Accepted Manuscript

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PII: S0023-6438(18)30454-7

DOI: 10.1016/j.lwt.2018.05.040

Reference: YFSTL 7150

To appear in: *LWT - Food Science and Technology*

Received Date: 5 January 2018

Revised Date: 27 April 2018

Accepted Date: 15 May 2018

Please cite this article as: Natabirwa, H., Nakimbugwe, D., Lungaho, M., Muyonga, J.H., Optimization of Roba1 extrusion conditions and bean extrudate properties using response surface methodology and multi-response desirability function, *LWT - Food Science and Technology* (2018), doi: 10.1016/j.lwt.2018.05.040.

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Optimization of Roba1 extrusion conditions and bean extrudate properties using Response surface methodology and multi-response desirability function

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Abstract

Effects of extruder die temperature, screw speed and ingredient feed moisture on Roba1 bean extrudate nutritional and physicochemical properties were evaluated by response surface methodology (RSM) and extrusion processing conditions optimized for optimal extrudate attributes by multi-response desirability function. Responses taken were protein content, protein digestibility, polyphenols, phytates, extrudate expansion, bulk density, water absorption index, water solubility index, and texture. Feed moisture, die temperature and screw speed significantly ($p < 0.05$) influenced the physicochemical properties of Roba1 extrudates. Increase in feed moisture at low die temperatures resulted in decrease in extrudate expansion ratio (~3.96%) and water solubility (~10%). Increases in expansion, and reduction in bulk density and water

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