

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*: **Center DRIFT-FOOD**

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Forma studia/*Form of Study*: **Full_time**

Typ tématu/*Type of Theme*: Framework

Téma/Topic: Edible insects-based beverages and meat analogues

Hypotézy/Hypotheses: Edible insects can be used for the sustainable production of highly nutritious beverages and meat-analogue products with acceptable sensorial characteristics

Anotace/Summary: The growing demand for resource intensive animal-based food has significant implications on the sustainable application of resources. Innovative food sources, including insects, are potentially more sustainable food sources for human consumption. Edible insects are proposed as a feasible solution for supporting food security mainly due to their high feed-conversion efficiency, as well as low greenhouse emissions and reduced water requirements. *Tenebrio molitor* (mealworm) larvae has recently (2021) been recognised as safe by the European Food Safety Authority paving the way for the development of a number of novel food products, such as milk alternatives and meat analogues, to add to the existing range of bakery goods and powders.

An alternative to bovine milk can be developed that will closely resemble the organoleptic and nutritional characteristics of bovine milk, while being significantly more environmentally friendly in its production. Similarly, a plant-based meat analogue with enhanced nutritional and technological characteristic can be developed.

Aims: To develop an edible insect-based product (milk alternative)

Methodology: Milk alternative

Firstly, the mealworm larvae will be characterised chemically (protein, lipids, fibre, carbohydrates, ash).

Formulation optimisation for the milk alternative, based on Response Surface Methodology, will be carried out. The target compositions will be aiming to duplicate the most common bovine milk products (0, 1.5 and 3.5 % fat).

A number of emulsifiers will be assessed for their suitability for this application (for example lecithin as well as complex emulsions).

The effect of pre-treatments (ultrasonication and microwaving) to the yield and nutrient composition of the alternative milk formulations will be assessed.

The formulations (with or without pre-treatments) and the standards (bovine milks) will be assessed for colour, viscosity, smell, flavour, sensory acceptability.

Approach:

The approach of this framework them is to develop a range of bovine milk alternatives based on the EFSA approved *Tenebrio molitor*. As bovine milk is a high environmental impact product, our work will contribute, through utilising this novel source, to achieving food security for the increasing population while reducing the environmental footprint of the end product. Through process and formulation optimisation we will enable local producers to be competitive in this novel area of food production.

Zdroje financování práce/*Funding Sources*: The activity will be financed from the Institutional Support of the Department, from the METROFOOD-CZ research infrastructure, and from the Horizon 2020 projects (EraChair, InfraServ).

V/In Prague

dne/*Date*: 31.10.2022

Podpis/*Signature*:

