CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY

journal homepage: **http://chimie-biologie.ubm.ro/carpathian_journal/index.html**

EFFECT OF MODIFIED STARCH/ NON-STARCH THICKENER COMBINATION ON CONSISTENCY, STABILITY AND RHEOLOGICAL PROPERTIES OF TOMATO KETCHUP

Mina Dzhivoderova-Zarcheva[1]✉, Kremena Nikovska[2] and Eva Dimitrova[3]

[1]Department of Technology of Tobacco, Sugar and Plant Essential Oils, Technological Faculty, University of Food Technologies, Plovdiv, Bulgaria

[2]Department of Nutrition and Tourism, Economic Faculty, University of Food Technologies, Plovdiv, Bulgaria

[3]Department of Mathematics, Physics and Informatics, University of Food Technologies, Plovdiv, Bulgaria

✉mina_dj@abv.bg

https://doi.org/10.34302/crpjfst/2024.16.3.6

Article history:

Received:

January 14th, 2023

Accepted:

August 22nd, 2024

Keywords:

Modified starches;
Hydrocolloids;
Tomato ketchup;
Rheological properties;
Consistency;
Syneresis.

ABSTRACT

Ketchup is one of the most popular tomato products on the world market and requires limited equipment and simple processing. Thickeners are used in the manufacturing process due to their ability to act on the viscosity, affect the consistency and prevent the ketchup from delaminating.

The effect of two modified starches in combination with a non-starch thickener (guar gum, xanthan gum and carrageenan) was investigated on the consistency, stability and rheological properties of tomato ketchup. A two-way ANOVA was performed to evaluate the effects of starch and non-starch thickener on structural mechanical properties and Bostwick consistency of ketchup.

All samples appeared to be non-Newtonian fluids and their viscosity and variation were close. Ketchup samples showed the highest shear stress values with 0.2% carrageenan with 3.4% modified potato starch, while the lowest were shown for samples with 0.1% guar gum. The highest consistency values determined by the Bostwick method of ketchups were reported for the combination of 3.4% modified potato starch and 0.1% guar gum, and the lowest for 3.8% modified waxy corn starch and 0 .2% carrageenan. During the analysis of the obtained samples, the serum-separated liquid was detected in ketchup with only modified potato starch, in combination with guar gum, in an amount of 0.1%. Based on these results, the combination of modified waxy corn starch and 0.2% carrageenan was the most suitable to be used for the production of tomato ketchup, with the aim of creating a more sustainable product.