

Effect of Shortening on Sensory Characteristics of Wheat Bread

Allha nawaz Rind and Tahseen Fatima Miano*

Institute of Food Sciences and Technology, Sindh Agriculture University Tandojam, 70060, Pakistan

Abstract

An investigation was conducted to evaluate the effect of shortening on sensory characteristics of wheat bread; the study was carried out in the Bakery Technology Laboratory, Institute of Food Science and Technology, Faculty of Crop Production, Sindh Agriculture University Tandojam. Effect of shortening on wheat bread for sensory analysis appearance, color, flavor, texture, palatability of wheat bread. The results revealed that the wheat bread subjected to shortening with animals fat (butter), edible oil (Soybean) and control. In palatability scored 7.08, 7.31 and 6.89 numbers (out of 10), flavor scored 7.47, 7.64 and 7.28 numbers (out of 10), texture scored 7.42, 7.83 and 7.23 numbers (out of 10). The sensory analysis suggest that shortening of wheat bread with animals fat (butter) was relatively better in palatability, flavor, texture, appearance as well as color, as compared to shortening with edible oil (Soybean) or when bread left without shortening. However, the different between treatments were statistically non-significant ($P>0.05$).

Keywords: Shortening; Bread; Sensory evaluation

Introduction

Bread as a staple food was perceived in 1950s and increased its consumption slowly. Today, attitudes towards bread are changing with more consumers regarding bread as a healthy food. After two decades fresh and crusty bread sold by hot bread shops provided an alternative to the bread sold in supermarkets which some consumers considers bland, boring and not always fresh. Pakistan had mostly roti or chapatti, types of unleavened flat bread made from whole-wheat flour and baked on a hot iron griddle (tava), from the major part of the propels diet. Same bread baked in a tandoor or clay oven and is rarely prepared at home. White and brown breads are also very common, but not as much as Roti, however, bread being a nutritious food supplies protein, vitamins and carbohydrates are consumed by utmost of peoples, major basis of dietary melanoidins [1] wheat lipids [2] Vitamin E is a natural antioxidant [3] wheat-heavy diet consumed over lengthy ages can result in micronutrient malnutrition[4] functional bakery products having therapeutic value other than nutrition [5] starch retro gradation, water migration properties varies, changes in the gluten network binding, and interactions between [6] the cells, sensory attributes (overall acceptability) properties of bread [7] also considered a quality parameters. Stability time characterizes the mixing tolerance of dough, and water activity of the dough particles [8] starch pasting [9] properties of dough under mixing and heating controls the dough expansion. This has been an essential element of human diets [10]. Flour is made from grinding grain in a process of milling, mostly grain flours are being used in bread making, and wheat flour is the most common. There are two kinds of wheat flour wheat and white. Whole-wheat flour is milled from the entire wheat kernel [4]. Bran and germ give whole-wheat flour a brown color, and it is sometimes referred to as brown flour. White flour is milled only from the endosperm. Natural white flour has a slightly yellow tint from pigments in wheat that tend to white with time. Wheat flour is particularly well suited to bread making because it contains glutenin and gliadin, two proteins that combine with water to form a substance called gluten. Gluten acts like elastic, all [2] owing the dough to stretch to trap gas and air bubbles. Yeast breads making involves mixing, kneading, rising the dough, shaping and braking the bread as a rule, bread is raised by causing the yeast plant to develop in it so called aerated bread is also made by forcing carbonic acid gas into it. The latter plan has its merits, but the yeast-raised bread is preferable. To be good and palatable, bread must be light and sweet, and great care must be used in making the dough, raising it, baking it, and keeping it.

Heavy bread is bad, dangerous food, and the cause of much misery and suffering, for it is far too common in the household [10,11].

Material and Methods

An experiment was conducted to investigate the effect of shortenings on sensory characteristics of wheat bread at bakery technology laboratory of Institute of Food Science and Technology, Faculty of Crop Production, Sindh Agriculture University Tandojam. Wheat breads were prepared by using (500 gm) wheat flour (Maida), (100 gm) sugar, (64%-70%) water, (2 No.) eggs, (2 gm) Eka chemical (bread improver), (4 gm) yeast, (1 gm) salt and (2 ml) vanilla flavor procured from the local market of Hyderabad. All ingredients were added mixed in dough mixer for 5 minutes dough preparation and development at the same ratio of ingredients with different shortenings one batch of sample (control) was prepared by mixing of all ingredients without using shortenings such as (20 ml) edible oil (soybean) and (20 ml) animal fat (butter) (Figure 1).

