OBJECTIVE
To determine whether long-term increases in consumption of dairy calcium alter body weight and fat mass in young, healthy women.

STUDY DETAILS
– 12-month, randomised, controlled trial (n=155; 135 completed the trial)
– There were no significant differences in baseline study characteristics (age, weight, body mass index [BMI], fat mass, lean mass, calcium, energy intake and expenditure) in participants or in drop-outs
– Healthy, normal-weight women aged 18 to 30 years (mean 20.1 ± 2.4)
– Dietary calcium intake was <800 mg/day and energy intake ≤2200 kcal/day at study entry
– Women were randomly assigned to 1 of 3 groups:

<table>
<thead>
<tr>
<th>Control</th>
<th>Continue established dietary intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium-dairy</td>
<td>Substitute dairy products to achieve intake of calcium of 1000 to 1100 mg/day and maintain energy intake</td>
</tr>
<tr>
<td>High-dairy</td>
<td>Substitute dairy products to achieve intake of calcium of 1300 to 1400 mg/day and maintain energy intake</td>
</tr>
</tbody>
</table>

– Anthropometric and body-composition measurements were taken at baseline and at 12 months. Daily calcium intake and physical activity (in 15-minute time periods) were assessed by 3-day records at baseline and at 3, 6, 9 and 12 months
– Compliance criteria:
  • all subjects consumed ≤2200 kcalories daily
  • control subjects didn’t increase daily calcium intake by >200 mg
  • intervention subjects increased daily calcium by >200 mg

– Exclusion criteria included: intake of energy >2200 kcal/day; intake of chronic medication that interfered with calcium metabolism; pregnancy or lactation within the previous 6 months; irregular menses; self-reported lactose intolerance; malabsorptive, bone, kidney or hormonal disorders that might affect calcium metabolism; bone or muscle disorders; being >20% overweight or >15% underweight; eating disorders and high alcohol consumption (>2 drinks/day)

KEY FINDING
An increase in dairy calcium intake over one year did not lead to a decrease in body weight or fat mass in young, healthy, normal-weight women, nor did it promote weight gain or increased fat mass despite slightly higher energy intakes.

Additional research is needed to further explore the relation between calcium and changes in fat mass in other populations such as obese individuals.

RESULTS
– Mean daily dietary calcium was significantly greater in the intervention groups than in the control group throughout the intervention
– Mean daily calcium intakes were 742.4 ± 321.5 mg (control group), 1026.4 ± 311.3 mg (medium-dairy group) and 1131.29 ± 337.2 mg (high-dairy group) (p<0.0001)
– At each time point, the medium- and high-dairy groups had slightly higher (although not significant) energy intakes than did the control group
– According to the authors, it is possible that this slight increase in energy prevented weight loss in the intervention groups over the study period
– There were no significant differences between the groups in body weight, BMI, fat mass or lean mass
In this study, there was no significant difference between groups in parathyroid hormone and 1,25 dihydroxyvitamin D [1,25(OH)₂D] at one year, or for the mean one-year change. These are two hormones that are thought to be responsible for one of the possible mechanisms for the effect of calcium intake on fat mass.

Since dairy products are often avoided by young weight-conscious women and increased dairy intake did not promote gains in body weight or fat mass, young women should be encouraged to increase consumption of calcium through dairy products to increase and optimize peak bone mass.

| Absolute change in body weight, BMI, and body-composition measures from baseline to 1 year |
|---------------------------------------------------------------|-----------------|-----------------|-----------------|
| Control group (n=42)                                         | Medium-dairy group (n=45) | High-dairy group (n=48) |
| **Body weight (kg)**                                         | 0.8 ± 2.8        | 0.7 ± 3.0        | 1.5 ± 4.1        |
| **BMI (kg/m²)**                                              | 0.4 ± 1.2        | 0.3 ± 1.3        | 0.7 ± 1.7        |
| **Fat mass (kg)**                                            | −0.5 ± 2.5       | 0.3 ± 2.7        | 0.5 ± 3.5        |
| **Lean mass (kg)**                                           | 0.5 ± 1.1        | 0.6 ± 1.2        | 0.6 ± 1.2        |

*There were no significant differences between groups for any variable.*

Gunther et al. 2005