

# **FOOD PACKAGING MATERIALS**

***Tajnuba Sharmin***

***Lecturer***

***Dept. of Nutrition & Food Engineering***

***Daffodil International University***

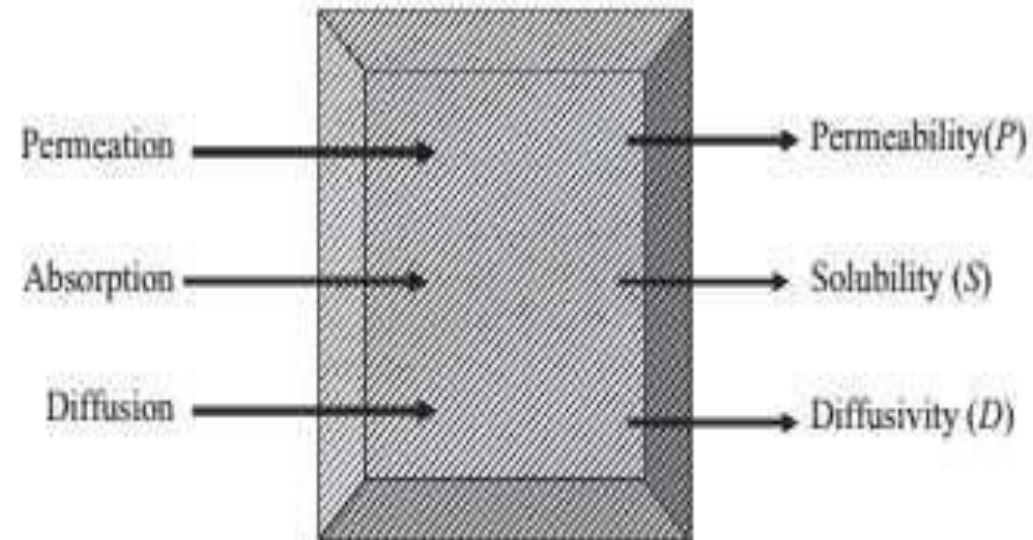
CAN YOU SAY SOME EXAMPLE FOOD PACKAGING MATERIALS



# PACKAGING MATERIALS

- The major categories of materials used for food packaging are
  - glass,
  - metals,
  - paper and
  - paperboard, and
  - Plastics etc.

A SIMPLIFIED MASS TRANSFER OPERATION IS ILLUSTRATED IN FIGURE:



**Figure 41.1** Mass transfer in food packaging.

# TYPES OF PACKAGING MATERIALS:

1. Traditional materials (Leaves, fiber, wood, leather etc.)
2. Industrial materials (Paper.....)

# TRADITIONAL PACKAGING



# BANANA/PLANTAIN, MAIZE, PALMYRA PALM LEAVES



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## LEAVES, VEGETABLE FIBRES AND TEXTILES

- Leaves are cheap and readily available, and are used as wrappers for products such as cooked foods that are quickly consumed.
- **Banana or plantain leaves** are used for wrapping traditional cheese and fruit confectionery such as guava cheese.
- **Maize leaves** are used to wrap corn paste or blocks of brown sugar, and 'Pan' leaves are used for wrapping spices in India.
- Other examples are green coconut palm, papyrus leaves and bamboo and **rattan fibres**, which are woven into bags or baskets and used for carrying meat and vegetables in many parts of the world.
- **Palmyra palm** leaves are used to weave boxes in which cooked foods are transported, and small banana leaf bags are used to contain coffee beans that are a traditional gift in some parts of Africa.
- Some of these have the **potential** to be developed as niche packaged products for tourist markets.



# LEAVES, VEGETABLE FIBRES AND TEXTILES

- Fibres from **kenaf and sisal** plants are mainly used for making ropes, cord and string, which can be made into net bags to transport hard fruits.
- They can also be spun into a yarn that is fine enough to make **coarse canvas**. Other examples of textile containers are woven jute sacks, which are used to transport a wide variety of bulk foods including grain, flour, sugar and salt.
- **Plant fibre sacks** are flexible, lightweight and resistant to tearing, have good durability, and may be chemically treated to prevent them rotting.
- **Their rough surfaces** are non-slip, which makes stacking easier compared to synthetic fibre sacks, and they are bio-degradable.
- Most textile **sacks can be re-used several times** after washing and they are easily marked to indicate the contents.
- They are still widely used to transport **fresh or dried** crops, but they are being replaced as shipping containers by woven polypropylene or multi-walled paper sacks (below).
- **Calico** is a closely woven, strong cotton fabric that can be made into bags for flour, grains, legumes, coffee beans and sugar.
- **Muslin and cheesecloth** are open-mesh, light fabrics used both to strain liquid foods during processing and to wrap foods such as cheeses and processed meats (e.g. smoked ham).



