

Influence of the addition of turmeric on the color and texture parameters of healthy beef pâté

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Introduction: Nowadays, consumers aware of the effect that diet has on their health and wellbeing demand healthy foods (Domínguez et al., 2021). So, the reformulation of meat products by adding high-unsaturated oils is a common strategy, which makes them more susceptible to oxidation processes (Domínguez et al., 2019). In this regard, the use of natural antioxidants such as turmeric can delay lipid and protein oxidation. However, the use of turmeric can change multiple characteristics of the product, which influences consumer acceptance. Thus, the aim of this study was to assess the effect of turmeric on color and texture properties of beef pâté.

Materials and methods: A total of five batches of healthy beef pâté reformulated with canola oil were manufactured: batch 1 and 2 were the controls, without and with sodium ascorbate, respectively. The remaining batches were reformulated by adding increasing amounts of turmeric (25, 50 and 75 mg/kg). Color was measured using a portable colorimeter (CR-600d, Minolta Co. Ltd., Osaka, Japan), while texture (penetration test) was assessed following a procedure previously described by Vargas-Ramella et al. (2020).

Results: Regarding hardness, the addition of turmeric produced a significant ($P < 0.001$) reduction (from 0.79 to 0.98 N) in comparison with control (between 1.18 and 1.47 N) groups. Our values agree with those recently reported in a deer pâté (Vargas-Ramella et al., 2020). The differences in texture could be attributable to the use of turmeric as dry-powder, which has totally different consistency than the other ingredients. Concerning the color parameters, the control treatments presented the highest values ($P < 0.05$) of redness (a^*) and luminosity (L^*). The L^* values ranged from 54.74 to 58, and no differences were observed between turmeric-added samples. Variations in L^* could be related that turmeric was added as a powder, which could affect light reflection. Similarly, the a^* values did not show differences among reformulated samples prepared with turmeric (from 10.04 to 11.35), but these values were significantly lower than those obtained in the control samples (between 12.9 and 13.7). Our findings agree with those reported by other authors in sausages reformulated with turmeric (de Carvalho et al., 2020). These authors also noted that the addition of 250, 500 and 750 mg/kg of turmeric extract decreased both, L^* ($P > 0.05$) and a^* ($P < 0.05$), in comparison with controls. In contrast with the other color parameters, the yellowness (b^*) progressively increased as increased the turmeric content, from 28.34 to 37.91, and these values were significantly higher than those observed in control samples (about 19). Similarly, a progressive and significant increase of b^* were also displayed in sausages with turmeric addition (de Carvalho et al., 2020). This result is expected since turmeric had an intense yellow color. In fact, the food industry uses turmeric powder as a yellow colorant.

Conclusions: Turmeric addition resulted in significant changes in the pâté color. Therefore, taking into account that meat products color is an important attribute for consumer, the use of turmeric could affect pâté acceptability.

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