

SNS COLLEGE OF TECHNOLOGY



An Autonomous Institution
Coimbatore-35

Department of Food Technology

23FTB303 –FOOD PACKAGING

III B.Tech. FT/ VI SEMESTER

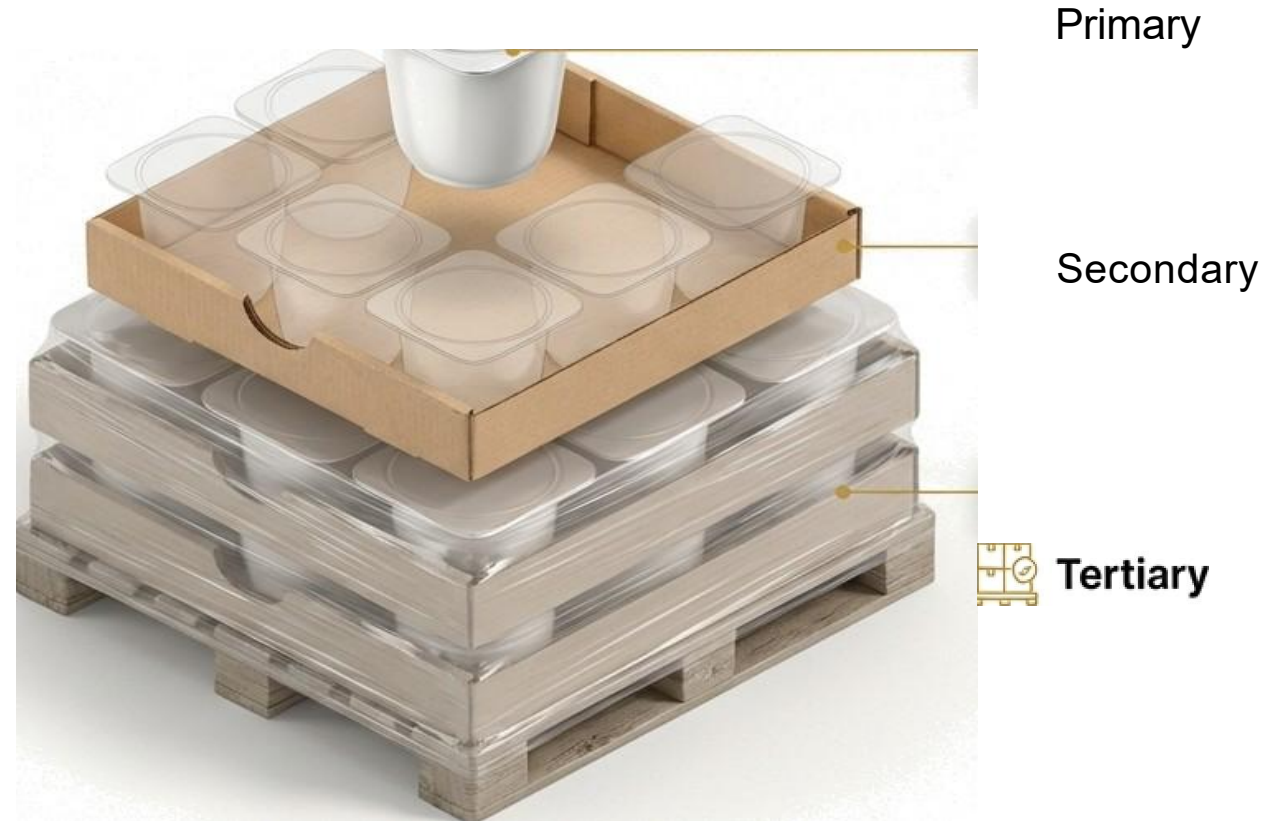
UNIT I : INTRODUCTION TO FOOD PACKAGING

Topic 3 : Primary, secondary and tertiary packaging,
Interaction between food and packaging materials



Food Packaging is a System of Three Integrated Layers.

Every food product is protected by a multi-layered system designed for safety, handling, and logistics. Understanding the distinct role of each layer—Primary, Secondary, and Tertiary—is fundamental to ensuring product integrity from factory to consumer.



