OSCILATORY RHEOMETRY A TOOL TO UNDERSTAND THE EXTRUSION OF RICE/WHEY BLENDS

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The food extrusion cooking process has been widely used in the food industry to produce a large variety of value added products. Whey is a byproduct of the dairy food industry which has been used to enhance the nutritional value of varied types of foods, including snacks. Mixtures of whey and rice could result in a food of outstanding nutritional value. This work evaluated the dynamic rheological properties of extruded rice-whey (ES) dispersions blends and compared with a similar rice porridge commercial sample (CS). Rice-whey blend were prepared in different additions of whey (0-50%) and were extruded in a twin screw extruder. The rheological tests were carried out in an oscillatory rheometer and the dynamic analysis were performed within linear viscoelastic region determined by amplitude sweep. The results showed a shear thinning behavior well-adjusted to Ostwald de Waele model. The 20% whey sample presented best fitted to this model. CS showed a more pronounced shear thinning behavior, however, its elastic recovery was higher (94.87%) than ES (85.41%). The viscosity-zero-shear-rate and relaxation time were determined through the creep and recovery tests, which allowed differentiating between the viscous and elastic samples responses, introducing the stress-dependency of both viscous and elastic behavior of solids and fluids. The rheology proved to be useful for providing information that would predict the viscoelastic behavior of the final extruded products and also showed that the 20% whey sample was closer to the commercial rice porridge texture.