

BIOPROT

Finding new sources of plant proteins is a necessity to obtain sustainable and affordable foods for the growing global population since the production of animal protein is not a feasible option in the future. There are two major solutions to increase plant based protein sources: 1) increased cultivation of protein rich crops and 2) efficient utilisation of protein rich side streams of food production. Several current agrobiomass processes such as wheat flour production generate significant amounts of side streams like bran, which are mainly used as feed or incinerated. Furthermore, there are potential leguminous crops such as faba bean, which could provide protein if presence of anti-nutritional factors would be diminished. Both of these multifaceted plant materials have high content of nutrients and bioactive compounds, e.g. proteins, dietary fibres (DF) and phytochemicals. The protein rich materials, however, consist of recalcitrant cell walls which are rich in insoluble heterogeneous polymers or presence of anti-nutritional factors. Availability of bioactive compounds and proteins is restricted as they are often entrapped in the complex cell wall matrices which limit their exploitation.

Bioprocessing (fermentation or enzyme aided fermentation) of cereal raw materials has shown great potential to improve nutritional and technological properties of plant materials. However, impact of fermentation on the protein bioavailability and quality in bran has not been yet studied even though there are indications that enzyme aided fermentation could enhance both features. Fermentation is also potential mean to detoxify faba bean by significantly reducing content convicine, vicine and tannin and improving bioavailability of bean protein for food use. As protein degradation is also determining structure and flavour formation in most foods, bioprocessing has to be tuned to take into account both nutritional and technological functionality. Aim of the project is to develop novel protein enriched bran and faba bean ingredients, which have high potential to be used in several food categories. This will be obtained by developing tailored fermentation technology for matrix modification resulting in diminished anti-nutritional factors and upgraded nutritional and technological protein quality. The results will promote cultivation of faba beans in Europe, and valorise both bran and bean as protein sources for food and feed use.