The details of treatments were as under:

Experimental design

- S1. Preparation of dough without addition of shortenings in wheat flour
- S2. Preparation of dough with addition of 20 ml animal fat (butter) in wheat flour
- S3. Preparation of dough with addition of 20 ml edible oil (soybean) in wheat flour.

Experiment was designed and each sample was analyzed in triplicate to achieve the better quality results.

*Corresponding author: Tahseen Fatima Miano, Faculty of crop production, Institute of Food Sciences and Technology, Sindh Agriculture University Tandojam, 70060 Pakistan, Tel: +92-22-2765554; E-mail: tahseenfm@yahoo.com

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Statistical analysis

The data obtained was tabulated and analyzed according to statistical procedure of analysis of variance (ANOVA) and significant differences of the mean were further computed using least significant difference (LSD) test at 0.05% level of probability through computerized statistical package i.e. Student Edition of Statistix, Version 8.1 (Copyright 2005, Analytical Software, USA) (Figure 2).

The samples of prepared breads of each treatment were given to the panel of seven judges for evolution of sensory characteristics such as palatability, flavor, texture, assessment of consumer products by the use of the human senses (sight, smell, taste, touch and hearing). The discipline of sensory analysis required to use of panel of human evaluators, where in test results were recorded based on their responses to the products under test. Statistical analysis was then employed to generate inferences and insights regarding the product. After completion of baking process of wheat bread, the bread brought to the panel of judges for evaluation of shortenings effects on quality of bread. The change of color during the preparation of food was useful index of the required degree of baking color also provided useful guide

to quality. After completion of evaluation of appearance and color also types of bread prepared by without and with animal fat (butter) and edible oil (soybean), added to the wheat flour. Evaluated by the same panel of physical properties perceived by senses (musical-nerve endings), touch (including mouth feel), sight and hearing.

Also evaluated by panel of seven judges and marking were recorded on scorecard. The palatability of bread was subjected to agreeable to the taste by initiating the bites followed by chewing and also to the mind for its palatability (Figure 3 and Table 1).

Result

It was noted from the result that wheat bread shortening with animal fat (butter) was better in palatability achieving average score 7.08, 7.31 and 6.89 as compared to shortenings with edible oil (Soybean) or when wheat bread left without shortening. The wheat bread shortening with animal fat (butter) was better in flavor achieving average score of 7.64, and shortenings of wheat bread with edible oil (Soybean) ranked third as per the sensing of panel of seven judges with score of 7.28, while wheat bread prepared without shortening (control) ranked second in flavor

Characteristics	Treatments			SE	Prob.
	Control	Animal Fat (Butter)	Edible Oil (Soybean)		
Palatability	7.08	7.31	6.89	0.35	0.66
Flavour	7.47	7.64	7.23	0.35	0.77
Texture	7.42	7.83	7.23	0.34	0.44
Appearance	7.52	8.28	7.09	0.35	0.05
Colour	7.80	8.92	7.61	0.31	0.03

Table 1: Effect of shortenings on sensory characteristics of wheat bread.

