

DOKTORSKÝ STUDIJNÍ PROGRAM/*DOCTORAL STUDY PROGRAM*

**VYPSÁNÍ TÉMATU/*LISTING OF TOPIC***

Studijní program/*Study Program*: **Nutrition and Food**

Studijní obor/*Branch of Study*: **program without field**

Katedra/*Department of*: **Centre DRIFT-FOOD**

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Konzultant/*Co-supervisor*: **Dr Bilge Taskin**

Forma studia/*Form of Study*: **Full\_time**

Typ tématu/*Type of Theme*: **Framework**

**Téma/Topic**: Cereal products with enhanced functional properties

**Hypotézy/Hypotheses**: Cereal products with enhanced functional properties can be developed utilising waste and by-products from the food industry as main material

**Anotace/Summary**: There is currently increased interest in the formulation of staple food products with enhanced functionality. Cereals are prime targets for such efforts. Enhancing functionality can be achieved through the incorporation into the cereal products, of bioactive or other functional compounds that have been recovered from by-products from the food industry. The incorporation of functional compounds into cereal products is important since it can lead to extension of shelf life as well as quality, while at the same time contributing to the enhanced nutritional profile of the products. Due to the health concerns of consumers, current research in functional foods is particularly suited to the utilisation of by-products, rather than using synthetic materials.

Functional cereal products have acquired significant interest in recent years due to their benefits over conventional products as well as their enhanced durability. The motivation for the increase of interest and research activity in functional cereal products is due to the rising consumer need for safe, healthy, and stable foods and also the awareness concerning the harmful environmental effects of disposal of by-products and waste without maximising their utilisation.

A doctoral study can be proposed with the following outline topics/area:

- Extraction of bioactive compounds mainly polyphenols from food wastes
- Stabilisation of the extracted bioactives through encapsulation
- Development of cereal functional products, with enhanced antioxidant, antimicrobial and physical properties

Aims:

Our aim is to contribute to the development of cereal products with enhanced nutritional profile through utilisation of food industry waste.

Methodology:

Extraction of bioactive compounds from food industry by-products will be optimised, using RSM (Response Surface Methodology).

Factors that will be included in our design include type and concentration of bioactives, solvent to sample ratio, extraction conditions etc.

Stabilising and extending the bioactivity of the extracts through encapsulation, optimised by RSM. The stability of the encapsulated bioactives will also be evaluated over period of storage at a range of conditions.

The encapsulated bioactives will be incorporated into a selection of cereal products (bread, cookies etc), and the stability and physical characteristics of the food products will be assessed during storage. Acceptability by consumers and full sensory characterisation of the products will also be performed.

Approach:

Our approach is to have an impact of the significant environmental footprint of the food industry. Functional ingredients formulated from waste-derive components will be characterised to ensure that they are suitable for food applications. In addition, the cereal products functionality will be enhanced to provide additional benefits to the consumers. Bioactive compounds will also be sourced from food waste, valorising by-products and reducing the amount of waste that needs to be disposed of.

This way the impact that our project will generate is not only environmental, but also societal, since we will provide consumers with products with enhance nutritional value, and economical (since we will enable valorisation of waste products).

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V/In Prague

dne/Date: 31.10.2022

Podpis/Signature:

A handwritten signature in blue ink, consisting of a stylized, cursive script with a long horizontal line extending to the right.