Effect of Whole Buckwheat Flour on Loaf Volume and Textural Properties of Partially Baked Frozen Bread

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Buckwheat (BWF) is an annual plant that belongs to polygoneaceae family. In addition to being rich in trace elements, dietary fiber, protein and amino acid compound, it also contains phenolic components and these make it a nutritious harvest. Within the current study it was aimed to determine the effect of BWF, which was added to bread wheat flour according to displacement principle in various amounts (0, %10, % 20 and %30), on volume and some textural properties of bread which were partially-baked and frozen, during 3, 15, 30, 45-day-storage time.

After 3-day storage, it was identified that depending on the increment of buckwheat, bread volumes respectively reduced to %11.61, %22.16 and %32.07. At the end of the 15-day storage volumes of control samples experienced respectively %2.83 decrease. However, no further decrease was recorded in volume on 30th and 45th day storage time. As no change was recorded in values of volume for samples with %10 BWF on 3rdand 15th days of storage, extended time interval caused lower values of volume. As %20 and %30 addition of BWF caused a significant decrease in volume at the end of 3rd, 15th and 20th days of storage, no significant change was recorded on 30th and 45th days. At the end of 3-day-storage time, in parallel with BWF increase, bread firmness also increased. As the average was 10001.4 g in control samples, after the addition of BWF, the following values were identified respectively 1993.4, 3219.4, 4756.5 g. 15, 30 and 45 day storage led to an increase in firmness values. Adhesiveness increased significantly after the addition of BWF at around %20. Longer storage time also led to an increase in adhesiveness. Cohesiveness also increased in parallel with the addition of BWF. As no change was recorded regarding cohesiveness of control samples, the ones with BWF addition increased. Depending on the increase of BWF addition, gumminess increased statistically. As longer storage led to a decrease in this value, no significant change was recorded in the ones with BWF. As chewiness increased according to BWF addition, no significant change was recorded due to various storage times. Generally the chewiness of BWF addition at around %20 or more was found to be more difficult to chew in comparison to bread samples without BWF. At the end of the study it was found out that enrichment of bread through BWF addition can turn it into a functional food. However, due to undesirable elements in bread volume and texture, more than %10 was not recommended. New studies are needed in order to prevent the undesirable factors that are arised by decreased gluten amounts when more BWF is used.

Keywords: Buckwheat, Partially baked frozen, TPA