

## Effects of Extrusion Conditions on the Cooking Properties of Extruded Rice Vermicelli Using Twin-Screw Extrusion

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**Abstract :** Rice is one of the most important crops used in the production of ready-to-cook (RTC) products such as rice vermicelli, noodles, rice paper, Banh Kanh, wine, snacks, and desserts. Meanwhile, extrusion is the most creative food processing method used for developing products with improved nutritional, functional, and sensory properties. This method authorizes process control such as mixing, cooking, and product shaping. Therefore, the objectives of this study were to produce rice vermicelli using a twin screw extruder, and the cooking properties of extruded rice vermicelli were investigated. Response Surface Methodology (RSM) with Box-Behnken design was applied to optimize extrusion conditions in order to achieve the most desirable product characteristics. The feed moisture rate (30-35%), the barrel temperature (90-110°C), and the screw speed (200-400 rpm) all play a big role and have a significant impact on the water absorption index (WAI), cooking yield (CY), and cooking loss (CL) of extrudate rice vermicelli. Results showed that the WAI of the final extruded rice vermicelli ranged between 216.97% and 571.90%. The CY ranged from 147.94 to 203.19%, while the CL ranged from 8.55 to 25.54%. The findings indicated that at a low screw speed or low temperature, there are likely to be more unbroken polymer chains and more hydrophilic groups, which can bind more water and make WAI values higher. The extruded rice vermicelli's cooking yield value had altered considerably after processing under various conditions, proving that the screw speed had little effect on each extruded rice vermicelli's CY. The increase in barrel temperature tended to increase cooking yield and reduce cooking loss. In conclusion, the extrusion processing by a twin-screw extruder had a significant effect on the cooking quality of the rice vermicelli extrudate.

**Keywords :** cooking loss, cooking quality, cooking yield, extruded rice vermicelli, twin-screw extruder, water absorption index

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