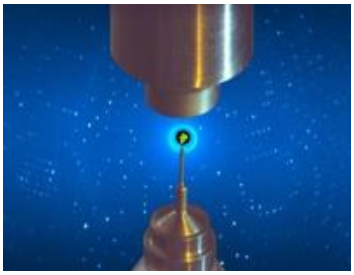

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Monitoring in vitro human digestion of model food, a plant protein gel, using SANS”

Wednesday, 9 June 2021 14:40 (20 minutes)

Proteins are essential macronutrients in the human diet, being fundamental in body structure and functions. The protein digestibility depends not only on their composition but also on food structure, which in turn can be influenced by different types of processing.
We monitored degradation kinetics of the structure during simulated gastric and intestinal digestion, and analyzed its impact on digestibility. As a model solid-like food (the form in which most proteins are ingested) we used plant protein gels - from rapeseed (napin and cruciferin). The gels were synthetized by heat-treatment of solutions at various concentrations and pHs.
Different techniques were used. We will focus here on SANS, on 1cm size samples as in real digestion bolus, but which need to be homogeneous. We make a link with rheological measurements. SAXS (LLB and SWING-SOLEIL synchrotron) gives additional information at the same q values but not the same size of samples,enabling inframillimetric access to the spatial gradient. We also used UV fluorescence imaging (DISCO) at intermediate gel size (20-200 microns).
The state of gelled proteins defines both their intrinsic digestibility and the gel structure. To separate the two, we propose to introduce the protein inside a gel of a different species, polygalacturonane (issued from pectin), not digestible by human enzymes. First results on betalactogloblin show we can use contrast matching.
We may discuss other techniques available via MLZ programs.

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