The effect of synthetic and bovine conjugated linoleic acid on energy balance

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ABSTRACT

Conjugated linoleic acid (CLA) is biologically active and has altered body composition in experimental animals. Dietary supplementation with synthetic CLA reduced body fat in mice and rats in a number of studies. The CLA used in previously published research contained mixed isomers, the majority of which were 9c11t-CLA and 10t12c-CLA. The biologically active isomer at the time of starting the trials described in this thesis was assumed to be 9c11t-CLA, due to the prevalence of this isomer in biological tissues.

The two trials in this thesis were designed to investigate the effect of dietary CLA on energy balance. In the first (refer Abstract, section 2.1), synthetic CLA reduced body fat in male BALB/c mice in a dose response manner, over the range 0.25 to 1.0 % w/w CLA in the diet. High levels (1.0 % and 2.0 %) caused a reduction in growth. In the second (refer Abstract, section 3.1) dietary treatments supplemented with synthetic CLA, or bovine CLA in milk fat, at levels similar to the 0.25 % w/w synthetic CLA treatment found to be effective in reducing body fat in mice, had no effect on energy balance in female Sprague-Dawley rats.

The CLA in milk fat contains approximately 86 % of the 9c11t-CLA isomer while synthetic CLA contains approximately 37 %. 9c11t-CLA and 46 % 10t12c-CLA. Results from these two trials support recent evidence from research demonstrating 10t12c-CLA is the biologically active isomer, in relation to energy metabolism and body composition.

9c11t-CLA is the prevalent isomer of CLA found in the human diet. The CLA used in previously published research was chemically synthesised and contained a considerably higher proportion of 10t12c-CLA then found in human food sources.

PREVIOUS PUBLICATION: The study described in Chapter 2 has been previously published as an abstract and displayed as a poster presentation at the Pacific Partners in Nutrition Conference, held at Auckland, New Zealand, September, 1999 (Hayman, *et al.*, 1999).

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