MINISTRY OF AGRICULTURE ANIMAL INDISTRY & FISHERIES

FRUVASE-MUK

HOW TO PROCESS CASSAVA LEAVES USING REFRACTANCE WINDOW DRYING TECHNOLOGY

1.0 Introduction

Cassava (*Manihot escutenta*, Crantz) is a drought-tolerant and an important staple food crop grown in tropical and subtropical Africa (Nhassico *et al.,* 2008). It is mainly grown for its starchy tubers though the leaves and petioles are also edible and are widely used as food in Sub Saharan Africa and Asia. Cassava leaves are an important vegetable which are available throughout the year (Montagnac *et al.,* 2009) with an estimated global production of 2.4 million tonnes of which 76,945 tonnes are produced in Congo (FAOSTAT, 2017). In much of East Africa, all of Central Africa and parts of West Africa, cassava leaves are a major component of the diet and constitute a very significant source of dietary protein, minerals and vitamins (Bokanga, 1994). Fresh cassava leaves are usually cooked freshly harvested, but preservation by sun-drying or solar drying to extend their shelf life is also done.

2.0 Nutritional benefits of cassava leaves

Cassava leaves are a valuable source of protein (16 - 40% dry matter) (Khieu *et al*., 2005), minerals and vitamins B1, B2, C, and carotenoids (Adewusi & Bradbury, 1993). The vitamin A content of cassava leaves is comparable with that of carrots and is higher than that reported for legumes and leafy legumes (Montagnac *et al*., 2009). They are rich in minerals such as iron, zinc, manganese, magnesium, and calcium (Wobeto *et al*., 2006). The leaves have a well-balanced amino acid profile comparable to white fresh egg (Jackson & Chiwona-Karltun, 2018) milk, cheese, soybean, fish, with the exception of sulphur containing amino acids methionine and cysteine (Lancaster & Brooks, 1983; Diasolua *et al*., 2003. While cassava leaves are good sources of mineral, vitamin, and fibre for humans, they contain antinutrients and toxic substances. Therefore, leaves must be processed carefully to reduce bitterness (cyanide compounds).

3.0 Technology innovation

3.1 Cassava leaf drying using Refractance Window Drying (RWD) Technology

- Drying is a widely used preservation technology, which prolongs shelf life, minimizes storage, transportation and packaging costs.
- Cassava leaves can be dried using various methods including solar drying, freeze drying, and convection oven drying.
- Refractance Window Drying Technology, a novel drying technology, emphasizes retention of nutrients, bioactive compounds and sensory characteristics**.**

3.2 RWD Comparative advantages

- **Weather susceptibility**

  The dryer is not susceptible to weather changes since it uses both electricity and biomass.

- **Moisture content**

  Can achieve relatively low moisture content of up to 3-7%.

- **Product quality**

  Produces high quality products with respect to appearance, flavour and microbial load.

- **Nutrition**

  High retention of bioactive compounds.

- **Drying time**

  Relatively shorter drying time.

- **Product variety**

  A variety of product forms can pe produced such as powder and flakes.

3.3 Brief outline of process flow for RWD

1. Young cassava leaves up to position 5 from the top shoot are plucked from the plant and cleaned with water.
2. The leaves are heated with very little water for 5 -10 minutes (wet blanching).
3. The cleaned leaves are pounded in a wooden mortar with pestle for about 40 – 60 minutes until a finer texture is obtained.
4. Spread the pounded product on mylar using 2.6 mm slate and dry on a preheated dryer at 93°C water temperature for 60 minutes

5. Carefully scrape off the dried pounded leaves from the mylar and leave to cool for 1-2 minutes
6. Grind and pack powder in air tight bags.

4.0 Products from dried cassava leaves

Dried cassava leaves can be used in stews, soups and relishes.

Figure 3: Relish from dried pounded cassava leaves

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References:

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