Nutritional protection against obesity

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Obesity is a pressing public health problem caused by an interaction of several factors including genetic susceptibility and lifestyle changes (e.g. consumption of energy-dense, high fat/sugar foods and, possibly, increases in sedentary behaviour).

We have analysed potential anti-obesogenic interventions using two different mouse models. The data obtained point to alternative physiological mechanisms which mediate anti-obesogenic effects. Supplementation with blueberry (BB) extracts completely prevents the detrimental effects of high fat diet in a C57B/6 mouse obesity model. Many physiological parameters including body weight, body composition, organ weight, serum lipids, adipose tissue inflammation, food intake, and glucose tolerance were all normalised by the supplementation. Liver lipid metabolism was significantly changed in response to BB supplementation leading to a significant reduction in liver MUFA (monounsaturated fatty acid) storage. BB supplementation also resulted in a significant change in the gut microbiota and an increase in energy excretion.

Attenuation of post-natal growth in C57B/6 mice results in lower adult body and an extended lifespan. It also provides a partial resistance to a high fat diet challenge. Weight gain, serum insulin, serum leptin, are all reduced in mice whose weight gain was attenuated during the postnatal period. The programming intervention significantly reduces lipid incorporation into the liver and changes the composition of liver lipids including a reduction in MUFA. In contrast, serum lipids are not normalised in programmed mice.