

Quantification of Peptides (linusorbs) in Gluten-free Flaxseed Fortified Bakery Products

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Abstract : Flaxseed (*Linum usitatissimum* L.) is gaining popularity in the food industry as a superfood due to its health-promoting properties. Linusorbs (LOs, a.k.a. Cyclolinopeptide) are bioactive compounds present in flaxseed exhibiting potential health effects. The study focused on the effects of processing and storage on the stability of flaxseed-derived LOs added to various bakery products. The flaxseed meal fortified gluten-free (GF) bakery bread was prepared, and the changes of LOs during the bread-making process (meal, fortified flour, dough, and bread) and 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 analyzed by high-performance liquid chromatography-diode array detection. The total oxidative LOs and LO1OB2 were almost kept stable in flaxseed meals at storage temperatures of $22\text{--}23\text{ }^{\circ}\text{C}$, $-18\text{ }^{\circ}\text{C}$, and $4\text{ }^{\circ}\text{C}$ for up to four weeks. Processing steps during GF-bread production resulted in the oxidation of LOs. Interestingly, no LOs were detected in the dough sample; however, LOs appeared when the dough was stored at $-18\text{ }^{\circ}\text{C}$ for one week, suggesting that freezing destroyed the sticky structure of the dough and resulted in the release of LOs. The final product, flaxseed meal fortified bread, could be stored for up to four weeks at $-18\text{ }^{\circ}\text{C}$ and $4\text{ }^{\circ}\text{C}$, and for one week at $22\text{--}23\text{ }^{\circ}\text{C}$. All these results suggested that LOs may change during processing and storage and that flaxseed flour-fortified bread should be stored at low temperatures to preserve effective LOs components.

Keywords : linum usitatissimum L., flaxseed, linusorb, stability, gluten-free, peptides, cyclolinopeptide

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