सत्यमेव जयते

MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

NIFTEM
KNOWLEDGE • INNOVATION • OUTREACH

PACKAGING OF BAMBOO SHOOT

AATMANIRBHAR BHARAT

PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)

INTRODUCTION

Kingdom : Plantae

Order : Poales

Family : Poaceae

Subfamily : Bambusoideae

- Bamboo shoot is the new tender growth of young culm from the rhizome apex having compressed internodes which are protected by numerous leathery sheaths.
- The natural distribution of bamboo encompasses mainly the tropical, subtropical and mild temperate zones of worldwide.

INTRODUCTION

- There are more than 1,250 species which belong to 75 genera worldwide, indeed India has more than 125 species belonging to 23 genera.
- Examples: *Dendrocalamus strictus, Bambusabambos,Bambusanutans*, *Bambusatulda*, *Dendrocalamus giganteus*and etc.
- The shooting period of bamboo varies species to species.Runners are the temperate climate bamboos which shoot in the spring and clumpers which shoot in the late summer and fall which belong to tropical and subtropical regions.
- Bamboo shoots are highly nutritious and a great source of dietary fibers, carbohydrates, antioxidants, amino acids, minerals, vitamins, protein, low in calorie and fat content, but rich in essential fatty acids with health beneficial properties.

PACKAGING

- Packaging is an important part of food manufacturing process. It protect the food products from physical ,chemical, biological damages.
- Without packaging, materials handling would be a messy, inefficient and costly exercise and modern consumer marketing would be virtually impossible.
- Packaging Institute International defined packaging as the enclosure of products, items or packages in a wrapped pouch, bag, box, cup, tray, can, tube, bottle or other container form to perform one or more of the following functions: containment, protection, preservation, communication, utility and performance. If the device or container performed one or more of these functions, it was considered a package.

NEED OF PACKAGING

- **CONTAINMENT :** protecting the environment from the myriad of products that are moved from one place to another.

- **PROTECTION :** to protect its contents from outside environmental influences such as water, water vapor, gases, odors, microorganisms, dust, shocks, vibrations and compressive forces.

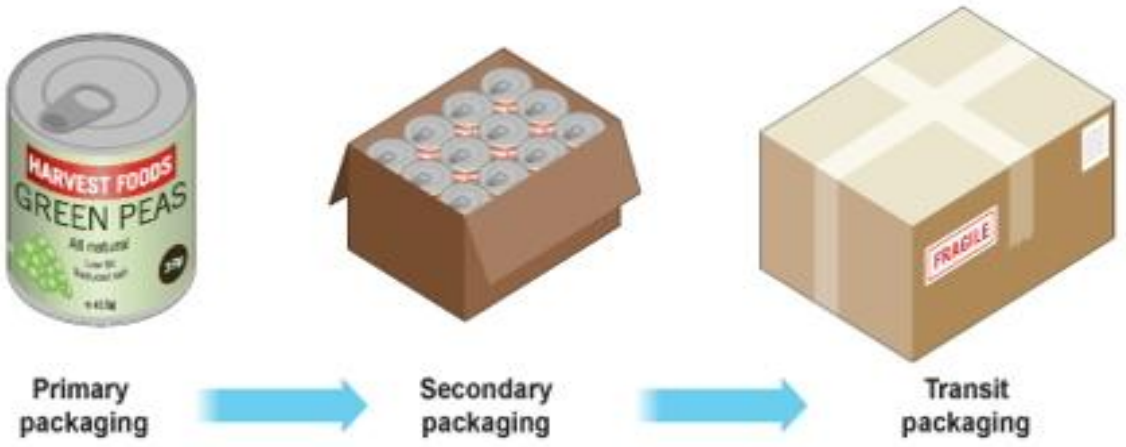
- **CONVENIENCE :** Products designed to increase convenience include foods that are prepared and can be cooked or reheated in a very short time, preferably without removing them from their primary package.

NEED OF PACKAGING

- **COMMUNICATION :** Packaging contains a lot of information such name of its manufacturer, product name, terms and uses, date of manufacturing, best before. nutritional information thus helping the consumer to be more informed.

TYPES OF PACKAGING

- **Primary packaging:** Here, the food product is in direct contact with the packaging. Examples: Metal cans, tea bag, paperboard cartons, glass bottles and plastic pouches etc.
- **Secondary packaging:** It surrounds or contains the primary package. It can be made up of various components such as box, padding, separators, reinforcements, bags, paper, etc. Examples: Corrugated case, Boxes etc.



TYPES OF PACKAGING

- **Tertiary package:** It contains groups of secondary packaging. Transportation of large or heavy loads can be safely and securely transferred by this tertiary packaging. Examples: stretch-wrapped pallet etc.
- **Quaternary package:** It generally handles quaternary packages such as metal container which can be transferred to or from ships, trains etc.

