



PM Formalisation of Micro Food Processing Enterprises Scheme

Processing of Sago



AATMANIRBHAR BHARAT

**National Institute of Food Technology, Entrepreneurship and
Management (NIFTEM) - Thanjavur**

(an Institute of National Importance under Ministry of Food Processing Industries, Government of India)

Pudukkottai Road, Thanjavur – 613005

<https://niftem-t.ac.in/>

Ph : 04362-228155, Fax:04632-227971

TABLE OF CONTENTS

Chapter 1: Introduction	Page No
1.Introduction	3
2.Cassava	3
3.Nutrient Composition of Cassava	4
4.Health Benefits of Cassava	6
Chapter 2: Preparation of Sago	
1.Sago	7
2.Manufacturing of sago	7
3.Process Flow for Making Sago	15
Chapter 3: Packaging of Sago	
1.Sago Packaging	17
2.Functions of Sago Packaging and types	18
Chapter 4: Food Safety Regulations & Standards	
1.FSSAI	22
2.Food Standards for Sago	22
3.Labelling Standards	23

CHAPTER 1

INTRODUCTION

1.1. Introduction

Cassava (*Manihot esculenta* Cralztz) is a starchy root crop which is an essential food eaten mainly by developing countries. The root tuber and leaves are edible and serve as source of nutritional food for about 500 million people and more world wide. The root tuber is called as Tapioca. Sago(saboodana) is the processed edible starch extracted from tapioca marketed in the form of small globules or pearls. The production of sago is mainly carried out using small scale industries. On the average,the yield of sago is 200 kg of per tone of tapioca tubers.Sago is of course very popular because it is convenient, nutritional, economical and commonly used fd during festive season all over india.

1.1.1 Cassava

Cassava (*Manihot esculenta* belonging to the family Euphorbiaceae) commonly known as tapioca, Brazilian arrowroot, manioc and yuca is a perennial shrub grown primarily for its storage roots for food, feed and industrial products. Cassava grows to a height of 1-3 m with erect stems and spirally arranged simple lobed leaves with petioles. The plant produces flowers on a raceme. Tubers are usually cylindrical , tapered and brown in color and can be harvested 5-12 months after planting.

Tuber are eaten raw and after cooking. It is also used as a source of starch,flour and ethanol. The starch from cassava tubers are used in the production of adhesives, textiles and cosmetics. It is an important crop in developing countries because, it is a major food for households, drought tolerant, fairly resistance to plant disease, and extremely flexible in its cultivation, management requirements and harvesting cycles. Cassava is said to be the highest producer of carbohydrates when it comes to staple crops. Cassava is the third most important source of calories in the tropics after rice and maize (Food Safety Network, 2014)

1.2. Nutrient Composition of Cassava

1.2.1 Protein content

Cassava tubers have low protein content (0.7% to 1.3% fresh weight (Ngiki et al., 2014)). The protein content of cassava flour, peels and leaves is also low at approximately 3.6%, 5.5% and 21% respectively (Iyayi and Losel, 2001). The protein content of cassava could be improved by addition of protein sources into the diet, or alternatively fermenting the cassava prior to adding it into the diet. Antai and Mbongo (1994) found that fermenting cassava peels using pure cultures of *Saccharomyces cerevisiae* increased protein content from 2.4% in non-fermented cassava to 14.1% in fermented products.

1.2.2 Lipid content

Cassava is very low in lipids containing about 0.1% lipids, compared with maize which has approximately 6%. Hudson and Ogunsua (1974) found that flour from cassava roots contains approximately 2.5% lipids, but only half of this is extractable with conventional solvent systems, and the fatty acids in cassava are primarily saturated. It had low levels of vitamin A, B1, B2 and niacin but high levels of vitamin C.

1.2.3. Carbohydrate content

Cassava contains highly digestible starch compared cassava starch to maize starch and found that cassava starch contains 17% amylose and 83% amylopectin, compared with maize starch which has 28% amylose and 72% amylopectin. The comparatively higher amylopectin level means that the digestible starch may be higher in cassava compared with other common starch sources fed to poultry. Resistant starch refers to starch and starch degradation products that escape digestion in the small intestine. Cassava chips contain approximately 40.91% resistant starch compared with maize which has 47.55% (Promthong et al., 2005), and raw cassava contains approximately 75.38% resistant starch (Onyango et al., 2006). Amylose becomes a resistant starch by crystallisation, as a result of chain elongation by double helical formation between amylose molecules. These elongated chains become folded and form tightly packed structures which are stabilised by hydrogen bonds

1.2.4. Anti-nutritional factors

Anti-nutritional factors In order to replace maize with cassava on a large scale, technology needs to be developed that can reduce the high moisture and HCN content of cassava tubers. The cyanide levels in cassava range from 75 to 1,000 mg/kg, dependent on the variety and age of the plant, the soil conditions, presence of fertilizer and weather, among other factors (Ngiki et al., 2014). There are two types of cyanogenic glucosides in cassava; linamarin (93%) and either lotaustralin or ethyl linamarin (7%). They act as sources of aspartic acid, glutamic acids and glutamine, and are not harmful to the plant. Linamarin is chemically similar to glucose but is conjugated to cyanide ions.

