



CUET PG Dairy Technology Question Paper with Solutions

Time Allowed : 1 hour 45 minutes	Maximum Marks : 300	Total questions : 75
-----------------------------------------	----------------------------	-----------------------------

General Instructions

Read the following instructions very carefully and strictly follow them:

- (i) This question paper comprises 75 questions. All questions are compulsory.
- (ii) Each question carries 04 (four) marks.
- (iii) For each correct response, candidate will get 04 (four) marks.
- (iv) For each incorrect response, 01 (one) mark will be deducted from the total score.
- (v) Un-answered/un-attempted response will be given no marks.
- (vi) To answer a question, the candidate needs to choose one option as correct option.
- (vii) However, after the process of Challenges of the Answer Key, in case there are multiple correct options or change in key, only those candidates who have attempted it correctly as per the revised Final Answer Key will be awarded marks.
- (viii) In case a Question is dropped due to some technical error, full marks shall be given to all the candidates irrespective of the fact who have attempted it or not

1. Match List-I with List-II:

List-I (Defects in Ice Cream)	List-II (Cause for Defects)
(A) Bitter	I. Due to use of excessive or poor-quality flavouring material
(B) High flavour	II. Using low-quality ingredients, especially flavour dairy products etc
(C) Acidic	III. Using synthetic or imitation flavours in excessive quantity
(D) Unnatural	IV. Due to use of sour dairy products

Options:

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
2. (A)-(I), (B)-(I), (C)-(III), (D)-(I)
3. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Correct Answer: 3. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

Solution:

Ice cream is a delicate product where minor defects can significantly impact quality and consumer perception. Each defect listed is caused by specific issues in ingredient selection or processing:

- (A) Bitter (I): Excessive or low-quality flavoring materials can impart a bitter taste to the ice cream. This typically happens due to poor-quality extracts or artificial flavors.
- (B) High flavour (II): Using low-quality ingredients such as substandard dairy products or flavoring agents results in an overly intense or unpleasant flavor profile.
- (C) Acidic (IV): Acidic taste is caused by sour dairy products, which may indicate

microbial spoilage or poor storage practices.

- (D) Unnatural (III): Synthetic or imitation flavors, especially when used in excessive amounts, create an unnatural taste. This can detract from the natural appeal of the product.

Understanding these defects and their causes enables manufacturers to implement preventive measures, such as quality control and proper ingredient sourcing, to ensure consistent product quality.

Quick Tip

Conduct regular quality checks on raw materials and production processes to minimize defects in ice cream.

2. What is the best pH range for the growth of most of the bacteria in milk and milk products?

Options:

1. 5 to 6
2. 6.0 to 7.7
3. 8 to 9
4. 3 to 5

Correct Answer: 2. 6.0 to 7.7.

Solution:

Most bacteria associated with milk and milk products, particularly lactic acid bacteria, thrive in a pH range of 6.0 to 7.7. This range corresponds to the natural pH of fresh milk, making it conducive for microbial growth.

- Lactic Acid Bacteria (LAB): These beneficial bacteria, like Lactobacillus and Streptococcus, grow well within this range, facilitating fermentation processes.

- Pathogenic Microbes: Harmful microbes such as Listeria and Salmonella also prefer this range, emphasizing the need for strict hygiene.

Maintaining pH within this range is critical for dairy production, as it supports the desired microbial activity for fermentation while preventing spoilage.

Quick Tip

Monitor and control pH levels during dairy production to ensure product safety and quality.

3. How will you detect the presence of hydrogen peroxide in milk?

Options:

1. When adulterated milk is treated with ferric chloride solution and concentrated sulfuric acid, violet color develops at the junction of two layers.
2. When adulterated milk is treated with para-phenylenediamine hydrochloric acid, it gives dark blue color.
3. When adulterated milk is treated with HCl and resorcinol powder and boiled in a water bath, it gives red color.
4. By measuring lactometer reading.

Correct Answer: 2. When adulterated milk is treated with para-phenylenediamine hydrochloric acid, it gives dark blue color.

