

PHYSICO-CHEMICAL AND TEXTURAL INDICATORS OF SAUSAGES FOR CHILD NUTRITION ENRICHED WITH PREBIOTIC INGREDIENTS

Olga K. Derevitskaya¹, Natalya E. Soldatova¹, Marietta A. Aslanova¹, Anna L. Bero^{1*}

¹V. M. Gorbatov Federal Research Center for Food Systems, Russian Academy of Sciences, Talalikhina 26, 109316 Moscow, Russia

*e-mail: a.bero@fncps.ru

Abstract

The addition of healthy prebiotic fibers into meat products can affect product technological parameters, especially texture. The work aimed to develop a recipe of air-dried sausages for child nutrition enriched with a complex of prebiotic ingredients and to study their physico-chemical, textural, and bifidogenic properties.

The composition of the sausages was developed concerning the current Russian requirements for meat products for the nutrition of children over three years of age in terms of fat, sodium chloride, and sodium nitrate content. The experimental and control (without enrichment) samples were made. The mixture of beef and pork subjected to the curing process, a complex of prebiotics (resistant corn starch Fiberfin, collagen hydrolysate, oligofructose powder ORAFIT, and wheat fiber), spices and water were mixed. Sausages were dried up to reach a moisture content of not more than 42%. The following indicators were determined in the experimental and control samples: pH with a pH-meter Testo 205 (Germany), water holding capacity (WHC) of meat by the press method, protein by the spectrophotometric method, fat with the use of a Soxhlet extraction apparatus, texture with a texture analyzer Structurometr ST-2 ("Laboratory of quality", Russia). To determine the bifidogenic properties, the sensitivity of the test strain to the action of the product was revealed. The test culture *Lactobacillus plantarum* was incubated at a temperature of 37 ± 0.5 °C for 24 hours. Statistical analysis of experimental data was carried out using the Mann-Whitney criterion using the STATISTICA 10.0 software ($p < 0.05$).

The moisture content of the samples was in a range of 36 - 42 g/100 g. The samples were characterized by the high protein content (4 g/100 g) and low-fat content (12 g/100 g). The addition of the prebiotic complex reduced the pH level relative to the control sample due to the accumulation of organic acids during fermentation and WHC. With that, the sodium chloride concentration (1.8%) required for this product group is ensured in this product. The number of viable *Lactobacillus plantarum* 8P-A3- cells was 1×10^4 CFU/cm³ in the experimental sample and 5×10^3 CFU/cm³ in the control sample, which contained potato starch. The hardness and springiness values of the experimental sample were significantly ($p < 0.05$) lower (by 1.5 times and 1.1 times, respectively) compared to the control. Chewiness correlated with hardness and was 1.3 times lower in the sample with the addition of prebiotic fibers, probably because wheat fibers have a complex crystalline structure, which makes mincing easier and facilitates chewing.

The results obtained suggest the general improvement of the organoleptic properties due to the softer texture and tenderness of the experimental sample compared to the control.

Key words: Sausages, Prebiotic fibers, Texture.