**KENAF FIBER**

<https://textilelearner.net>



# WOOD

- Wooden containers protect foods against crushing, have good stacking characteristics and a good weight-to-strength ratio.
- **Wooden boxes, trays and crates** have traditionally been used as shipping containers for a wide variety of solid foods including fruits, vegetables and bakery products.
- **Wooden tea chests** are produced more cheaply than other containers in tea-producing countries and are still widely used.
- **Small wooden boxes** are used to pack tea or spices for tourist markets in some countries.
- **Wooden barrels** have been traditionally used as shipping containers for a wide range of liquid foods, including cooking oils, wine, beer and juices.
- They continue to be used for some **wines and spirits** because flavour compounds from the wood improve the quality of the products, but in other applications have been **replaced by aluminium, coated steel or plastic barrels**.

## WOODEN TEA CHESTS AND WOODEN BARRELS



# LEATHER

- Leather containers **made from camel, pig or kid goat hides** have traditionally been used as flexible, lightweight, non-breakable containers for water, milk and wine.
- Manioc flour and solidified sugar were also packed in leather cases and pouches, but the use of leather has now ceased for most commercial food applications

# LEATHER CONTAINERS AND MANIOC FLOUR



## EARTHENWARE

- **Pottery** is still used domestically for storage of liquid and solid foods such as yoghurt, beer, dried foods, honey, etc..
- **Corks, wooden lids**, wax or plastic stoppers, or combinations of these are used to seal the pots.
- If they are **glazed and well sealed**, they prevent oxygen, moisture and light from entering the food and they are therefore suitable for storing oils and wines.
- They also **restrict contamination** by micro-organisms, insects and rodents.
- Unglazed earthenware bowls or pots are porous and the evaporating moisture makes them suitable for products that need cooling.
- They are still used for local sales of curd or yoghurt in parts of Asia.

# EARTHENWARE





# WHERE DO THEY COME FROM?



# METALS

- Metals are the **most versatile** of all forms of packaging.
- Advantages:
  - They offer the combination of **excellent** physical protection and barrier properties, formability, decorative potential, recyclability, and consumer acceptance.
- Metal containers are **vacuum-sealed** and thermally sterilized under low oxygen pressure.
- The **decomposition of nutrients is kept to a minimum in metal** containers, since metals are a perfect barrier to oxygen, light and moisture.
- The **major limitations** of metal containers are cost, the weight of the containers and the fact that they are difficult to crush.
- **Aluminum and steel** are the most predominantly used metals in food packaging.

# ALUMINUM FOIL



**Pawaca**

50 PACK



# I. ALUMINUM FOIL

- Aluminium is a lightweight, silvery white metal derived from **bauxite ore**.
- **Magnesium and manganese** are often incorporated into aluminium to improve its mechanical strength.
- Aluminium is highly **resistant to most forms of corrosion**; its natural coating of aluminium oxide provides a highly effective barrier to the effects of air, temperature, moisture and chemical attack.
- The **mechanical, physical and chemical properties** of aluminum foil such as its barrier effect, deadfold properties and suitability for food contact enable a wide range of applications in many different products and sectors.
- The material is **light but strong**, can be formed and converted into complex shapes, has a high thermal and electrical conductivity, and can be recycled without decrease in quality.
- Aluminium foil is **used for** aseptic cartons, pouches, wrappings, bottle capsules, push - through blisters, laminated tubes, lids, trays and containers.

## BAUXITE ORE

- **Bauxite** is primarily comprised of aluminum oxide compounds (alumina), silica, iron oxides and titanium dioxide.
- The chemical formula of bauxite is  **$\text{Al}_2\text{O}_3$** .



## ii. Tinfoil

- Tinfoil has been used for preserving food for well **over a hundred years**.
- Tinfoil is a **thin steel sheet coated by tin**.
- Produced from low-carbon steel (that is, black plate), tinfoil is the result of **coating both sides of black plate with thin layers of tin**.
- The coating is achieved by **dipping the sheets of steel in molten tin** (hot-dipped tinfoil) or by the electrodeposition of tin on the steel sheet (electrolytic tinfoil).
- Food cans and the lids of glass **screw-cap** containers are made of tinfoil.
- The benefit provided by the bare tin surface inside the can is protection of the **natural flavor and appearance of the food**, through oxidation of the tin surface in preference to oxidative degradation of the food.



