## Effect of texturized pea protein and protein isolates on the textural properties of blended beef patties

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**Introduction:** A growing number of consumers are concerned about their red meat consumption due to more evidence of the association between red meat and certain cancers. The number of flexitarians is rising, who are defined as those who reduce their meat intake and increase their consumption of plant-based foods. Meat products with a partial substitution with plant materials are considered as a novel and effective method to reduce meat consumption in a meal context. This trend for a shift in diets provides an opportunity for blended meat products, which bridge the gap between meat and plant-based food products. Textural properties are one of the most sensory attributes of emerging products in the market, and non-vegetarian consumers prefer blended meat products with a meat-like taste. It is crucial to explore how plant-based meat substitutes, including fibrous and powdery plant protein, affect the texture of blended meat products. Therefore, the aim of this study was to determine the effect of the addition of plant proteins, including Pea Protein Isolate (PPI), Fava bean Protein Isolate (FPI), and Texturized Pea Protein (TPP), on textural attributes of beef patties.

**Method:** A variety of plant-based proteins inclusive of TPP, PPI and FPI were obtained from Agri Food Ingredients (Victoria, Australia). Beef chuck and salt were purchased from a local market. The beef was trimmed of fat and connective tissues and minced before blending with plant protein. TPP was hydrated at 1:2 (w/w) with water. In total, four batches of samples were made. One control and eight treatments of blended beef patties were prepared: Control (no plant proteins), 5% PPI or 5% FPI (replacing 5% meat) with 0, 10, 25 or 50% TPP (replacing the equivalent amount of beef). The water and salt levels were the same for all treatments. The patties were formed by a patty maker and stored at -20℃ until analysis. Samples were thawed overnight and cooked in an oven at 180℃ to an internal temperature of 75℃. Cooking loss, Warner-Bratzler shear force (WBSF) with a V-shape blade, and Textural Profile Analysis (TPA) with a cylindrical probe, were measured on three patties per formula per batch.

**Results:** Addition of plant proteins had a positive effect on reducing cooking loss compared to the control. Increasing TPP content was correlated with reducing cooking loss. A reduction in WBSF was observed with increasing TPP content. Insignificant differences between the control and blended patties were found for TPA parameters, including hardness, cohesiveness, gumminess, and chewiness, regardless of the types of plant protein. Patties with 5% isolate and 10% TPP had similar TPA parameters to those of the control.

**Conclusions:** In summary, the texture of blended meat patties can be manipulated by the type (isolate and texturized proteins) and content of plant proteins to achieve a texture similar to conventional beef patties.

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