

Algal biomass enriches poultry meat with n-3 PUFA and enhances immune response

Hanan Al-Khalifa

Kuwait Institute for Scientific Research, Kuwait

There is interest in the enrichment of poultry meat with n-3 polyunsaturated fatty acids (PUFA) so as to increase consumption of these fatty acids by humans. However, there is concern that high levels of n-3 PUFA may have detrimental effects on immune function. The purpose of this study was to investigate the effects of various dietary sources of n-3 PUFA on natural killer (NK) cell activity and cell proliferation in broiler chickens. One day old male Ross 308 broilers (n=20) were fed on one of four sources of n-3 PUFA: linseed oil-, echium oil-, fish oil (FO)- or algal biomass-enriched diets until slaughter. At slaughter, samples of blood, thymus and spleen were collected from each bird. The source of n-3 PUFA had a strong influence on fatty acid composition across the tissues. Algal biomass was as efficient as FO in enriching chicken meat with DHA. NK activity was highest in splenocytes and PBMCs from broilers fed linseed oil, followed by those fed algal biomass or echium oil, and lowest for those from broilers fed FO. There was a significant positive relationship between NK activity/cell proliferation and splenocyte/PBMC linoleic acid, AA and total n-6 PUFA, and a negative relationship between NK activity and EPA/total n-3 PUFA. However, there was no relationship between NK activity/cell proliferation and DHA content. These results suggest that the immunosuppressive effects of FO are primarily dependent on the EPA content, and that a DHA-rich algal product may enrich chicken meat with n-3 PUFA without significant detrimental effects on chicken immunity.

Biography

Hanan Al-Khalifa completed her PhD at the age of 30 years from the University of Reading, Department of Food Biosciences and Department of Agriculture, United Kingdom. She is a research scientist in Kuwait Institute for Scientific Research. She has been working in many research projects in the field of agriculture, avian biology, physiology and immunology. She participated in many international conferences and meetings. She published more than 50 papers in refereed journals. She is a member in several internationally reputed organizations.

hkhalifa@kisir.edu.kw