

Stability of Novel Peptides (Linusorbs) in Flaxseed Meal Fortified Gluten-Free Bread

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Abstract : Flaxseed meal is rich in water-soluble gums and, as such, can improve texture in gluten-free products. Flaxseed bioactive-antioxidant peptides, linusorbs (LOs, a.k.a. cyclolinopeptides), are a class of molecules that may contribute health-promoting effects. The effects of dough preparation, baking, and storage on flaxseed-derived LOs stability in doughs and baked products are un-known. Gluten-free (GF) bread dough and bread were prepared with flaxseed meal and the LO content was determined in the flaxseed meal, bread flour containing the flaxseed meal, bread dough, and bread. The LO contents during storage (0, 1, 2, and 4 weeks) at different temperatures ($-18\text{ }^{\circ}\text{C}$, $4\text{ }^{\circ}\text{C}$, and $22\text{--}23\text{ }^{\circ}\text{C}$) were determined by high-performance liquid chromatography-diode array detection (HPLC-DAD). The content of oxidized LOs like [1-9-NaC],[1(Rs, Ss)-MetO]-linusorb B2 (LO14) were substantially constant in flaxseed meal and flour produced from flaxseed meal under all conditions for up to 4 weeks. However, during GF-bread production LOs decreased. Due to microbial contamination dough could not be stored at either 4 or $21\text{ }^{\circ}\text{C}$, and bread could only be stored for one week at $21\text{ }^{\circ}\text{C}$. Up to 4 weeks storage was possible for bread and dough at $-18\text{ }^{\circ}\text{C}$ and bread at $4\text{ }^{\circ}\text{C}$ without the loss of LOs. The LOs change mostly from processing and less so from storage. The concentration of reduced LOs in flour and meal were much higher than measured in dough and bread. There was not a corresponding increase in oxidized LOs. The LOs in flaxseed meal-fortified bread were stable for products stored at low temperatures. This study is the first of the impact of baking conditions on LO content and quality.

Keywords : flaxseed, stability, gluten-free, antioxidant

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