Influence of Stir-frying on the Lipid Stability and Flavor Substances in Oat Flour during Storage using HS-SPME-GC-MS and Electronic Nose

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Objectives: We used stir-fried oat flour as experimental material and raw oat flour as a control to explore the influence of stir-frying on the storagequality of oat flour.

Materials and Methods: The HS-SPME-GC-MS method combined with electronic nose technology was used to understand the lipid stability and analyze the changes in the flavor of the substances during the entire storage period.

Results: Itwas observed that during the storage period, stir-fried oat flour contained less water than raw oat flavor. The former was characterized by a lower fatty acid value, lower acid value, and lower linoleic acid content, but higher oleic acid content and palmitic acid content compared tothe latter. With the passage of storage time, the palmitic acid content significantly increased, and the linoleic acid content significantly decreased in raw and stir-fried oats flour ($P<0.05$). The sulfur and methyl contents in the stir-fried oat flour were higher than those in the raw flour, while nitrogen oxide content in the former was lower than that in the latter. Stir-fried oat flour possessed a total of 78 identified flavor substances. The process of stir-frying boosts the oxidation decomposition of unsaturated fatty acids aldehydes and heterocyclic compounds produced by theMaillard reaction, so the flavor substances of stir-fried oat flour are richer.

Conclusions: Stir-fried oat flour, containing diverse types of flavorsubstances, experienced more obvious flavor changes throughout the storage period than raw oat flour.

Keywords: Stir-frying; oat flour; lipid stability; flavor substances; storage.