Acerola as a source of plant-derived antioxidants in homogenized sausages

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Introduction: In recent years, there has been a growing interest among consumers in high-quality foods that are free of artificial additives and preservatives. In meat processing, a key group of additives are antioxidants. Antioxidants prevent the oxidation of lipids in meat and the formation of oxidation products that negatively affect the taste and flavour of meat and meat products. A common antioxidant used in meat processing is ascorbic acid, however, it is a synthetically produced substance. That is why food producers started to look for its natural source, such as acerola. This tropical fruit can contain from 1000 to 4500 mg of ascorbic acid in 100 g of fresh weight. Besides its high ascorbic acid content, acerola also contains other compounds with antioxidant properties such as polyphenols, flavonoids and carotenoids [Pisula & Pospiech, 2011; Kałwa & Wilczyński, 2017; Amaral et al. 2018; Prakash & Baskaran, 2018; Majewski et al. 2018].

The aim of this study was to analyse the effect of acerola addition on the microbiological stability of meat products.

Materials and methods: The study compared sausages with 0.35% acerola extract (S1), 0.15% sodium isoascorbate (S2) and a control sample without antioxidant (S3). 15 kilograms of base stuffing was divided into 3 parts of 5 kilograms each, the appropriate amount of additive was added to two, and the third part was left unadded. The sausages were steamed until the temperature reached 70°C in the thermal centre. The sausages were vacuum packed and stored in the at 5°C. The total aerobic bacteria (TAB) was examined by inoculation on PCA agar (at 30°C for 72 hours), and yeast and mould counts were examined on Chloramphenicol LAB-agar (at 25°C for 120 hours) on days 1, 7, and 14 of storage. The sausages were subjected to sensory evaluation. The 10 respondents scored the sausages using a 5-point method; external appearance, colour, taste, aroma, and texture were evaluated. Respondents also rated the sausages using a 9-point preference scale where overall impression was assessed.

Results: In a 9-point evaluation, the S2 sausage received the highest scores (6.65±2.14), the S3 sausage received 6.35±2.33 points while the S1 sausage received 5.00±1.43 points. In the 5-point method, an intense aftertaste of rosemary was perceptible in the sausages with added acerola extract, while this spice was not used in the sausages.

TAB on the first day of storage was $5.5*10^3$ CFU/g in the S3 sausage, in the S1 sausage $1.9*10^4$ CFU/g, and in the S2 sausage $1.6*10^4$ CFU/g. On the 7th day of storage in the S3 sausage the TAB was $1.3*10^4$ CFU/g, in the S1 sausage $4.5*10^4$ CFU/g, in the S2 sausage $1.1*10^4$ CFU/g. The number of yeasts and moulds on the 1st day of storage in S3 sausage was $4.5*10^1$ CFU/g, in S1 sausage $1.8*10^3$ CFU/g, in S2 sausage $1.1*10^3$ CFU/g. Whereas on the 7th day of storage the number of yeasts and moulds in the S3 sausage was $4.5*10^3$ CFU/g, in the S1 sausage $1.8*10^3$ CFU/g, and in the S2 sausage $7.3*10^3$ CFU/g.

Conclusions: The results obtained so far suggest that the acerola extract used is not an effective substitute for ascorbic acid in cured meats. The use of acerola did not improve the microbiological stability of the product and caused a decrease in sensory evaluation. To further test the antioxidant properties of acerola extract and its actual effect on preventing lipid oxidation in meat and meat products, acid and peroxide values should also be determined in products made with it. In addition, detailed testing of acerola and its content of essential oils and natural aromas, which may affect the taste and smell of products for which acerola will be used, should also be performed.

Literature:

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