PACKAGING OF BAMBOO SHOOT

- Different external factors such as temperature, humidity, microorganisms, and storage conditions impact on the shelf life of bamboo shoots, which can limit its marketability.
- After harvesting, raw bamboo shoot can be undergone discoloration and browning.
- Losses of water can decrease the fresh outlook and the quality of bamboo shoots.
- As a result enzyme activity and saccharine content is enhanced and that makes bamboo shoot prone to hydrolysis and rotting etc.

PACKAGING OF BAMBOO SHOOT

- Low temperature and proper packaging can reduce transpiration of bamboo shoot and can protect from other external damages also.
- Packaging o bamboo shoot is done on the basis of extending shelf life of bamboo shoot specially color, flavor, freshness etc for a longer period of time.

PACKAGING OF BAMBOO SHOOT

- In old days bamboo shoots were packaged by using natural packaging material such as leaves, barks and animal skin
- The plastic-based packaging for bamboo shoots is manufactured mainly with polyethylene, polypropylene and polyvinyl chloride.
- Also, glass bottle, high-density polyethylene bottle, low- density polyethylene bag, polyvinyl chloride, vacuum packaging, modified atmospheric packing and edible films and coating based on different storage durations are available for various bamboo shoot species.

SELECTION OF PACKAGING MATERIAL

- **Tensile Strength & Elongation:** Tensile Strength and Elongation properties of materials need to be studied as their running on high-speed machines should be suitable.
- **Tear Strength:** For a processed product, tear strength is of importance as low tear values are necessary and useful for opening packages by hands.
- **Heat Seal Strength:** The performance of a finished package is determined by the effectiveness of the package seal i.e. the permeability to water vapor, gases and volatiles increase if the seal is not perfect. Thermoplastic films such as polyethylene give excellent heat seals.

SELECTION OF PACKAGING MATERIAL

- **Performance Properties :** Apart from the above mentioned important properties, a material has to perform well on machines; therefore knowledge of physical properties like slip, stiffness, blocking resistance is also necessary.
- Twist retention for twist wrap is also of importance. The initial function of packaging is to protect. However, the emotional role played by packaging is also of importance, especially when the confection is a gift. A sophisticated packaging using deluxe materials is often used as a way of expressing feelings.

PACKAGING MATERIAL

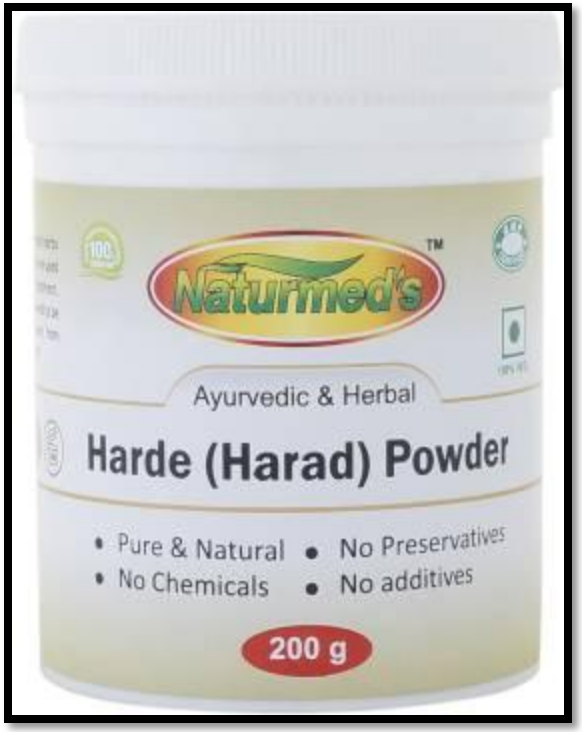
1. LDPE :

- Low-density polyethylene is heat sealable, inert, odour free and shrinks when heated.
- It act as a barrier to moisture and has high gas permeability
- It is less expensive, therefore widely used.
- Has ability of fusion welded to itself to give good, tough, liquid-tight seals.

PACKAGING MATERIAL

2. PET :

- PET can be made into film by blowing or casting.
- Melting point of PET is higher than PP which is around 260°C and due to the manufacturing conditions does not shrink below 180°C.
- PET is ideal for high-temperature applications.
- It also act as good barrier of oxygen and water vapor.



PACKAGING MATERIAL

3. POLYPROPYLENE :

- Polypropylene films have better clarity than polyethylene and enjoy superior machinability due to stiffness.
- Lack of good salability has been a problem; however, PVDC and vinyl coating have been used to overcome this problem.
- Some varieties of PP have been specially developed for twist-wrap applications as they have the ability to lock in position after twisting.

