

Rheological methods for plant proteins based foods: characterization of ingredients and final products, formulation and processing

BRAUN A. (1), SESSER C. (2), MATHYS A. (2), LGER J. (1)

1 Anton Paar Germany GmbH, Ostfildern, Germany

2 ETH Zurich, Zurich, Switzerland

Plant proteins based foods have become a huge topic during the last few years. The key issue for establishing them in the market is to achieve sensory acceptance of consumers, which relates to both food structure and taste. Rheological methods are beneficial not only to check the quality or functionality of single ingredients or to characterize different formulations but also to mimic processing steps such as cooking of the final product.

The characterization of different protein samples is carried out by exposing the samples to a heat-hold-cool temperature profile while stirred in a rheometer set-up. The viscosity is monitored to characterize the samples during the different stages of the temperature profile. Additionally, commercially available plant proteins based foods were exposed to oscillatory shear flow to characterize their viscoelasticity and hence its structure and texture. Measurements were conducted both at room temperature and at higher temperatures, to mimic the cooking process.

We can show that that rheological characterization is of greatest interest for the formulation of plant proteins based foods. Both, single ingredients as well as final products can be characterized in an easy and time-saving analysis. When comparing the vegan food alternatives products with their non-vegan counterparts, the direction of future developments and formulation can be evaluated.