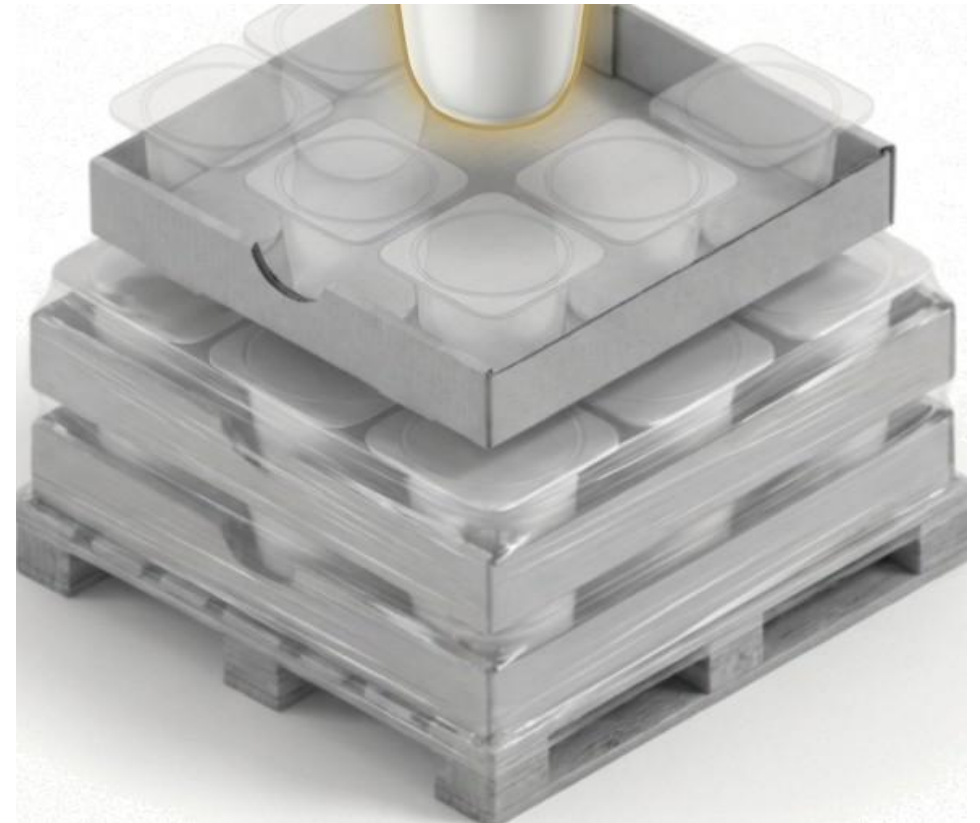
Primary Packaging: The Direct Guardian of the Food DT-EMPHATHIZE

This is the first and most critical layer, as it is in direct contact with the food product. Its primary responsibility is to protect and preserve the food from external contaminants and degradation.

Contamination Shield: Protects from microbial, chemical, and physical hazards.



Quality Preservation: Maintains freshness, extends shelf life, and prevents damage from moisture, oxygen, and light.



Secondary Packaging: **Grouping** for Handling and Branding DT-DEFINE

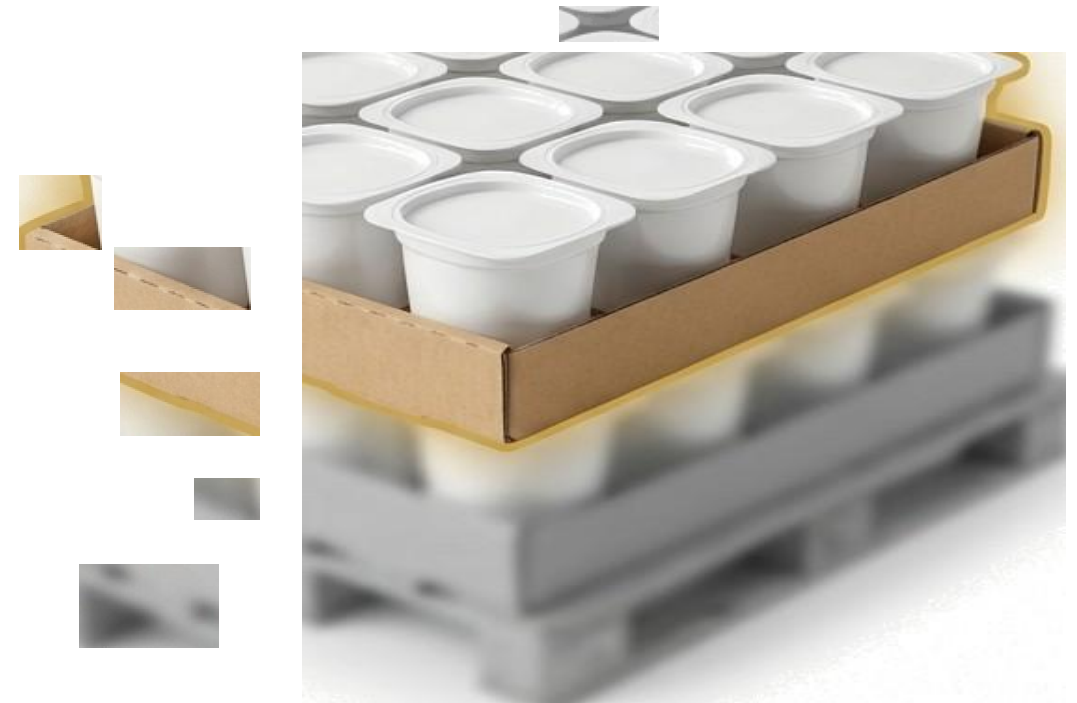
This layer bundles multiple primary packages together. It does not directly contact the food but serves crucial roles in logistics, merchandising, and brand communication.

