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**Integral valorisation of Faba-beans molecular compounds to nutritional texturized food products**

Klara Nilsson1, Rosana Moriana1, Corine Sandström1, Mikael Hedenqvist2, Maud Langton1

*1SLU- Swedish University of Agricultural Sciences, Molecular Sciences. PO Box 7051, SE-750 07, Uppsala, Sweden*

*2 KTH-Royal Institute of Technology, Teknikringen 56-58, SE-100 44, Stockholm, Sweden*

Faba-beans that can be cultivated in cool climates, is a promising alternative to the two most commonly used vegetables for the creation of texturized plant-based products; soybeans, with limited cultivation in Scandinavian countries, and wheat gluten, which may be undesirable due to awareness of celiac disease.

In the past five years there has been a dramatic increase of 50000 tons in the production of Faba-beans in Sweden1. In 2017, the Swedish Faba-bean production exceeded 100 000 tons. Currently the primary usage of Faba-bean is animal feed, however, the nutritional profile of Faba beans2; protein (26-34%), starch (40-50%) and fibres (12-24%) render is suitable for human consumption.

The aim of this PhD project is to develop novel texturized food model products from Faba-bean polysaccharides. The Faba-beans will undergo physico-chemical characterization; microscopy, FTIR and XRD, to elucidate biomass cell-wall structure and the biopolymer interactions. For development of Faba-bean Biorefinery processing, efficiency of different multi-component isolation bioprocessing techniques will be compared through altering extraction parameters. The impact on the compositional and functional properties of the Faba-bean fractions of the varying extraction parameters will be investigated using HPLC, NMR spectroscopy and mass spectrometry. The fractions obtained during processing will be deconstructed and recombined to from new structures i.e. emulsions, foams, gels. The stability of the structures will be tested under varying conditions and the influence of microstructures on the rheology will also be investigated. Finally the function and processing parameters of the fractions in the creation of new texturized foods will be assessed with the ultimate aim of creating a novel food product. The model food developed will be tested using a combination of sensory and instrumental techniques. Consumer and hedonic analysis will be conducted for establishing suitability of the product to the Nordic food market of vegetable-based foods.

1. Jordbruksverket 2017, Skörd av spannmål, trindsäd och oljeväxter JO 19 SM 1701
2. Guillon, F., & Champ, M. M. (2002). Carbohydrate fractions of legumes: uses in human nutrition and potential for health. Br J Nutr, 88 Suppl 3, S293-306. doi:10.1079/BJN2002720