaced with maize flour.

Selected maize varieties were subjected to different techniques in order to develop ready-to-eat (RTE) and ready-to-cook (RTC) products. The process was standardized in the laboratory and explained as follows :-

Maize flour 50g, sugar 25g, Eno ½ tsp and baking powder ¼ tsp were mixed and solid fat was cut into the flour mixture. The mixture was stirred with the hand until the mass adheres firmly together. The dough was rolled lightly to the ½ cm thickness and cut with a biscuit cutter and baked at 150ºC for 20 minutes. Baked biscuit was symmetrical with a golden brown colour. Dough was made using 50g of maize flour and spices *i.e. a*jwain one pinch, chilli powder ½ tsp, salt ½ tsp with 50-60 ml of luke warm water. The dough was divided into eight eual sized balls and shaped into khakhara with puri making machine and cooked through chapati making machine using oil 10-20ml.

Maize flour 30 g and bengal gram flour 20 g

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were mixed with green chilli powder 2 tsp, hing (asafoetida) ¼ tsp, ajwain ½ tsp, black pepper ¼ tsp, cloves ¼ tsp, salt ½ tsp. 50-60ml water was added to form hard dough which were filled in kitchen press and sev was extracted directly into the hot fresh oil and fried till light brown colour was obtained. Pasta was extruded through cold extruder machine (Pasta producing machine by using **m**aize flour 500g, semolina 500gm and 350-400ml water . Acceptability test of pasta done after cooking.

Equal amount of maize flour 100g and semolina 100g were mixed with 140-150ml of water to prepare semi hard dough. The dough was filled in kitchen press and seviyan was extracted with round shaped blade. Seviyan served after cooked in milk. Fine maize flour 100 g was added into the boiling water wich contains papad khar 2 g and salt 1g and cooked.

Then prepared small balls, rolled it with puri making machine and dried. Papadies were served after frying in oil.

Organoleptic or sensory evaluation refers to the evaluation of recipes by sense organs. Therefore, the sensory qualities such as color, flavor, taste, appearance and overall acceptability were got evaluated by thirty selected members by using nine point hedonic scale (Swaminathan, 1987).

RESULTS AND DISCUSSION
Biscuit

It is evident from Table 1 that no significant difference in various sensory attributes of biscuits made from Malan, HQPM 5 and Pratap Makka 5.

Table 1: Mean ± SD acceptability scores of biscuit n=30

Maize varieties	Appearance	Colour	Flavour	Taste	Texture	Overall acceptability
Malan	8.53±0.15	8.37±0.72	8.2±0.67	8.1±0.76	8.24±0.68	8.29±0.51
Pratap Makka5	8.3±0.66	8.47±0.63	8.3±0.66	8.27±0.7	8.14±0.82	8.3±0.48
HQPM 5	8.27±0.74	8.2±0.77	8.2±0.77	8.07±0.7	8.14±0.63	8.18±0.59
CD at 5 per cent	NS	NS	NS	NS	NS	NS

It is evident from the scores assigned by members for individual sensory attributes that the products prepared from selected recipe could secure values in the range of 8.07 to 8.53 which permit us to draw conclusion that the product "liked very much".

Biscuits of Pratap Makka 5 have highest score in colour, flavour, taste and overall acceptability. But in appearance and texture Malan have highest score. Hence in the present study Pratap Makka 5 was preferred for biscuit making. Out of 6 characteristics

judged by members 4 were scored higher for the biscuits prepared with Pratap Makka 5 followed by Malan and HQPM 5.
Khakhra

The mean scores of Malan, HQPM 5 and Pratap Makka 5 presented in Table 2 showed no significant difference in various attributes of Khakhra. The Khakhra prepared from selected maize verities was "like very much" in terms of all sensory characteristics by a panel of thirty judges.

