

Influence of the addition of turmeric on the color, texture and lipid oxidation of healthy beef sausage

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Objectives: Nowadays, consumers demand healthy foods. However, meat products are a source of non-healthy ingredients such as salt, saturated fat, cholesterol, etc. So, the reformulation of meat products by adding nutritive and healthy oils is a common strategy, and a new trend in the meat industries [1]. Nevertheless, the high unsaturated profile of these oils makes them more susceptible to oxidation, and thus produces a consumer rejection [2]. In this case, the use of natural antioxidants is also necessary to limit oxidative degradation. Turmeric, an important natural antioxidant, can be used to protect the fatty acids, but their use can change multiple characteristics of the meat products, including color or texture, which influences consumer acceptance. Thus, the main objective of the present study was to evaluate the effect of the turmeric addition on lipid oxidation and physicochemical characteristics of beef sausages.

Materials and Methods: Four batches of healthy beef sausages (chorizo), reformulated with canola emulsion hydrogel and with different antioxidant (turmeric) amounts were manufactured: batch 1 was the control (C), without turmeric. The remaining batches were reformulated by adding increasing amounts of turmeric (T25, T50, and T75; 0.25, 0.50 and, 0.75%, respectively). After 24h fermentation, the sausages were kept in a dry-cured chamber at 6-8°C and 45-80% relative humidity for 14 days, and at 10-12°C and 70-75% for another 20 days. The total process was 35 days. The color was measured using a portable colorimeter (CR-600d, Minolta), texture profile analysis (hardness; N) using a texturemeter TA-XT Plus [3], while lipid oxidation was evaluated by the thiobarbituric acid reactive substances (TBARS) [4]. Data were examined using a oneway ANOVA analysis. Duncan's test was used for the determination of the differences between least squares means (P<0.05).

Results and Discussion: Regarding hardness (texture), the addition of turmeric produced a slight reduction (between 2.21 N and 2.47 N) in comparison with the control (2.63 N). However, these differences were not significant, thus, no effect was observed on the texture properties of beef sausage. This could be expected since, in this type of product, the dry-curing conditions determine the product's final texture, and the effect of less than 1% of turmeric is insignificant. Concerning the color parameters, the control, T25 and T50 did not show differences in any of the parameters, while T75 had the highest values (P<0.05) of yellowness (b*) and luminosity (L*). The redness (a*) values ranged from 13.89 to 15.21, and no differences were observed between samples. Although the turmeric had an intense yellow color, its use produce minimal changes in color parameters (only in T75 samples), and this would be related to the fact that the sausages formulation use paprika as the main spice, which undoubtedly, due to its intense red color, makes the effect of turmeric on the final color negligible. Regarding oxidative stability, the inclusion of turmeric produces a strong antioxidant effect, limiting the degradation processes of beef sausage. Thus, the value of TBARS decreased progressively with the inclusion of turmeric, from values e 6.47 mg MDA/kg to 3.32 mg MDA/kg (T25) and <0.9 mg MDA/kg (T50 and T75). This fact was expected since the powerful antioxidant activity of this species is known.

Conclusions: The use of turmeric as a functional ingredient in the manufacture of healthy beef sausages produced minimal changes in color and texture properties, but inhibited the lipid oxidation reactions, which supports the use of turmeric as a natural antioxidant in meat products.

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