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**Microalgae, Plants and Animal Husbandry Waste as Highly-Valued Natural Sources.**

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## MICROALGAE, PLANTS AND ANIMAL HUSBANDRY WASTE AS HIGHLY-VALUED NATURAL SOURCES

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In the framework of the project BIORAF, supported by Technology Agency CR (project no. TE01020080), various sources as microalgae, fungi, plants and waste of animal husbandry were used as a sources for the highly-valued products. All developed technologies were designed as waste-free. As the most important technologies it is possible to mention:

1) a highly effective extraction of lipids from algae *Trachydiscus minutus* and *Japanochytrium sp.* The extraction of lipids from algae *Trachydiscus minutus* and *Japanochytrium sp.* enables the biotechnological production of omega-3-fatty acids, which strongly supports the health condition of a person when consumed. An extraction of lipids applied in the batch reactor using n-hexane/ethanol showed that both species are rich in omega-3-eicosapentaenoic acid (EPA-C20:5n3), unsaturated fatty arachidonic acid (AA-C20:4n6), unsaturated fatty acid, linoleic acid (LA-C18:2n6) and the following saturated acids - myristic acid (MA-C14:0) and palmitic acid (PA-C16:0).

2) biotechnological treatment of *Miscanthus giganteus* and *Miscanthus sinensis* to obtain a broad spectrum of various substances. Tall stems of this plant contain a broad spectrum of various substances as waxes, lipids, carotenoids, etc., which are potentially exploitable in cosmetics. It was proved that an extraction processing of crushed dry stems using non-polar solvent is a promising way for separation of all mentioned substances into an extract and the waste raffinate can be used as "green fuel" in the form of pellets.

3) hydrolysis of feather, the persistent waste from a poultry production. A processing technology of waste feathers by the pressure hydrolysis of chicken cartilage and feathers protein wastes in the presence of carbon dioxide was developed and verified. This

technology is focused on production of the valuable amino acid's mixtures with high nutraceutic importance.

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