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Elucidating the effect of amylose on on-line rheology of pearl millet flours during extrusion

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Pearl millet is a micro-nutrient rich crop grown in arid regions of Asia and Africa. Millet based extruded products can ensure both food and economic security amongst these malnutrition prone areas. The effect of flour crystallinity and percentage amylose in starch on the rheological attributes during thermo-mechanical processing of pearl millet flour (varieties: P 443, ICTP 8203, L 74) was measured using on-line rheometer during twin-screw extrusion. The shear strain measurements (270-670 s-1) indicated a shear thickening behavior which has been modeled using modified Power law (R2>0.8). The consistency index of pearl millet flour decreased with increasing moisture content (23 to 28%, wb) and barrel temperature (70-90o C). The flow behavior index was found to increase with moisture and temperature. Consistency index was found to increase with increase in amylose content. Modified Arrhenius model was used to explain the effect of temperature and moisture on consistency index. This study formidates the effect of crystallinity and amylose content in raw material on the rheological attributes of flours during extrusion cooking at various temperatures and moisture levels.

Biography

Shalini Gaur Rudra is a Scientist at Division of Food Science and Postharvest Technology at Indian Agricultural Research Institute, India.

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