



Influence of Cooking Methods and Temperature on Essential Amino Acid Score of Breakfast Sausage

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Objectives

In meat and its product such as breakfast sausage, the essential amino acids which are organic acids that are integral components of proteins and which cannot be synthesized in the human organism are made available in well balanced proportions and concentrations. These essential amino acids could however be affected by amount of heat applied during cooking and the adopted methods of cooking. This study was designed to assess the best cooking method and temperature for breakfast sausage

Materials and Methods

Breakfast sausage subjected to three cooking methods: boiling, grilling and frying; and three cooking temperature: 80, 90, and 100°C were prepared using standard procedures with the same sausage recipe. Beef 65%, Lard 20%, Soybean binder 3.5% green spices 2.19%, dry spices 1.5%, ice water 4.5%, salt 2%, sugar 1%, Sodium nitrite 0.01%, and phosphate 0.3%. Amino acid score was determined using Spectrophotometric determination for amino acids using ninhydrin chemical reaction. Ninhydrin combines with amino acids to form colored complexes, the intensity of whose colors depend on the amount of amino acid present according to Moore and Stein (1954) modified by Schroeder et al.(1990). Statistical design employed was factorial arrangement in complete randomized design

with 6 replicate per treatments. Data obtained were subjected to analysis of variance using SAS (2010; SAS Inst. Inc., Cary, NC). The means were separated using Duncan's Multiple Range Test of the same procedure.

Results

The essential amino acid score as affected by cooking methods and temperature was significantly ($p < 0.05$) different. It was observed that there was decrease in the essential amino acid score as cooking temperature increased in both grilled and fried breakfast sausage but the reversed was boiled sausage, Histidine was significantly ($p < 0.05$) higher in grilled breakfast sausage at 80°C and lower in boiled breakfast sausage at 80°C when compared to other cooking methods and temperatures. Similar trend was observed for isoleucine, lysine, methionine, phenylalanine, threonine, alanine, tryptophan, valine, leucine, and cysteine amino acids. The interaction effect of cooking methods and temperatures on breakfast sausage was neither linear ($R^2 = 0.00$) nor quadratic ($R^2 = 0.006$).

Conclusion

In conclusion, grilling at 80°C was observed to be the best cooking method and temperature for breakfast sausage in term of its essential amino acid score and can therefore be recommended for its production.