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PROSPARE: AN EUROPEAN PROJECT FOR THE VALORIZATION OF THE LEFTOVERS OF POULTRY INDUSTRY

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Abstract

Food industry leftovers constitute an enormous cost and an unnecessary waste of food-grade material. In the production of meat for human consumption, up to 50% of the animal weight is discharged. In EU only, the total leftover mass from the meat industry amounts to 15 million tons, formally residues, but actually potential raw materials rich in proteins and lipids. Although this potentiality, most of this material is incinerated-only 22% is converted into feed and a bare 3% becomes food. The traditional rendering technologies, based on prolonged heating of the leftovers, ensure microbial safety and increase digestibility, but use enormous amounts of energy and induce the degradation of high biological value components.

A new technological/biotechnological platform has been developed in the framework of PROSPARE (PROgress in Saving Proteins and Recovery of Energy), a joint European-Russian research project, financed under the 7th Framework Programme, aimed at the recovery of poultry industry leftovers into valuable food and feed end products, by applying new advanced enzymatic technologies for the obtainment of hydrolyzed meat and feather proteins of high nutritional value.

In particular, by using a novel biocatalytic approach, unmarketable poultry secondary resources (feathers, bones, trimmings, etc.) were converted into added value peptide hydrolyzates, with programmable nutritional properties, and biodiesel. These hydrolyzates have been characterized in order to certificate their safety, by assessing the absence of microbial (*lysteria*, *escherichia*) as well as chemical (mycotoxins, biogenic amines, heavy metals) contaminants. Their content in free and total amino acids, the molecular weight distribution of the peptide fractions and the sequences of the main peptides present in the mixture were also determined. These parameters, together with the digestibility, allowed to tailor the nutritional properties of the mixtures obtained. The mixtures have also been characterized in order to assess their functional properties, such as antioxidant, antihypertensive, antimicrobial and prebiotic. Finally, new food and feed products were produced by using the protein hydrolyzate mixtures as ingredients.

The interdisciplinary character of the investigation is demonstrated by the parallel application of biotechnological, chemical, biophysical, physico-chemical, biochemical, immunological and toxicological studies, as well as the industrial trials for the evaluation of proposed technologies.

The outcome of the PROSPARE project is likely to generate a significant technological breakthrough of animal by-products treatment, with an impact also on the current Regulatory Framework both in EU and Russian Federation.
