

COMPARISON OF PRODUCTS MADE OF MEAT BATTER WITH DIFFERENT QUALITY AND QUANTITY OF BLOOD PRODUCTS BASED ON THEIR TECHNO-FUNCTIONAL ATTRIBUTES

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Abstract

Utilization of by-products of animal origin, especially blood, is a good means of sustainability. Animal blood is a good source of protein and iron, so products enriched with blood may help to solve the global protein lack and iron deficiency anemia. The scope of this investigation was the development of meat batter products enriched with blood products. Fortification by blood products may have an effect on techno-functional attributes. Factors, factor levels and measured attributes were selected based on previous research.

In this study different types of blood products (whole blood powder in 1 w/w%, 3 w/w% and 5 w/w%, hemoglobin powder in 1 w/w%, 3 w/w% and 5 w/w%, blood plasma powder in 5 w/w%, 10 w/w% and 15 w/w%) were added in different amount into pork meat batters, and then the heat-treated, filled meat products were investigated by different methods. Texture was measured by Stable Micro System TA.XT Plus texture analyzer. Hardness, cohesiveness, springiness and chewiness were determined by texture profile analysis method and the shear force was measured by Warner-Bratzler shear test. Beside these, water holding capacity (based on pressing on filter paper, calculated in mm² mg⁻¹), dry matter content (based on drying and analytical mass measurement), water activity (by Novasina LabMaster-aw neo at room temperature), pH (by Testo 206 pH stick) and color (by Konica Minolta Chromameter CR-400 in the CIELAB color space) were measured. MANOVA and Tukey post-hoc test were used for evaluation of results after check homogeneity of variances and normality of residuals.

Based on the result of MANOVA (value of Wilks' Lambda) and Tukey post-hoc test, only a few sample groups could be clearly separated in case of water holding capacity, water activity, dry matter content and pH after heat treatment, but most of the sample groups could be significantly separated in case of pH and color of raw batter and color of heat-treated meat product. Samples made with whole blood powder and hemoglobin powder in the same ratio were similar.

Product development was successful. Moisture content (avg. 0.69), water holding capacity (avg. 1.89) and water activity (avg. 0.94) remained on a desirable level for meat batter products. Texture (avg. hardness: 10952.78 N; avg. cohesiveness: 0.72; avg. springiness: 0.97; avg. chewiness: 7669.25 N; avg. shear force: 7.99) of different sample groups was different as well, but it could be detected only by instrumental method. Color (avg. L*: 55.26; avg. a*: 5.19; avg. b*: 10.78) and pH (avg. 6.7) changed as an effect of blood product enrichment and color change was clearly visible to the naked eye, but these attributes can be influenced by additives or other ingredients.

Key words: Animal blood, By-product, Product development, Sustainability, Texture profile analysis.