Raw Materials properties

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WHAT ARE RAW MATERIALS?

- **Definition:**

        Raw materials are materials or substances that a company uses to manufacture its finished products.

- Raw materials are commodities that are bought and sold on commodities exchanges worldwide.

- Raw materials are the inputs or resources that a company used in the primary production or manufacturing of goods..

Basic raw materials of food industry

PROBLEM

- Find the list of raw materials used in Baking industry?
- Find the list of raw materials used in Beverage industry?
- Find the list of raw materials used in confectionary industry?
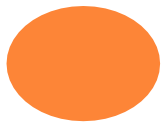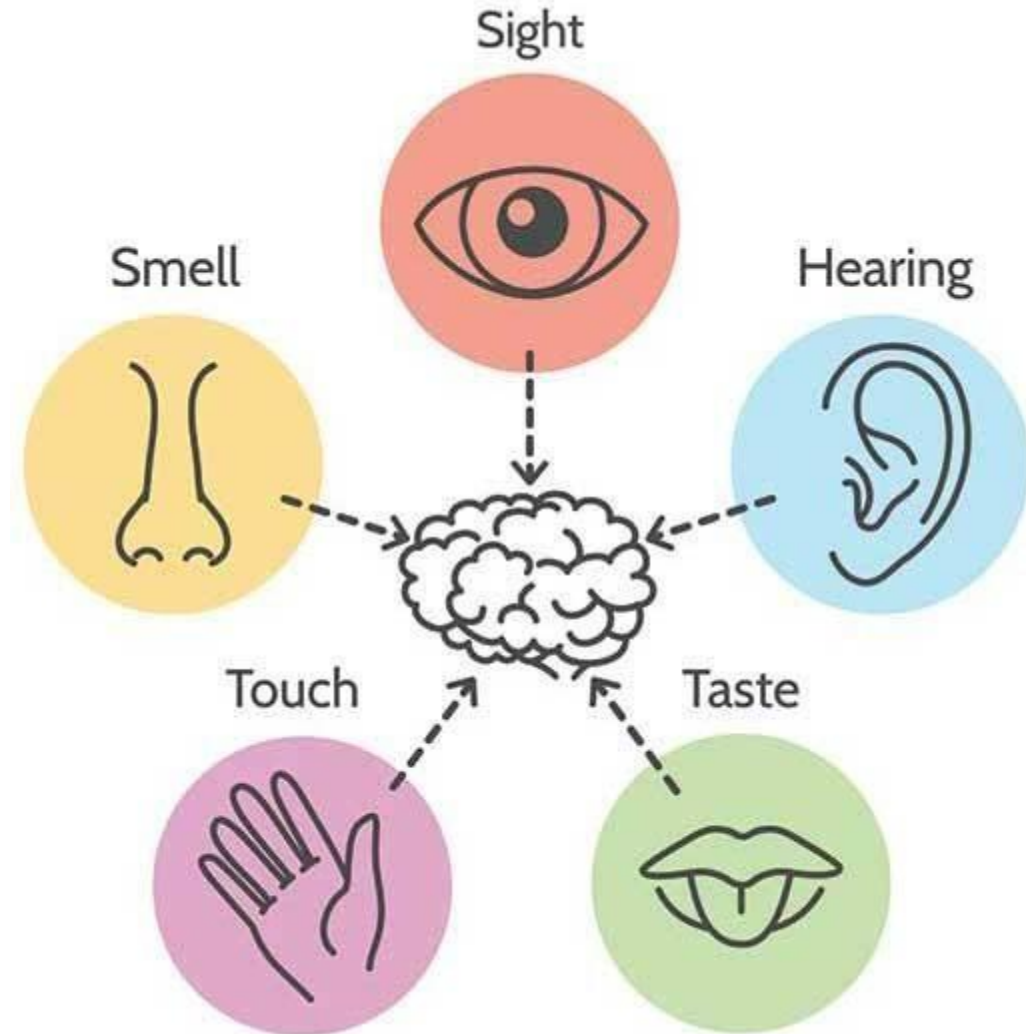- Find the list of raw materials used in dairy industry?

Raw Material Properties

- Physical properties
- Mechanical Properties
- Thermal Properties
- Electrical Properties
- Optical Properties
- Chemical Properties

