A comprehensive approach to formulation of seaweed-enriched meat products: From technological development to assessment of healthy properties

Food Research International (2016) In Press, Corrected Proof.

S. Cofrades[1], J. Benedí[2], A. Garcimartin[2], F.J. Sánchez-Muniz[2], F. Jimenez-Colmenero[1,*].

[1] Institute of Food Science, Technology, and Nutrition (ICTAN-CSIC), 28040 Madrid, Spain
[2] Facultad de Farmacia, Universidad Complutense de Madrid (UCM), 28040, Madrid, Spain

[*] Corresponding authors: fjimenez@ictan.csic.es

Abstract

Meat consumption is influenced by various kinds of factors, among them health implications. Different strategies can be effective in developing meat-based functional foods. These basically entail reducing the presence of compounds with negative health implications and enhancing the presence of beneficial compounds. This article reviews a comprehensive model for the development of meat-based functional foods based on a presentation of the research achieved in terms of the design and development of qualitatively and quantitatively modified meat products (frankfurters, patties and restructured steaks). These were reformulated to incorporate nutrients associated with three different seaweeds (wakame–*Undaria pinnatifida*; nori–*Porphyra umbilicalis*; and sea spaghetti–*Himanthalia elongata*) as sources of bioactive substances, while simultaneously reducing sodium and fat and improving fatty acid profiles. Those seaweeds were chosen, because in terms of composition and health implications, abundance on Spanish coasts, relatively widespread consumption, and suitability in terms of flavour and colour they are better suited than others for use as ingredients in new products. It also discusses the consequences of the use of this type of meat-based functional foods (combination of pork meat and 5% of each seaweed with or without hypercholesterolaemic agent included in the diets) on growing animals (Wistar male rats), and their effects on different aspects of lipoprotein metabolism, oxidative stress and liver structure. This article, then, reports a comprehensive approach to the production of seaweed-enriched meat products, considering aspects of technological development aimed at achieving the functional effect.