1.2.5. Improving the nutritive value of cassava products through physical processes

Drying is the most popular practice used to reduce cyanide content of cassava. Sun-drying is more effective at eradicating cyanide than oven-drying because with this method the cyanide is in contact with linamarase for a longer period (Ngiki et al., 2014). Ravindran (1991) stated that sun-drying alone can eliminate almost 90% of initial cyanide content. Ravindran et al. (1987) found that fresh cassava leaves had an average HCN content of 1,436 mg/kg, but when they were sun-dried this was reduced to 173 mg/kg. Additionally, Khajarnern et al. (1982) found HCN content was reduced from 111.83 to 22.97 mg/kg when cassava roots were sun-dried for 6 days. Gomez et al. (1984) found that more than 86% of HCN in cassava was lost by sun-drying due to evaporation of free cyanide at 28 C. Fermentation also reduces the cyanide content of cassava products. Fresh cassava root contains approximately 400 to 440 mg/kg HCN which can be reduced to 84 mg/kg by wet fermentation and 14 mg/kg by solid-state fermentation (Muzanila et al., 2000), and to 15 or 8 g/kg when turned into unfermented or fermented meal, respectively (Udedibie et al., 2004). Soaking of cassava roots preceding cooking and fermentation can enable heightened extraction of soluble cyanide by removing approximately 20% of free cyanide in the fresh root after 4 h (Tewe, 1991).

1.3. Health Benefits of Cassava

1.3.1. Helps In Weight Gain

Sabudana is a vegetarian food and a rich source of the purest and simplest forms of carbohydrates and starches. This aids in building essential fat tissues to protect internal organs, as well as ensures uniform lipid distribution across the body and is hence very useful for those who are underweight.

1.3.2. Ideal For Restricted Diets

Being naturally gluten-free, nut-free and grain-free, sabudana is a perfect ingredient that can be routinely added in the diet of people suffering from food allergies and gluten sensitivity. Gluten is a protein intrinsically present in some whole grains such as wheat, barley and rye which triggers a severe reaction in some people whose bodies are averse to this component

1.3.3. Promotes Strong Muscle Growth

Sabudana abounds in essential amino acids and is a good source of vegetarian protein, both of which are crucial for many enzymatic reactions in cells and tissues in the body, to maintain proper functioning of all the organs. Moreover, it adds muscle mass and improves the tensile strength of connective tissues, thereby fostering muscular development.

1.3.4. Regulates Proper Digestive Function

As sabudana is an unprocessed food, the simple sugars and starches it contains will promptly be assimilated in the body and broken down in the stomach, to provide a source of energy. Furthermore, sabudana also helps in eliminating blockages in the gut passage upon digestion and hence prevents constipation and irritable bowel syndrome.

1.3.5. Combats Neural Tube Defects

Sabudana can be taken by expecting mothers, as it has profuse amounts of folate, that plays a vital role in the normal development of the foetus, avoiding any chances

of neural tube defects and other birth abnormalities in the newborn. Folate also enhances red blood cell synthesis, required for transporting nutrients to vital organs in the body.

CHAPTER-2

PREPARATION OF SAGO

2.1. Sago

Sago (Saboodana) is a processed edible starch produced from tapioca starch marketed in the form of small globules or pearls. Sago is a traditional, convenient and ready to cook food consumed in many parts of the India. Sago production is carried out by many small scale industries. On the average yield of 200kg can be produced from one tone of tapioca starch. About 5,000 liters is required to process one tonne of tapioca tubers to yield 200kg saboodana.

Sago is classified into two types viz Roasted sago(commercial sago) and boiled sago(Nylon sago).It is also commercially available in different grades viz,super fine, milky white, best, pearl and broken. Sago is easily digestible, rich in carbohydrate. It is highly recommended for quick recovery of patients. When cooked, sago turns opaque white colour to translucent and becomes soft and spongy. Sago is very heat sensitive, if it subjected to fry,it will turn into a sticky,gluey mass,which is nearly impossible to separate.

