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***Bacillus* and *Rhizopus* fermentations reduce the flatulence inducing properties of *Vigna unguiculata* measured in-vitro**

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The flatus-inducing capacity of legumes has long been assigned to galacto-oligosaccharides. However, the importance of dietary fibre compounds is nowadays known to be considerable. Therefore, we investigated the effect of different food processing treatments (including traditional practices) of two landraces of cowpeas on the digestibility and fermentability of indigestible residues as a whole portion.

In vitro digestion and *Clostridium perfringens* fermentation of undigested residues were carried out, in order to simulate humans' gastro-intestinal digestion, absorption and fermentation. Gas production and acetate production were assessed by gas meters and HPLC.

Our experiments revealed a consistent relation between gas production and acetate production. Flatulence inducing compounds are not mainly located in cowpea hulls, since both the digestibility and fermentability of indigestible

residues were much lower in hulls than in samples obtained from other treatments. *Rhizopus* and *Bacillus* fermentation reduced the flatulence factors while lactic acid bacteria fermentations did not. Dehulling, normal cooking and cooking with softeners (*kanwu* and bicarbonate) did not have much effect on the in-vitro digestibility and fermentability of indigestible residues.

The red landrace has thicker hulls, which resulted in a lower digestibility than the white landrace when not processed. Processed cowpeas as well as untreated hulls from red and white cowpeas did not differ significantly in digestibility and fermentability.

Overall, *Bacillus* and *Rhizopus* fermentations result in relatively high digestibility and low fermentability, which make them to be the most recommended food processing methods for reducing flatulence in cowpeas.