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Ibadahun L Nongrang
Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Science Prayagraj Uttar Pradesh, India

SN Thakur
Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Science Prayagraj Uttar Pradesh, India

Correspondence
SN Thakur
Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Science Prayagraj Uttar Pradesh, India

Sensory quality of buns produced from wheat flour and sorghum flour blends

Ibadahun L Nongrang and SN Thakur

Abstract
A study was conducted to evaluate the quality character of wheat flour and sorghum flour which could be used as low gluten supplemented cereal baked product. The buns was prepared by adding 100% wheat flour for control (T_0), T_1 was prepared by adding 80% of wheat flour and 20% sorghum flour, T_2 was prepared by adding 70% wheat flour and 30% sorghum flour, T_3 was prepared by adding 60% wheat flour and 40% sorghum flour and T_4 was prepared by adding 50% wheat flour and 50% sorghum flour. Bun were analysed for sensory parameters results from organoleptic evaluation.

Keywords: Gluten, bun, sensory quality

Introduction
Bakery and cereal products are an important part of the diet of today's consumer. Among all the bakery products, bread is of particular interest for today's food industry due to its indispensable role as a staple food across the world. Bakery products are mainly prepared from wheat as it is a main ingredient. Bakery products such as bread, buns etc. are considered as a major role of nutrition, besides they are also inexpensive, convenient and easily accessible ready to eat food items.

Sorghum (*Sorghum bicolor* (L. Moench) is a cultivated tropical cereal grass. It is the only species which is cultivated for food and feeds among other 28 species and it is generally, although not universally, considered to have first been domesticated in North Africa, possibly in the Nile, Sub-Saharan and/or east Africa regions as recently as 1000 BC (Kimber, 2000) (Taylor, 2003).

Sorghum is cultivated for different purposes, USA which is a major producer of sorghum; the grain is used mainly as animal fodder, while in Africa and India, the grain is considered as a major food source and forms the staple diet for large populations living in the semi-arid regions in Asia and Africa where, sorghum is produced for human consumption and it is almost the only source of energy and protein in those regions (Taylor *et al*., 2011). Lack of gluten in sorghum gives a significant importance to tackle the present day scenario of Celiac Disease (CD) occurrence (Kasarda 2001).

Sorghum is consumed into a wide variety of foods, such as baked products, tortillas, couscous, gruel, steam-cooked products semi-leavened breads, popped form, fermented or non-fermented porridges and alcoholic or non-alcoholic beverages (Anglani, 1998). Moreover, grain sorghum has great potential to be used in different industrial applications and processed into starch, flour, grits and flakes as well as malted products. In this review article, we will try to recap the possible sorghum potentiality to use it in a modern bread making industry.

Sorghum is used for food, beverage, feed, and biofuel. Variety of food such as biscuit, pizza, snack, and bread were made from sorghum. Sorghum has a high nutrient content, so it is good as a source of food alternative.

Utilization of sorghum as a substitute for wheat flour can be used by the food industry to reduce imports of wheat flours.

Bread is a food prepared from dough of flour and water, usually by baking. The most important property of bread is swelling property because presence of gluten that made a network forms the structure of bread dough and makes it elastic and extensible. Sorghum has no gluten, so the sorghum bread could not expand and appearance is not good. Therefore required some approach to make good bread from sorghum flour.

Materials and methods

The experiment was carried out in the research lab of Dairy Technology Department, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture and Sciences Prayagraj. The prepared bun was prepared using wheat flour and different levels of sorghum flour. Five number of treatments which were replicated 4 times. The ingredients were obtained from the local market of Prayagraj.

Treatments Combination

Bun was prepared by blending different levels of wheat flour and sorghum flour in the following levels:

T_0- Bun was prepared by blending of wheat flour

T_1- Bun was prepared by blending 80% of wheat flour with 20% of sorghum flour

T_2- Bun was prepared by blending 70% of wheat flour with 30% of sorghum flour

T_3- Bun was prepared by blending 60% of wheat flour with 40% of sorghum flour

T_4- Bun was prepared by blending 50% of wheat flour with 50 % of sorghum flour

Sensory evaluation of the bun samples were carried out by experienced staff members served as panellist on a 9 point hedonic scale allotted for different parameters such as colour, flavour, taste, texture, appearance and overall acceptability of the bun. The numerical was used as an indication of the quality of the product.