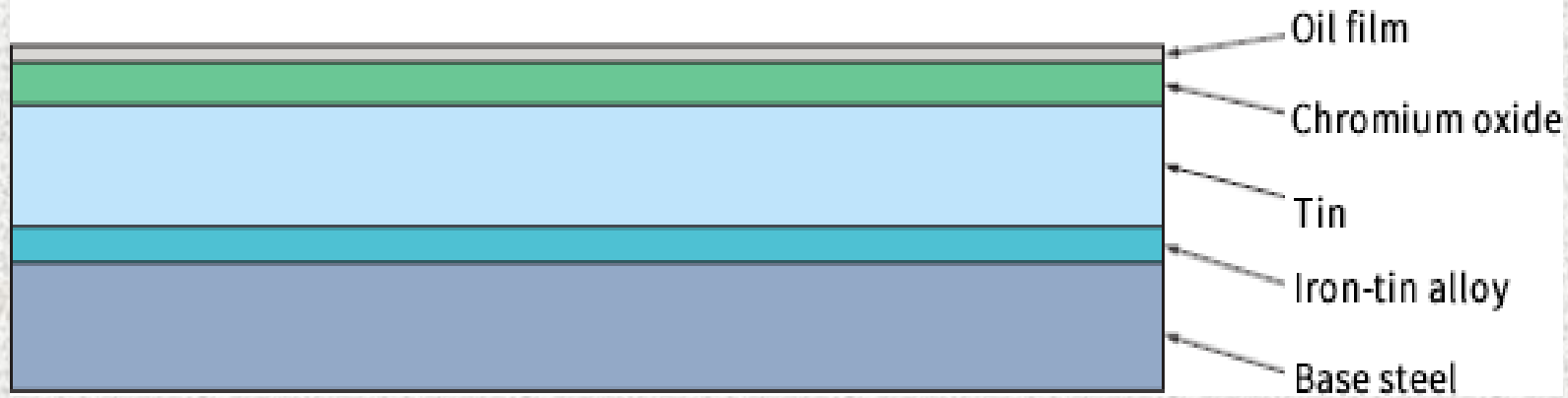
### iii. Tin - Free Steel

- Tin Free Steel (TFS) is produced by applying **electrolytic chromic acid treatment over steel sheets.**
- This is also known as **electrolytic chromium-coated steel** or **chrome-oxide-coated steel.**
- Tin - free steel requires a coating of an organic material to **provide complete corrosion resistance.**
- Tin-free steel has good **formability and strength**, but it is **much cheaper than tinplate.**

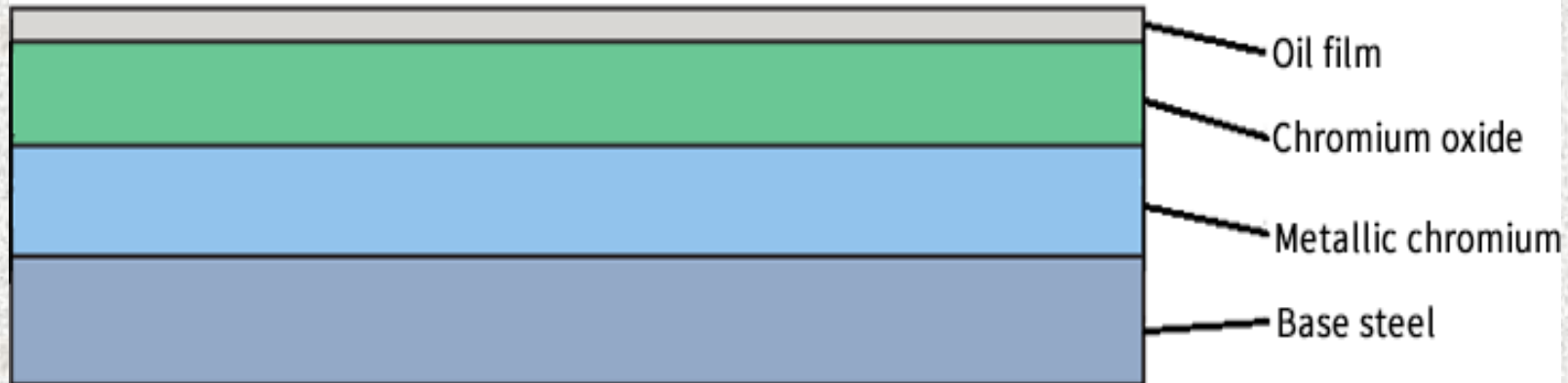


# TIN PLATE VS TFS

## ● TIN PLATE



## ● TFS





ANY QUESTION



Thank  
you!

