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Dietary fibre residues obtained by *in vivo* and *in vitro* enzymatic digestion.

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Dietary fibres are resistant to hydrolysis by human digestive enzymes but can be affected by environmental conditions through the gut. Analytical methods, including starch and protein hydrolysis, have been developed to simulate intestinal digestion (Hoebler *et al*, 1990). The purpose of this study was to measure the extent of modification of dietary fibre (wheat and barley bran, beet fibre) in the small intestine of pig (Millard and Chesson, 1984) and to compare the chemical composition of dietary fibre present in the ileal digesta and prepared by *in vitro* enzymatic procedure.

Dietary fibre residues from wheat bran, barley bran and beet fibre were recovered after proteolytic and amylolytic treatment and in ileal digesta of cannulated pigs. Insoluble and soluble fractions were separated and sugar composition was determined in starting substrates and all fibre residues.

The total dietary fibre content of substrates ranged from 42.4% (dry wt) for barley bran, 49.0% for wheat bran and 94.3% for beet fibre. Beet fibre, rich in pectic substances, contained a

high amount of soluble fibre (15.3% of dry wt of starting materials).

Fibre residues recovered from *in vivo* experiments represented \approx 50% of ileal content for all substrates. Sugar composition of insoluble fibre residues of cereal obtained from *in vitro* enzymatic digestion and ileal digesta were similar, although loss of glucose was found for barley bran (\approx 40%). The insoluble fibre residues of beet fibre recovered in digesta were modified; there was an approximately 28% loss of uronic acid, glucose, galactose and 16% arabinose; the modifications consisted of solubilisation of pectic substances and may also include the degradation of pectic substances and cellulose by microbial activity. Similar amounts of uronic acid and arabinose were solubilised after *in vitro* enzymatic treatment.

The results suggest that cereal fibre is not modified during gut transit of enzymatic digestion, but that changes of pectic substances and cellulose occur through the gut or in the *in vitro* enzymatic digestion. The influence of these chemical modifications on the physicochemical properties and on fermentation of dietary fibre requires further investigation.

References

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