

- **Relation between structural, mechanical and sensory properties of gluten-free bread as affected by modified dietary fibers**

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Abstract:

Gluten-free bread was fortified with modified dietary fibers (wheat bran, resistant starch and inulin) and their effects on water mobility, friction coefficient, thermal behavior, crystalline pattern and textural properties were evaluated. Moreover, time-intensity evaluation was used to study temporal dynamics of sensory attributes of fortified-breads. Dietary fibers increased gelatinization temperature while decreasing gelatinization enthalpy, more notably when inulin was used. X-ray diffraction patterns of bread showed the appearance of new peaks after addition of resistant starch and wheat bran, coinciding with an increase in crumb hardness. In contrast, inulin considerably decreased starch crystallinity in the bread, resulting in a softer crumb. Faster decay and shifting of protons to shorter times were found with incorporation of dietary fibers. Friction coefficient determined by tribology measurement was higher in the breads containing resistant starch and wheat bran compared to other samples. Pearson's correlation analysis indicated the sensory attributes of firmness, chewiness and dryness were positively correlated with instrumental findings. Time-intensity evaluation revealed inulin-fortified bread had the lowest firmness and chewiness with less dryness, whereas resistant starch-fortified bread showed the highest intensity of these descriptors.

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