

CHAPTER 7

INTRODUCTION TO MICROBIOLOGY

LECTURE 01

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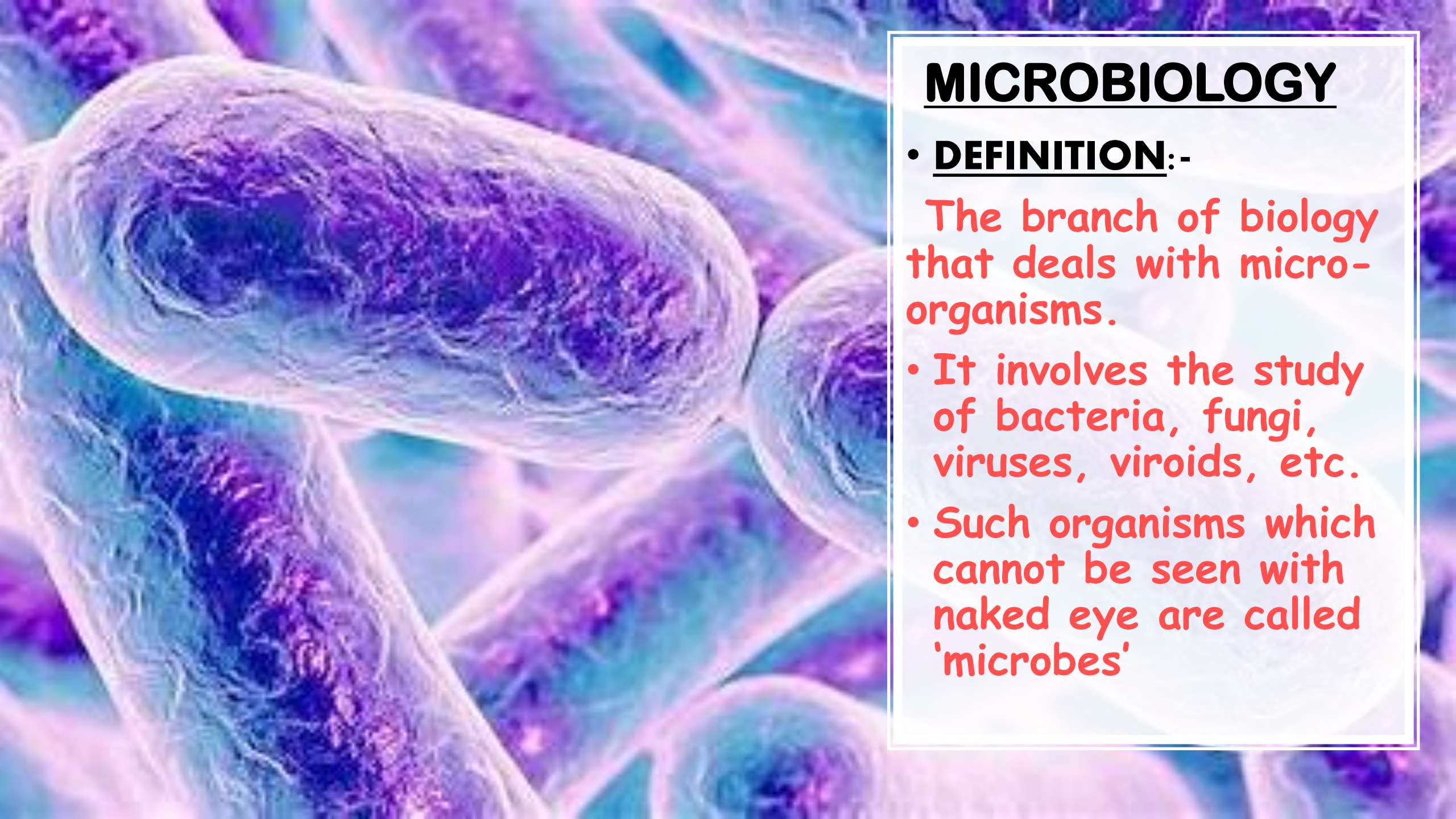


