

## Letters to the Editors

### *Xanthan gum and colonic function in man*

It was with interest that I read this paper, which looks at the effect of feeding xanthan gum on colonic function in man. The authors look at whether it is possible to predict the laxative effect of a polysaccharide from its fermentation characteristics *in vitro*, as proposed by Adiotomre *et al.* (1990). However, the authors have not used the methodology used in the Adiotomre paper and, therefore, can hardly be said to have refuted the acceptability of this approach.

The Adiotomre experiments were designed to form the basis of simple methods to measure and compare the potential biological effects of various dietary fibres. The intention was not to produce absolute measurements of biological action to compare with grams of fibre, but to enable a hierarchy of potential biological activity to be established for a series of fibres. This would allow a fibre to be chosen for a particular function of fibre, whether the required function be retardation of nutrient absorption, influence on sterol metabolism or effect on caecal fermentation and stool weight.

The mechanism by which dietary fibre increases stool weight is not fully understood, but the major mechanism is thought to be an increase in the water-holding capacity of stool, which is either due to the presence of the fibre itself or to bacterial cells which increase in number if the fibre is fermented (Stephen & Cummings, 1980).

Fibres are degraded to some extent in the colon and therefore lose some of their water-holding capacity. The water-holding capacity after incubation with human faecal bacteria has been suggested to be a good indicator of their effect on stool output (McBurney *et al.* 1985). However, residual water-holding capacity on its own was not useful as a predictive index for stool weight; therefore, a predictive index was developed which combined the water-holding capacity of the fibre after fermentation and the production of short-chain fatty acids.

We have also suggested that the prediction of how a dietary fibre would affect stool weight could be shown by a simple formula:

$$\text{stool weight} = W_f(1 + H_f) + W_b(1 + H_b) + W_m(1 + H_m),$$

where  $W_f$ ,  $W_b$  and  $W_m$  are respectively the dry weight of fibre after fermentation in the colon, bacteria present in the faeces and osmotically active metabolites and other substances in the colonic contents which would affect the amount of free water absorbed.  $H_f$ ,  $H_b$  and  $H_m$  denote their respective water-holding capacity (i.e. weight of water resistant to absorption from the colonic contents per unit weight of each faecal constituent; Eastwood & Morris, 1992).

This is not what the authors of the Adiotomre paper studied (Adiotomre *et al.* 1990). In none of the experiments that we conducted was viscosity measured as part of the protocol.

It is important that functional measures of dietary fibre are developed. I think that this paper is an important one in exploring different methods to identify a predictive index for

fibre. It is unfortunate that an alternative method is dismissed without, in fact, using the methodology suggested by that hypothesis.

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*Reply from Tomlin and Read*

In response to Dr Eastwood's letter, we would like to point out that we did not dismiss the acceptability of the methodological approach which attempts to use *in vitro* fermentation characteristics of polysaccharides to predict their laxative effects. The final sentence of our paper (Daly *et al.* 1993) states that the results obtained *do not substantiate* the suggestion that it is possible to do this. The results did not refute this suggestion but clearly did not support it.

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