PRACTICE ABSTRACT nº 34

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Production of precooked nutrient-enhanced flours containing biofortified crops

Starchy staples are widely consumed in developing countries, with cereal flours widely used in feeding of infants and children. Cereal flours are low in nutrients and do not adequately cover the nutritional needs of infants and children. This practice abstract outlines processes for production of instant nutrient-enhanced flours from biofortified beans, orange-fleshed sweet potatoes (OFSP), grain amaranth and maize that was developed as part of FoodLAND research.

Steps for production of instant nutrient-enhanced flour

- Fleshly harvested orange-fleshed sweet potatoes are harvested, washed, trimmed, peeled and sliced.
- The slices are soaked in a solution of sodium metabisulphite for 5 minutes.
- The slices are dried at 60℃ for about 8 hours, and milled into flour
- The flour is kept in airtight container or polyethylene bags for subsequent use.
- Flours are then mixed according to the optimal formulations (Table 1), wetted with water (max 5% of flour), fed into a double screw extruder and extruded at barrel temperatures of 60, 120 and 150℃ (for the 3 regions)
- Extrusion is done at screw speed of 350 rpm and the cutter speed of 90 rpm.
- The extrudate is allowed to cool before milling using a food grade mill, with typical sieve size of 200-500 µm.
- If milling is to be done later, the extrudate should be packed in containers with good moisture barrier properties.
- Pack produced composite flour is packed in polyethylene bags (or other moisture protective materials), ready for distribution to the market.

Ingredient	Maize	OFSP	Beans	Grain amaranth
Formulation 1	0.0	46.6	36.9	16.5
Formulation 2	5.9	49.0	35.1	10.0

Properties of noodles made with orange-fleshed sweet potatoes

The resulting flours (Figure 1) exhibit high sensory acceptance and contain markedly higher protein, fibre, iron, zinc and phytochemicals content than widely marketed composite flours.

Figure 1: Instant nutrient-enhanced flours made using formulations in table 1. EF1 (Formulation 1); EF2 (Formulation 2)

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