

Objectives

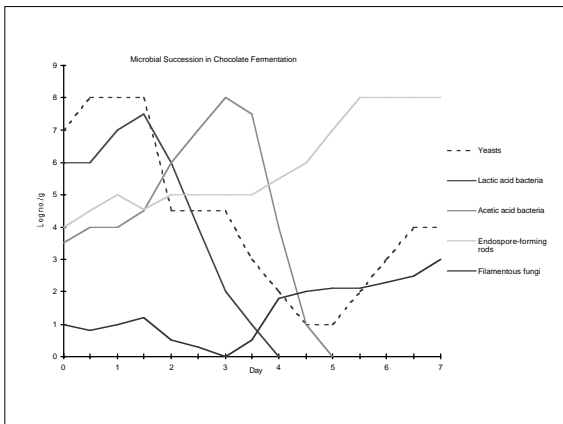
1. Define the following terms: industrial microbiology, biotechnology, fermentation.
2. List the microorganisms most commonly used in industrial processes.
3. Describe the source(s) of microbes in natural fermentations.
4. List an example of each of the following types of cultures: pure culture, succession, consortia.
5. Identify an advantage and disadvantage of each of the following: continuous culture; batch fermentation; solid-state fermentation; immobilized cells.

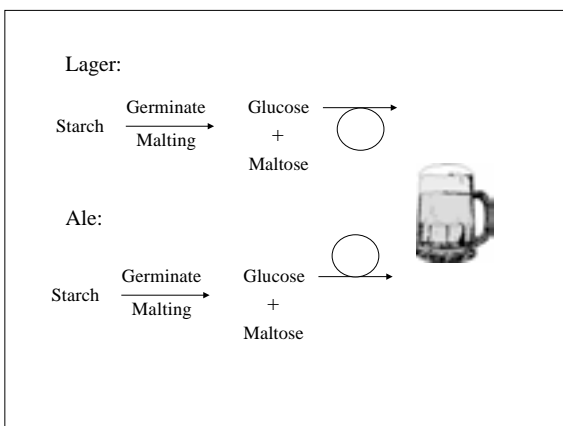
Definitions

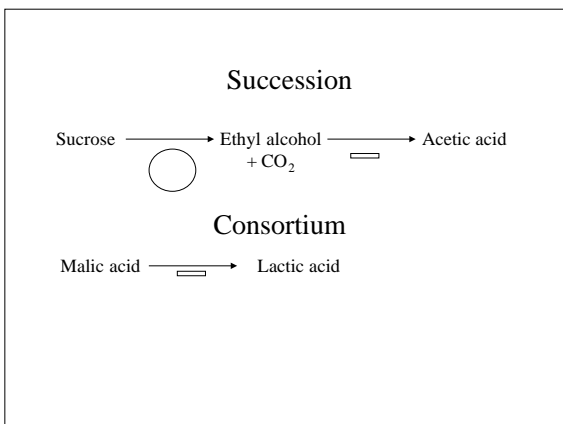
- Industrial Microbiology
- Biotechnology
- Fermentation

World History

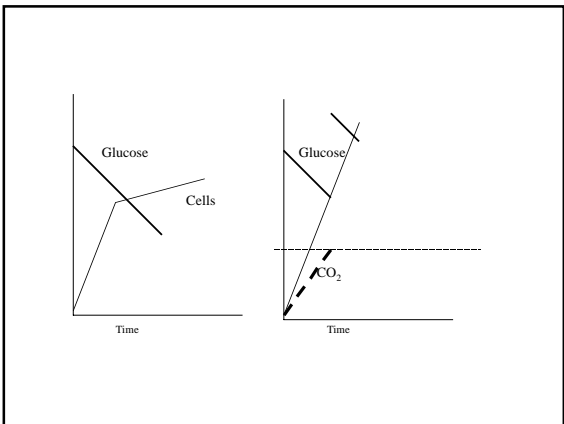
- 20,000+ years ago
- 1502
- 1620
- 1849
- 1912
- 1914
- 1939
- Now








- Primary metabolite
- Secondary metabolite
- Batch fermentation
- Continuous culture
- Fed-batch fermentation
- Solid-state fermentation



	Blue Jeans	Designer Jeans
<ul style="list-style-type: none"> • Cotton • Bleaching • Sizing • Dyeing • Washing 	<ul style="list-style-type: none"> • <i>Gossypium</i> • Chlorine • Starch • <i>Indigofera</i> • Soap, water, washing machine 	

Objectives

1. Compare and contrast each of the following pairs:
 - a. Natural selection and artificial selection
 - b. Selective breeding and recombinant DNA
2. Explain how each of the following is used to improve a product: selection; high-throughput screening; enrichment; mutation; directed evolution.
3. Describe the process of making rDNA using a plasmid vector.
4. List 10 microbial products.


Semi-synthetic products

The diagram illustrates the process of semi-synthetic products. On the left, a horizontal line leads to a square, which then branches to a circle. Below this, another horizontal line leads to a circle and a square. On the right, a vertical box contains a circle at the top, followed by a horizontal line, and then a yellow squiggle at the bottom, representing a specific product or process.

Value added

The diagram is a hierarchical organizational chart. At the top is a box labeled "Your Company". Below it are two boxes. The left box has two sub-boxes below it. The right box has three sub-boxes below it. The middle box of the right branch has two more sub-boxes below it, and the bottom-most box has one final sub-box below it.

Enrichment



Evolution

Natural Selection	Artificial Selection
<ul style="list-style-type: none"> • • • 	<ul style="list-style-type: none"> • • • •

Translation

DNA	TAC	TTC	AAA	CCG	ATT
MRNA	AUG	AAG	UUU	GCC	UAA
Amino acid	Met	Lys	---	---	---

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MRNA	AUG	AAG	UUU	AGC	UAA
Amino acid	---	---	---	---	---
