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Evaluation of sensory attributes of millet based pizza base

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Abstract

Millet plays an important role in the diet of people in many regions of the world. Bakery products are popular all over the world and it has been marked the fast growing industry in food sector. Use of millets in bakery products create a good potential for millets to enter in the bakery world for series of value added products. Nowadays pizza was highly consumed and easily acceptable bakery products. Based on this millet based pizza was developed by incorporating bajra flour and wheat flour at various levels of 40:60 (T1), 50:50 (T2) and 60:40 (T3) along with control. The results of the study shows that the millet based pizza base (T2) was equivalent with control for its sensory attributes. The study concluded that use of millets can enrich the pizza base and may also help to fulfill the needs of consumers for this product.

Keywords: millet, bajra, bakery product, pizza base, sensory characteristic

Introduction

Minor millets are the small seeded with different varieties which includes proso millet (*Panicum miliaceum*), finger millet (*Eleusine coracana*), pearl millet (*Pennisetum glaucum*), kodo millet (*Paspalum setaceum*), foxtail millet (*Setaria italica*), little millet (*Panicum sumatrense*) and barnyard millet (*Echinochloa utilis*). They were known as coarse cereals. (Balasubramanian *et al.* 2012) [2]

Coarse grains and small millets like (finger millets, oat, buck wheat and pearl millets) having the anti microbial, anti oxidant properties. The incidence of diabetes and obesity are increasing in an exponential manner globally and to combat them, a raise in demand for food containing complex carbohydrates with higher levels of dietary fibre and health beneficial phytochemicals has been in demand (Anu Agrawal and Anisha Verma, 2016) [1]

Recent urbanisation has made to increase the demand for the therapeutic bakery products as most of the people are becoming health conscious and with the advancing of many health related conditions. So, there is a need to develop the low cost and therapeutic bakery products with minimum changes in the composition and procedure, yet suitable in the working conditions (Kamaliya, 2000) [3]

Bakery products are popular all over the world and the production has risen by many folds due to their low cost, varied taste and textured profiles with attractive package and longer shelf-life to suit easy marketing (Patel and Rao, 1996) [6]. The use of millets in bakery products will not only be superior in terms of fibre content, micronutrients but also create a good potential for millets to enter in the bakery world for series of value added products (Verma and Patel, 2013) [8].

Pizza was one of the most commonly purchased items in retail food stores and maintained its market share through the changing nature of the processed food industry and even gained popularity. Pizza was one of the popular consumer foods. It markets in America, Europe and other continents and boosted the trend towards international cuisine and convenience foods. As a result, pizza production has been increased enormously and is expected to increase further in the next decade in relation to growing world population (Preeti and Goyal, 2011) [7]

Materials and Methods

The study was conducted in the Food processing unit of the Department of Social Sciences, Anbil Dharmalingam Agricultural College and Research Institute, Tiruchirappalli, Tamil Nadu.

Preparation of Millet based Pizza base

Millet based pizza base was prepared by addition of millet flour (Bajra millet) along with wheat flour and other common ingredients like yeast, sugar, salt, emulsifier and butter.

Table 1: Formulation of Millet based Pizza Base

Ingredients	Proportion (In Grams)			
	Control	T1	T2	T3
Bajra flour	-	40	50	60
Wheat flour	100	60	50	40
Sugar	5	5	5	5
Salt	2	2	2	2
Water	40	40	40	40
Yeast	2	2	2	2
Binding agent (Xanthum Gum)	3	3	3	3
Butter	8	8	8	8

The procedure for the preparation of pizza base was followed according to the methods of Kent (1984)^[4] were followed in the making of pizza.

- The yeast was dissolved in warm (40 °C) water (8ml water/ g of yeast) to ferment for 10 minutes.
- Sugar and salt were dissolved in remaining quantity of water. All the ingredients were mixed mechanically in a mixer for about 10-15 minutes to make dough.
- The prepared dough was set aside for 2 hours. While fermentation proceeded, the dough was covered with moistened cloth to prevent moisture loss.

- After 2 hours, the dough was manipulated to push out the gas that had been evolved in order to even out the temperature and gave more thorough mixing.
- After manipulation, the dough was again rested for about 1 hour. Then the dough was divided into loaf size portion and these were roughly flattened.
- The dough pieces were rested at about 27 °C for 10-15 minutes (1st proof) and molded into final shape (0.25 inch thick) during which the dough was worked to tighten it so that the gas was better distributed and retained and placed in pre-greased baking pans.
- The dough was rested again in the baking pan for the final proof for 1 hour at 37 °C. Then the doughs were then baked in the oven at a temperature of 210 °C for 20 minutes.