Results and Discussion

The highest score for color and appearance was obtained in T_3 (8.25), containing 60% of wheat flour and 40% of sorghum flour, the highest score for Flavour was obtained in T_3 (7.75), Highest score for Body and texture was obtained in T_4 (8.25), and the highest score for overall acceptability was obtained in T_3 (8.13).T_3 was found to have the highest score in sensory evaluation.

Table 1: Sensory score of value added bun of wheat flour and sorghum flour

Colour &appearance	7.75	7.75	7.63	8.25	7.50
Flavour	7.38	7.13	7.75	7.75	7.50
Body Texture	7.63	7.25	7.38	7.88	8.25
Overall acceptability	7.25	7.38	8.00	8.13	7.75

Colour and appearance

Colour and appearance score for bun samples of different treatment and control, the highest mean color and appearance percentage was recorded in sample T_3(8.25) followed by T_2(7.63), T_1(7.75), T_0(7.75), T_4(7.50).

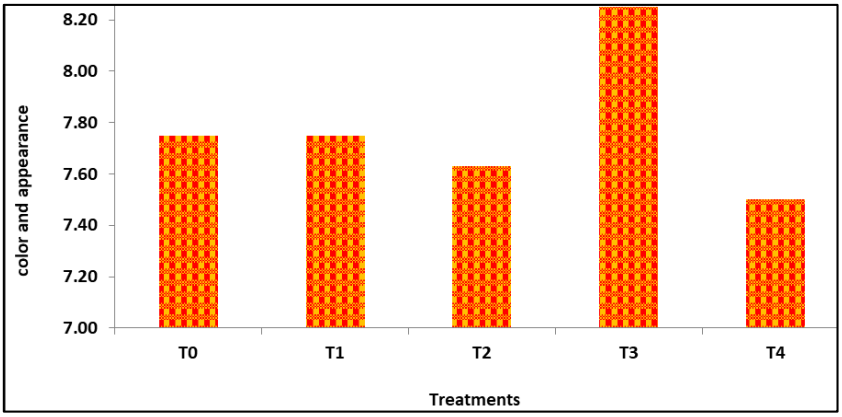


Fig 1: Colour and appearance score of control and experimental wheat & sorghum flour incorporated bun.

Flavour of Bun

Flavour of bun samples of different treatment and control, the highest mean flavour was recorded in sample of T_2 (7.75) followed by T_3 (7.75), T_4 (7.50), T_0 (7.38), T_1(7.13).

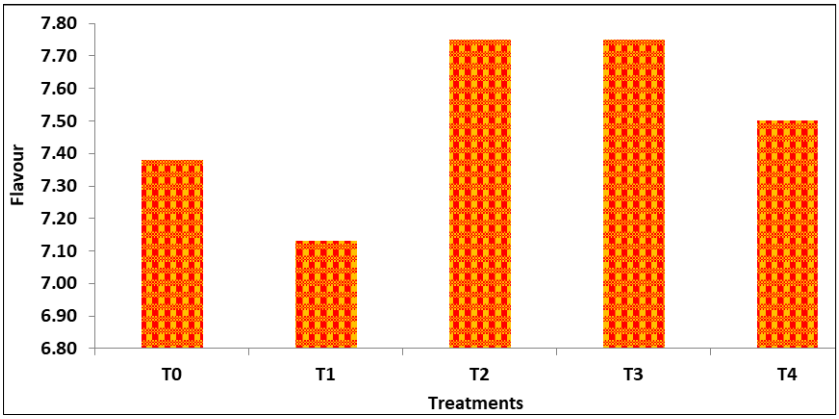


Fig 2: Flavour score of control and experimental wheat & sorghum incorporated bun

Body and Texture

Body and texture of bun samples of different treatment and control, the highest mean body and texture was recorded in the sample of T_4 (8.25) followed by T_3 (7.88), T_0(7.63), T_2(7.38), T_1(7.25).

