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ACCEPTED MANUSCRIPT

Classification of puffed snacks freshness based on crispiness-related mechanical and acoustical properties

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Highlights

- Acoustics strongly influence the sensory perception of puffed snacks' freshness.
- Multisensory integration of crispiness is modeled using instrumental data.
- The parameters impacting crispiness are evaluated to enable product optimization.
- The classification accuracy of crispiness is improved using spectral features.
- Machine learning is introduced for rapid quality control of food texture.

Abstract

The use of instrumental methods to support sensory panels in the routine quality control of crispiness remains challenging. Texture analysis is often insufficient to accurately classify this complex sensory attribute. Herein, 70 different food properties were combined via machine learning algorithms to mimic multisensory integration. Force and sound were measured during crushing of puffed snacks equilibrated at different humidity levels. Sensory panels

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