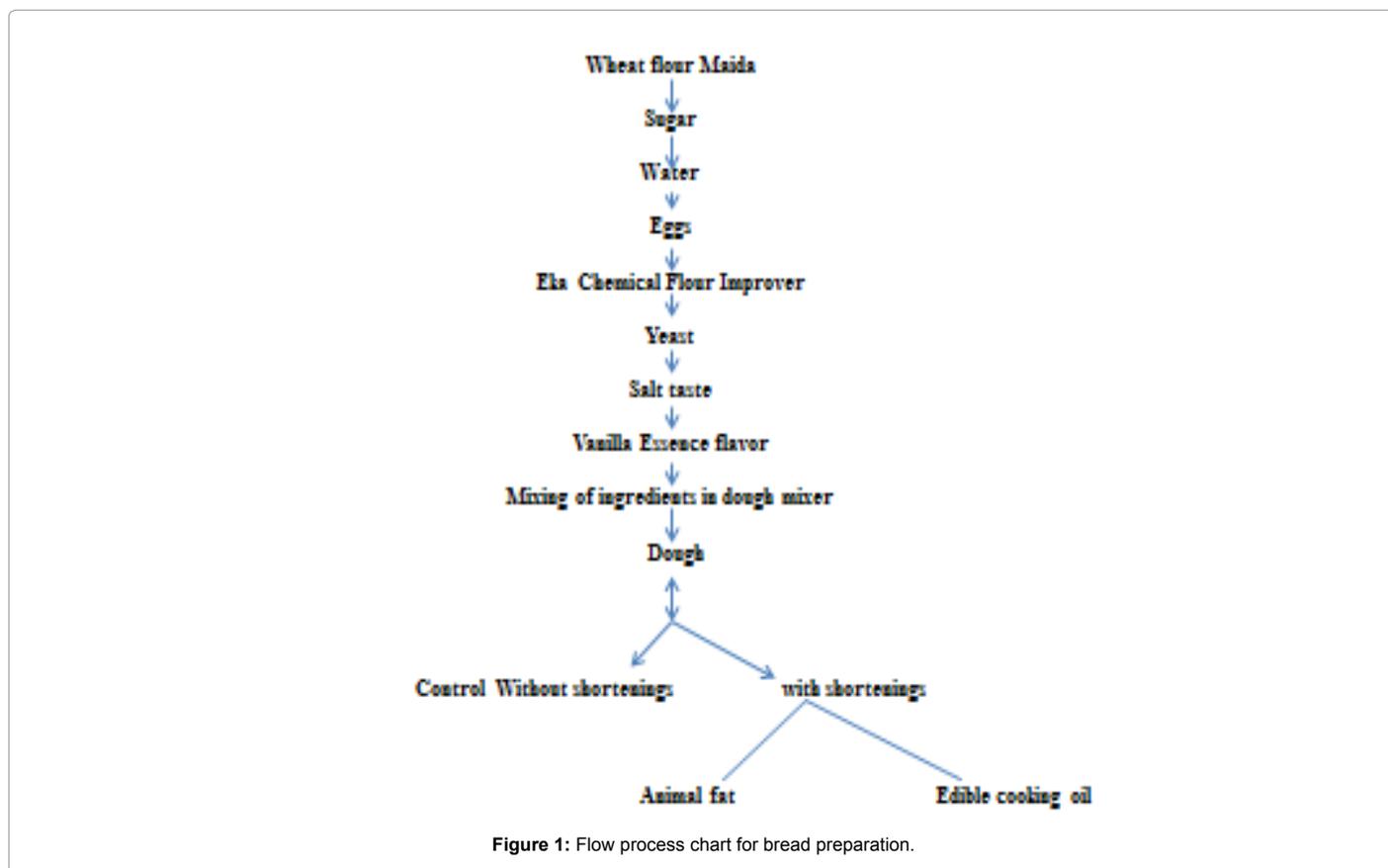
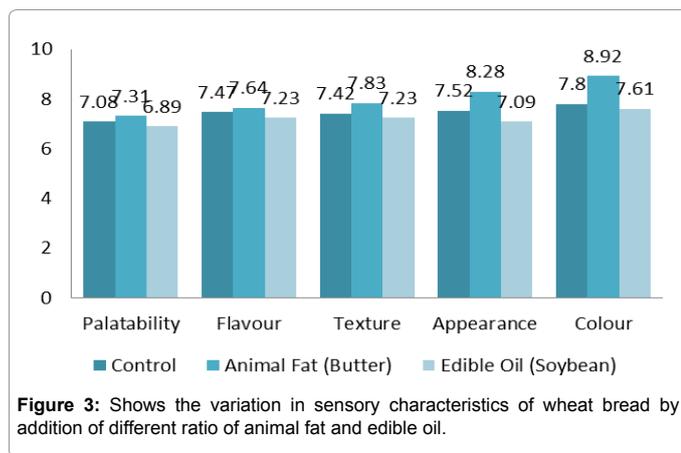
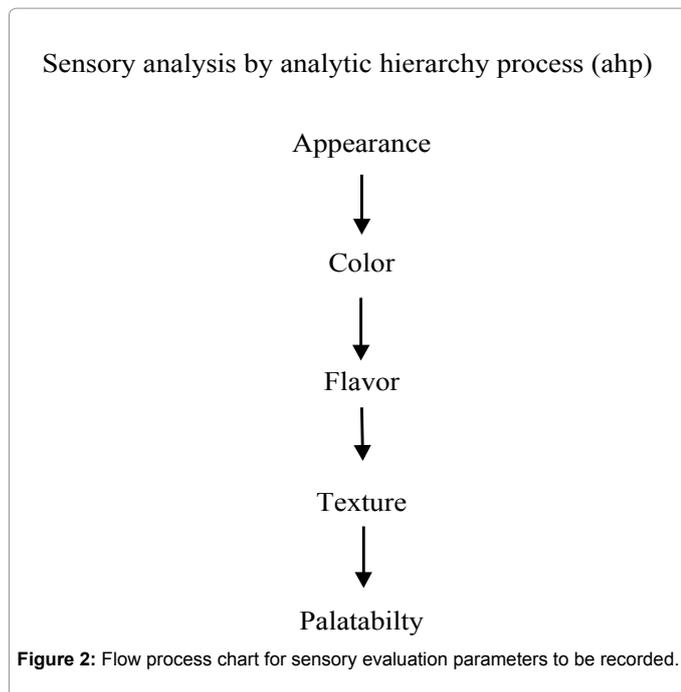


