

**Title** Innovative functional food based on grain legumes with special consideration of the whole food supply chain

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### Abstract

Especially in Western Europe, regional grain legumes become less important in cultivation and breeding. The cultivation area is shrinking for many years and breeding programs are discontinued. A common mentioned argument against the cultivation is the lack of marketing opportunities. Beside the low (modest) economical attractiveness for the cultivation, the acceptance by the consumer is also relatively low. Stated reasons are homely recipes and the typical 'pea-like' taste and especially contradictory results about allergic responses and the increased incidence of flatulence. The ecological potential as well as the nutritional-physiological benefits find rather less consideration by the consumer and other stakeholders of the food supply chain. Aim of this research project is the efficient and market-driven production of innovative food and food ingredients on the basis of grain legumes such as *Pisum sativum* and *Vicia faba*. Moreover, new application fields for grain legumes have to be established on one hand and on the other hand cultivated areas of grain legumes have to be promoted. In a *SMART*-breeding approach grain legumes - rich in flavonoids - are obtained without negatively affecting the protein content or the protein composition. The increasing demand of high quality plant proteins and health-promoting secondary plant metabolites is efficiently met by innovative technological approaches in processing (e.g. high hydrostatic pressure, UV-B radiation, and solid matter fermentation), new product innovations are developed, and a scientific proof of the health-promoting potential of the food and food ingredients based on legumes is provided. In human intervention studies the anti-diabetic and vascular effects of products containing grain legumes are substantiated. Concurrently, the product development is accompanied by a target-oriented user integration study. In the development process the entire value chain is taken into consideration in order to be able to provide for sustainable development concepts and a high consumer acceptance on all levels from plant breeding to consumption ("from farm to fork").