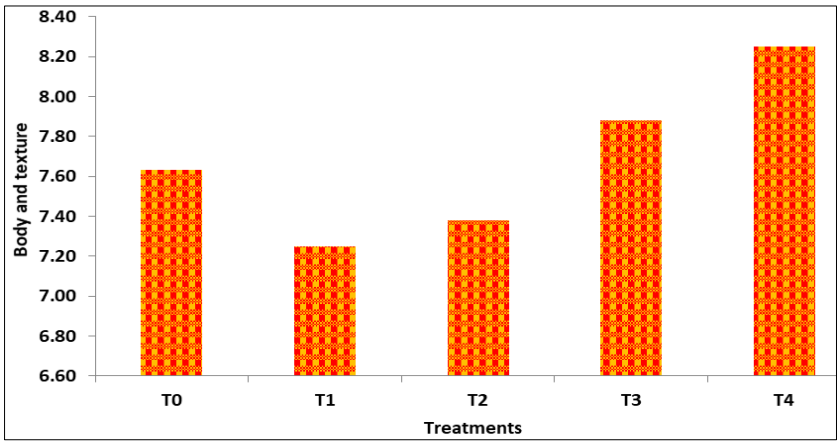


Fig 3: Body and texture score of control and experimental wheat & sorghum incorporated bun

Overall Acceptability

Overall acceptability of bun samples of different treatment and control, the highest mean overall acceptability was recorded in the sample of T_3 (8.13) followed T_2(8.00), T_4(7.75), T_1(7.38),T_0 (7.25).

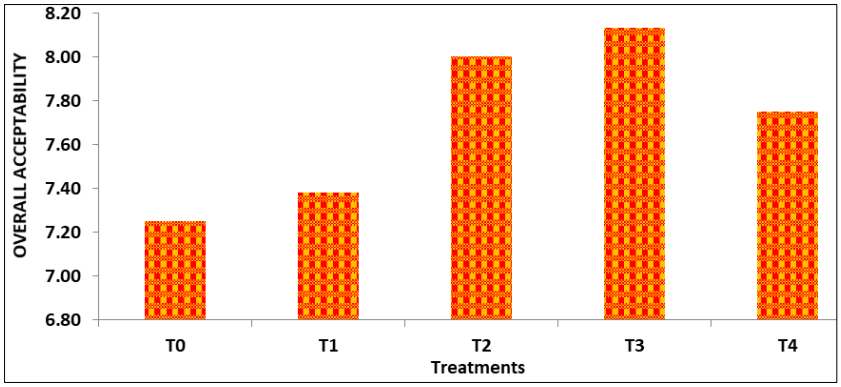
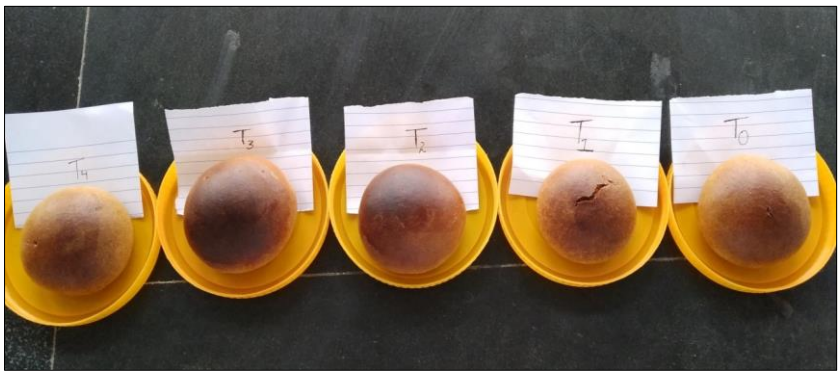


Fig 4: Overall acceptability score of control& experimental wheat & sorghum incorporated bun.



Body of the product

Conclusion

The results of sensory analysis in terms of colour and appearance, Flavour, Body and texture and overall acceptability was recorded maximum in T3 due to the increase in ratio of wheat flour and sorghum flour which led to the colour changes and texture of the bun.

Acknowledgement

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