RECYCLING OF SECONDARY SALMON FISH PROCESSING WASTE

Julia Bazarnova[1], Irina Timoshenkova[1], Svetlana Eliseeva[1*], Svetlana Nesmelova[1], Sandra Muizniece-Brasava[2]

[1]Graduate School of Biotechnology and Food Science, Peter the Great St. Petersburg Polytechnic University (SPbPU), Polytechnicheskaya 29, 195251 St. Petersburg, Russia
[2]Faculty of Food Technology, Latvia University of Life Science and Technologies, Liela iela 2, LV-3001 Jelgava, Latvia

[*]e-mail:eliseeva_sa@spbstu.ru

Abstract

The salmon processing food waste amounts to an essential share of the secondary fish resources. With that salmon meat has high nutrition value and includes a lot of polyunsaturated fatty acids (PFA), minerals, vitamins B_1, B_2, C, E, and A. The purpose of this work was specification of the Atlantic salmon secondary waste obtained during processing and rationale of technology of fish sausages with use of them.

As objects of this investigation, there were chosen frozen Atlantic salmon ridges of and dietary wheat fiber Vitatcel and Unitcell WF-200. The production of sausages includes the next main stages: separating the bone tissue of the ridge part from the muscle one using a mechanical deboning press; preparing minced fish by traditional technology with addind of dietary wheat fiber Vitatcel and Unitcell WF-200, forming mechanical properties and the water-holding ability of the fish mixes. During of the research in the sausages the following physicochemical and technological parameters were identified: water holding capacity of wheat fiber (Hamm, 1972), mass fraction of water (AOAC method 977.11), crude protein Kjeldahl's (AOAC method 955.04), crude fat Soxhlet (AOAC method 960.39), and sodium chloride (AOAC method 937.09). The fatty acid composition in samples was determined by gas-liquid chromatography of pharmacopoeial fish oil methyl esters, the amino acid was determined by AOAC method 994.12. To analyze fish sausages for sensory characteristics there was used standardized method [GOST 9959-2015 Meat and meat products. General conditions of organoleptical assessment]. Tasting grading of the fish sausages was hold by seven panelists of staffmembers of Graduate School of Biotechnology and Food Science scored appearance, texture, juiciness, flavor, tenderness and overallacceptability using a 9-point scale.

It was found when cutting the Atlantic salmon into fillets, the amount of waste is about 30–40%, and minced meat after separation is about 10% of the actual weight of the fish. The average content of protein, lipids, and moisture in the muscle tissue of the ridges of the Atlantic salmon was determined, which amounted to 17.1, 14.0 and 68.6%, respectively. As a result of study of the fatty acid composition of sausages, it was found that the content of polyunsaturated fatty acids, including ω-3 and ω-6, is 24.1% of the total fat content. There were identified eicosapentaenoic (C20: 2), docosahexaenoic (C22: 2), linoleic (C18: 2), alpha-linolenic (C18: 3) and gamma-linolenic (C18: 3) acids. The results of studies of the amino acid composition of sausages indicate their high nutritional value, especially in the content of lysine, threonine, leucine, phenylalanine and tyrosine. During the tastings, there were noted high organoleptic characteristics of the new developed products.

The obtained results allowed optimizing the selection of components depending on their functional and technological characteristics when creating combined the molded fish products – the fish sausages "Tender" and "Vienna".

***Key words**: Recycling, Secondary waste, Salmon fish, Wheat fiber.*