

Reduction of The Beany Flavor Formation

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Outline

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 - Desirable beany flavors
 - Undesirable beany flavors
3. The formation mechanism of soybean flavor
4. Reduction of beany flavor by radio frequency treatment
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Abstract

Beany flavor is an off-flavor produced by soybeans during processing. It has unpleasant odor and has negative impact on soybean products. The main cause of formation is that lipoxygenase (LOX) in soybeans catalyzes the oxidation of polyunsaturated fatty acids (PUFA) to produce hydroperoxide and cracks to produce volatile aldehydes and alcohols. Lipases in soybeans may hydrolyze triacylglycerol (TAG) to produce PUFA and interact with LOX to generate a beany flavor. Therefore, the aim of this study discuss the effects of lipase and LOX on the formation of beany flavor and whether radio frequency treatment can reduce the production of beany flavor. Tian *et al.* (2021) prepared different reaction models for LOX, lipase, and TAG according to the order of addition and enzyme addition; Jiang *et al.* (2018) processed soy protein through radio frequency treatment. The results show that the presence of LOX, lipase and TAG are necessary conditions for odor formation, and the type and concentration of volatile flavor substances are related to the composition of lipids. The reaction model of LOX and lipase is highly similar to soy milk in the composition of volatile compounds, but there are differences in concentration. In conclusion the odor formation of soy milk is affected by other components. The amount of volatile compounds produced by radio frequency treatment was much lower than that of untreated. Radio frequency-treated soy protein has a substantially lower degree of denaturation than conventional thermal-treated soy protein. It means that radio frequency treatment can more effectively improve the smell of soy milk and retain protein activity.

1 **References**

2 Jiang, Y., Wang, S., He, F., Fan, Q., Ma, Y., Yan, W., ... & Zhao, W. (2018). Inactivation
3 of lipoxygenase in soybean by radio frequency treatment. *International Journal of*
4 *Food Science & Technology*, 53(12), 2738-2747.

5 Tian, Q., & Hua, Y. (2021). Oxidation reactions in model systems simulating the
6 processing of soybeans into soymilk: role of lipase and lipoxygenase in volatile
7 flavors formation. *International Journal of Food Properties*, 24(1), 192-202.

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