Solution:

Hydrogen peroxide is sometimes added to milk as a preservative to inhibit microbial growth or mask spoilage. To detect its presence:

1. Procedure: Add para-phenylenediamine hydrochloric acid to the milk sample.
2. Reaction: A distinct dark blue color appears if hydrogen peroxide is present. This reaction occurs due to the oxidation of para-phenylenediamine by hydrogen peroxide.

Hydrogen peroxide adulteration poses health risks, including potential damage to tissues and enzymatic imbalances, making its detection crucial for consumer safety.

Quick Tip

Regularly test milk for adulterants like hydrogen peroxide to comply with safety standards.

4. How will you detect the presence of formaldehyde in milk?

Options:

1. When adulterated milk is treated with HCl and resorcinol powder and boiled in water, it gives red color.
2. When adulterated milk is heated, cooled, and added with 1% iodine solution, it becomes blue.
3. When adulterated milk is treated with para-phenylenediamine hydrochloric acid, it gives dark blue color.
4. When adulterated milk is treated with ferric chloride solution and concentrated sulfuric acid, violet color develops at the junction of two layers.

Correct Answer: 4. When adulterated milk is treated with ferric chloride solution and concentrated sulfuric acid, violet color develops at the junction of two layers.

Solution:

Formaldehyde is a prohibited preservative sometimes used to extend milk's shelf life.

Detection involves the following steps:

1. Procedure: Add ferric chloride solution and concentrated sulfuric acid to the milk sample.
2. Reaction: The formation of a violet color at the junction of two layers confirms the presence of formaldehyde. This reaction occurs due to the condensation of formaldehyde with ferric ions under acidic conditions.

Using formaldehyde in food products is illegal due to its toxicity and carcinogenic properties.

Quick Tip

Educate stakeholders on the risks of formaldehyde and adopt safe preservation methods.

5. Late blowing (bulging of cans) defect in canned foods is caused by—

Options:

1. Clostridium foetidum
2. Coliform
3. Bacillus cereus
4. Bacillus subtilis

Correct Answer: 1. Clostridium foetidum

Solution:

Late blowing is a defect in canned foods characterized by bulging cans caused by gas production due to microbial contamination. The main culprit is Clostridium foetidum, a spore-forming anaerobic bacterium.

1. Mechanism: Clostridium spores survive inadequate sterilization processes and germinate under anaerobic conditions within the sealed cans. The bacteria ferment carbohydrates, producing gases like hydrogen and carbon dioxide, which cause the can to bulge.
2. Health Risks: The presence of such contamination can lead to food spoilage and pose serious health hazards if the food is consumed.
3. Prevention: Proper sterilization during the canning process, maintaining hygiene, and storing the cans under suitable conditions can prevent this defect.

Quick Tip

Adopt rigorous sterilization techniques in canning to eliminate spore-forming bacteria and ensure food safety.

6. Cheese cancer of Swiss and similar cheeses is caused by—

Options:

1. Oospora caseovorans
2. Oospora aurantiacum
3. Oospora crustacea
4. Oospora caseovorans and Oospora aurantiacum

Correct Answer: 3. Oospora crustacea

Solution:

Cheese cancer, also known as a structural defect in Swiss and similar cheeses, is caused by the growth of Oospora crustacea, a fungal species.

1. Defect Mechanism: The fungus grows on the surface and penetrates the cheese, breaking down the texture and forming hollow cavities or cracks.

2. **Conditions Favoring Growth:** The presence of moisture and improper curing conditions contribute to fungal contamination.
3. **Impact on Quality:** Cheese cancer significantly affects the quality, appearance, and marketability of the cheese.
4. **Prevention:** Using clean equipment, controlling humidity, and maintaining proper curing conditions during cheese production are critical to avoiding this defect.

Quick Tip

Focus on controlling humidity and sanitation during cheese curing to prevent fungal contamination.

