

## Texture improvement of Black Bean Patty using Carrageenan

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### Structured Abstract

**Background:** The increasing demand for plant-based food products has driven the need for developing alternatives with improved sensory and physicochemical properties. This study investigates the effect of carrageenan on the texture, water holding capacity, cooking properties, pH, colour, and sensory attributes of black bean patties. The primary objectives are to evaluate the physicochemical changes induced by carrageenan and to determine its influence on sensory attributes, including taste, mouthfeel, and overall consumer acceptability.

**Methods:** The research involved two formulations, incorporating 1% and 3% carrageenan against a control with 0% carrageenan. Texture profile analysis, colour measurement, pH analysis, water holding capacity, and cooking properties were systematically evaluated. Additionally, sensory analysis was conducted to assess attributes such as appearance, taste, aroma, mouthfeel, and overall acceptability. Data were statistically analysed to identify significant differences and correlations among the variables.

**Results:** The findings reveal that carrageenan significantly improves the texture and water holding capacity of black bean patties. Increased concentrations of carrageenan enhanced the hardness, cohesiveness, and chewiness, aligning with expected outcomes. The colour analysis indicated slight variations, which were within acceptable sensory limits. pH levels remained stable across different formulations. Although there were observable trends in the sensory scores, these differences were not statistically significant. But it is important to highlight that the sensory scores for all formulations were relatively high. This indicates that all the black bean patties, regardless of carrageenan concentration, were generally well-received by the panellists, indicating overall consumer acceptability.

**Conclusion:** This study demonstrates that carrageenan is a valuable additive for improving the physicochemical and sensory properties of black bean patties. The enhancements in texture, water holding capacity, and consumer acceptability suggest potential for broader application in plant-based food products. While some limitations were noted, the overall findings support the use of carrageenan in developing high-quality meat alternatives. Further research on shelf life and long-term stability is recommended to ensure product viability in the market.

**Keywords:** Black Bean Patty, Carrageenan, Physicochemical, Consumer acceptability

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