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Methylcellulose replacement with different enzymatically treated plant fibres as a binder in the production of plant-based meat patties

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Abstract

Texturised vegetable protein (TVP) is a sustainable and economical base for plant-based meat patties but requires binders to create an emulsified gel and hold the patty structure together. This study evaluated the physicochemical and sensory attributes of TVP patties incorporated with three different enzymatically-treated plant fibres i.e., pea (EPF), citrus (ECF) or apple (EAF) as a binder compared to positive control (methylcellulose, MC) and negative control (no binder, NC). All the patties with plant fibres had similar water-holding capacity compared to the MC. EAF exhibited the least fluid release and uniform surface, while ECF demonstrated the least cooking loss and shrinkage, uniform surface, hard texture, better cohesiveness, gumminess and chewiness compared to other samples. All the plant fibre-incorporated patties scored similarly for taste, texture, juiciness and overall acceptability compared to the positive control. The agglomerative hierarchical clustering revealed that the EPF had similar characteristics to the MC but the principal component analysis indicated that citrus fibre was a superior binder to pea fibre, therefore it could be used to replace methylcellulose for plant-based meat patties. Future research should explore more variations in plant-based binders to optimise the performance and sensory attributes of different types of texturised vegetable protein-based meat analogues. © 2024 The Authors

Author Keywords

Apple fibre; Citrus fibre; Meat analogue; Methylcellulose; Pea fibre

Index Keywords

Binders, Fruits, Meats, Principal component analysis, Proteins, Textures, Vegetables; Apple fiber, Citrus fibre, Meat analog, Meat patty, Methylcellulose, Pea fiber, Physico-chemicals, Plant fibres, Sensory attributes, Vegetable protein; Emulsification

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