Figure 1: Flow process chart for bread preparation.



with score of 7.47. The wheat bread shortenings with animal fat (butter) was superior in texture obtaining average score of 7.83, and shortening of wheat of wheat bread with edible oil (Soybean) ranked third as per the observation of panel of seven judges with score of 7.23, while wheat bread prepared without shortening (control) ranked second in texture with score 7.42. The shortening with animal fat (butter) ranked first in appearance with average score of 8.28, and shortening of wheat bread with edible oil (Soybean) ranked third as per the observation of panel of seven judges with score of 7.09, and while wheat bread prepared without shortening (control) ranked second in texture with score of 7.52. The result showed that the wheat bread shortening with animal fat (butter) ranked superior in color with average score of 8.92, and shortening of wheat bread with edible oil (Soybean) ranked third as per the observation of panel of seven judges with score of 7.61, while wheat bread prepared without shortening (control) ranked second achieving score of 7.80. It was observation that wheat bread shortening with animal fat (butter) had remarkably was better suggested by the panel of judges as compared to shortening with edible oil (Soybean) or when wheat bread left without shortening.

Discussion

In Pakistan, approximately 80 percent of the total population relies on homemade wheat and rice made bread chapatti, roti and only 20 percent population use commercial bread. However, bread industry has now been flourishing fast and bread products are gaining much popularity. Bread has been accepted as a popular substitute of, nans, chapatti, paratha [2]. In commercial bread making fats are used for bread shortening, especially baked goods to promote crumbly texture. Shortening are blend of refined fats and oils, which are processed for desired texture and performance [11]. Shortening provide a significant provide a significant and increasing proportion of total fat in the diet. Functional and nutritional required contributing significantly to the evolution of formulation and unit processing technology required produce such products [12]. Fluid shortening is useful in the preparation of baked goods and in bread-making processes [13]. The present experiments were conducted to investigate the effect of shortening on the physical properties of wheat bread [14]. The sensory analysis indicated that the panel of seven Judges awarded 7.31, 6.89 and 7.08 for palatability to wheat bread with shortening and without shortening, for flavor of wheat bread with shortening and without shortening scored 7.64, 7.28 and 7.47, for texture of wheat bread with shortening and without shortening scored 7.83, 7.23 and 7.42, for appearance of wheat bread with shortening and without shortening scored 8.28, 7.09 and 7.52, for color of wheat bread with shortening and without shortening scored 8.92, 7.61 and 7.80. The sensory analysis suggested that shortening of wheat bread with animal fat (butter) resulted in improved wheat bread palatability, flavor, texture. Appearance as well as the color of the product as compared to edible oil (Soybean) or when wheat bread left without shortening. These results are partially supported by Friedman et al. [3] who suggested that the enriched bread with vitamins and protein can be made more acceptable and tasteful by its shortening with edible oil (Soybean). Kang et al. and Jorge et al. [6,9] has reported that different fats sources were used for shortening and all the used blends showed almost equal impact on the quality characteristics of the bread and improved shelf life including consumer acceptance. Gerits et al., Kang et al., Jorge et al. and Ganji and Kies [2,6,9,10] found no significant differences in color and texture by different shortening; however, canola Oil bread was judged significantly superior to soybean oil bread in flavor, and both of these breads were found to be significantly superior to coconut oil bread in flavor, tenderness, and overall acceptability. The comparative analysis of the findings from the present study and results reported by other workers, it is obvious that there is a gap between research aspect carried out in the advanced countries of the world and work being conducted under our condition miserable [12].

Conclusion

The all bread samples that were prepared with the mixture of shortenings to improve the better eating quality and sensory analysis suggested that shortening of wheat bread with animal fat (butter) resulted in improved wheat bread palatability, flavor, texture. Appearance as well as the color of the product as compared to edible oil (Soybean) or when wheat bread left without shortening. The use of shortening [6] has good nutritional and appealing effect on quality of bread probably due to the higher protein content and the ratio of shortenings formulations that was incorporated, which would enhanced the eating quality of bread.

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