MICROBIOLOGY

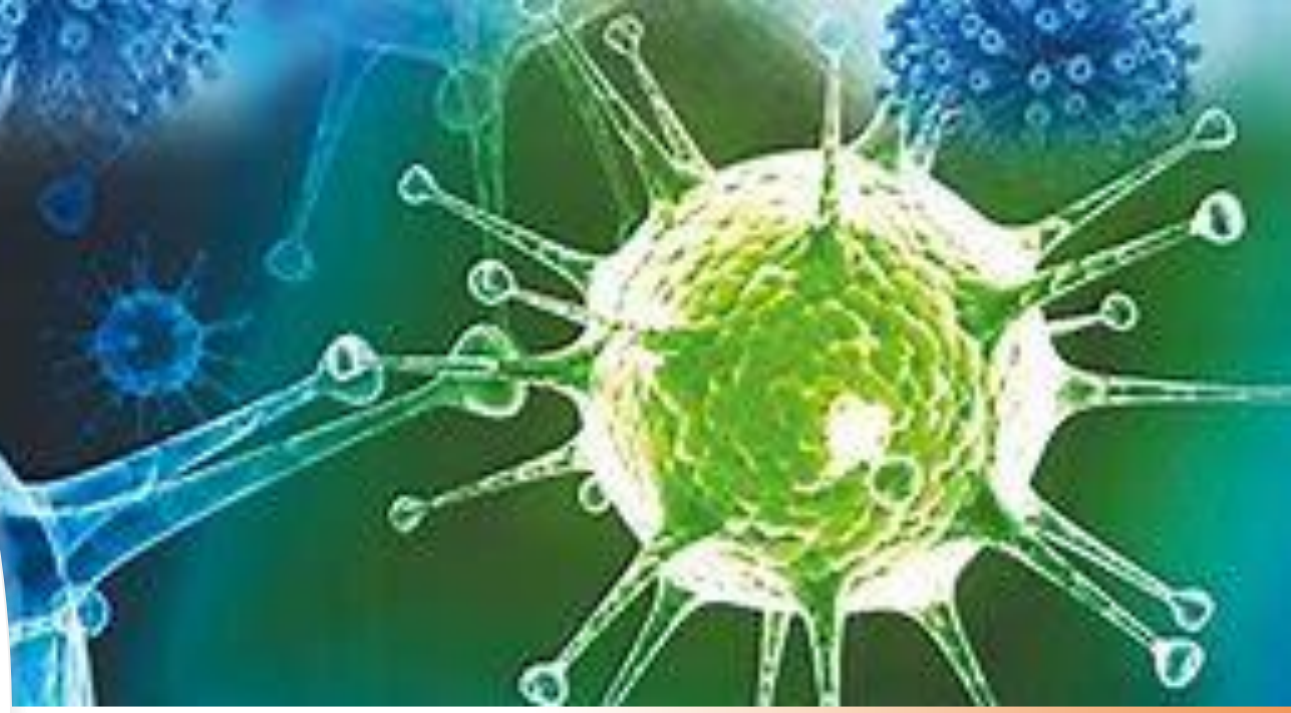
- **DEFINITION**:-

The branch of biology that deals with micro-organisms.

- It involves the study of bacteria, fungi, viruses, viroids, etc.
- Such organisms which cannot be seen with naked eye are called 'microbes'

APPLIED MICROBIOLOGY :-

- Branch of biology in which study of enzymes related to prokaryotic and eukaryotic microbes, proteins, molecular biology is done.