Table 2: Mean ± SD acceptability scores of khakhra n=30

Maize varieties	Appearance	Colour	Flavour	Taste	Texture	Overall acceptability
Malan	8.1±0.81	8±0.88	8.17±0.88	8.24±0.9	8.2±0.85	8.14±0.73
Pratap Makka-5	8.27±0.64	8.17±0.84	8.1±0.61	8.3±0.8	8.2±0.72	8.21±0.52
HQPM 5	8.14±0.74	8.34±0.72	8.27±0.74	8.1±1.1	8.17±1.02	8.2±1.53
CD at 5 per cent	NS	NS	NS	NS	NS	NS

The mean score presented in table 2 showed that appearance, taste and overall acceptability of the khakhra prepared from Pratap Makka 5 has high scores then other two verities. In terms of colour and flavour HQPM 5 has more score and same scores was found in texture of Malan and Pratap Makka 5. It indicated that khakhra is better acceptable when prepared with Pratap Makka 5 or HQPM 5.

Sev

Fried foods are popular due to their taste, distinctive flavour, aroma and crunchy texture. Table 4.25 represents no significant difference in various sensory attributes of biscuits made from Malan, HQPM 5 and Pratap Makka 5. All biscuits were "liked very much" in terms of appearance, flavour, taste, texture and in terms of colour scores ranged between "Like very much" to "Like moderately".

Table 3: Mean ± SD acceptability scores of sev   **n=30**

Maize varieties	Appearance	Colour	Flavour	Taste	Texture	Overall acceptability
Malan	8.1±0.76	8.3±0.66	8.07±0.74	8.07±0.83	8.2±0.81	8.14±0.62
Pratap Makka-5	8.04±1.13	8.34±0.81	8.4±0.68	8.3±0.66	8.44±0.78	8.3±0.62
HQPM 5	8.04±0.81	7.97±0.62	8±0.79	8±0.95	8.1±0.85	8.02±0.63
CD at 5 per cent	NS	NS	NS	NS	NS	NS

It is evident from the table 3 that mean sensory scores for the sev ranged from 7.97 to 8.44 indicating that the product varied from "Like moderately" to "liked very much". It was observed that all the characteristics were scored higher for the sev prepared from Pratap Makka. Deep fried foods develop a characteristics structure with an outer brown, crisp zone and a cooked, moist interior. The degree of browning is dependent on the time and temperature of frying and the chemical composition of the food rather than the type of fat used. The crispness in the outer zone is attributed to dehydration of food 3% or less from the heat of frying. The desirable characteristics were observed more in the sev prepared from Pratap Makka then prepared with other two varieties.

Ready-to-cook products

Pasta

Pasta was served after cooking with sauce. Mean scores of sensory characteristics (Table no. 4) indicated that flavour of the pasta prepared from Pratap Makka 5 was "Liked moderately". The scores for all other sensory attributes of the pasta were almost similar and all the three types of verity were "liked very much". There was no significant difference found between pasta of three maize genotypes.

Table 4: Mean ± SD (SE) acceptability scores of pasta   **n=30**

Maize varieties	Appearance	Colour	Flavour	Taste	Texture	Overall acceptability
Malan	8.3±0.75	8.24±0.68	8.14±0.82	8.27±0.87	8.37±0.93	8.26±0.66
Pratap Makka-5	8.14±0.82	8.34±0.76	7.94±0.83	8.1±0.93	8±1.02	8.1±0.7
HQPM 5	8±0.75	8.27±0.64	8.1±0.96	8.14±0.87	8.07±0.95	8.12±0.62
CD at 5 per cent	NS	NS	NS	NS	NS	NS

Out of 6 attributes evaluated by members 5 were given higher scores to pasta prepared with Malan variety indicating that for such recipes Malan variety is more suitable.