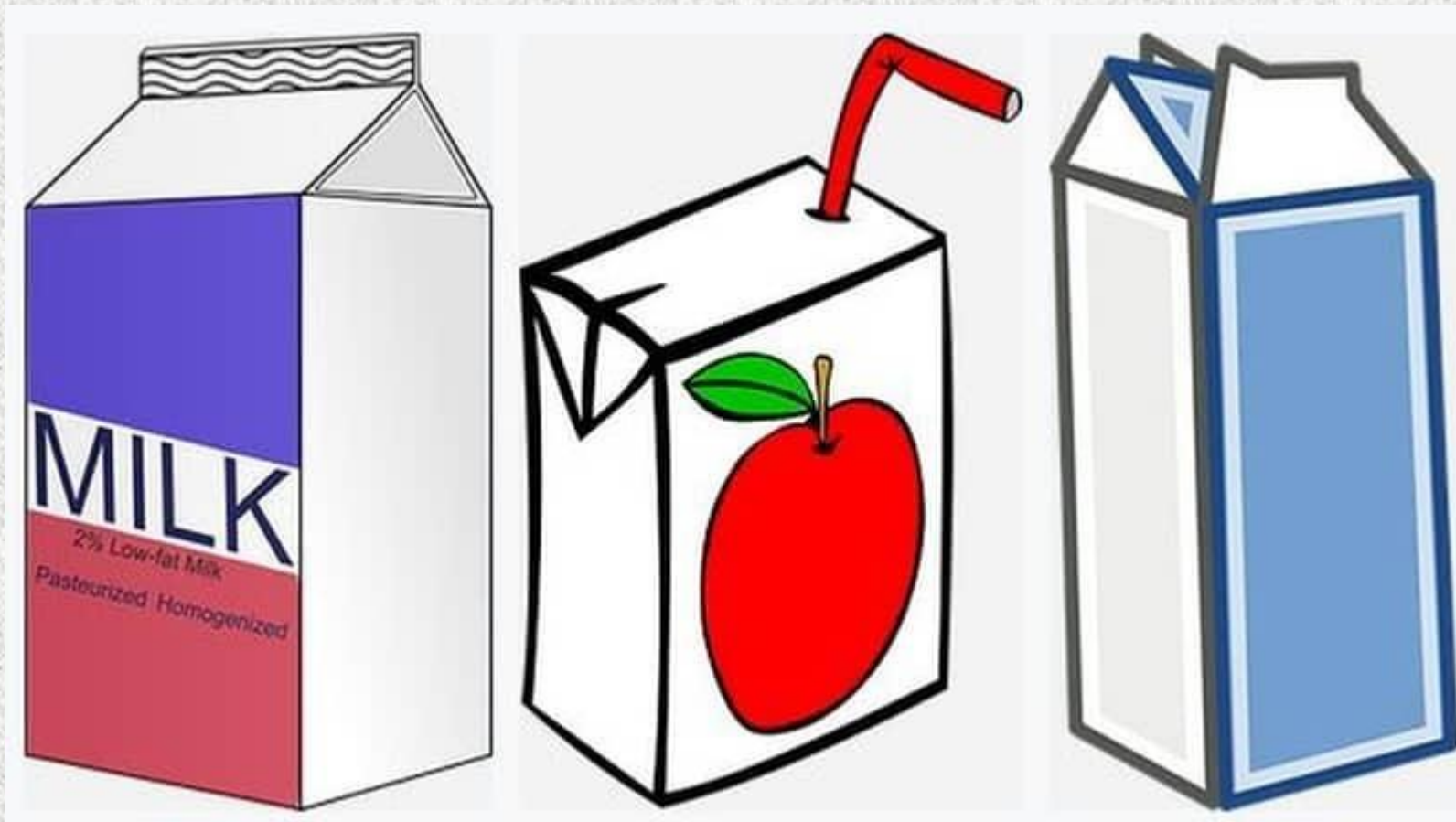
The image features the words "Thank you!" in a highly stylized, 3D font. The word "Thank" is positioned above "you!". The letters of "Thank" have a vertical gradient from purple at the top to orange at the bottom. The letters of "you!" have a vertical gradient from light blue at the top to green at the bottom. The text is set against a white background. Each letter is surrounded by a starburst effect consisting of a yellow star and a pink-to-orange gradient bar with diagonal hatching. The overall style is vibrant and celebratory.

# IDENTIFICATION OF DIFFERENT TYPES OF PACKAGING MATERIALS USING IN THE FOOD INDUSTRY.

# PRINCIPLE

WRITTEN

TETRA PACK!!!!!!!!!!



## PROCEDURE?

- I have Supplied different types of food products
- Thickness of measuring the HDPE or LDPE?