FRAUNHOFER INSTITUTE FOR PROCESS ENGINEERING AND PACKAGING IVV

We recover new ingredients from plant raw materials for the food, animal feed, and cosmetics industries. Suitable fractionation methods allow us to develop customized ingredients for specific applications.

Raw materials

The raw materials we use include:
- Residual plant materials after oil recovery (e.g. press cake after the recovery of sunflower oil, rapeseed oil, soya oil, and linseed oil)
- Plant materials from the fruit and vegetable processing industry
- Protein seeds such as those from leguminous plants (e.g. lupins, peas, and beans)
- Cereals (e.g. rice, spelt)
- Pseudo-cereals (e.g. buckwheat, amaranth)
- Tropical fruits

Our processes are versatile and can be adapted to new raw materials.

Processes

We develop suitable manufacturing processes using the following technologies:
- Peeling/dehulling, sifting, milling
- Extraction (aqueous and solvent extraction)
- Separation (decanters, separators, ultrafiltration)
- Various drying methods
- Functionalization via homogenization, enzymatic and chemical treatments

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Technical equipment

We have a modern, start-of-the-art food pilot plant that was built in 2011. We possess the following equipment for fractionating plant raw materials:

- Grinding/milling and dry separation of solids: Various mills, flaking mill, zig-zag air classifier, sieving machine
- Extraction techniques: Percolation-extractor, stirred vessels, explosion-proof extraction vessels
- Mechanical technologies for separating liquids: Decanters, clarification separators, filter presses, ultrafiltration equipment, dynamic cross-flow filtration plant (explosion-proof)
- Heating equipment: Tube and plate heat exchangers, ploughshare mixer, high frequency heating (27.12 MHz) in a water bath and in a continuous heater
- Evaporation equipment: Down-draught evaporator, rotary evaporators
- Drying equipment: Spray dryers (including explosion-proof), ring dryer, belt dryer, freeze dryer

Most of the equipment is available on both a laboratory and pilot plant scale.

Products

We produce protein fractions, dietary fiber products, and secondary plant materials (e.g. phenolic components and carotinoids) that can be used in foods, animal feeds, and cosmetics.

These ingredients alter the nutritional value and texture of the food/feed formulations and/or have a bioactive effect on health or the skin structure.

Evaluation

In order to evaluate the fractions and products we analyze their compositions and techno-functional properties (solubility and emulsifying/foaming/gelling properties). We test them in cosmetic formulations, animal feeds and food products (baked products, pastries, sausage products, pasta, in emulsified and whipped food products and in extruded products). We can manufacture larger sample quantities of specific ingredients for customers to test in their products.