2.2. Manufacturing of Sago

The technology of sago production has been greatly improved from low quality starch produced by sedimentation process to high quality starch produced by fully automated and mechanized, dewatering centrifugal process. In this process, tapioca roots are transported to factories. Since the roots quickly undergo deterioration due to microbial attack, most starch factories apply good practices to process delivered roots within 1-2 days and avoid the storage of perishable fresh roots. Processed roots are firstly passed through a drum to remove soil, sand, pieces of peels and impurities. Roots are then passed through the root washer and part of the remaining peels, called wet peels, with some hard stems or stumps are manually removed. Washed roots are

subsequently chopped and ground by a rasper. Fresh root slurry from the rasper is passed through a series of extractors, from coarse to fine, where the pulp is separated from starch slurry. Fermentation is carried out in settling tank for 3-5 days. Water is further separated by subjecting the starch slurry to a dewatering centrifuge where the water content is reduced from 60% in slurry to 35-40% in cake. Starch cake is pulverized using spike mills. The wet starch is subjected to globulation in vibratory units provided with gunny cloth surfaces forming two pouches. Each pouch or sack can hold 10 to 12 kg. of wet starch powder for globulation. The globulated starch powder is then graded in oscillating screens. The sago so formed is given a mild roasting on hot plates at about 100°C for about 6 to 8 minutes with 12% moisture content. The roasted sago is then dried in the sun on cemented floor for about 8 to 12 hours depending on the intensity of sun shine. During roasting sago lumps are formed which passing the material through disintegrate breaks down.

2.2.1. Harvesting

The harvest involves cutting stems at a height of 25 to 34 cm from the ground using a machete and removing the tubers, making sure not to damage them. This can be done by hand if the soil is light or using a hoe, a stick or a daba. A maximum of 500 kg of tubers are harvested daily in compacted soil and up to 1,000 kg tubers are harvested each day in wet and light soil. The dry season is the best time to harvest cassava because the tubers are rich in starch at that time, drying is easy and the products can be easily processed and preserved. The early varieties may mature at between 6 and 8 months on average after planting, whereas the late varieties require 12 and 19 months under optimal conditions (such as a humid forest region). In the humid savannah, the late varieties should be harvested 20 to 24 months after planting. Cassava grows faster in humid lowlands than in high altitude areas. The yield varies from 20 to 30 tonnes per hectare for local varieties and from 25 to 70 tonnes per hectare for improved varieties. In hostile environments where other crops fail, cassava can provide good yields. In typical conditions, the yield may vary between 8 to 15 tonnes of tubers per hectare.

2.2.2. Washing

The roots are normally received from the field as soon as possible after harvest and

cannot be stored for more than two days. Since the presence of woody matter or stones may seriously interfere with the rasping process by stoppage or by breaking the blades, the woody ends of the roots are chopped off with sharp knives before the subsequent processing operations. Dry sieve is used to remove the extra plant fibers, other roots and leaves, etc.

2.2.3. Peeling

The structure of the root permits peeling to proceed smoothly by hand. The roots are cut longitudinally and transversely to a depth corresponding to the thickness of the peel, which can then be easily removed. Any dirt remaining on the smooth surface of the core of the root can now be washed off without any trouble and the peeled roots deposited in cement basins where they remain immersed in water until taken out for rasping. Frequent treading by foot cleans any loosely adhering dirt from the roots.

In the larger factories, whole roots are generally processed. The washing here serves to remove the outer skin of the root as well as the adhering dirt. Provided the root is sufficiently ripe, skin removal may proceed without the use of brushes. Only the outer skin or corky layer is removed, as it is profitable to recover the starch from the cortex. The inner part of the peel represents about 81.5 percent of the weight of the whole root.

In order to accomplish a more effective and fast method of washing, mechanical washers can be employed. The mechanical washer is a perforated cylindrical tank which is immersed in water. A spiral brush propels the roots while they are subjected to vigorous scrubbing in order to remove all dirt. A centrifugal pump is fitted to one end of the machine and connected to a series of jets arranged along the carrying side of the brush. These jets produce a countercurrent to the flow of the roots, ensuring that they receive an efficient washing. Another efficient washer is a rotary drum with an interior pipe which sprays water on the roots. The drum is either wooden or perforated metal, about 3 to 4 m long and 1 m in diameter, with horizontal openings; it is mounted inside a concrete tank. In some, rotating paddles are fitted along the axis. Washing is done by the action of water sprayed, assisted by the abrasion of the roots both against one another and against the sides of the cylinder or the paddles. The roots are hand-fed

from one end and when they come out at the other they are clean and partially peeled, the action being continuous. Dirty water and skin are periodically drained out through a small opening in the concrete tank.

