

ABSTRACT

The Utilization of Cassava Flour in the Extrusion of Ready-to-Eat Breakfast Cereals

Daveka Mahadeo-Ruben

Ready-to-eat breakfast cereals are made mainly from cereal grains such as corn, oat, wheat and rice. While many researchers have studied the extrusion of flours made from root tubers, these flours are rarely used as an ingredient in commercial products. The purpose of this study is to explore the possibility of utilizing cassava flour in the extrusion of breakfast cereals.

Five composite blends using cassava flour (MX69) were evaluated. Work done by previous authors on the extrusion of cassava flour was reviewed together with variable parameters such as screw speed, barrel temperatures, feed rate and feed moisture that affect the extrusion process. Using a twin screw extruder, the effect of process conditions on the properties of the different blends was studied to obtain optimal extrusion parameters. The data obtained from sensory evaluation, expansion and colour of extrudates were statistically analyzed.

This study indicates that cassava flour could be a viable partial or whole carbohydrate replacement to wheat flour and other flours in cereal production.

Wheat flour can be substituted with cassava flour up to 21% without any adverse effect on the product shape and texture. The optimum process values for feed rate, feed moisture, barrel moisture, screw speed and cooking temperatures were: 16kg/hr, 9.33%, 18%, 384 rpm and 110 – 150°C respectively.

Extrudates expansion ratio varied from 3.46 – 4.16. However, there was no significant difference ($P>0.05$). The extrudates bulk density varied from 0.089 to 0.200 g/cm³. Colours L* and b* were significantly different ($P<0.05$) among all extrudates. Sensory evaluation and hedonic scores show that blend 4 extrudates (20% cassava flour) was most preferred. The texture was significantly different ($P<0.05$), the bowl life and shelf life were 5 mins and 9 months respectively. A gluten-free cereal was made and no significant difference ($p>0.05$) in the sensory attributes was obtained.

Keywords: Daveka Mahadeo-Ruben; Cassava Flour; Extrusion; Breakfast Cereals.