P25  The effect of honey versus sucrose, mixed sugars and a sugar-free diet on weight gain in young rats

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Background – Obesity is a major concern for westernised populations and one of the leading contributors is the prevalence of foods that are high in fats and sugars. Honey is a ready source of sugar that offers nutritional benefits over the use of sucrose.

Objectives – To assess whether replacing sucrose in a standard western diet with honey would have any impact on weight, food intake or blood sugar and cholesterol levels.

Design – Forty rats, aged 6 weeks were fed one of four experimental diets that contained either no sugar, 8% w/w sucrose, 8% w/w mixed sugars as in honey or 10% w/w high peroxide/high antioxidant rewarewa honey (honey is 20% w/w water). The diets were fed ad libitum for 6 weeks. The carbohydrate/fat/protein ratio of each diet was formulated to be equivalent to a typical New Zealand diet based upon data from the 1997 NZ National Nutrition Survey. During the experiment, the rats were housed in standard rat cages (2 animals per cage) that had a raised mesh floor. Animals’ weights and food intakes were assessed weekly. On day 42, all rats were anaesthetised using CO\textsubscript{2} gas. Blood samples were taken via cardiac puncture, and analysed for glycated haemoglobin (HbA1c) and fasting lipid profiles. After euthanisation, each rat was minced using a Sunmile SM-G50 mincer (Vantage) and total body fat and protein levels determined using soxtec fat extraction and LECO total combustion method, respectively.

Outcomes – Overall percent weight gain in honey-fed rats was significantly reduced by 16.7% compared with sucrose-fed rats (p < 0.01), and similar to that observed in rats fed a sugar-free diet after 6 weeks. Total food and calorie intake was significantly higher in all sugar treatments compared with the sugar-free treatment group (P<0.01); however, no statistically significant differences in total food intake were observed between the three sugar treatments. No differences in HbA1c, total-, LDL- and HDL-cholesterol or triglyceride levels were observed between the three sugar treatments. Body fat measurements were inconclusive due to large data variability, but no significant differences in total body protein levels were observed.

Conclusion – The replacement of sucrose with honey in the diet can lead to lower weight gains in young animals despite a similar food intake. Mixed sugars (as in honey) did not show decreased weight gains suggesting the effect with honey may be due to other components of the honey.

References

P26  Adhesion and competitive exclusion - basis for development of new probiotics

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Background – Adhesion and colonization of the mucosal surfaces by probiotics are possible protective mechanisms against pathogens through competition for binding sites and nutrients (1) or immune modulation (2).

Objectives – The objective was to test the abilities to inhibit, to displace and to compete with pathogens in order to screen the most effective adhesive probiotic combination, and to develop methods for new probiotic characterization.

Design – A human intestinal mucus model\textsuperscript{2)} was used to assess probiotics strains and their combinations. The strains were selected on the basis of their use as a commercial probiotic strains and they have each demonstrated to have beneficial \textit{in vivo} health effects.

Outcomes – Probiotic strains showed different abilities against pathogen adhesion. These properties were strain- and combination-specific indicating the need of a case-by-case characterization. All combination were able to reduce (p<0.05) the pathogen adhesion and in some cases over 40-50% of inhibition was demonstrated, but not all strains alone were able to inhibit pathogen adhesion. Thus, the selection of probiotic strains or combination to inhibit or displace a specific pathogen could be the basis for both product development and future clinical intervention studies on prevention or treatment of dysfunctions.

Conclusion – Our results suggest that different probiotic combinations can be formulated to enhance the inhibition and the displacement percentages to pathogen adhesion to intestinal mucus. New combinations could be useful in inhibition and displacement of pathogen adhesion than a single strain. Further studies are needed to characterize each combination and to understand their role in inhibition mechanisms.

References