2.2.4. Rasping

It is necessary to rupture all cell walls in order to release the starch granules. This is usually carried out by pressing the roots against a swiftly moving surface provided with sharp protrusions, the cell walls are torn up and the whole of the root is turned into a mass in which the greater part of the starch granules is released. The percentage of starch set free is called the rasping effect. Its value after one rasping may vary between 70 and 90 percent: the efficiency of the rasping operation therefore determines to a large extent the overall yield of starch in the processing. It is difficult to remove all the starch, even with efficient rasping devices, in a single operation. Therefore, the pulp is sometimes

subjected to a second rasping process after screening. The rasping is carried out in different ways with varying efficiency.

Hand and mechanical rasping

A simple but effective grater is obtained by perforating a sheet of galvanized iron with a nail and then clamping it around a wheel with the sharp protruding rims of the nail openings turned outward. The wheel may be driven by hand, but it is often driven by foot like a tricycle, the worker pressing the roots from above onto the rasping surface which is attached to one side of a rotating disk equipped with a crank transmission, which is driven by foot. The pulp is collected in baskets or wooden containers to be carried to the sieves.

Hydraulic raspers

Larger water-powered raspers can be used where running water is available. The waterwheel is rotated by a flywheel and driving belts to a pulley on the shaft of the rasping drum. The drum, 20-30 cm in diameter is either attached to a primitive wooden construction or fitted into a "rasping table." The operator seated at the table, presses the roots against the drum. The grated mass is forced through a narrow slit between the

drum and the shelf before it drops into the trough, whence it is carried to the sieves. Though inexpensive, they are relatively inefficient as the rasping plate must often be replaced on account of rapid wear.

Engine-driven rasps

Engine-driven rasps are more economical for the handling of 10 tons of fresh roots a day. The machine has a rotor of hardwood or drawn steel tube, 50 cm in diameter, with a number of grooves milled longitudinally to take the rasping blades or saws. The number of saw teeth on the blades varies from 10 to 12 per centimetre according to need. The blades are spaced 6-7 mm apart on the rotor.

In simpler versions, the rotor is fitted into housing in such a way that the rasping surface forms part of the back wall of the receptacle for the roots. Facing the rasping surface, a block or board is inserted which is movable by a lever and turns on an axis near the upper rim of the compartment. By manipulating this buffer the roots are pressed onto the rasping surface, which moves downward in the hopper, and the mass is propelled through a slit in the bottom of the hopper. It is advisable to give the inner surface of the buffer the form of a circular segment corresponding to the section of the rotor exposed so that, at its extreme position inward, the distance between rotor and block is only a few mm.

Secondary rasping or grinding

In modern factories, it may be estimated that an effect of about 85 percent is attained at the first rasping; at these production levels, however, it is economical to submit the pulp to a second crushing process, either in a second rasper or in special mills where the pulp is ground between stones. These mills, however, do not seem to have found much favour with tapioca manufacturers.

In a secondary rasper, the indentation of the saw blades should be somewhat finer, about 10 per cm (25 to 27 teeth per in) as compared with about 810 per cm (19 to 26 teeth per in) for the primary rasper. The overall rasping effect is raised to over 90 percent by the secondary rasper.

2.2.5. Fermentation

The term "settlings" includes the whole series of operations for separating the pure starch from soluble contaminants. The quality of the flour produced depends to a great

extent on the proper performance of these operations, which comprise settling in successive tanks, settling on flour tables, and the action of modern separators. Each operation can be used alone or carried out in different combinations. They all result in a more or less concentrated suspension of starch in pure water.

Settling in tanks

In very small mills, wooden barrels or troughs serve the purpose, but as soon as the production reaches several hundred kilograms of flour per day it is usual to construct tanks of cemented brickwork sunk into the ground. The dimensions and the number of tanks are determined by level of production and convenience of handling (e.g., 2 x 4 m in surface dimensions and 0.5 to 1 m in depth). Settling takes longer periods ranging from 6 to 20 hours depending upon the quantity as well as the size of the settling tank. However, longer the settling time the more is the action of the enzymes and micro organisms. The upper layer of sedimented flour, which has a yellowish green tint, contains many impurities and is generally scrapped off and rejected. The remaining moist flour is then stirred up with water and left to settle again. In most cases, two settlings suffice to obtain reasonably clean flour. In large factories producing flour for special purposes, settling may be repeated several times with or without the addition of chemicals. Stirring a slurry in tank to remove fine dust particles from starch is done manually which is very unhygienic

2.2.6. Screening

In separating the pulp from the free starch a liberal amount of water must be added to the pulp as it is delivered by the rasper, and the resulting suspension stirred vigorously before screening. Mixing with water can be carried out more or less separately from screening, but more often the two operations are combined in "wet screening" - that is' the mass is rinsed with the excess water on a screen which is in continuous motion.

