Concurrent Session 7A: Micronutrients, Cereals and Milk

Estimation of *in vitro* prebiotic activity of individual and mixed dietary fibres

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Background - Epidemiological studies have demonstrated a link between dietary fibre deficiency and prevalence of many "Western diseases" particularly colon related diseases. Many of the health benefits associated with dietary fibre are attributed to their prebiotic effect. However, not all fibres have the same prebiotic potential or the same impact on colon health.
Objective - To examine the *in vitro* fermentation properties of individual and mixed dietary fibres by measuring fermentation byproducts over time.
Design - Wheat bran and guar gum were selected for this study. Individual and mixed dietary fibres were added to batch fermentation system and were inoculated with fresh faecal inoculum (n= 4). Positive (inulin) and negative (no substrate) fermenters were also used to determine the differences. The pH of the five fermenters was adjusted to a baseline of 5.5 and 6.8 representing the pH of the proximal and distal sections of the colon respectively. Samples were drawn out of the fermenters at 0, 3, 9 and 24 hours for the analysis of pH, ammonia and short chain fatty acids (SCFAs).
Outcomes - There were no significant differences in the pH levels at various time points between fermenters adjusted to pH 5.5 at baseline. However, in fermenters adjusted to pH 6.8 the pH of the fermenter containing wheat bran increased over the time (24h (P = 0.017)) due to production of a high amount of ammonia. The total SCFAs production was greater in fermenters containing combined fibres.
Conclusion - There is a large inter-individual variation in the prebiotic effect of all types of dietary fibres, however, in the present study, dietary fibre combinations showed greater prebiotic potential compared with the individual fibres.

A robust extraction method and a rapid HPLC technique for the analysis of vitamins D_2 and D_3 and their 25 hydroxy forms in meat

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Background – Vitamin D deficiency is a growing concern in Australia. The contribution of dietary sources to vitamin D status in Australia is not known and current Australian food composition tables do not contain reliable vitamin D values. Existing local methods for vitamin D analysis cater only for high potency products such as fortified foods. Australian red meats (beef and lamb) are a potentially significant dietary source of vitamin D. Current analytical methods for meat, e.g. as developed by Jakobsen et al. 2004 (JFCA, 17, 777-787) are highly complex and non-robust.
Objectives – To establish, optimise and validate a rapid, reliable, robust, and accurate extraction and analytical methods for vitamins D_2, D_3 and their 25 hydroxy compounds, in a single HPLC run for application in foods, particularly meats.
Design – The experimental protocol of Jakobsen et al. 2004 was refined and modified. Retail samples of lean beef mince were analysed for D vitamers. A reverse phase C18 hydro column was identified to separate and quantify the compounds under isocratic conditions using methanol, acetonitrile and water. External and internal standards were used.
Outcomes – Results include the development of a fast, one-step analytical method to separate both vitamin D forms and their 25 hydroxy metabolites. Sample preparation and extraction problems have been overcome.
Conclusions – Validation of the analytical method must be performed using standard techniques, and a collaborative trial between the three local laboratories and the Danish laboratory should be carried out.
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