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## Cross-sectional analyses show no association between fibre intake and faecal butyrate level

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**Background:** Dietary fibre and the fermentation product butyrate have been implicated in promotion of colonic health. The prevailing paradigm is that dietary fibre consumption leads to increased levels of short-chain fatty acids including butyrate, yielding a potential mechanism of action. This concept has been supported by intervention studies of fibre supplementation; however, the evidence-base from cross-sectional analyses is sparse.

**Objective:** We aimed to evaluate the strength of support for a linear relationship between fibre intake and faecal butyrate in the absence of a perturbation/intervention. Two studies were undertaken: (i) a cross-sectional analysis of the relationship between habitual fibre intake and faecal butyrate; (ii) a cross-sectional analysis of the relationship between recent (24 hr) fibre intake and faecal butyrate.

**Methods:** Seventy six subjects were recruited from gastroenterology clinics to a cross-sectional analysis of habitual fibre intake using a validated food frequency questionnaire. Sixteen healthy subjects were recruited to a cross-sectional analysis of recent fibre intake using multiple pass 24 hr recall. Sampling was undertaken on 4 occasions, 3 weeks apart. Faecal SCFA were extracted within 3 hr of passing stool and were later analysed by gas chromatography.

**Results:** When faecal butyrate was compared against habitual fibre intake, no relationship was found ( $r = 0.09$ ,  $P = 0.438$  ( $n = 76$ , all subjects);  $r = 0.092$ ,  $P = 0.597$  ( $n = 35$ , subjects without a pathology). When faecal butyrate was compared against recent fibre intake no relationship was found ( $r = 0.124$ ,  $P = 0.331$  – AOAC fibre;  $r = 0.068$ ,  $P = 0.596$  – Englyst fibre). When published cross-sectional studies of the fibre-butyrate relationship were reviewed, generally no relationship had been found.

**Conclusions:** This study suggests that the assumed linear relationship between dietary fibre intake and faecal butyrate does not hold. Both datasets agree with other cross-sectional studies investigating the fibre-butyrate relationship. The hypothesized relationship between fibre intake and faecal butyrate should be re-evaluated.