

DEVELOPMENT OF LOW-FAT MAYONNAISE: CANNED AQUAFABA BEANS AS AN EMULSIFIER

Chepurniak M.S., Melnyk A.V. gr. 424
Institute of Biology, Chemistry and Bioresources,
Yuriy Fedkovych Chernivtsi National University
Scientific advisors – Ph.D., Ass.Prof. **A.V. Sachko**
Yuriy Fedkovych Chernivtsi National University, Ukraine
Ph.D., Ass. Prof. **S.M. Gubsky**
Biotechnological State University, Kharkiv, Ukraine

Mayonnaise is one of the most widely used fat-containing foods. There is a growing need to reduce fat in the diet and consume low-fat foods. The purpose of research was to develop a low-fat mayonnaise containing 30% sunflower oil using aquafaba from commercially canned white beans as an emulsifier and an egg white substitute in formulation. To maintain the physical stability of the mayonnaise-like emulsion, a water-soluble polymer carboxymethylcellulose was used as a thickener, and a pectin-xanthan mixture was used as a stabilizing agent. The ratio of the main ingredients of the emulsion emulsifier/stabilizer/thickener was 3.0:0.7:0.3 (% w/w).

The apparent viscosity and the yield shear stress were performed on a rotational viscometer Visco QC 300R (Anton Paar, Graz, Austria) with concentric cylinder CC12 geometry and a vane spindles, respectively. The droplet size distribution of samples was measured by laser diffraction on a PSA 1190 particle size analyzer (Anton Paar, Austria) in the range of 0.1–2500 μm .

Developed low-fat mayonnaise was characterized by high sedimentation stability at the level of 98%, as well as acidity equal to 0.691 g (acetic acid equivalent)/100 g and pH=3.66. The volume droplet size distribution D [4;3] had a mean particle size of 8.4 μm and a SPAN factor of 1.7 μm . These values are typical of a well homogenized mayonnaise-like emulsion. The flow curves of the samples are characteristic of viscoelastic fluids with pseudoplastic behavior and a high shear yield strength of 132 Pa. Calculations of quantitative parameters of various rheological models such as power law, Herschel-Bulkley, generalized Casson and Cross were carried out. The change in microstructural and rheological parameters over time was studied to characterize the stability of the finish product.

Sensory analysis confirmed high scores for the consistency, taste and smell of low-fat mayonnaise. A comparison of sensory indicators was carried out with commercial samples having a traditional formulation.