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Dairy Modulation of Oxidative and Inflammatory Stress in Overweight and Obese Subjects

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ABSTRACT

We recently found calcitriol to increase both oxidative and inflammatory stress; moreover, inhibition of calcitriol with high Ca diets decreased both adipose tissue and systemic oxidative and inflammatory stress in obese mice, while dairy exerted a greater effect. However, these findings may be confounded by concomitant changes in adiposity. Consequently, we have now evaluated the acute effects of a dairy-rich diet on oxidative and inflammatory stress in overweight and obese subjects in the absence of adiposity changes. 20 subjects (10 obese, 10 overweight) participated in a blinded randomized crossover study of dairy vs. soy supplemented eucaloric diets. The dairy supplement resulted in significant suppression of oxidative stress (plasma MDA, 22%; 8 isoprostane $F_{2\alpha}$, 12%, $p<0.0005$) and reduced inflammatory markers (TNFα, 15%, $p<0.002$; IL6, 13%, $p<0.01$; MCP-1, 10%, $p<0.0006$) and increased adiponectin (20%, $p<0.002$), while the soy exerted no significant effect. These effects were evident by day 7 of treatment and increased in magnitude at the end of the 28-day treatment periods. Greater effects were noted in obese vs. overweight subjects for oxidative, but not inflammatory, markers. These data demonstrate that high Ca dairy foods produce significant and substantial suppression of the oxidative and inflammatory stress associated with overweight and obesity. Supported by the National Dairy Council.

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