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aglycone contents in citrus extracts. In a first step, citrus extracts rich in naringin and hesperidin were treated with citric acid to remove terminal rhamnose groups. This was followed by incubation with lactic acid bacteria to cleave the remaining glycosidic bonds and to release the aglycones naringenin and hesperetin. The composition of flavonoids was analyzed before and after biotransformation by high performance liquid chromatography (HPLC). As expected, hydrolysis with citric acid resulted in a significantly higher content of naringenin-7-O-glucoside and hesperetin-7-O-glucoside. Subsequent biotransformation of these socalled monoglucosides by bacteria significantly increased the yield of aglycones. In conclusion, we introduced an innovative method to enrich the aglycone levels in flavonoid-rich extracts. Molecular mechanisms affected by the relevant bioactive compounds will be investigated in future experiments.

#### P-05.1-007

#### Ghee butter from bovine colostrum reduces inflammation in dextran sulfate sodiuminduced colitis in mice

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Pharmacological treatment and/or remission maintenance in inflammatory bowel disease (IBD) is currently one of the most difficult challenges in the field of gastroenterology. The available therapies are mostly aimed at alleviating symptoms rather than addressing the underlying cause of the disease. Ghee butter from bovine colostrum (GBBC) is a clarified butter produced by heating milk fat to 40°C and separating the precipitating protein. As colostrum mainly contains fatty acids, immunoglobulins, maternal immune cells, we hypothesized that it may exert anti-inflammatory effects. We characterized the effect of GBBC on intestinal barrier function in dextran sulfate sodium (DSS) mouse model of colitis. 100% GBBC (per os, 100 µL/mouse) significantly reduced colon-damage score, MPO activity, stool score, and concentration of FITC dextran in serum in comparison with DSS mice. GBBC notably reduced the level of TNF-a, IL-17, and IL-23 while compared to the DSS mice group. Additionally, administration of the FFAR4 antagonist followed by treatment with 100% GBBC significantly increased the anti-inflammatory effect of GBBC by decreasing production of IL-17 and 23 and the IL-6 level in comparison with DSS. We also assessed tight junctions (TJs) mRNA expression using distal colon samples collected from control, DSS-treated, DDS+GBBC-treated mice, and mice-treated DSS with the combination of GBBC+FFAR1 or 4 antagonists. Administration of GBBC alone not only restored the expression of OCLD 1 and CLDN1 to the level of control but also notably increased expression of these TJs mRNA above the basal level. FFAR1 antagonist in combination with GBBC significantly potentiated this effect. Of note, attenuation of FFAR4 expression reversed the effect of GBBC, thus indicating that FFAR4 receptor may affect the expression of OCLD1 and CLDN 1 in the colon. This is the first study to show the anti-inflammatory potential of a nutritional supplement derived from GBBC in the colitis animal model.

#### P-05.1-008

#### Interaction between alpha-2-macroglobulin and phycocyanobilin – structural and physiological implications

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The interaction between phycocyanobilin (PCB), a bioactive chromophore of blue-green cyanobacteria Spirulina's phycobiliproteins, and human alpha-2-macroglobulin (a2M), a universal anti-proteinase, was investigated in this study under simulated physiological conditions using spectroscopic techniques and a2M activity assay. Protein a 2M was found to bind PCB with a moderate affinity, as assessed by spectrofluorimetric titration. The binding constant was calculated to be  $6.3 \times 10^5$  M<sup>-1</sup> at 25°C. The binding of PCB to a2M did not cause significant change in the secondary structure of the protein, as determined by circular dichroism. PCB protected a2M from oxidative damage in the presence of AAPH-induced free radical overproduction. PCB binding also effectively preserved a2M anti-proteinase activity. Since a2M is involved in controlling the action of enzymes during the inflammatory process, the protection that PCB expresses could indirectly influence the intensity and direction of the body response to impaired homeostasis, especially under oxidative stress.

#### P-05.1-009

#### Stability of oligosaccharides and rutin after *in vitro* digestibility of enzymatically hydrolyzed common buckwheat (*Fagopyrum esculentum* M.)

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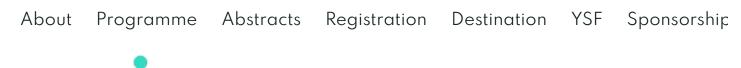
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Enzymes-assisted extraction of common buckwheat (Fagopyrum esculentum M.) is an exciting tool for developing food with higher-added value and characteristics because of their mild extraction conditions. During extraction, the permeability increases of the plant cell wall, releasing functional compounds such as rutin and forming new derivatives and properties. The research aims to determine rutin and oligosaccharides' stability after enzymes-assisted extraction and INFOGEST in vitro digestibility afterward. For analysis, two different batches were performed. Milled common buckwheat flours (> 0.5 mm) were homogenized with distilled water in a ratio of 1:5. Continuously, for the first batch, 0.15% of amylase (AL) and 0.15% non-starch polysaccharides enzymes (NSP), and for the second batch, 0.45% AL+ glucoamylase (AG) and 0.15% NSP was incorporated. After 2.5 hours at 68°C enzymatic extraction, a liquid fraction of buckwheats was collected. Samples were lyophilized, and rutin content was determined using HPLC. Furthermore, the HPLC SEC - NSP methodology was implemented for sugars and





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