Sensory evaluation

The panel of judges from Anbil Dharmalingam Agricultural College and Research Institute using , Tiruchirappalli had evaluated the millet based pizza base along with control for its sensory attributes like appearance, crust colour, flavour, texture, taste and overall acceptability were determined by using 9- point hedonic scale (9= (like extremely: to 1= dislike extremely) to measure the degree of preference of the sample. (Meilgaard *et al.*, 1999)^[5]

Results and Discussion

The millet based pizza base along with control was evaluated for sensory evaluation and presented in the Table 2 and Fig 1.

Table 2: Sensory Evaluation of Millet Based Pizza Base

Sample	Appearance	Crust color	Flavor	Palatability	Texture	Overall acceptability
Control	7.4	7.4	7.4	7.4	7.2	7.4
T1	6.9	7.2	7	7.3	7.1	7.0
T2	7.3	7.4	7.1	7.4	7.0	7.4
T3	7.0	7.0	6.9	7.2	6.9	6.9

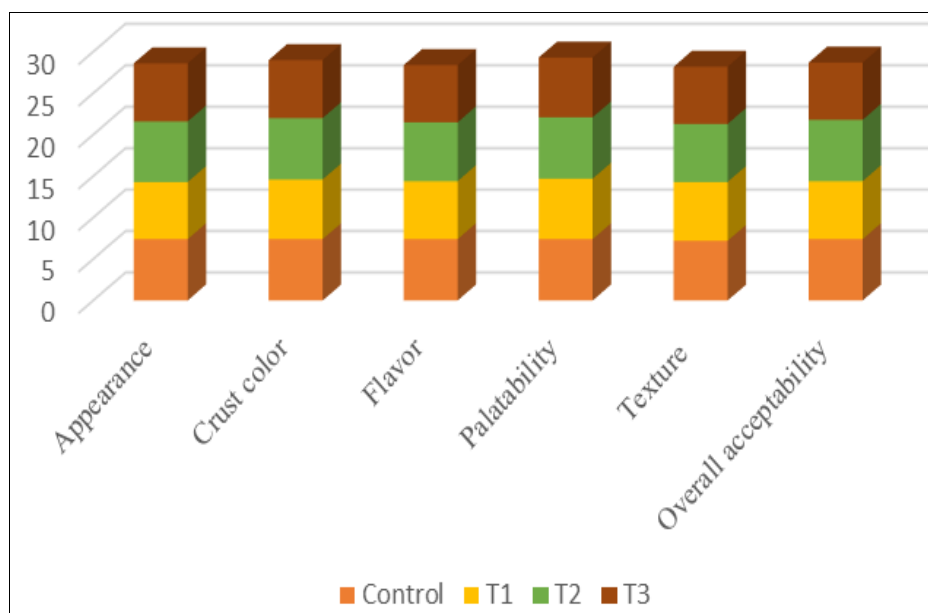


Fig 1: Sensory Evaluation of Millet Based Pizza Base

The results showed that the appearance of millet based pizza base T2 (7.3) was significantly higher than T1 and T3 (6.9 & 7.0) and was not on par with the control pizza base (7.4). There was a significant difference between the control and developed pizza bases.

The crust colour showed that the control (7.4) was equivalent with millet based pizza base T2 (7.4) but not on par with the T1 and T3 (7.2 and 7.0). Flavour of the control was highest (7.4) followed by millet based pizza base of T2 (7.1), T1 (7.0) and T3 (6.9) respectively.

The palatability of the millet based pizza was evaluated and the score showed that the control (7.4) was equivalent with that of T1 (7.4) but showed difference in value with T1 (7.3) and T3 (7.2). The texture of the control sample secured a highest score value of 7.2 when compared with millet based pizza base of T1 (7.1), T2 (7.0) and T3 (6.9). There was a significant difference among the millet based pizza base and the control for palatability.

The overall acceptability of the millet based pizza base T2 (7.4) was equivalent with the control (7.4) and showed difference in T1 (7.0) and T3 (6.9). The results indicated that there was a significant difference between the control and millet based pizza bases.

Conclusion

The millet based pizza base prepared with different proportion of bajra and wheat flour and studied for its sensory characteristics. Among these proportion, millet based pizza base prepared with bajra flour and wheat flour at the ratio of 50:50 was found to be acceptable and equivalent to the control sample.

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