Hand screening

In the smallest mills, screening is done by hand. The rasped root mass is put in batches on a cloth fastened on four poles and hanging like a bag above the drain leading directly to the sedimentation tanks. The pulp is vigorously stirred with both hands while screening.

Another type of centrifugal separator consists mainly of a horizontal imperforated drum or bowl with a continuous spiral-ribbon starch remover or scraping device inside. The drum rotates in a frame with bearings at both ends. Over a gearbox, the drum and the scraper are driven at slightly different speeds by a direct-coupled motor. The starch milk enters the slightly conical drum at the narrow end and passes to the other end where the liquid outlet is located. On its way through the bowl the milk throws off starch grains and other solid matter which concentrate at the periphery. Here the concentrate is taken up by the scraper and brought counter-current to the narrow end where it is discharged with the addition of fresh water. The purest starch is made by using liberal amounts of soft water. Hard water (high in lime content) has been known to leave calcium oxalate in the finished product.

2.2.7. Pressing or Dewatering

Pressing or Dewatering carried out using plate frame presser. The moisture content of wet starch will be reduced to 35 to 40%.

2.2.8. Pulverization, globulation, grading and roasting

The operations involved are pulverisation, globulation, sizing, roasting, drying, polishing, screening and packing, pulverisation is done in spike mills and the wet starch is subjected to globulation in vibratory units provided with gunny cloth surfaces forming two pouches. Each pouch or sack can hold 10 to 12 kg. of wet starch powder for globulation. The globulated starch powder is then graded in oscillating screens. The sago so formed is given a mild roasting on hot plates at about 100°C for about 6 to 8 minutes. The roasted sago is then dried in the sun on cemented floor for about 8 to 12 hours depending on the intensity of sun shine. During roasting sago lumps are formed which passing the material through disintegrate breaks down.

2.2.9. Drying

The removal of free water from the starch sediment obtained in settling tanks and on flour tables or from the concentrated slurries produced by separators and purifiers can be partly accomplished by mechanical means (e.g., centrifugation). The final drying

however must always be performed by evaporation, either in the open air (sun drying) or in ovens. In modern factories, oven drying is always combined with mechanical drying, the whole operation, as in all other phases of the process, being conducted so as to take the least possible time. The mechanical dryers used for this purpose include drying ovens, chamber dryers, drum dryers, belt dryers, tunnel dryers, pneumatic dryers etc. Though mechanical drying is costly, more uniform and quicker drying is possible while using mechanical dryers besides facilitating drying throughout the period irrespective of weather.

