



EFFECTS OF XANTHAN GUM ON THE QUALITY OF GLUTEN-FREE BORA RICE AND CORN FLOUR NOODLES USING D-OPTIMAL MIXTURE DESIGN APPROACH

Rangina Brahma¹, Manuj Kumar Hazarika² and Subhajit Ray¹✉

¹Department of Food Engineering & Technology, Central Institute of Technology Kokrajhar, Kokrajhar, BTAD, Assam:783370, India

²Department of Food Engineering & Technology, Tezpur University, Tezpur, Assam, 784028
✉subhajit@cit.ac.in

<https://doi.org/10.34302/crpjfst/2023.15.3.7>

Article history:

Received: 26 February 2022

Accepted: 1 August 2023

Keywords:

Bora rice;

Extrusion noodles;

Physicochemical property;

Sensory Quality;

Storage Studies.

ABSTRACT

Bora rice found in Assam contains a significant amylopectin concentration (i.e., > 95%) and has a waxy, branched polymer, indicating physical durability and resistance to enzymatic action. This category of rice starch hydrates and expands when exposed to cold water, generating sols that contribute to its bio-adhesive characteristics. Due to glutinous nature, it poses a challenge in making extruded products. Now, xanthan gum has the ability to replace the gluten network of bora rice and blended with corn flour to develop noodles by using extrusion technology. The study was based upon the experiments for three independent variables using a D-optimal mixture design (DOMD). Different responses viz. cooking time, cooking loss, swelling power and solubility were studied. Numerical optimization was done and the optimum values were found to be rice flour (82.3%), corn flour (15%), and xanthan gum (2.6%). The developed noodle product was then analyzed for physicochemical, sensory, and storage properties. The recorded readings were swelling index (37gg^{-1}), solubility (36.5%), cooking loss (27%) and cooking time (209 s). The moisture, protein and ash content were found as approximately 2.5%, 30% and 0.213% respectively. Therefore, based on DOMD optimization technique, a good balance between the bora rice, corn flour and xanthan gum led to the development of extruded noodle with characteristic physicochemical property, storage stability and satisfactory sensory quality.