7. Ester-like flavors in butter are caused due to the action of—

Options:

1. *Pseudomonas mephitica*
2. *Pseudomonas fragi*
3. *Aeromonas hydrophila*
4. *Pseudomonas synxantha*

Correct Answer: 2. *Pseudomonas fragi*

Solution:

Pseudomonas fragi is a psychrotrophic bacterium that contributes to flavor defects in butter:

1. **Flavor Production:** This bacterium metabolizes milk fats to produce ester compounds, imparting fruity or ester-like flavors to the butter.
2. **Conditions Favoring Growth:** *Pseudomonas* species thrive at low temperatures, making them common in refrigerated dairy products.
3. **Impact:** The ester-like flavors caused by this microorganism reduce the acceptability of butter and indicate microbial spoilage.
4. **Prevention:** Strict hygiene practices, proper pasteurization, and minimizing contamination during production and storage are essential to avoid such defects.

Quick Tip

Store butter at appropriate temperatures and ensure strict hygiene to prevent microbial spoilage.

8. A yellow color in the creamy layer of milk may be caused by—

Options:

1. *Serratia marcescens*
2. *Aeromonas hydrophila*
3. *Pseudomonas syncyanea*
4. *Pseudomonas synxantha*

Correct Answer: 4. *Pseudomonas synxantha*

Solution:

The yellow coloration in the creamy layer of milk is attributed to *Pseudomonas synxantha*, a pigment-producing bacterium:

1. **Pigment Production:** *Pseudomonas synxantha* produces a yellow pigment as a by-product of its metabolic activity.
2. **Contamination Source:** The contamination typically arises from unclean equipment, improper storage, or exposure to unsterilized conditions.
3. **Impact on Milk Quality:** The presence of such pigments not only affects the visual appeal but also indicates microbial spoilage.
4. **Prevention:** Maintaining stringent hygiene standards and proper refrigeration during milk handling and processing can minimize contamination.

Quick Tip

Ensure clean equipment and proper storage conditions to avoid discoloration and spoilage in milk.

9. Following steps are involved in the preparation of _____:

- A. Reception of buffalo milk
- B. Pre-heating and filtration (35–40°C)
- C. Standardization (5.5 to 6% fat and 9% SNF)
- D. Open pan condensing till obtaining pindi type khoa
- E. Heat pindi khoa
- F. Addition of sugar (@30% of khoa or 6% of milk)
- G. Kneading of sugar with a wooden kneader (60°C)

Options:

- 1. Peda
- 2. Burfi
- 3. Gulab Jamun
- 4. Rabari

Correct Answer: 1. Peda

Solution:

The steps described are specific to the preparation of peda, a traditional Indian sweet made from khoa (reduced milk):

- 1. Milk Reception and Standardization: Buffalo milk is typically preferred for its high-fat content, ensuring a rich and creamy texture.
 - 2. Open Pan Condensing: Milk is reduced to form pindi-type khoa, which is the base for peda.
 - 3. Heating and Kneading: The khoa is mixed with sugar and kneaded at around 60°C to achieve the desired consistency.
 - 4. Final Product: The mixture is shaped into peda, known for its soft texture and rich flavor.
- Each step is crucial for maintaining the authentic taste and quality of the sweet.

Quick Tip

Master traditional sweet-making techniques to ensure consistency and authenticity in flavor.

10. Excess fermentation of butter or addition of old butter to fermented cream leads to

_____ **flavor defect in ghee.**

Options:

1. Acidic
2. Curdy
3. Rancid
4. Smoky

Correct Answer: 2. Curdy

Solution:

The curdy flavor defect in ghee is caused by excess fermentation of butter or the use of old butter in the production process. This defect occurs due to the following reasons:

1. **Excessive Fermentation:** During butter fermentation, microbial activity produces volatile compounds and peptides that impart an off-flavor resembling curd or sour milk.

Over-fermentation exacerbates this issue.

2. **Use of Old Butter:** Butter that has been stored for too long develops breakdown products from fat and protein degradation, contributing to the curdy flavor.

3. **Production Issues:** Improper processing conditions, such as insufficient heating during ghee preparation, can allow these off-flavors to persist.

4. **Impact on Quality:** The curdy flavor reduces the sensory appeal and marketability of ghee, as consumers expect a clean, nutty flavor profile.

To prevent this defect, use fresh, high-quality butter and follow controlled fermentation and heating practices.

Quick Tip

Ensure the use of fresh butter and proper heating techniques to maintain the authentic flavor of ghee.