Physical Characteristics/Properties

- 1. Shape
- 2. Size
- 3. Weight
- 4. Volume
- 5. Surface area
- 6. Density
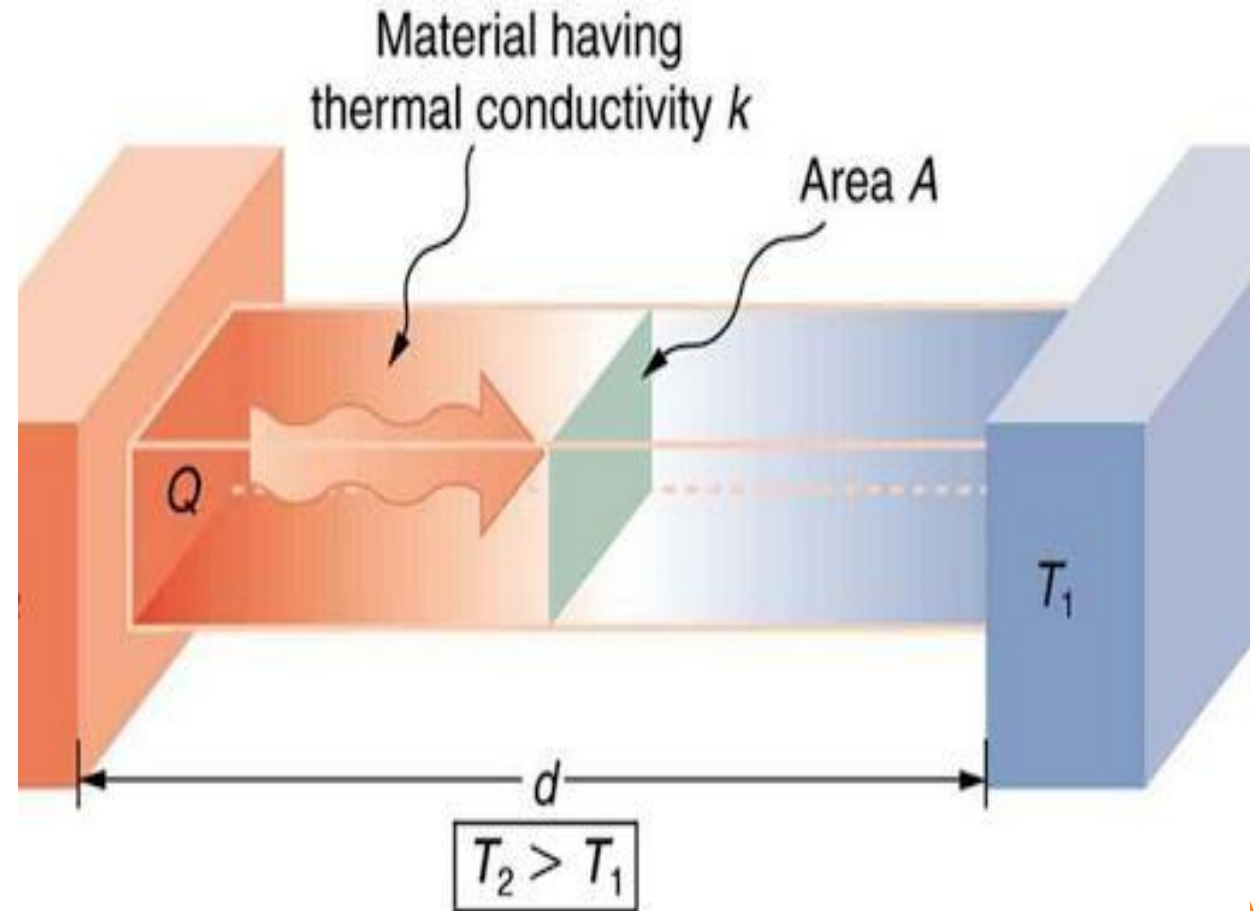- 7. Porosity
- 8. Color
- 9. Appearance

Mechanical Properties

- ??????????????????
?????

THERMAL PROPERTIES

- 1. Specific heat
- 2. Thermal capacity
- 3. Thermal diffusivity
- 4. Thermal conductivity
- 5. Surface conductance
- 6. Absorptivity
- 7. Emmisivity
- 8. Transmissivity

Material having thermal conductivity k

Area A

Q

d

T_1

$T_2 > T_1$

Electrical Properties

- 1. Conductance
- 2. Resistance
- 3. Capacitance
- 4. Dielectric properties
- 5. Reaction to electromagnetic radiation
- 6. Conductivity.

Optical Properties

- 1. Light transmittance
- 2. Light reflectance
- 3. Light absorptance
- 4. Color
- 5. Contrast
- 6. Intensity

Raw Materials Types?

- Direct Raw materials
- Indirect Raw materials
- Home work

FACTORS AFFECTS THE GROWTH OF THIS PLANT?

Factors affects the Raw materials quality:

- **Environmental Factors:**

    The same plant species growing in different geographic regions can exhibit different Raw material compositions.

- **Genetic Factors:**

    Genetic factors are also responsible for chemical variability in the Raw materials.

- **Growing, Harvesting Factors:**

    It is well known that growing conditions (geographic region, environmental factors, irrigation, etc.) are crucial to chemical variability and to raw material quality. Harvesting conditions also influence chemical variability.

- **Post-harvesting processing:**

    After harvesting, plant materials are subjected to a primary processing, including cleaning/washing, cutting before drying, freezing, distillation, drying, etc., and are then packaged and stored for distribution.

- **Packaging and storage conditions:**

    Packaging and storage conditions should ensure that the strength and integrity of the plant material.

DETERIORATION OF RAW MATERIALS

- Endogenous enzymes:

- Microbiological contamination:

- Chemical changes: deterioration in sensory quality by lipid oxidation, non-enzymatic browning, breakdown of pigments such as chlorophyll, anthocyanin's, carotenoids.

- Nutritional changes: especially ascorbic acid breakdown.

- Physical changes: dehydration, moisture absorption.

- Biological changes: germination of seeds, sprouting.

WHICH ENZYMES ARE RESPONSIBLE FOR THE FOLLOWING CHANGES?

- Sugar-starch conversion?
- Browning in fruits and vegetable?
- postharvest demethylation of pectic substances?
- softening tissues during ripening?

Causes of food spoilage

The major causes of food spoilage include

1) Growth and activity of Microorganisms
2) Action of native enzymes
3) Chemical reactions of the constituents of food
4) Vermin
5) Mechanical damage and
6) Storage conditions

MECHANIZATION

- *Mechanization* is the process by which raw materials may be operated, regulated, and controlled without the need for human intervention.

- *Mechanization* is the process of introducing a machine to do something that used to be done by hand.

- Examples of mechanized systems encountered in everyday life include tractors, thrashers, bulldozers, Combine harvester, washing machines, dishwashers, automated car wash systems, air conditioning, and heating systems.

BENEFITS OF MECHANIZATION IN RAW MATERIALS PROCESSING:

- Reduction of manual labor.
- Reduction of variability in finished product quality.
- Reduction in waste.
- Improved productivity.
- Improved food safety.
- Improved worker safety. etc

ANY QUESTION