Seviyan

Seviyan served after cooking in the form of khir with milk. On the basis of mean scores of sensory characteristics (Table 5). it was found that seviyan prepared from selected maize varieties were "Liked very much" in terms of all the sensory attributes. Malan was significantly better (pd"0.05) than Pratap Makka 5 in terms of appearance, test and overall acceptability. HQPM 5 was scored lowest value on acceptability characteristics. The results revealed Malan is a better option for preparing seviyan.

Papadi

In frying, the fat serves as a lubricant and a heat transfer medium. Deep-fat-fried foods are golden brown and crisp. The dry papadi was deep fried to assess the acceptability. Malan and HQPM 5 were significantly better than Pratap Makka 5 for appearance (pd"0.01) and overall acceptability (pd"0.05).

Mean scores of sensory characteristics (Table 6) indicated that papadi prepared using local (Malan), hybrid (HQPM 5) and composite (Pratap Makka 5) was "Liked very much" in terms of all sensory characteristics but scores were superior for the papadi prepared with Malan for 4 attributes out of 6 than the other two varieties.

Table 5: Mean ± SD acceptability scores of seviyan　　　　　　　　　　　　　　　　**n=30**

Maize varieties	Appearance	Colour	Flavour	Taste	Texture	Overall acceptability
Malan	8.5±0.69	8.4±0.57	8.47±0.58	8.54±0.58	8.37±0.72	8.46±0.44
Pratap Makka-5	8.3±0.64	8.1±0.2	8.2±0.67	8.1±0.81	8.07±0.79	8.11±0.57
HQPM 5	8.34±0.61	8.14±0.16	8.14±0.69	8.4±0.68	8.2±0.72	8.24±0.49
CD values	0.33*	NS	NS	0.35*	NS	0.26*

*significant at 5% level

Table 6: Mean ± SD acceptability scores of papadi　　　　　　　　　　　　　　　　**n=30**

Maize varieties	Appearance	Colour	Flavour	Taste	Texture	Overall acceptability
Malan	8.57±0.57	8.5±0.74	8.33±0.67	8.3±0.75	8.55±0.67	8.45±0.49
Pratap Makka-5	8±0.79	8.07±0.79	8.14±0.78	8.3±0.8	8.24±0.78	8.15±0.62
HQPM 5	8.47±0.63	8.3±0.6	8.4±0.63	8.57±0.57	8.37±0.62	8.43±0.42
CD values	0.45*	NS	NS	NS	NS	0.26**

**significant at 1%, *significant at 5% level

The result thus indicates that Malan and Pratap Makka 5 are better suitable for preparation of products. In this also Malan is good for pasta, seviyan and papadi recipe may be due to high content of starch because starch absorbs water and form a firm gel and gelatinization was necessary for these recipes and Malan forms a more better gel in less amount water in comparison to other two varieties. Pratap Makka 5 suitable for biscuit, khakhra and sev preparation might be due to good gelation capacity and higher content of protein. Products of HQPM 5 were lowest acceptable may be due to high contain of oil or all over chemical composition.

CONCLUSION

Acceptability of the products was assessed through organoleptic evaluation. The result thus indicated that Malan and Pratap Makka 5 had better suitability for preparation of products. The maximum overall mean scores were obtained by Malan in case of RTC products *i.e.* Pasta (8.26), seviyan (8.46) and papadi (8.45) respectively may be due to high content of starch because starch absorbs water and forms a firm gel and gelatinization is necessary for these recipes and Malan formed a better gel in less amount of water in comparison to the other two varieties and Pratap Makka 5 in regarding to RTE products *i.e.* biscuit (8.3), khakhra (8.21) and sev (8.3) respectively may be due to good gelation capacity and higher content of protein. HQPM 5 obtained lowest acceptable score.

The result clearly indicates that all the varieties were found to be acceptable in the form of ready to eat and ready to cook products. Malan had best acceptability for ready-to-cook and Pratap Makka 5 for ready-to-eat products. The study concluded that variety of maize affects the products quality to some extent thats why different quality of maize are reccomonded for production of different food products in food industry.

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