



Utilisation of Carrot Pomace as an Ingredient in Tomato Paste Production

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Abstract

Carrot pomace, a by-product accounting for 50% of food waste from carrot juice extraction, is significantly valued for its high content of antioxidants, minerals, vitamins, and dietary fibre. Tomatoes, one of the most widely consumed vegetables, are often processed into tomato paste for year-round availability. However, significant nutrient loss occurs during processing, making fortification necessary. This study investigated the effect of incorporating carrot pomace on the nutritional profile and quality attributes of tomato paste. The tomato paste formulations were prepared with varying proportions of carrot pomace, specifically 20%, 27.5%, 35%, 42.5%, and 50%, with the remaining composition consisting of tomato and a control made up of 100% tomatoes. The formulated tomato-carrot pomace pastes were evaluated for their proximate composition, pH, titratable acidity, total soluble solids, beta-carotene content, lycopene content, vitamin C content, colour parameters, and microbial load. Results showed significant variations in moisture, ash, protein, oil/fat, fibre, and carbohydrate content. Beta-carotene content and total soluble solids increased with the addition of carrot pomace, while pH, titratable acidity, lycopene content, and vitamin C content decreased. Colour analysis revealed an increase in yellowness (b^*), while redness (a^*) and lightness (L^*) exhibited a decrease. Samples with a higher proportion of tomato recorded relatively high yeast and mould counts. The optimized formulation, consisting of 61.8% tomato and 38.2% carrot pomace, was well rated for appearance, texture, taste, and aftertaste. The incorporation of carrot pomace into tomato paste not only enhances its nutritional profile but also contributes to reducing food waste, offering a sustainable and functional approach to improving food products.

Keywords: Carrot pomace, by-product, tomato paste, food enrichment, food waste reduction