Key Functions:

Unitization: Groups primary packs for easier handling.

Structural Protection: Adds a layer of protection during transit and storage.

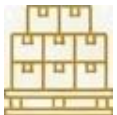
Display & Marketing: Acts as a 'mini-billboard' on retail shelves, communicating brand identity.



Tertiary Packaging: The Backbone of Bulk Logistics

The final layer of packaging is used for the bulk handling and shipping of products. Its sole purpose is to protect shipments during transit and make them easy to move and store mechanically. Key Functions:

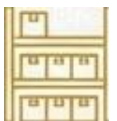
Load Unification: Secures large quantities of secondary packages for efficient movement.



Transit Protection: Prevents damage during long-distance transport and rough handling.



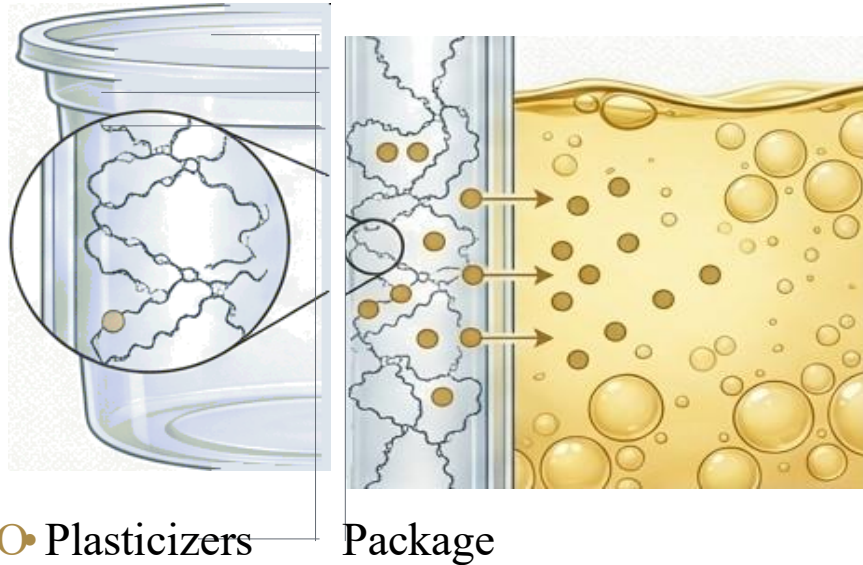
Warehouse Optimization: Facilitates efficient stacking, storage, and inventory management.



Unwanted Transfers: Migration and Permeation

DT- IDEATE

Migration



○ Plasticizers

Package

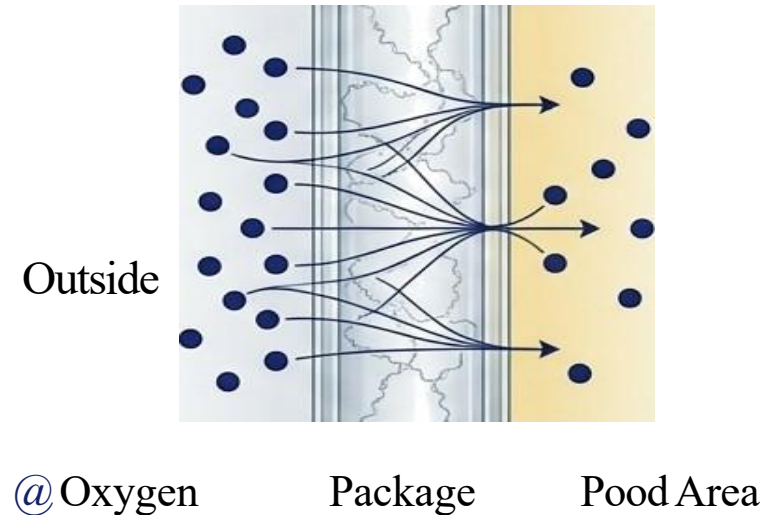
Food

The transfer of components from the packaging material *into* the food.

Critical Example

Plasticizers from a plastic container migrating into oily foods, potentially affecting safety and taste.

