FRESH SAUSAGE ADDED ENCAPSULATED AÇAÍ OIL AS ANTIOXIDANT POTENTIAL

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I. INTRODUCTION

The antioxidant capacity of the açaí fruit and its derivatives has generated significant interest, particularly its oil and potential role as a food or food ingredient [1]. Microencapsulation techniques have been widely used, particularly in compounds with bioactive properties, allowing controlled release under specific conditions [2]. Thus, the aim of the study was to use açaí oil capsules with antioxidant potential in fresh sausages frozen for 90 days and to evaluate the oxidative and sensory characteristics.

II. MATERIALS AND METHODS

The açaí oil was encapsulated through the ionic gelation process using sodium alginate in order to control the release of acai oil during the storage period. The fresh sausages were prepared using ground pork, pork backfat and spices and were filled in natural casing. Four treatments were developed: control (C) without the addition of açaí oil capsule; T1 with 1.5g/kg of açaí oil capsule; T2 with 2.5g/kg of açaí oil capsule and T3 with 3.5g/kg of açaí oil capsule. The pH was determined by the Hanna pH meter (Hanna Instruments, Woonsocket, USA). The determination of substances reactive to thiobarbituric acid (TBARS) was carried out according to Raharjo et al. [3] and protein oxidation was analyzed according to the method described by Levine et al. [4]. The sensory analysis of the sausages was carried out using an acceptance test with 10 pre-trained panelists aged 22-47, members of the meat laboratory and familiar with the product. All analyses were carried out in triplicate and analyzed using ANOVA and the Tukey test through Statistica® 7.0 software with a 5% significance level.

III. RESULTS AND DISCUSSION

The pH average between 5.64 and 5.72 on day 0 and 5.12 to 5.43 on day 90, with the samples with capsules showing higher values than the control ($P < 0.05$). A possible explanation is that the alginate used to form the capsules contributed to increased pH values, as it has a basic pH. Regarding storage time, there was a decrease in pH values for all treatments ($P < 0.05$).

In relation to TBARS values the values averaged between 0.22 on day 0 and 0.96 mg of MDA/kg on day 90 of storage. Açaí oil capsules were not as effective in inhibiting lipid oxidation. In future work, it is suggested to increase the concentration of encapsulated oil added.

In the protein oxidation results (Figure 1), it can be seen that on day 0, T2 showed the highest levels of oxidation. On day 90, the control and T2 showed the highest levels. In other words, the release of oil from the capsules was not homogeneous, with T1 having a lower açaí content than T2, and even so it showed more promising results.

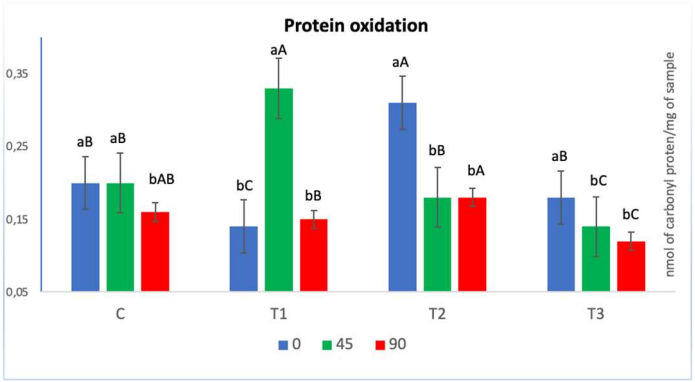

Figure 1. Protein oxidation of fresh sausages.

a-b Mean values with different letters showed significant differences between treatments ($P < 0.05$) by Tukey's test. A-C Mean values with different letters showed significant differences between days ($P < 0.05$) by Tukey's test.

Control treatment – C: without inclusion of açaí oil capsules; T1: inclusion of 1.5 g of açaí oil capsules / kg of sausage; T2: inclusion of 2.5 g of açaí oil capsules / kg of sausage; T3: inclusion of 3.5 g of açaí oil capsules /kg of sausage.

There was no significant difference ($P > 0.05$) between treatments for the sensory attributes global acceptance, color, aroma, flavor, and texture. According to Meeilgard et al. [5], panelists "moderately liked" the color, aroma, texture and flavor. A score of 7.94 was obtained for the global acceptance, indicating that overall, they "moderately liked" the product. Regarding purchase intention, there was no significant difference ($P > 0.05$) demonstrating that the panelists "maybe bought, maybe not."

The scores of all evaluated attributes did not vary significantly between treatments, including the control treatment. This suggests that the addition of açaí oil may be a promising alternative, as in addition to improving the fatty acid profile and containing antioxidant properties, it does not alter the sensorial quality of the products. This is particularly exciting from a nutritional standpoint as açaí oil is a known rich source of essential fatty acids, antioxidants, and other health-beneficial nutrients [6].

IV. CONCLUSION

Açaí oil capsules and storage period influenced the pH of fresh sausages. Açaí oil was not very efficient in inhibiting lipid oxidation and protein. The sausage samples with the capsules were well accepted sensorially, suggesting that it is possible to develop fresh sausages with the addition of açaí oil.

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