

Effect of experimental oligosaccharide on brain and body weight

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Background - The biological function of human milk oligosaccharides (HMO) is not fully understood. In addition to their ability to stimulate growth of *Bifidobacteria* and inhibit pathogens, there may be beneficial effects on brain development. Our hypothesis is that oral supplementation of certain oligosaccharides favourably influences brain growth and learning ability in an animal model. The piglet is the most appropriate as its brain growth closely parallels that of the human infant.

Objective - To investigate the effects of an experimental oligosaccharide found in human milk, on brain weight, total brain cortex cell number (estimated by DNA content) and body weight development in formula-fed piglets.

Design - Twelve 3-day-old male piglets were randomly allocated into a treatment (n = 6) or control group (n = 6). Piglets were fed a diet of soy/whey/casein sow's milk replacer (55:9:36) for 32 days. The treatment group were fed the standard diet with 215 mg/kg oligosaccharide per day. Body weight was determined daily using electronic scales prior to the morning feed. The piglets were euthanased on day 36 and brain weight and frontal cortex DNA content were determined.

Outcomes – The rate of body weight gain (mean \pm SD) did not differ between the groups: 217 \pm 34 g/d in the treatment group and 216 \pm 39 g/d in the controls. Brain weights were similar 54 \pm 6 g vs 57 \pm 4 g respectively, and cerebrum and cerebellum were 71% and 11% vs 69% and 11% respectively of total brain weight. Brain frontal cortex cell number was 24% higher (110.7 \pm 14.2 $\times 10^3$ cells/mg tissue) in treatment than controls (89.3 \pm 15.0 $\times 10^3$ cells/mg tissue) but the difference did not reach statistical significance (P=0.326).

Conclusions – This study showed that dietary supplementation of the experimental oligosaccharide had no significant effect on body weight gain, brain weight or frontal cortex cell number.