Permeation



@ Oxygen

Package

Food Area

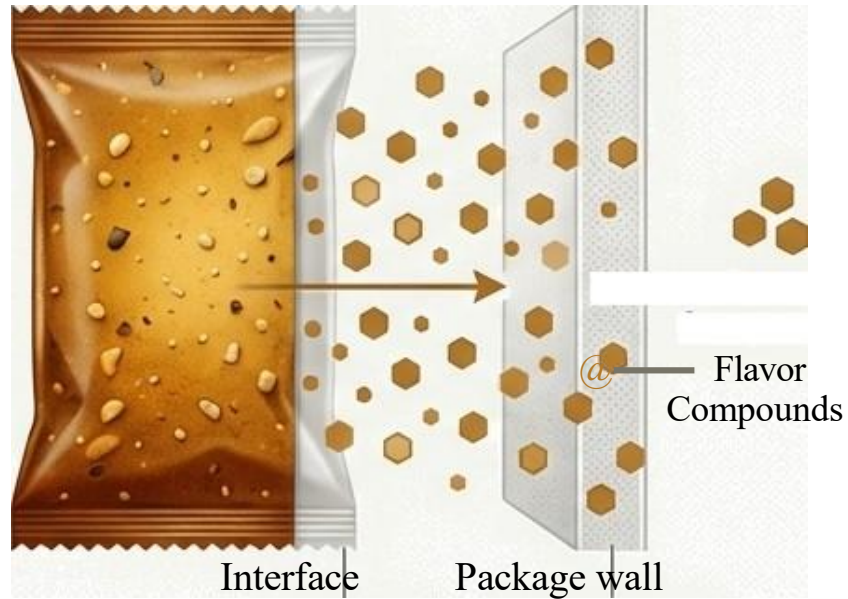
The passage of external gases, moisture, or aromas *through* the packaging barrier.

Critical Example

Oxygen permeation through a package causing oxidation of fats, leading to rancidity and spoilage.

Loss and Reaction: Sorption and Chemical Changes DT-PROTOTYPE AND TEST

Sorption

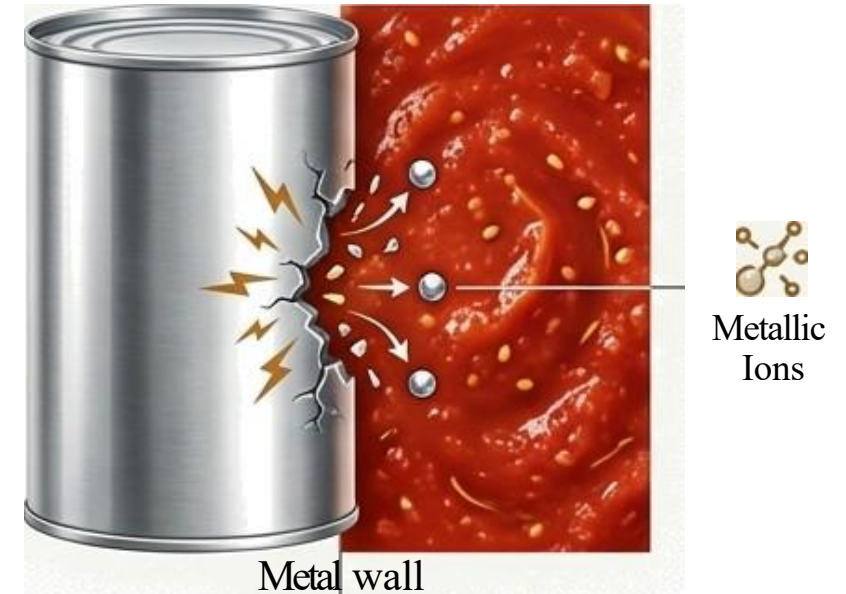


The absorption or "scalping" of food components (like flavors and aromas) by the packaging material.

Critical Example

The loss of key flavor compounds from a packaged snack into the plastic wrapper, resulting in a bland product.

Chemical Reaction



A direct chemical reaction between food components and the packaging material.

Critical Example

Corrosion of metal cans caused by direct contact with highly acidic foods like tomatoes, which can lead to metal leaching.

Ensuring Safety **and** Quality Through Prevention and Compliance DT-EVOLVE

Managing the food packaging system requires a proactive approach focused on material science, innovative technologies, and strict adherence to global safety standards.

Key Strategies

Material Selection

” ”- Meticulous use of certified food-grade packaging materials appropriate for the specific food type.

Barrier Technology

”- Application of specialized coatings and multi-layer laminates to prevent unwanted interactions.

Advanced Systems

Implementation of active and intelligent packaging that can, for example, scavenge oxygen or indicate spoilage.

The Regulatory Framework

Global Compliance is Non-Negotiable: Adherence to regulations set by key authorities is mandatory.

Key Bodies:



SUMMARY

