B-71: Influence of temperature on degree of cooking of soya and rice blends in an extrusion cooker

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A blend of 30% dehulled soyabean and 70% raw rice milled to 90% pass through U.S. 60 mesh screen and moisture adjusted to 18%, was extrusion cooked at a temperature range from 110 to 154°C. A single screw, autogenous extruder, (Insta-Pro-500 unit, operating at 550 RPM) was used with a die 9.5 mm diameter. The degree of cooking was quantified by determining protein dispersibility index, urease activity, trypsin inhibitors, water solubility index, water absorption index and Bostwick values. The data indicated a reduction of protein dispersiblity index, urease activity and trypsin inhibitors, from original values of 73.5, 1.78 pH units and 6.165 mg to 16.2% .008 pH units, and 0.62 mg respectively in the material cooked at 154°C. The water absorption and solubility indices increased from 1.78 and 0.083 to 7.21 and 0.21 respectively. Bostwick consistometer values of unextruded, but cooked blend indicated a mean value of 12.8 cm. The cooked materials above 135°C indicated Bostwick values greater than 12.8 cm. The temperature had a pronounced effect on hardness, considered a parameter of degree of cooking. The materials cooked at 110 and 154°C had mean shear force values 1,063 and 48 kg respectively. The expansion ratio increased from a mean value 1.61 to 1.94 with corresponding reduction of the bulk density from 0.96 g/cc to 0.55 g/cc. The data indicate processing raw materials, above 135°C imparts adequate cooking, once all the above cooking parameters are taken into consideration. The temperature range from 135 to 154°C was characterised by considerable starch modifications as shown by Bostwick values, water absorption and solubility indices.