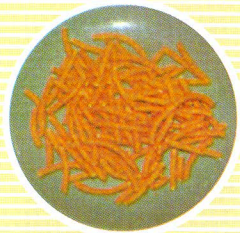


## Fortified extruded products

Cassava being rich in carbohydrates and lacking in protein content, addition of low cost protein sources give more nutritional and market value products.



Cassava-corn flour extrudates



Cassava-wheat flour extrudates



Cassava-finger millet flour extrudates



Cassava-coconut powder extrudates

## Properties of fortified extrudates

Raw material	Expansion ratio	Bulk density, gcm <sup>-3</sup>	Hardness, N	Toughness, N.s
Cassava- corn flour (60:40)	3.71	0.307	48.69	71.21
Cassava- wheat flour (60:40)	3.73	0.181	62.86	75.99
Cassava- finger millet flour (60:40)	2.79	0.290	62.01	74.71
Cassava- coconut powder (95:5)	3.27	0.275	47.17	54.82

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## EXTRUDED PRODUCTS FROM TUBER CROPS



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## Extrusion

Extrusion cooking is a high temperature short time cooking process designed for processing of starchy as well as proteinaceous materials. The use of extrusion cooking has distinct advantages like versatility, high productivity, low cost, product shapes, high product quality and production of new products. During extrusion process, the food ingredients undergo various changes such as starch gelatinisation and dextrinisation, protein denaturation, inactivation of raw food enzymes, destruction of naturally occurring toxic substances, degradation of fat and formation of starch-protein-oil complexes and destroying microbial count in final product.



## Tuber crop based extruded products

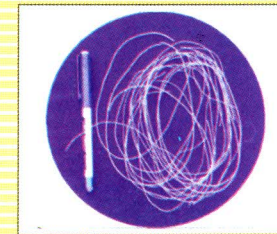
The demand for extruded snack products is expanding at a phenomenal rate in developed and developing countries. Several cereal based extruded products are available commercially. But tuber crop based extruded snack product has yet to appear in the market as we lack both technologies for value addition and products acceptable to elite/urban populace. Being the treasure house of starch with complex physico-chemical properties, tuber crops can be extruded to obtain a variety of nutritionally enriched, ready to eat/cook products.



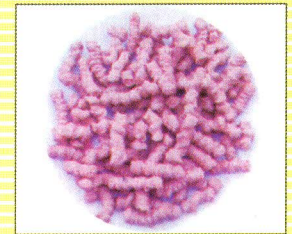
Cassava flour extrudates



Cassava starch extrudates



Sweet potato noodles



*Dioscorea* flour extrudates

## Properties of extrudates

Raw material	Expansion ratio	Bulk density gcm <sup>-3</sup>	Hardness, N	Toughness, N.s
Cassava flour	3.4	0.138	3.2	10.7
Cassava starch	2.9	0.287	16.6	51.7
<i>Dioscorea alata</i>	2.8	0.142	3.6	11.1