

Effect of Processing Parameters on the Physical Properties of Pineapple Pomace Based Aquafeed

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Abstract : The solid waste disposal and its management from pineapple juice processing constitute environmental contamination affecting public health. The use of this by-product called pomace has potentials to reduce cost of aquafeed. Pineapple pomace collected after juice extraction was dried and milled. The interactive effects of feeding rate (1.28, 1.44 and 1.60kg/min), screw speed (305, 355 and 405rpm), moisture content (16, 19 and 22%), temperatures (60, 80, 100 and 120°C), cutting speed (1300, 1400 and 1500rpm), pomace inclusion ratio (5, 10, 15, 20%) and open surface die (50, 75 and 100%) on the extrudate physical properties (bulk density, unit density, expansion ratio, durability and floatability) were investigated using optimal custom design (OCD) matrix and response surface methodology. The predicted values were found to be in good agreement with the experimental values for, expansion ratio, durability and floatability ($R^2 = 0.7970$; 0.9264 ; 0.9098 respectively) with the exceptions of unit density and bulk density ($R^2 = 0.1639$; 0.2768 respectively). All the extrudates showed relatively high floatability, durability. The inclusion of pineapple pomace produced less expanded and more compact textured extrudates. Results indicated that increased in the value of pineapple pomace, screw speed, feeding rate decreased unit density, bulk density, expansion ratio, durability and floatability of the extrudate. However, increasing moisture content of feed mash resulted in increase unit density and bulk density. Addition of extrusion temperature and cutting speed increased the floatability and durability of extrudate. The proportion of pineapple pomace in aquafeed extruded product was observed to have significantly lower effect on the selected responses.

Keywords : aquafeed, extrusion, physical properties, pineapple pomace, waste

Conference Title : ICASFE 2017 : International Conference on Agricultural Science and Food Engineering

Conference Location : Zurich, Switzerland

Conference Dates : July 27-28, 2017