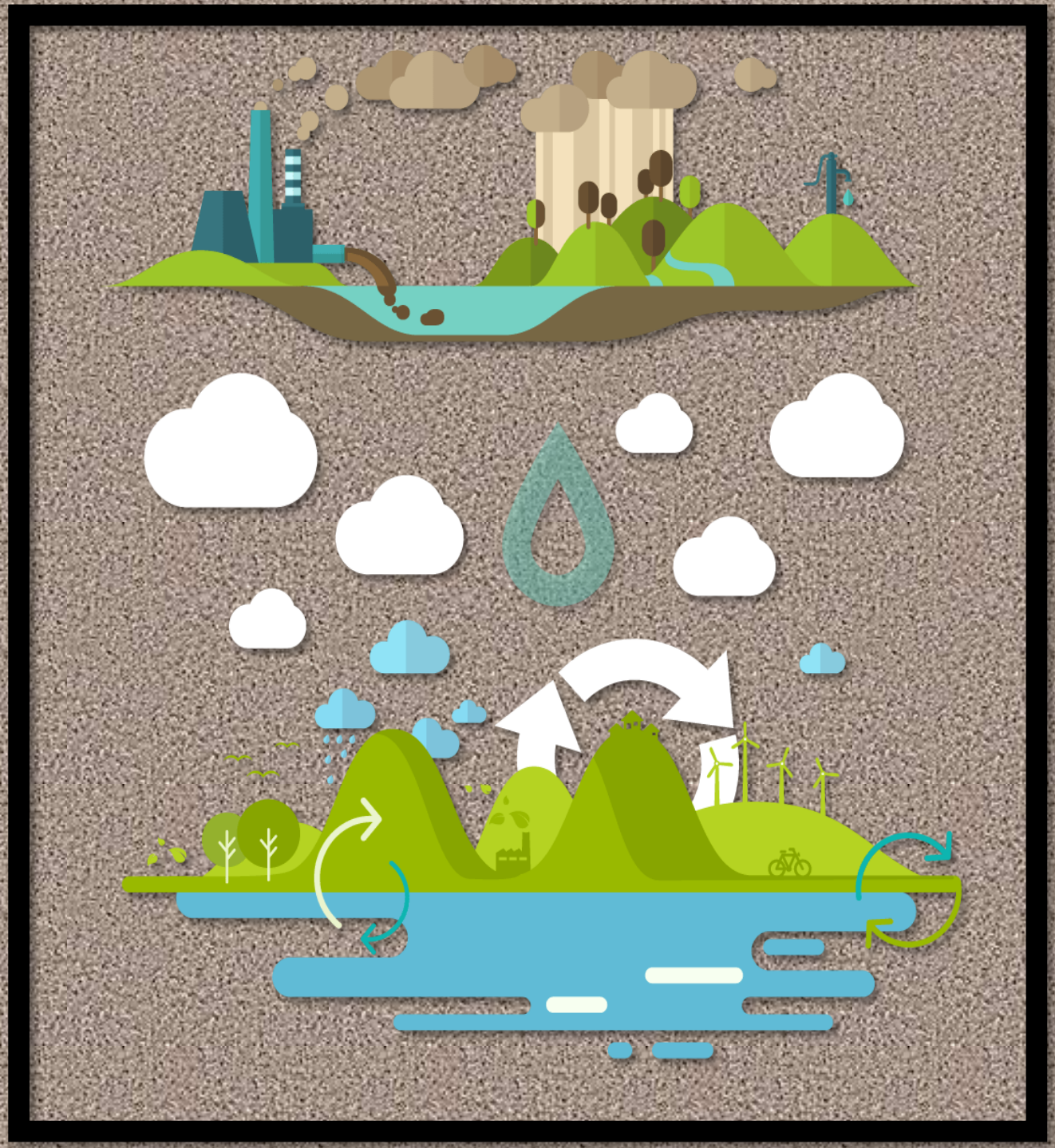




INDUSTRIAL MICROBIOLOGY :

- Commercial use of microbes.

1) Use of fermentation process in production of products like cheese, butter, wine, enzymes, nutrients, etc.
2) Use of microbes in sewage and garbage management and pollution control.



PRODUCTS :



A. **DAIRY PRODUCTS** :-

- Milk is converted into various products like kefir, cheese, cream, etc., in industries using machinery.
- Water content and acidity of milk changes which helps to improve the taste, texture and flavour.
- Most milk products are formed using bacteria, except cheese for which fungi is used.



Steps for formation of yogurt/cheese/cream:

1. Pasteurization
2. Fermentation using Lactobacilli.
   a) lactose sugar gets converted to lactic acid
   b) coagulation of milk proteins using lactic acid.
3. Taste and flavour formed.
   eg) Diacetyl has flavour of butter.

B. YOGURT PRODUCTS :

- Bacteria used- lactobacilli.
- In industries, condensed milk powder is added to maintain protein content.
- Boil the milk – add strains of Streptococcus thermophilus and Lactobacillus delbrueckii in equal proportion.
- Streptococcus helps in formation of lactic acid.
- Acetaldehyde like compounds formed – taste to the yogurt.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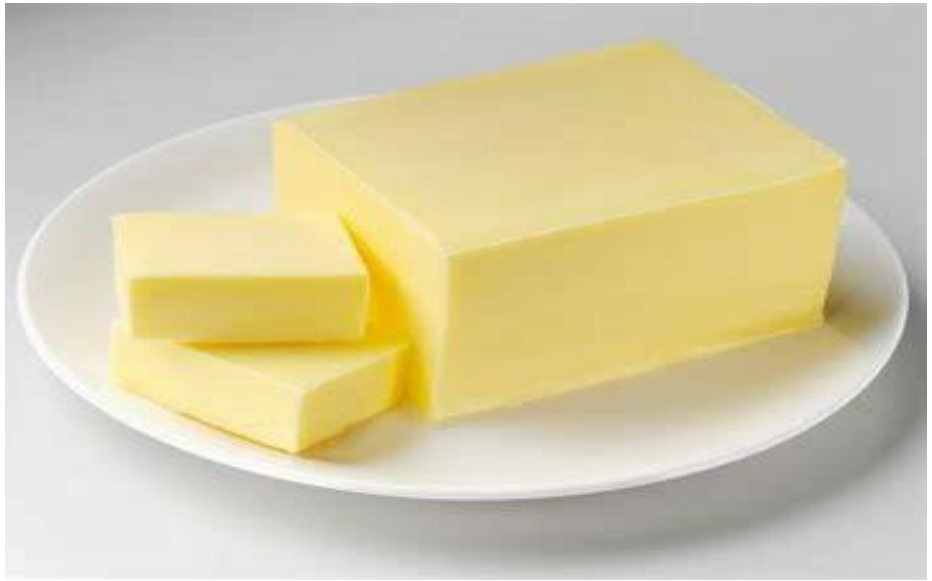
C. BUTTER :

- Two types –

i. Sweet cream

ii. Cultured





D. CHEESE PRODUCTION :







- Made from cow milk.
- Steps:

i) Chemical and microbiological tests are performed.

ii) Colours and microbes are added.

iii) Whey (water in yogurt) is removed.

iv) Cutting yogurt, washing, rubbing, salting, mixing microbes, pigments and flavours.

v) Cheese is cut and stored to ripen.