

INDOLE-3-CARBOXYALDEHYDE DOES NOT REVERSE THE INTESTINAL EFFECTS OF FIBER-FREE DIET IN MICE

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Indole-3-carboxyaldehyde (I3A), a bacterial tryptophan metabolite reduced by fiber-free diet, stimulates GLP-1 secretion in vitro but shows no beneficial effects on intestinal health when administered orally to mice.

KEY POINTS

- Mice fed a fiber-free diet had significantly lower I3A in colonic content compared to control diet mice (7883 ± 3375 AU, $p=0.04$)
- I3A increased GLP-1 secretion in GLUTag cells after 120 minutes at 1 mM (60% increase, $p=0.016$) and 5 mM (89% increase, $p=0.0025$) concentrations, but showed no effect after 5 minutes
- In isolated perfused mouse and rat colons, I3A applied lumenally or arterially at 500 μ M to 10 mM did not affect GLP-1 secretion
- Oral I3A supplementation (0.6 mg/day for 10 days) to fiber-free diet fed mice did not affect body weight, organ weight, crypt depth, villus length, mucosal area, or intestinal permeability despite confirmed colonic delivery
- This research is most relevant to investigators studying gut-brain signaling, microbial metabolites, and dietary fiber effects on intestinal physiology

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