

STUDY OF THE EFFECT OF PASTEURIZATION TEMPERATURE ON THE PRESERVATION OF GINGER AROMA IN LEMONADE

D.I. Savailo¹, D.V. Matiukhov²

¹ Graduate Student, Department of Technology of Fats and Fermentation Products, NTU "KhPI", Kharkiv, Ukraine

² Associate Professor, PhD in Engineering, Department of Technology of Fats and Fermentation Products, NTU "KhPI", Kharkiv, Ukraine

Denys.Savailo@ihti.khpi.edu.ua

Pasteurization is the primary method of ensuring the microbiological safety and stability of beverages. However, the heat required to inactivate microorganisms and enzymes also affects the volatile aromatic compounds of ginger, such as terpenes and phenolic compounds, as well as bioactive substances like gingerols. Generally, increased temperature and prolonged exposure accelerate the loss of volatile compounds, altering the aromatic profile of the beverage [1].

The aim of this study is to investigate the role of heat treatment in preserving the aroma of ginger in lemonade.

The aroma of the beverage depends on the type of pasteurization used. There are two methods. The first is high-temperature short-time (HTST) heating, which takes place at 72 °C for 15 seconds, and the second is low-temperature long-time (LTLT) pasteurization, which, unlike the previous method, takes place at 63 °C for 30 minutes.

The primary difference between these methods is that HTST has less destructive effects than LTLT, as the total heat exposure is lower, allowing for better preservation of aromatic compounds [2].

However, ginger has its own specific characteristics: its aromatic components, particularly monoterpenes, sesquiterpenes, and functional phenols such as 6-gingerol and its derivatives, are quite thermolabile, meaning they begin to decompose or chemically transform at temperatures close to or above 60 °C. For example, during heat treatment, gingerols are converted into shogaols [3], which also affects the perception of the drink's pungency: the formation of shogaols increases the pungency. It gives a more 'spicy' aftertaste compared to the fresh ginger aroma.

Thus, pasteurization changes not only the aromatic profile but also the overall sensory perception of the drink. Therefore, the temperature and duration of pasteurization directly affect the preservation of the ginger aroma. The higher the total heat exposure, the more 'freshness' is lost, and the aromatic profile changes, so it can be assumed that HTST is better for preserving the freshness of ginger, and LTLT is better for preserving the aroma [1].

References:

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