11. Hallikar is a breed of:

1. Cattle
2. Goat
3. Sheep

4. Pig

Correct Answer: 1. Cattle

Solution:

Hallikar is a breed of cattle native to Karnataka, India. Known for its endurance and strength, it is primarily used for agricultural purposes such as plowing and carting. Hallikar cattle are also well-known for their disease resistance and adaptability to local climatic conditions.

Quick Tip

Hallikar cattle play an essential role in traditional farming practices in Karnataka.

12. Match List-I with List-II:

List-I (Species)	List-II (Lipid content)
(A) Buffalo	(I) 6.0
(B) Cow	(II) 3.9
(C) Holstein	(III) 3.5
(D) Guernsey	(IV) 4.9

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
2. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
3. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Correct Answer: 1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution:

The lipid content varies among milk-producing species. Buffalo milk has the highest lipid content at 6.0%, making it rich and creamy. Cow milk contains 3.9%, Holstein milk has 3.5%, and Guernsey milk is valued for its 4.9% lipid content, contributing to its characteristic golden hue due to higher beta-carotene levels.

Quick Tip

Understand lipid variations in milk species for optimal dairy product formulations.

13. The fishy flavor defect in evaporated milk is caused by—

1. Lactococcus lactis ssp. lactis var. maltigenes
2. Candida lactis
3. Proteus ichthyosmius
4. Aspergillus flavus

Correct Answer: 3. Proteus ichthyosmius

Solution:

The fishy flavor defect in evaporated milk is caused by the bacterium *Proteus ichthyosmius*. This microorganism produces trimethylamine, a compound responsible for the fishy odor. Such contamination occurs due to improper sterilization or storage conditions. Strict hygiene and temperature control during production are essential to prevent this defect.

Quick Tip

Maintain rigorous hygiene and sterilization protocols to prevent microbial contamination in milk products.

14. Given below are two statements, one is labelled as Assertion (A) and the other as

Reason (R):

Assertion (A): The HACCP increases food safety and quality standards.

Reason (R): HACCP organizes your process to produce safe food.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

Correct Answer: 1. Both (A) and (R) are true and (R) is the correct explanation of (A).

Solution:

The Hazard Analysis and Critical Control Points (HACCP) system is a proactive approach to food safety. It identifies, evaluates, and controls hazards at critical points in the production

process, ensuring safe food production. By organizing processes effectively, HACCP enhances both safety and quality standards, which aligns (R) as the correct explanation for (A).

Quick Tip

Implement HACCP principles to comply with global food safety standards and ensure high-quality production.

15. Arrange the following steps in the way they are involved in aseptic packaging:

- (A) Filling and sealing system
 - (B) Sterilization of the packaging and the filling environment
 - (C) Material for aseptic packaging
1. (A), (B), (C)
 2. (A), (C), (B)
 3. (C), (A), (B)
 4. (C), (B), (A)

Correct Answer: 4. (C), (B), (A)

Solution:

Aseptic packaging involves three critical steps. The first step is selecting the material for aseptic packaging (C). The second step involves sterilizing the packaging and the filling environment (B) to eliminate any microbial contamination. Finally, the filling and sealing system (A) is utilized to ensure a sterile, safe, and long-lasting product.

Quick Tip

Master the aseptic packaging process to ensure product safety and extended shelf life.

16. In human milk, the major factor concerned for germicidal action is—

1. Lysozyme
2. Leucocytes

3. Complement
4. Bifidus factor

Correct Answer: 4. Bifidus factor

Solution:

The bifidus factor in human milk promotes the growth of *Lactobacillus bifidus*, which helps in maintaining gut health and provides protection against harmful pathogens. By creating an acidic environment unfavorable to pathogens, it enhances the germicidal properties of human milk and boosts an infant's immunity.

Quick Tip

Human milk contains natural germicidal agents like bifidus factor and lysozymes, critical for infant health.

