Contribution ID: **16** Type: **poster contributions**

Unravel the structure of meat analogues using SANS

The current, unsustainable meat industry makes a growing number of meat consumers turn to plant-based meat alternatives (PBMAs). To facilitate the transition towards a (partly) plant-based diet with its health, environmental and ethical benefits, the demand for an accurate reproduction of meat-like structure, texture and mouthfeel in PBMAs is pressing. High Moisture Extrusion Cooking (HMEC) is one of the methods to produce PBMAs starting from raw material powders. During HMEC, mixtures of plant proteins (e.g. soy, pea or wheat), dietary fiber and fat undergo heat- and flow-induced denaturation and subsequent plastification and texturization. The key to reproduce meat-like structures are the plastification and texturization which take place in a cooling die attached to the end of extruder. However, the "black-box" characteristics of the extrusion process including the cooling die make the understanding of the texturization process difficult. Small Angle Neutron Scattering (SANS) and complementary (scattering) techniques are a promising tool to unravel the mechanism of PBMA structurization. Here, we show the results of SANS measurements on different PBMA recipes. We employed contrast variation to elucidate the role of the different components in the texturization of PBMAs. We also provide insight into our plans to perform in-situ SANS with a customized neutron-transparent cooling die. Crucially, this setup will help shed light on the plastification and texturization mechanism throughout the entire cooling process of extrusion. Based on our results, we expect to obtain a detailed insight into the texturization of plant proteins in food processing and thereby to pave the way towards a more sustainable nutrition.

Primary authors: GUAN, Tong; MATSARSKAIA, Olga; Prof. FISCHER, Peter (ETH Zuerich); Dr ZYCHOWSKI, Lisa (Planted Foods AG)

Presenter: GUAN, Tong

Session Classification: Poster session/Wine and Cheese evening