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School of Engineering

# RESEARCHPROJECT

Institute Life Technologies

## Fibration of Plant Proteins by a High Moisture Extrusion Cooking process

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**Description** A gap of global food protein availability in near future due to increasing needs of a growing world population and a magnitude lower carbon food print of vegetable protein compared to traditional meat are some of the reasons for an high interest in new plant protein transformation technologies. Proteins as accumulated in pulses are considered as an important source for healthy nutrition and can be sustainable grown in large quantities. Among the downsides of pulse based food the pulpy texture, which is due to the globular character of plant reserve proteins, is often mentioned. Furthermore the savour is estimated as less attractive. Therefore, a lot of efforts have been done to produce anisotropic structures from dissolved globular proteins by different technologies. Nevertheless, assembling of globular proteins into more complex, fibrous structures is a highly empirical and not basically understood process.

This project is focused on improving the quality of a pea protein isolate based meat replacers which will be fibrated by a high moisture extrusion cooking (HMEC) process. Flow profiles in a crucial part of the extruder will be simulated and the geometry of flow channel adapted according to identification of critical zones. The impact of technological properties of PPI preparations on extrusion performance and final product texture will be studied in order to extract advanced process control parameters.

In addition flavour–protein interactions, important in perception of flavours, will be quantified especially with an in-house developed, unique combination of rheometer, gas management system and high resolution PTR-MS technology. This kinetic approach permits developing product tailored and profile balanced flavours, which are adapted to harsh conditions of HMEC.


*Extruder Evolum 25 (Clextral) used in pea protein fibration*

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