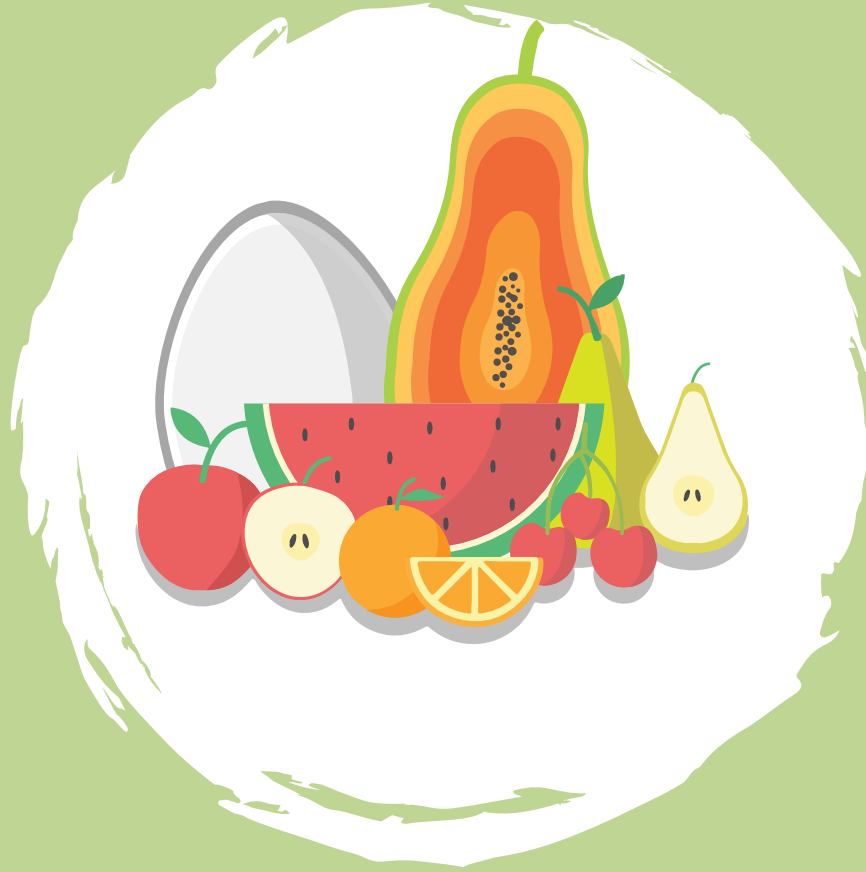
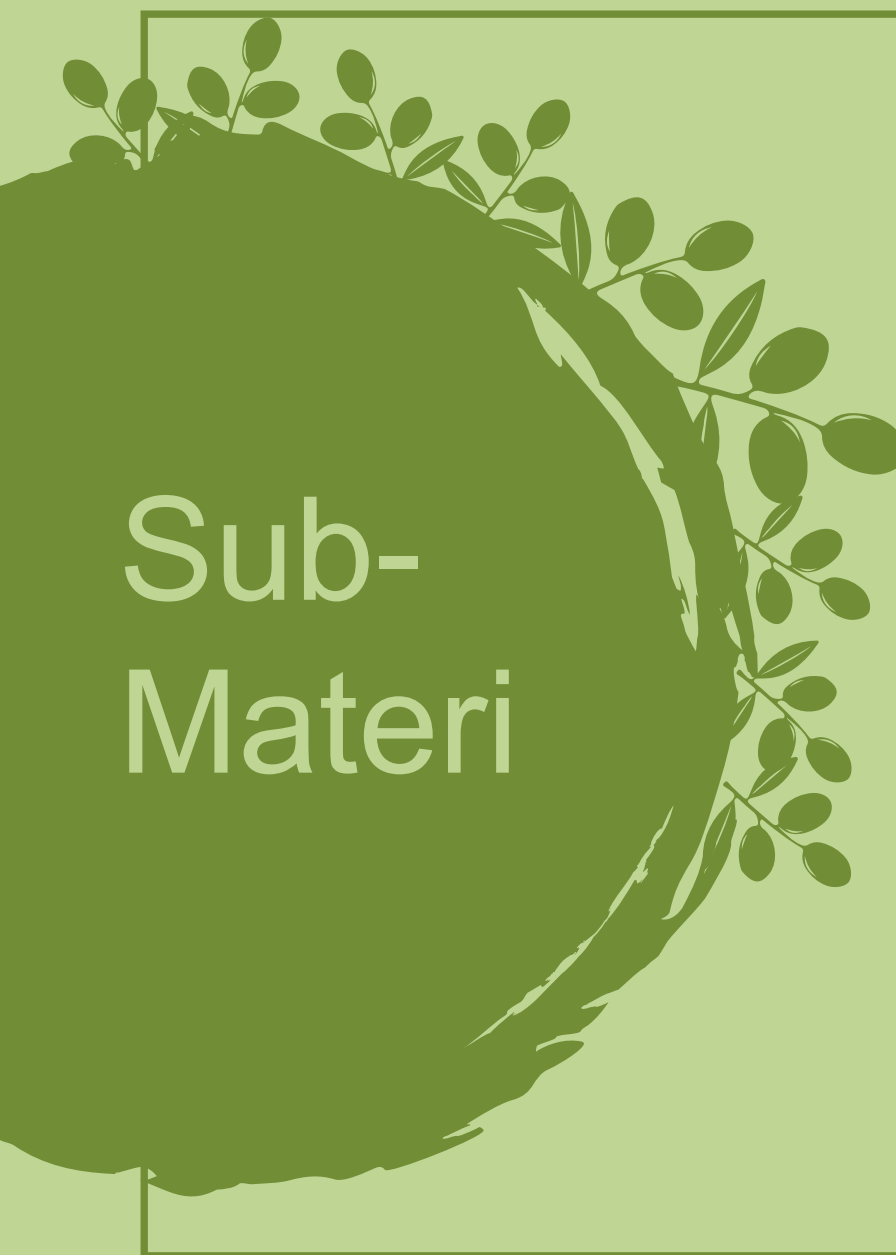




