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ANTIOXIDANT ACTIVITY OF FUNCTIONAL READY-TO-EAT PRODUCTS FOR CANCER PATIENTS

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Abstract

Main requirements for the nutrition of cancer patients include the presence of antioxidants in the diet. Animal products are a source of complete proteins and fat, vitamins and minerals and should be present in a balanced diet. The aim of the work was to determine the antioxidant activity of ready-to-eat turkey products enriched with the vitamin complex and intended for inclusion into the diet of cancer patients.

The research objects were the vitamin complex consisted of antioxidant vitamins C, B_9, B_{12}, D_3, which quantitative and qualitative composition was developed by the authors, finished minced products from turkey fillet without the vitamin complex (control) and finished minced products from turkey fillet enriched with the antioxidant vitamin complex. The products were prepared by different ways: 1 - in a microwave oven (Panasonic) at a power of 1000 W during 8 min.; 2 - in an electric oven (Panasonic) at a temperature of 180 ^{0}C during 30 min. with preliminary searing; 3 - in a steam convection oven (Unox) at a temperature of 170 ^{0}C and air humidity of 60% during 30 min. The total antioxidant capacity was determined by the ferric reducing/antioxidant power (FRAP). Catalase activity and the content of 2-thiobarbituric acid reactive substances (TBARS) were determined using SF-2000 spectrophotometer (OKB Spectr, Russia). Superoxide dismutase activity was determined using SF-2000 spectrophotometer in accordance with the method of Marklund and Marklund with modifications by Getellier, Mercier, and Renerre.

It was found that the vitamin complex developed by the authors had the antioxidant activity, which was 374.15 µmol-equivalent of dihydroquercetin/g. The maximum preservation of vitamins in the enriched products after heat treatment was revealed in the third method and amounted to: 19.6%, 72%, 34.5% and 51% for vitamins C, B_9, B_{12}, and D_3, respectively. Introduction of the vitamin complex into turkey products helps to increase the antioxidant activity. For example, a significant increase in the superoxide dismutase activity by 1.4, 1.6 and 1.43 times was observed in the enriched products compared to the control in the first, second and third treatment methods, respectively. The catalase activity increased by 2.2, 2.3 and 2.1 times, while the products of free-radical and peroxide oxidation of endogenic substances (TBA-AP) decreased by 3.8, 3.9 and 4 times, respectively.

Thus, the turkey culinary products enriched with the vitamin complex have the high antioxidant activity irrespective of the heat treatment method and, therefore, can be included into the diet of cancer patients.

***Key words**: Nutrition in cancer, Ready-to-eat turkey meat products, Antioxidant effect, Vitamins, Selenium, Anticarcinogenic activity, Methods of heat treatment.*