

## **Effects of protein source and cooking procedure on intestinal microbiota and on fermentation end-products in rats**

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Animal and plant proteins are major proteins sources in the human diet. After their enzymatic degradation in the upper gastrointestinal tract, the undigested fraction of these proteins is available for fermentation by the microbiota of the large intestine leading to the production of short-chain fatty acids (SCFA), branched-chain fatty acids (BCFA), ammonia, biogenic amines, sulphur metabolites, phenols and indoles. As some of these compounds have genotoxic and cytotoxic effects, protein fermentation is considered as detrimental to the host's epithelial health. BCFA are usually used as a marker of intestinal protein fermentation.

We studied *in vivo* the impact of proteins from animal and plant origin, raw or after a cooking procedure, on the composition of gut microbiota and on fermentation end-products. Weanling rats were used as models of the human gut microbiota. Eight experimental diets were formulated with beef meat (*Longissimus dorsi*), chicken meat (*Pectoralis major*), white pea beans (*Phaseolus vulgaris*), soybeans (*Glycine max*), used raw and cooked, as sole source of protein in the diet. One casein diet was used as control. All diets, formulated to contain 15% of raw protein, were given to seven rats for four weeks. After euthanasia, caecal contents were collected. Pyrosequencing analyses (Roche 454 GS Junior Genome Sequencer) were performed to study the microbial composition. SCFA and BCFA were measured using HPLC (Waters 2690).

Microbial composition in the caecum is associated to the type of dietary protein and to the cooking procedure applied. The proportion of BCFA in the caecal content is mainly affected by the type of protein. So BCFA represent respectively 04-06% and 35-44% of total SCFA with diets based on plant and on animal proteins. In conclusion, both the type of protein and the cooking procedure could impact the gut microbiota in terms of composition and of fermentative capacity.