17. In which product is the symbiotic action of bacterial cultures observed?

1. Yoghurt
2. Curd
3. Yakult
4. Acidophilus milk

Correct Answer: 1. Yoghurt

Solution:

Yoghurt is produced through the symbiotic action of *Streptococcus thermophilus* and *Lactobacillus delbrueckii* subsp. *bulgaricus*. These bacteria work together to ferment milk, with each creating conditions that benefit the other. This symbiotic interaction leads to the characteristic flavor, texture, and probiotic benefits of yoghurt, aiding digestion and gut health.

Quick Tip

Symbiotic bacterial cultures in yoghurt enhance its nutritional and probiotic properties.

18. _____ is responsible for milk fever.

1. Hypoglycemia
2. Hypocalcemia
3. Viral infection
4. Hypomagnesemia

Correct Answer: 2. Hypocalcemia

Solution:

Milk fever is a metabolic disorder in dairy cows caused by hypocalcemia, or a severe drop in blood calcium levels. This condition typically occurs after calving, as calcium demand spikes for milk production. Symptoms include weakness, difficulty standing, and, in severe cases, coma. Immediate calcium supplementation is essential for treatment.

Quick Tip

Monitor calcium levels in dairy cows, especially around calving, to prevent milk fever.

19. Pasteurization ensures—

- (A) Least damage to the cream line
 - (B) Complete destruction of spoilage-causing microbes
 - (C) Negative phosphatase test
 - (D) Complete destruction of pathogens
1. (A), (C), and (D) only
 2. (A) and (C) only
 3. (B) only
 4. (A), (B), and (C) only

Correct Answer: 1. (A), (C), and (D) only

Solution:

Pasteurization involves heat treatment to eliminate pathogens, ensuring food safety. It achieves a negative phosphatase test (indicating proper pasteurization) and preserves the

cream line's integrity. However, spoilage-causing microbes may not be fully destroyed without higher temperatures, as pasteurization targets pathogenic organisms.

Quick Tip

Follow pasteurization protocols to ensure safe milk without compromising quality.

20. The advantages of Low Temperature Long Time (LTLT) pasteurization are—

- (A) Less initial investment
 - (B) It is a slow process
 - (C) Easy to clean and maintain
 - (D) Large volume of milk may be processed continuously
1. (A), (B), and (D) only
 2. (A), (B), and (C) only
 3. (A), (B), (C), and (D)
 4. (A) and (C) only

Correct Answer: 4. (A) and (C) only

Solution:

LTLT pasteurization is economical, requiring less initial investment. Its equipment is easy to clean and maintain, making it suitable for small-scale operations. However, it is a slower process and less efficient for handling large volumes of milk compared to HTST methods.

Quick Tip

Choose LTLT pasteurization for small-scale operations with simpler equipment needs.

21. The advantages of High Temperature Short Time (HTST) pasteurization are—

- (A) Milk packaging can start as soon as pasteurization begins
- (B) The capacity can be increased easily by increasing the number of plates
- (C) Less chance of accumulation of milk stone in the vat
- (D) Large volume of milk may be processed continuously

1. (A), (B), and (C) only
2. (A), (B), (C), and (D)
3. (A), (B), and (D) only
4. (B) and (D) only

Correct Answer: 3. (A), (B), and (D) only

Solution:

HTST pasteurization is an efficient method for processing large volumes of milk continuously. Milk packaging can begin immediately after pasteurization, and the system's modular design allows easy capacity upgrades by adding plates to the heat exchanger. However, the accumulation of milk stone in the vat may still occur, requiring periodic cleaning.

Quick Tip

HTST pasteurization is ideal for large-scale production due to its speed and efficiency.

22. Assertion (A): After pasteurization, the amount of inorganic phosphate increases.

Reason (R): Phospholipids and some dissolved esters split.

1. Both (A) and (R) are correct and (R) is the correct explanation of (A)
2. Both (A) and (R) are correct but (R) is NOT the correct explanation of (A)
3. (A) is correct but (R) is not correct
4. (A) is not correct but (R) is correct

Correct Answer: 1. Both (A) and (R) are correct and (R) is the correct explanation of (A)

Solution:

Pasteurization involves heat treatment that breaks down phospholipids and dissolved esters in milk, releasing inorganic phosphate. This chemical change explains the observed increase in inorganic phosphate levels after pasteurization. Thus, (R) directly supports (A).

