Effect of food matrix and processing on release of almond protein during simulated digestion.

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Abstract:
The aims of the present work were to assess digestibility of almond protein in the upper gastrointestinal tract, evaluate the effects of food matrix on protein release and assess the persistence of immunoreactive polypeptides generated during simulated digestion. Prunin, the most abundant protein in almond flour, was sensitive to pepsin, with complete digestion after 20 min in the gastric phase. Addition of the surfactant phosphatidylcholine did not affect the rate and kinetic of digestion, as observed by SDS-PAGE analysis and HPLC, in the stomach and the small intestine of either natural or blanched almond flour. However, incorporation of almond flour into a food matrix, such as chocolate mousse and Victorian sponge cake, decreased the rate of almond protein degradation by pepsin and immunoreactivity of almond polypeptides detected by dot blots and sandwich ELISA retained better. Most of the almond protein identified by in-gel tryptic digestion and MALDI-TOF analysis corresponded to prunin, with pI values of 5-7. Further human sera studies are warranted to investigate the relationship between food matrix and almond allergy.