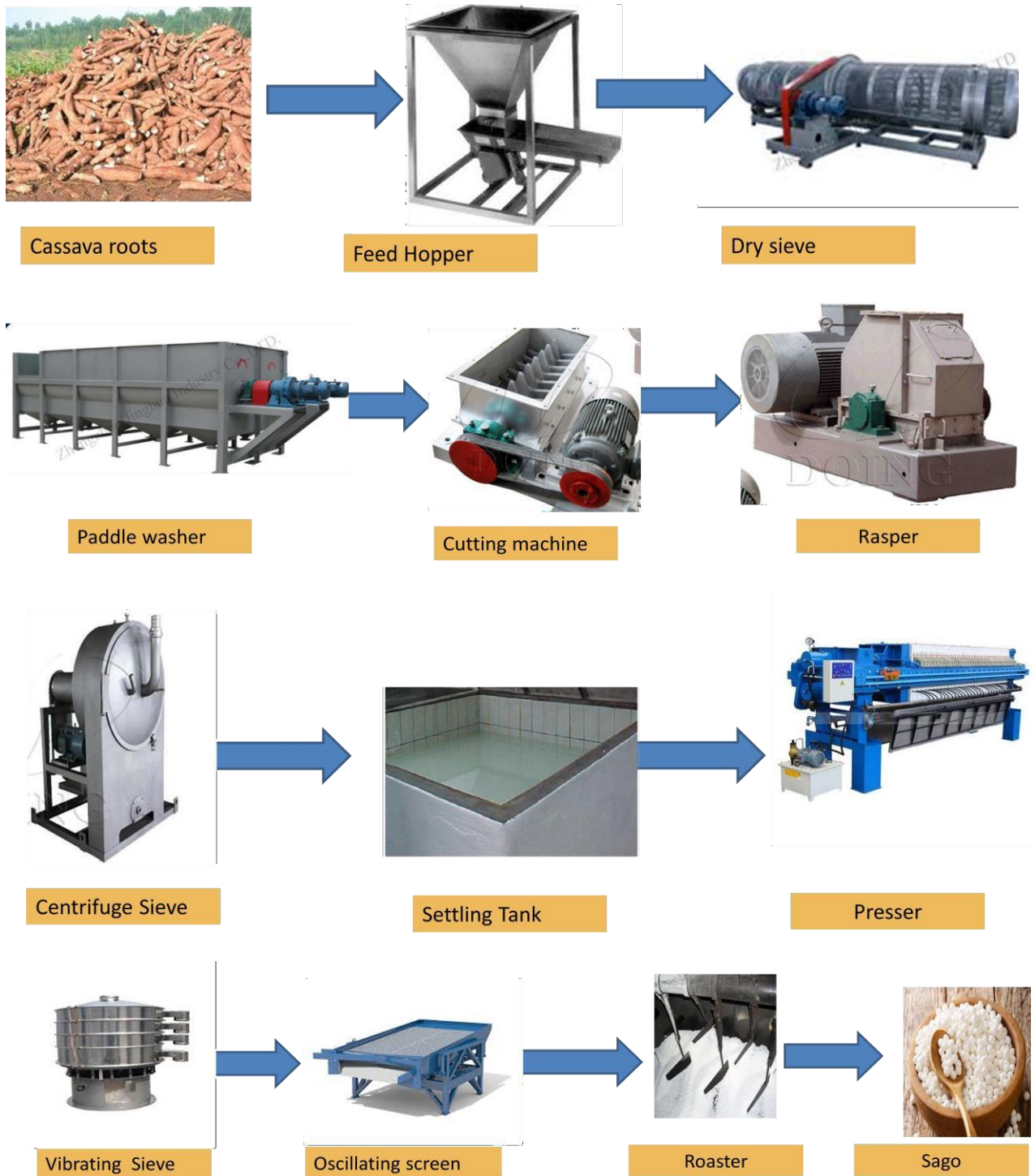
2.2.10. Packing

Packaging of sago is carried out in different sizes according to the customer needs.

2.3. Process flow chart for making Sago



2.3.Process flow chart for making Sago



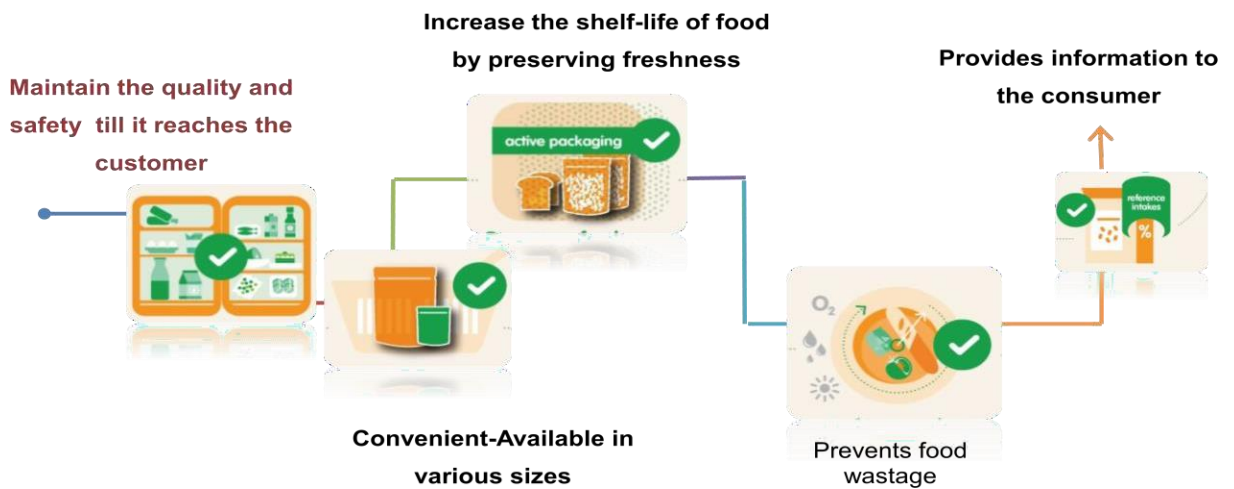
CHAPTER 3

PACKAGING OF SAGO

3.1. Packaging

Packaging is a co-ordinated system of preparing goods for transport, distribution, storage, retail and end use. It is a techno-economic function aimed at minimizing costs of delivery while maximizing sales.

3.1.1 Why food Packaging?



Packaging keeps the product free from contamination, protects sago from damage during shipment and storage, and displays the product favourably. The principal packaging material for sago is the cellophane bag, which provides moisture-proof protection for the product and is used easily on automatic packaging machines, but is difficult to stack on grocery shelves. Many manufacturers utilize boxes instead of bags to package sago because boxes are easy to stack, provide good protection for fragile sago products, and offer the opportunity to print advertising that is easier to read than on bags.

