Fatty acid bioaccessibility and structural breakdown from in vitro digestion of almond particles.

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Abstract:
Previous studies have shown that the size of almond particles influences lipid bioaccessibility during digestion. However, the extent of structural breakdown of almond particles during gastric digestion and its impact on lipid bioaccessibility is unclear. In this study, in vitro digestion of almond particles was conducted using a dynamic model (Human Gastric Simulator) and a static model (shaking water bath). Structural breakdown of particles during the gastric phase occurred only in the Human Gastric Simulator, as evidenced by a reduction in particle size (15.89 ± 0.68 mm2 to 12.19 ± 1.29 mm2, $p < 0.05$). Fatty acid bioaccessibility at the end of the gastric phase was greater in the Human Gastric Simulator than in the shaking water bath (6.55 ± 0.85% vs. 4.54 ± 0.36%, $p < 0.01$). Results showed that the in vitro model of digestion which included peristaltic contractions (Human Gastric Simulator) led to breakdown of almond particles during gastric digestion which increased fatty acid bioaccessibility.