

Thesis Title	Utilization of Sacha Inchi Press Cake in the Production of Plant-based Meat Alternatives
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ABSTRACT

This study evaluated the valorization of Sacha inchi press cake (SP), an oilseed by-product, to produce texturized vegetable protein (TVP) using single-screw extrusion. Steam pretreatment effectively reduced tannin content by 23.6% and saponin contents by 25% ,enhancing palatability of the Pretreated SP, referred to as Sacha inchi press cake meal (SPM), was blended with pea protein isolate (PPI) at SPM:PPI (w/w) ratios to produce five formulations: Control (0:100), TA (10:90), TB (35:65), TC (70:30), and TD (100:0). Increasing SPM incorporation in TVP formulations significantly altered color parameters, as evidenced by decreased lightness and increased redness and yellowness, thereby imparting a more meat-like appearance; however, elevated SPM levels were associated with a progressive decline in textural integrity. Among formulations, TA displayed a more compact and continuous microstructure with reduced pore formation and favorable textural properties comparable to commercial TVP (COM). Based on these characteristics, TA was selected for further analysis, showing high protein content (69.42%, d.b.), a balanced essential amino acid profile, and a predominance of oleic and linoleic acids without detectable trans fats. When incorporated into a burger patty, TA showed higher protein content (45.43%, d.b.) and fat retention while maintaining comparable cooking performance to commercial TVP based burger patty. Despite instrumental differences in color and texture, sensory evaluation (n=30) using a 9 -point hedonic scale showed no significant differences ($p > 0.05$) in appearance, aroma, taste, texture, or overall acceptance between TA (7.14), COM (6.77), and minced chicken burgers (7.27). Consumer perception data further indicated that the SPM-based burger was associated with health, modernity,

and environmental sustainability, with acceptance independent of food neophilia. These findings demonstrate the technological feasibility, nutritional value, and sensory competitiveness of upcycled Sacha inchi press meal as a sustainable ingredient for plant-based meat analogues, although further refinement of structural anisotropy and texture through advanced extrusion strategies may enhance meat-like fidelity.

Keywords: Sacha Inchi Press Cake, Texturized Vegetable Protein, Plant-Based Meat Alternatives, Food Waste Valorization, Consumer Acceptance, Sustainable Food Innovation

