

Influence of Soy Protein Concentrate Inclusion on the Physicochemical, Microbial and Sensory Attributes of Beef Patty during Chilled Storage

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In recent years, as the regular change in consumers' purchasing decisions for low-cost ready-to-eat meat products with high nutritional value and good eating quality increases, plant protein is used as an extender in ground beef formulations. Four different formulations with concentrations of 10, 15, 20, and 25% (w/w) of rehydrated soy protein concentrate (SPC) with the ratio of 1:2 (SPC: distilled water) added into beef patties were formed and stored at $4\pm 2^{\circ}\text{C}$ for 1, 3, 5, and 7 days. This study evaluated the effect of soy protein concentrate (SPC) on pH, color, WHC, cooking loss, cooking yield, TBARS, and microbial analysis of these formulations with a raw beef patty taken as a control. The addition of SPC didn't significantly affect the moisture loss during storage time ($p>0.05$), whereas instrumental color, cooking loss, cooking yield, and water activity were significantly affected by SPC level and storage days ($p>0.05$). The addition of SPC significantly increased Lightness (L^*) and yellowness (b^*), and redness (a^*) decreased ($p>0.05$) while the L^* , b^* , and a^* decreased throughout the storage period ($p>0.05$). Increased SPC levels resulted in high pH, greater WHC, water activity, cooking yield, and lower cooking loss ($p>0.05$). The shrinkage in diameter was lower in all SPC-added patties ($p>0.05$). Significantly lower lipid oxidation was recorded as the SPC level increased ($p>0.05$) while lipid oxidation increased over the days ($p>0.05$). The microbial count increased with the SPC level, and a similar trend of increment was found over storage days ($p>0.05$). SPC addition improved textural properties ($p>0.05$). The burger patty containing SPC 25% got higher scores for texture, juiciness, mouthfeel, and overall acceptance, among consumers, compared to all other treatments. SPC addition in patties positively impacted physical, textural, and sensory attributes preferred by consumers.