PACKAGING MATERIAL

5. PAPER BAG :

- The paper bag form an excellent packaging material. They may be kraft paper, plastic coated, solid fiber board, linear board, box board etc.
- The advantages of using of paper is that it is weightless, capability for printing on the surface, low cost and easy disposability.
- The disadvantage include low wet and tear strength.

PACKAGING MATERIAL

6. GLASS : Now a day glass container has been also used for packaging. It has following advantages:

- act as strong barrier to moisture, gases, odours and micro-organisms.
- do not react with food products.
- suitable for heat processing when hermetically sealed
- glass are re-useable and recyclable
- they are transparent to display the contents
- they are rigid, to allow stacking without container damage.

PACKAGING MACHINES

SOME RECENT TRENDS IN PACKAGING :

MODIFIED ATMOSPHERE PACKAGING:

- MAP can be defined as packaging of food items where atmosphere inside the packet has been modified to increase the shelf life of food products. It involves active modification or passive modification.
- In active modification air is displaced with a controlled, desired mixture of gases, and the process is called as gas flushing.
- Passive modification occurs due to respiration and the metabolism of microorganisms associated with the food.

SOME RECENT TRENDS IN PACKAGING :

ACTIVE AND INTELLIGENT PACKAGING :

- Active packaging is defined as packaging in which subsidiary constituents have been deliberately included in or on either the packaging material or the package headspace to enhance the performance of the package system.
- Intelligent packaging is defined as packaging that contains an external or internal indicator to provide information about the history of the package and/or the quality of the food.
- Various functions performed by intelligent packaging includes: Oxygen absorber, Carbon dioxide absorber or emitter, Ethylene absorber, Ethanol emitter, Moisture absorber.

SOME RECENT TRENDS IN PACKAGING :

ASPECTIC PACKAGING :

- Aseptic packaging is the filling of sterile containers with a commercially sterile product under aseptic conditions, and then sealing the containers so that reinfection is prevented; that is, so that they are hermetically sealed.

- **Active packaging are used for :**

✓ To take advantage of high temperature.

✓ Increase shelf life of food products at normal temperature.

✓ In package sterilization.

LABELING

- Labeling is a means of performing the communication function of packaging, informing the consumer about nutritional content, net weight, product use and so on. Labeling acts as a silent salesman through distinctive branding, as well as facilitating identification at check-outs through the Universal Product Code (UPC).

PACKAGING & LABELING LAWS - FSSAI

General requirement for packaging:

- A utensil or container made of the following materials or metals, when used in the preparation, packaging and storing of food shall be deemed to render it unfit for human consumption:—
- (a) containers which are rusty;
- (b) enameled containers which have become chipped and rusty;
- (c) copper or brass containers which are not properly tinned
- (d) containers made of aluminium not conforming in chemical composition to IS:20 specification for Cast Aluminium & Aluminium Alloy for utensils or IS:21 specification for Wrought Aluminium and Aluminium Alloy for utensils.

PACKAGING & LABELING LAWS - FSSAI

- **Labeling should contain following information:**

✓ Name of the food product.

✓ List of ingredients.

✓ Nutritional information.

✓ Declaration of VEG and NON VEG.

✓ Declaration of added food additives.

✓ Name and address of manufacturer.

PACKAGING & LABELING LAWS - FSSAI

- ✓ Net quantity
- ✓ Code number
- ✓ Lot number/ Batch number.
- ✓ Date of manufacturing.
- ✓ Best before date
- ✓ Country of origin.
- ✓ Instruction for uses.

QUALITY CONSIDERATIONS DURING PACKING

Quality control of packed products is the last time the product is checked before reaching the customer.

- ***Documented checking of the packages entails:***

- ✓ Weight of the package
- ✓ Weight of the products.
- ✓ Arrangement of the products.
- ✓ Defects; and Moisture content

QUALITY CONSIDERATIONS DURING PACKING

- ***The surrounding area is also checked:***

- ✓ Cleanliness of the handling equipment during processing
- ✓ Calibration of the scales (automatic or manual);
- ✓ Writing on the packages;
- ✓ Satisfactory working of the metal detector (installed on every retail packing line);
- ✓ Repackaging installations and marking; and
- ✓ Qualification for international standards such as ISO and HACCP

National Institute of Food Technology and Entrepreneurship and Management
Ministry of Food Processing Industries
Plot No. 97, Sector-56, HSIIDC, Industrial Estate, Kundli, Sonipat, Haryana-131028

Website: http:www.niftem.ac.in
Email: pmfmecell@niftem.ac.in
Call: 0130-2281089