Mikrobiologi Pangan dan Industri

BIO620316

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Sub- Materi

01 Pengawetan Makanan

02 Konsep Kualitas Air Sesuai Syarat

03 Konsep Kualitas Susu Sesuai Syarat

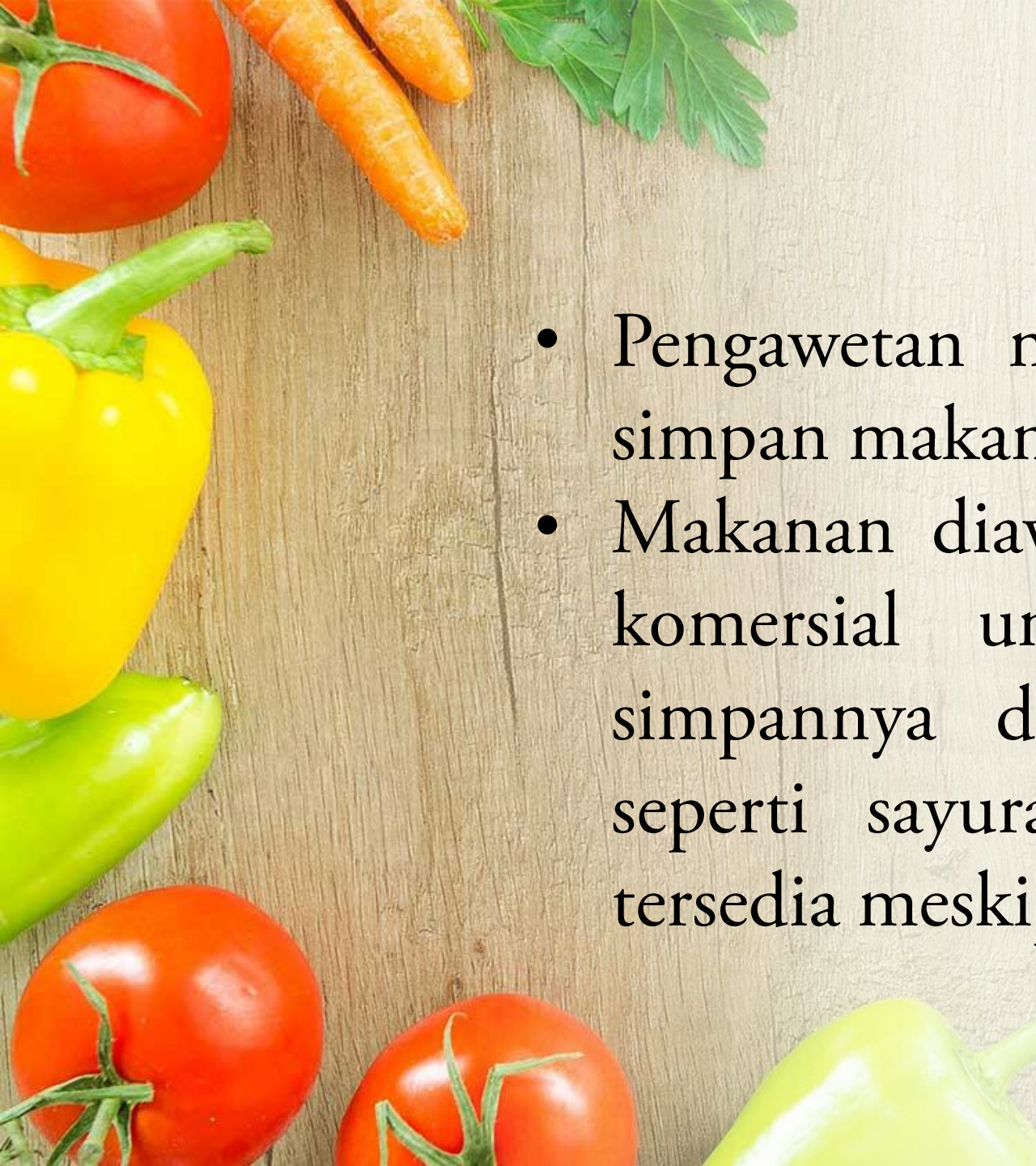
Pengawetan Makanan



Definition

Food preservation can be defined as the science that deals with the process of prevention of **spoilage** of food thus allowing it to be stored in a fit condition for future use.



- 
- A collection of fresh vegetables is arranged along the left and bottom edges of the slide. At the top left, there is a whole red tomato, two orange carrots, and a sprig of green parsley. Below these, a large yellow bell pepper and a green bell pepper are visible. At the bottom, there are two more red tomatoes and a light green bell pepper. The background is a light-colored wooden surface with a vertical grain pattern.
- Pengawetan makanan meningkatkan masa simpan makanan.
 - Makanan diawetkan di rumah atau secara komersial untuk memperpanjang masa simpannya dan agar makanan tertentu, seperti sayuran dan buah-buahan, tetap tersedia meskipun di luar musimnya.

Why Preserve Food?



A collection of fresh green herbs, including rosemary, parsley, and arugula, are arranged on a light-colored wooden surface. The herbs are vibrant and appear to be part of a decorative border on the left side of the slide.

Why Preserve Food?

A solid orange circle with a thin black outline, positioned to the left of the first text box.

If we are able to preserve foods, we can enjoy any kind of food in any season.

A solid brown circle with a thin black outline, positioned to the left of the second text box.

We can eat food even if it is not available in our area.

A solid green circle with a thin black outline, positioned to the left of the third text box.

We can store our food easily and without worries

Prinsip-Prinsip Pengawetan Makanan

Mencegah atau memperlambat pembusukan oleh mikroorganisme

- ✓ Mencegah mikroorganisme masuk ke dalam makanan
- ✓ Membunuh mikroorganisme
- ✓ Menyaring untuk memisahkan mikroorganisme
- ✓ Menghambat pertumbuhan mikroorganisme



Mencegah atau memperlambat pembusukan alami makanan

- ✓ Merusak atau menonaktifkan enzim yang menyebabkan makanan rusak
- ✓ Mencegah atau memperlambat reaksi kimia yang dapat merusak makanan