Quick Tip

Understand the chemical changes caused by pasteurization for better process optimization.

23. The recommended pressure range for homogenization of milk is—

1. 100-120 Kg/cm²
2. 125-135 Kg/cm²
3. 140-175 Kg/cm²
4. 175-200 Kg/cm²

Correct Answer: 3. 140-175 Kg/cm²

Solution:

The homogenization process reduces fat globules in milk, ensuring uniform distribution and preventing cream separation. The optimal pressure range of 140-175 Kg/cm² is necessary to achieve these results while maintaining milk quality and stability. Excessive pressure may damage milk proteins, whereas insufficient pressure leads to incomplete homogenization.

Quick Tip

Maintain the recommended pressure range during homogenization to optimize milk texture and quality.

24. The temperature of milk should not be less than for better homogenization—

1. 40°C
2. 80°C
3. 100°C
4. 60°C

Correct Answer: 4. 60°C

Solution:

For effective homogenization, milk should be heated to at least 60°C. At this temperature, the viscosity of milk decreases, and fat globules become more fluid, allowing for uniform dispersion. Lower temperatures can hinder the homogenization process, resulting in poor quality and instability of the milk product.

Quick Tip

Ensure milk temperature is at least 60°C before homogenization for optimal results.

25. The standard plate count (CFU/g) in ice cream should not be more than as per FSSAI regulations—

1. 3,00,000
2. 2,50,000
3. 60,000
4. 1,00,000

Correct Answer: 2. 2,50,000

Solution:

The Food Safety and Standards Authority of India (FSSAI) stipulates that the standard plate count in ice cream should not exceed 2,50,000 CFU/g. This microbial limit ensures consumer safety and product quality. Regular microbiological testing during production helps maintain compliance with these standards and reduces the risk of contamination.

Quick Tip

Regular microbial testing ensures compliance with regulatory standards and enhances consumer confidence.

26. Four-ply laminated pouch and vacuum packaging enhances the shelf life of khoa up to at refrigeration temperature:

1. 120 days
2. 90 days
3. 60 days

4. 30 days

Correct Answer: 1. 120 days

Solution:

Four-ply laminated pouches combined with vacuum packaging effectively extend the shelf life of khoa to 120 days under refrigeration. This advanced packaging method limits oxygen exposure and microbial growth, ensuring that the khoa remains fresh and free from spoilage for a longer duration.

Quick Tip

Use advanced packaging methods like vacuum sealing to enhance the shelf life of dairy products.

27. Soapy flavor defect in Gulabjamun is caused by:

1. Frying at low temperature for a short time
2. Frying at high temperature for a long time
3. Higher amount of baking powder
4. Lower amount of baking powder

Correct Answer: 3. Higher amount of baking powder

Solution:

The soapy flavor in Gulabjamun is caused by the excessive use of baking powder. Baking powder, when used in higher amounts, reacts chemically during frying, producing undesirable flavors. Precise measurements and adherence to recipe guidelines are essential to prevent such defects.

Quick Tip

Measure baking powder accurately to maintain the desired flavor in confections like Gulabjamun.

28. The yield of rabri from one liter of buffalo milk (Minimum fat 6.0% and SNF 9.0%) will be:

1. 10-20%
2. 20-30%
3. 30-40%
4. 40-45%

Correct Answer: 4. 40-45%

Solution:

Rabri preparation involves slow heating and condensing of buffalo milk, which is rich in fat and SNF. This high concentration of solids yields about 40-45% of the original volume. Buffalo milk's composition makes it ideal for producing thick and creamy rabri.

Quick Tip

Choose high-fat buffalo milk for maximum yield and superior texture in rabri production.

29. Acidic flavor defect in cream is caused due to:

1. Use of sour milk for cream separation
2. Hydrolysis of fat by the action of lipase enzyme
3. Undesirable microbial contamination
4. Oxidation of the fat content due to exposure to strong sunlight

Correct Answer: 1. Use of sour milk for cream separation

Solution:

Using sour milk for cream separation introduces lactic acid formed during microbial fermentation, resulting in an acidic flavor defect. Properly storing milk and using fresh milk for cream production prevents this issue.

