Extrusion has gained emphasis and expansion in the food industry since it is an important technique which, besides increasing the variety of processed food, presents more advantages when compared with other traditional systems of food processing. The opportunity to supplement common cassava biscuits with a product of higher nutritional value meets consumer expectations. In this work it was studied the effects of screw speed, extrusion temperature, moisture and percentage of flaxseed flour in mixture with sour cassava starch on physical properties of expanded snacks. Extrusion process was carried out using a single screw extruder in a factorial central composite design with four factors: flaxseed flour percentage, temperature, screw speed and moisture. Results showed that operational conditions of the extrusion process affected physical properties of snacks from sour cassava starch and flaxseed flour blends. The expansion index ranged from 2.23 to 5.36. The specific volume ranged from 1.43 mL.g$^{-1}$ to 17.24 mL.g$^{-1}$. Color analysis of extruded products showed brightness (L*) from 55.13 to 80.54, a* from 2.8 to 6.87 and b* from 13.26 to 20.93. The water solubility index obtained in the different extrusion treatments ranged from 11.06 to 73.08% and the water absorption index from 8.37 to 19.44 g gel.g$^{-1}$. Among the experimental conditions used in the present study, expanded snack products with good physical properties can be obtained under the conditions of 10% of flaxseed flour, 230 rpm of screw speed, temperature of 90°C and moisture of 18%.