Types of Food Preservation

- ✓ Use of low temperature
- ✓ Use of high temperature
- ✓ Canning procedures
- ✓ Drying methods
- ✓ Use of high concentrations of sugar and salt
- ✓ Preservation by chemicals
- ✓ Preservation by radiation





1. Metode Suhu Rendah

Pertumbuhan mikroorganisme dan reaksi enzim akan **melambat** pada makanan yang disimpan pada suhu rendah

Cellar storage: $\sim 15^{\circ}\text{C}$

Refrigeration or chilling: $0\text{--}5^{\circ}\text{C}$

Freezing: -18 to -40°C

Types of freezing: slow freezing, quick freezing, hydrofreezing

Cellar storage

Food is stored in cellars (underground rooms) in many villages, where the temperature is lower than 15 °C.



Refrigeration or chilling

- These temperatures are obtained and maintained by means of ice and refrigerators.
- Food prepared for serving, as well as leftovers, may also be stored in household refrigerators.



Freezing Method



- Freezing can preserve food for long periods of time.
- Some microorganisms are destroyed during freezing.
- The main preservative effect of freezing temperatures is the inability of microorganisms to grow at such temperatures.

2. Use of high temperature



Pasteurization



Heating at
temperatures of
about 100 °C



**Heating above
100 °C.**



3. CANNING



-  Cleaning
-  Blanching
-  Exhausting
-  Sealing the container
-  Sterilizing the sealed container
-  Cooling the container



4. Drying Method / Dehydration



- Microorganisms need moisture to grow.
- When food is exposed to sunlight or subjected to dehydration, its moisture is removed.
- This prevents the growth of microorganisms and thereby prevents the spoilage of food.



