Hyperspectral imaging of gluten-free dough and bread

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Production of a high quality gluten free bread is a big challenge due to the absence of gluten, which confers unique viscoelastic properties to dough (Houben et al., 2012). To overcome this challenge, different approaches are used in preparing gluten-free products, such as the use of different gluten-free flours (rice, maize), starches (corn, potato, cassava) and ingredients such as hydrocolloids

Food is a complex system that contains a lot of different compounds. These compounds can interact with each other and with food additives, such as hydrocolloids and may change the quality of the baked gluten-free product. Sensory analysis is usually a method of choice in food product development and quality control but tests must be set up in a specific way to minimize errors and biases during testing. To ensure both high food quality and requisite safety standards new analytical procedures using cameras and spectral imaging devices are being developed. In recent years HSI has become an important imaging modality in the food science and agriculture, especially in the food safety inspection and food quality control (Liu et al., 2017).

The objective of this study is to explore sensory and spectral properties of gluten-free bread. We have used sensory analysis and HSI to evaluate baked gluten-free bread. The obtained data were compared to try to find correlation between physico-chemical properties of different model doughs and sensory properties of gluten-free breads with a final goal to identify the crucial factors that yield better gluten-free bread.

**Keywords:** gluten-free bread, hydrocolloids, hyperspectral imaging, dough, sensory analysis

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