

In vitro protein digestibility of meat analogues made of sunflower and pea protein

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Global growing demand for meat and meat products has negative environmental impact such as increased greenhouse gas emissions, water, and energy consumption. Therefore, there is a need for sustainable plant-based foods alternative to animal counterparts. From a nutritional perspective, it is important to elucidate the processing induced effects on protein digestibility. However, there is limited knowledge on protein digestibility of meat analogues.

The aim of this study was to investigate the protein digestibility of plant-based meat analogues made with high-moisture extrusion from sunflower protein concentrate (SPC), pea protein isolate (PPI), fermented SPC and their mixtures. Protein digestibility was studied in vitro with the INFOGEST method, which mimics the physiological conditions in the oral and gastrointestinal phases of the digestion process. Digestibility was assessed by analysing the degree of protein hydrolysis (DH) after digestion with the OPA-method. The results of the extrudates were compared with those obtained with the corresponding powdered raw materials. The degree of protein hydrolysis of the samples ranged from 11 % to 53 %. Overall, powder samples showed similar protein digestibility, although slight differences were observed between PPI (34% DH), SPC (33% DH) and a 1:1 mixture of SPC and PPI (28% DH). The extrusion process showed improved results in protein digestibility compared to powder samples, with extruded SPC exhibiting 53% DH and extruded SPC and PPI blend (1:1) 39% DH. Fermentation of SPC powder increased the DH from 33% to 43%, indicating that application of fermentation process can have positive impacts on protein digestibility. However, when the fermented SPC was used in extrudates together with PPI (1:1), no change in digestibility was observed as compared with extrudates in which non-fermented SPC was used together with PPI (1:1).