Drying Method



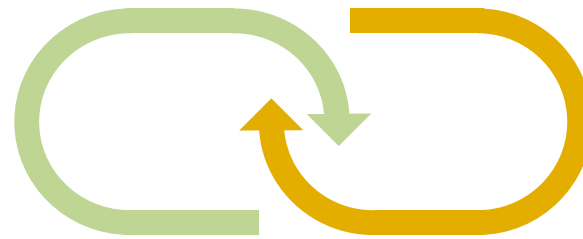
Sun drying



**Mechanical
drying**



Spray drying



**Foam mat
drying**



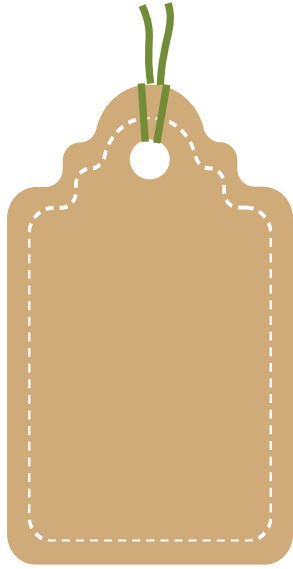
**Drying by
osmosis**



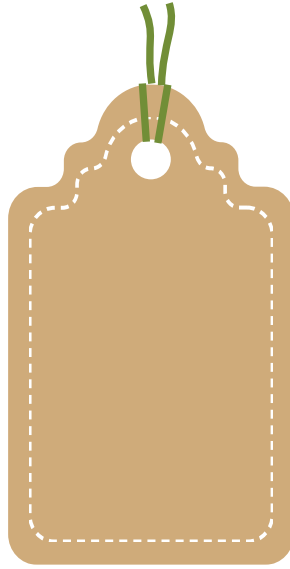
**Freeze
drying**



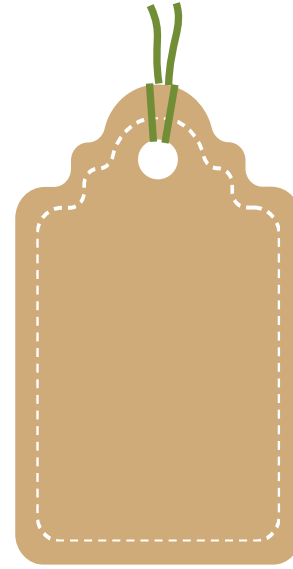
5. High Concentration of Sugar and Salt



Salting and
Pickling



Vinegar



Sugars

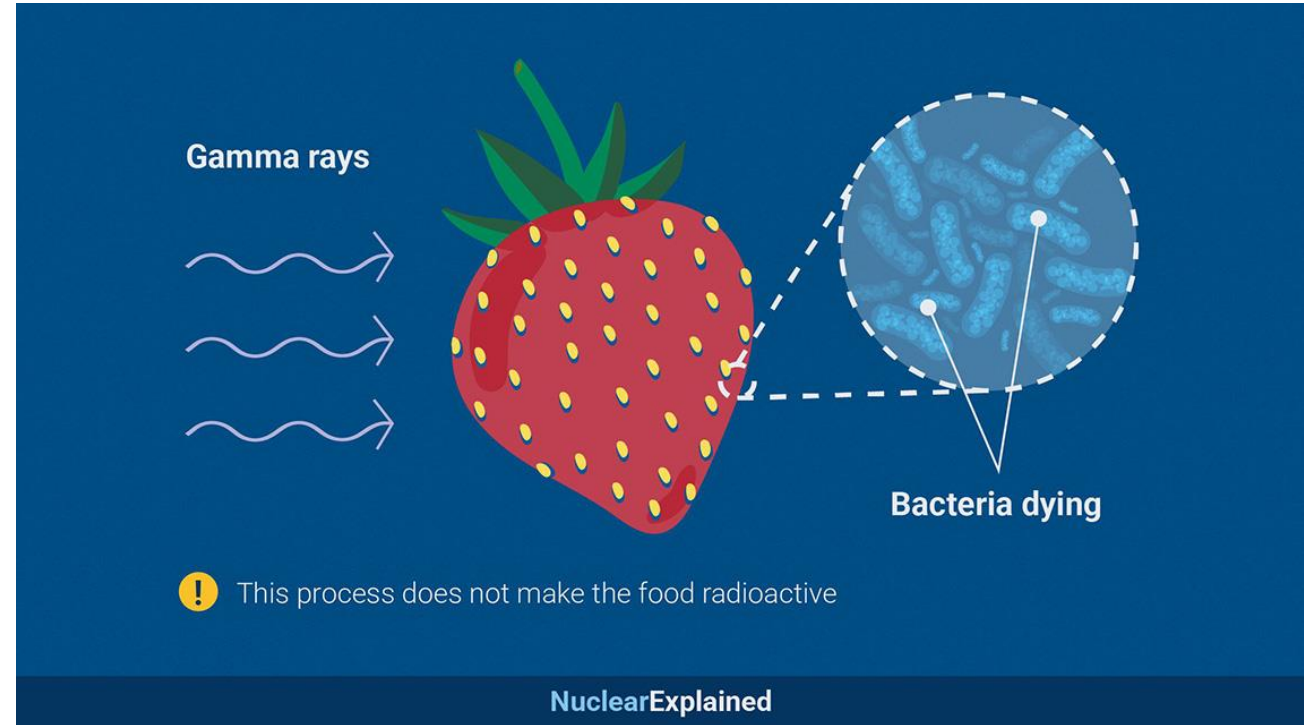
6. Chemical Preservation:

- Only a few chemicals are permitted at prescribed minimum levels for preserving food.
- Examples include sodium benzoate, sorbic acid, sodium and calcium propionate, and sulphur dioxide.
- For instance, sorbic acid is added to cheese.



Preservation by Radiation

- Microorganisms are inactivated by different kinds of radiation.
- Foods are usually irradiated with ionizing radiation.
- Spices, vegetables, fruits, pork, and poultry can all be preserved by radiation.
- Irradiation may cause changes in flavor, color, texture, and nutritive value.





Thank You



Tugas Individu



1. Pilih satu produk makanan komersial yang diawetkan.

2. Cantumkan:

- Nama produk dan merek
- Jenis bahan pangan utama
- Metode pengawetan yang digunakan (canning, drying)
- Alasan ilmiah kenapa metode itu cocok untuk produk tersebut.
- Bagaimana metode itu mempengaruhi mikroorganisme, tekstur, rasa, dan umur simpan.
- Alternatif metode pengawetan lain.

