

pharmaceutical industry they are found in the anti reflux formulation Gaviscon Advance. Alginates have been demonstrated to have a beneficial effect on the flora of the large bowel, promoting the growth of bifidobacter. However the mechanism of this effect has not yet been elucidated. We hypothesise that at least some of this effect may be related to the iron chelating potential of alginates, thereby modifying the free iron content of the gut environment and subsequently influencing the balance of commensal bacteria. Thus the aim of this study was to culture a panel of bacteria with differing concentrations of alginate (either preloaded with iron or in a naked form), followed by assessment of bacterial growth.

Methods We examined the in vitro antibacterial effects of an array of alginates on some common bacteria (*Staphylococcus aureus*, *Salmonella typhi*, *Escherichia coli*). Bacterial growth was examined using fluoroscopic imaging with the addition of alginates. The minimum inhibitory concentration (MIC) of the alginates was then determined in triplicate using naked alginates and alginates preloaded with iron to assess if there was a difference in effect on bacterial growth. These assays were then plated onto LB agar plates to determine if the effect was bacteriostatic or bacteriocidal.

Results Growth of *salmonella* and *staphylococcus* were both retarded by the addition of alginate to the growth media ($p < 0.05$). The MIC of alginates varied between the bacteria, and *E coli* seemed most resistant to the antibacterial effect of the alginates. There was a clear difference between the MIC of naked alginates and iron loaded alginates which still exhibited some attenuated antimicrobial effect.

Conclusion Alginates have a clear antibacterial effect as evidenced by the reduction in growth following the addition of alginates. This inhibitory effect of alginates on bacterial growth was found to be bacteriostatic as the cultures grew well when plated onto agar. The bacteriostatic effect is likely in part to be due to the iron chelating capabilities of alginates as the antibacterial effect was lost when the MIC assay was repeated using alginates loaded with iron. There was a small time lag between the addition of the alginate and the retardation of growth in the growth assay though this was likely to be due to the bacteria utilising their remaining stores of iron. Thus in summary we provide evidence that it is likely that alginates mediate these alterations in the gut microflora through their potential to sequester iron.

Competing interests None.

Keywords iron, microbiota.

PTU-028 **A MECHANISM FOR THE EFFECT OF ALGINATE ON THE GUT MICROFLORA**

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Introduction Alginates are hydrocolloids produced by brown seaweeds which are commonly used as gelling and thickening agents in the food industry. In addition in the