

## **DEVELOPMENT OF LOW-FAT EGG-FREE MAYONNAISE: PRELIMINARY RHEOLOGICAL RESEARCH**

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Mayonnaise is one of the most widely used sauces that contain fat in its formulation. There is an increase demand in reduction of the amount of fat in the diet and consume low-fat foods. Mayonnaise is a sort of semi-solid, oil-in-water emulsion which typically contains high amount of fat and mixing of egg yolk, vinegar, spices and some optional ingredients.

This study takes small part of the project and is focused on research of the rheological properties of o/w emulsions. Specifically, research type of emulsion which is researched low-fat egg-free mayonnaise. Oil-in-water (o/w) emulsions stabilized by protein casein as emulsifiers and carboxymethylcellulose as thickening agent were used.

The rheological behavior of mayonnaise is very important for the sensory properties contributing to its perceived texture as well as the quality evaluation and control. The shear stress and apparent dynamic viscosity of the samples in the range of shear rates 0.2-5.0 s<sup>-1</sup> were experimentally determined by used a rotating viscometer ViscoQC 300 type H (Anton Paar, Austria) at 20 °C, equipped with a Coaxial Cylinder Sensor System (12.5 mm). The static yield stress was determined using vane rotor F73 and 74.

In the present study, mayonnaise samples containing various amounts of oil and stabilized compounds were produced. Physical and sensory properties were carried out. Furthermore, the consistency coefficient and flow behavior index were calculated as rheological parameters. All mayonnaise samples fitted by empirical power model exhibited non-Newtonian and pseudoplastic behavior.

Within the framework of the structural approach, the rheological data were analyzed on the basis of the generalized rheological model of Casson. The contributions to the process of viscous flow calculated from the experimental data from the integral characteristics of associates of droplets and individual particles during their hydrodynamic interaction made it possible to explain the effect of changing the viscosity of emulsions from the nature of the emulsifier used. The calculated and experimental rheological parameters were used to optimize the composition of the developed mayonnaise. A comparison was made with similar parameters determined for commercially available samples.