Mastication of almonds: effects of lipid bioaccessibility, appetite, and hormone response.

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Abstract:
Background: Epidemiologic and clinical data indicate that nuts can be incorporated into the diet without compromising body weight. This has been attributed to strong satiety properties, increased resting energy expenditure, and limited lipid bioaccessibility. Objective: The role of mastication was explored because of evidence that the availability of nut lipids is largely dependent on the mechanical fracture of their cell walls. Design: In a randomized, 3-arm, crossover study, 13 healthy adults (body mass index, in kg/m^2: 23.1 +/- 0.4) chewed 55 g almonds 10, 25, or 40 times. Blood was collected and appetite was monitored during the following 3 h. Over the next 4 d, all foods were provided, including 55 g almonds, which were consumed under the same chewing conditions. Complete fecal samples were collected. Results: Hunger was acutely suppressed below baseline ($P<0.05$), and fullness was elevated above baseline longer ($P<0.05$) after 40 chews than after 25 chews. Two hours after consumption, fullness levels were significantly lower and hunger levels were significantly higher after 25 chews than after 10 and 40 chews ($P<0.05$). Initial postingestive glucagon-like peptide-1 concentrations were significantly lower after 25 chews than after 40 chews ($P<0.05$), and insulin concentrations declined more rapidly after 25 and 40 chews than after 10 chews (both $P<0.05$). Fecal fat excretion was significantly higher after 10 chews than after 25 and 40 chews (both $P<0.05$). All participants had higher fecal energy losses after 10 and 25 chews than after 40 chews ($P< 0.005$). Conclusion: The results indicate important differences in appetitive and physiologic responses to masticating nuts and likely other foods and nutrients.