A proper packaging system provides not only the required physical protection that maintains the integrity of a food product but also the needed microenvironment that minimizes quality degradation.

3.2. Functions of sago packaging

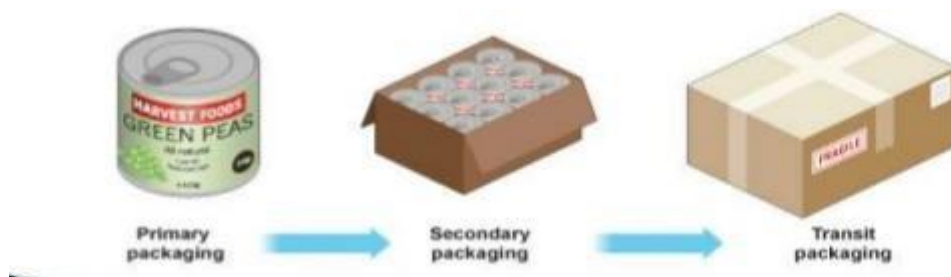
It is important to understand the functions of sago packaging to effectively select, design, and utilize noodle packaging systems. The functions of noodle packaging can generally be described as

1. Promoting and Selling the Product
2. Defining Product Identity
3. Providing Information
4. Expressing Customer Needs
5. Ensure Safe Use
6. Protecting the Product

3.2.1. Components of sago packaging

Like most food packages, sago packaging is usually composed of three components:

- (1) Primary package,
- (2) Secondary package, and
- (3) Tertiary package.



Depending on the specific sago product and the way it is served, there could be at least one or two or all three components used in a noodle packaging system.

A primary package is defined as a package that is directly in contact with the

sago product. It is mainly used to form a sealed microenvironment to protect and isolate the sago content from an unwanted environment (e.g., high humidity, oxygen, microbial) and other contamination from dust and undesired human contact.

Secondary package is the package that contains one or more primary packages. A secondary package can also be used to provide convenience in handling. Another function of the secondary package is to provide sago product information such as lot number, production and expiration dates, and nutritional labels. It is also often used as a product display box.

A tertiary package incorporates the secondary package in the final shipping and distribution. The purpose is to consolidate secondary packages and to assist in storage and handling and to provide an additional layer of protection for the packaged sago against physical damage and weather conditions. Examples are corrugated boxes, pallets, and stretch plastic films.

3.2.2. Requirements for effective food packaging

1. Be nontoxic
2. Protect against contamination from microorganisms
3. Act as a barrier to moisture loss or gain and oxygen ingress
4. Protect against ingress of odors or environmental toxicants
5. Filter out harmful UV light
6. Provide resistance to physical damage
7. Be transparent - be tamper – resistant or tamper – evident
8. Be easy to open
9. Have dispensing and resealing features
10. Be disposed of easily
11. Meet size, shape and weight requirements
12. Have appearance, printability features
13. Be low cost
14. Be compatible with food
15. Have special features such as utilizing groups of product together.



3.2.3. Dried sago packaging using cellophane bags

Dried sago have been dehydrated to a low moisture content of less than 12% to achieve extended shelf life. They are often packaged in watertight and airtight bags and containers.

Cellophane bags which are moisture-proof, easy to use in automatic machines, but difficult to stack, and boxes which are easy to stack and print advertising, and protect the fragile sagos. In packaging line the product is first scaled, then sealed in the package, detected for open flap and metals, double-checked the weight and last packed in large cases.

3.2.4. Flexible pouch packaging: Sago can be packed in flexible plastic packaging materials. The system is called standard form/fill/seal system which is similar to carton packaging.

❖ Flow –wrap pillow type packaging

1. A pillow style bag with conventional seals on the top and the bottom and with a long seal in the centre of the back panel from top to bottom.
2. The long seal can be fin seal or lap seal

❖ Flow –wrap stand up self supporting bottom flexible packaging

1. Stand up flexible pouches Commonly known as bottom gussets .
2. Gussets are heat sealed to produce flexible bases on which the pouches may stand without support .
3. These are three panel flexible pouches that are self standing when full or partially full of product
4. Heavy enough to bear down on the bottom panel
5. Adaptable for packing of dry products and liquids

3.2.5. Equipments used for sago packaging

These are equipments used to pack sago after processing

1. Flow vertical packaging machine
2. Flow horizontal packaging machine
3. Multi-head weighing and loading system



FLOW PACKAGING MACHINE



**MULTI-HEAD WEIGHING SYSTEMS AND
LOADING SYSTEMS**

CHAPTER 4

FOOD SAFETY REGULATIONS AND STANDARDS OF SAGO

4.1. FSSAI

FSSAI stands for Food Safety and Standards Authority of India which is an organization that monitors and governs the food business in India. It is an autonomous body which is established under the Ministry of Health & Family Welfare, Government of India. The FSSAI has been established under the Food Safety and Standards Act, 2006 (FSS Act) which is a consolidating statute related to food safety and regulation in India.

