OMICS Group Conferences
Accelerating Scientific Discovery
International Conference and Exhibition on
Obesity & Weight Management
December 3-5, 2012 DoubleTree by Hilton Philadelphia, USA

Effects of dietary fatty acid intake on meal pattern

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In humans and rodent models, obesity is associated with chronic consumption of diets high in saturated fatty acids (SFAs), abnormal meal patterns (MPs) and reduced brain neurogenesis. In contrast, polyunsaturated fatty acids (PUFAs) attenuate weight gain, increase neurogenesis and are more satiating than SFAs. However, the MP signature of PUFA consumption has never been determined. We hypothesised that it would differ from that of SFAs.

For two months, Wistar rats were fed isocaloric high-fat diets, providing 40% kcal as fat, either from menhaden fish oil (PUFA) or lard (SFA; n=8/group). MPs were recorded by automated cages (TSE Systems, Germany). The groups showed comparable weight gain, food intake, circulating levels of glucose, leptin, insulin, adiponectin and BDNF (p>0.05). However, there was a 50% reduction in triglyceride levels in PUFA-fed rats (p=0.002), consistent with known effects on metabolism. Overall, MPs were also similar between the groups but satiety was marginally enhanced throughout by the PUFA diet. Therefore, we have shown that MP signatures are similar for calorically matched, chronic high-PUFA and -SFA consumption. We believe the lack of difference may be due to the diet composition: The fish oil was also relatively high in SFAs.

Further studies are currently underway to examine the metabolic and neurogenic changes in response to a pure, high-DHA diet Incromega™ E1070. This source seemed logical due to the requirement of this omega-3 for normal nervous development and known associations with cognitive health.

Biography

Marianne Yon is a final year Ph.D student at the University Of Liverpool, UK. She has worked within one of the leading veterinary departments for the last four years, and gained many skills in the process. At the age of 27 she hopes to go onto postdoctoral studies. She has three manuscripts pending publication.

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