4.1.1. Functions of FSSAI

1. Framing of regulations to lay down food safety standards
2. Laying down guidelines for accreditation of laboratories for food testing
3. Providing scientific advice and technical support to the Central Government
4. Contributing to the development of international technical standards in food
5. Collecting and collating data regarding food consumption, contamination, emerging risks etc.
6. Disseminating information and promoting awareness about food safety and nutrition in India

4.2. Food Standards

Sago

It shall conform to the following standards:-

SAGO shall mean small hard globules or pearls made from either the starch of the sago palm or the tubers of tapioca (*Manihot utilissima*) and shall be free from any extraneous matter including natural colours.

It shall conform to the following standards, namely:—

- (i) total ash (on dry basis) shall not be more than 0.4 percent;
- (ii) ash insoluble in dilute hydrochloric acid (on dry basis). shall not exceed 0.1 percent

Tsble :4.1.FSSAI STANDARDS OF SAGO

S.NO	PARAMETER	LIMIT
1.	Moisture (percent by mass), Max	12.0
2.	Total Ash (on dry matter basis), Max. percent	0.40
3.	Acid insoluble ash (on dry matter basis), Max. percent	0.10
4.	Starch (on dry basis), Min. percent	96.0
5.	Protein (percent on dry matter basis), Max	0.3
6.	Crude fibre (percent on dry weight basis), Max.	0.2
7.	pH of aqueous extract 10	4.5 to 7.0
8.	Colour of gelatinized alkaline paste in the porcelain on the lovibond scale not deeper than	0.4R+1.5Y
9.	Sulphur Dioxide content, Max	100 ppm
10.	Colouring matter	Absent

4.3. Labelling Standards

Labeling requirements for packaged food products as laid down in the Part VII of the Prevention of Food Adulteration (PFA) Rules, 1955, and the Standards of Weights and Measures (Packaged Commodities) Rules of 1977, require that the labels contain the following information:

1. Name, trade name or description
2. Name of ingredients used in the product in descending order of their composition by weight or volume
3. Name and complete address of manufacturer/packer, importer, country of

origin of the imported food (if the food article is manufactured outside India, but packed in India)

4. Nutritional Information
5. Information Relating to Food Additives, Colours and Flavours
6. Instructions for Use
7. Veg or Non-Veg Symbol
8. Net weight, number or volume of contents
9. Distinctive batch, lot or code number
10. Month and year of manufacture and packaging
11. Month and year by which the product is best consumed
12. Maximum retail price

Wherever applicable, the product label also must contain the following:

The purpose of irradiation and license number in case of irradiated food..Extraneous addition of coloring material. Non-vegetarian food – any food which contains whole or part of any animal including birds, fresh water or marine animals, eggs or product of any animal origin as an ingredient, not including milk or milk products – must have a symbol of a brown color- filled circle inside a brown square outline prominently displayed on the package, contrasting against the background on the display label in close proximity to the name or brand name of the food.

Vegetarian food must have a similar symbol of green color-filled circle inside a square with a green outline prominently displayed.

All declarations may be: Printed in English or Hindi on a label securely affixed to the package, or Made on an additional wrapper containing the imported package, or Printed on the package itself, or May be made on a card or tape affixed firmly to the package and bearing the required information prior to customs

clearance.

Exporters should review the Chapter 2 of the “FSS (Packaging and Labeling) Regulation 2011” and the Compendium of Food Safety and Standards (Packaging and Labeling) Regulation before designing labels for products to be exported to India. FSSAI revised the labeling Regulation and a draft notification to that effect was published on April 11, 2018, inviting comments from WTO member countries and the comments received are under review and the publication date remains unknown.

According to the FSS Packaging and Labeling Regulation 2011, “prepackaged” or “pre packed food” including multi-piece packags, should carry mandatory information on the label.



Contact Us

National Institute of Food Technology, Entrepreneurship and Management (NIFTEM) - Thanjavur

(an Institute of National Importance under Ministry of Food Processing Industries, Government of India)

Pudukkottai Road, Thanjavur – 613005, Tamil Nadu, India

Ph: 04362-228155, Fax: 04362-227971

Email: director@iifpt.edu.in Web: <https://niftem-t.ac.in/>