Quick Tip

Ensure the use of fresh, high-quality milk to maintain the sensory qualities of cream.

30. Cheesy/putrid flavor defect in cream and butter is caused by:

1. Pseudomonas synxantha
2. Pseudomonas putrefaciens
3. Coliform
4. Pseudomonas nigrifaciens

Correct Answer: 2. Pseudomonas putrefaciens

Solution:

Pseudomonas putrefaciens produces enzymes that degrade proteins in cream and butter, resulting in putrid or cheesy flavors. Proper hygiene practices during processing and storage at low temperatures are essential to prevent bacterial growth and spoilage.

Quick Tip

Implement rigorous hygiene standards and cold storage to prevent spoilage in dairy products.

31. Alkaline flavor defect in butter is caused due to:

1. Use of sour neutralized cream
2. Over neutralization of cream
3. Storage of butter at high temperature for a long period
4. Use of milk from animals who consume bitter weeds

Correct Answer: 2. Over neutralization of cream

Solution:

Over neutralization of cream occurs when excessive alkali is added to balance acidity. This results in an off-flavor that can be described as alkaline. Controlling the neutralization process ensures a balanced pH, maintaining the sensory quality of butter.

Quick Tip

Monitor the cream's neutralization process to avoid introducing off-flavors in butter.

32. Cheesy flavor defect in butter is caused due to:

1. Over neutralization of cream
2. Storage of butter at high temperature for a long period
3. Use of milk from animals who consume bitter weeds
4. Growth of proteolytic bacteria causing casein breakdown

Correct Answer: 4. Growth of proteolytic bacteria causing casein breakdown

Solution:

Proteolytic bacteria break down casein into peptides and amino acids, leading to a cheesy flavor defect in butter. These bacteria can proliferate if proper hygiene practices are not followed during production. Regular cleaning and sterilization of equipment are vital to avoid this issue.

Quick Tip

Adopt stringent sanitation measures in butter production to prevent microbial contamination.

33. The best storage temperature for ghee is between:

1. 20–25°C
2. 25–30°C
3. 20–30°C
4. 30–35°C

Correct Answer: 3. 20–30°C

Solution:

Storing ghee at 20–30°C helps preserve its texture, flavor, and shelf life. This temperature range minimizes the risk of oxidation, which can lead to rancidity. Ghee stored outside this range may experience quality degradation, affecting its usability and taste.

Quick Tip

Store ghee in a cool, dry place to ensure its longevity and maintain its flavor profile.

34. Match List-I with List-II:

List-I (Ghee manufacturing method)	List-II (Fat recovery %)
(A) Indigenous method	(I) 92
(B) Direct cream method	(II) 93
(C) Creamy-butter method	(III) 88–92
(D) Pre-stratification method	(IV) 88–90

1. (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
2. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
3. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Correct Answer: 1. (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

Solution:

Different ghee manufacturing methods yield varying fat recovery rates. The indigenous method typically recovers 88–90%, while the direct cream method has a recovery rate of around 92%. Creamy-butter methods achieve 88–92%, and the pre-stratification method provides the highest recovery at 93%. Understanding these methods aids in optimizing production efficiency.

Quick Tip

Select a ghee manufacturing method based on production needs and fat recovery efficiency.

35. The optimum combination (ratio) of cocci and rod-shaped bacteria in yoghurt culture should be

1. 1:1
2. 1:2

3. 1:3

4. 1:4

Correct Answer: 1. 1:1

Solution:

In yoghurt fermentation, the ideal ratio of cocci (e.g., *Streptococcus thermophilus*) to rod-shaped bacteria (e.g., *Lactobacillus delbrueckii* subsp. *bulgaricus*) is 1:1. This balance ensures proper acid development, texture formation, and flavor enhancement. A deviation from this ratio can adversely affect yoghurt quality.

Quick Tip

Maintain a balanced ratio of bacterial cultures to optimize yoghurt quality and fermentation efficiency.

36. Which culture combination is used for Bifighurt?

- (A) *Streptococcus thermophilus*
 - (B) *Lactobacillus delbrueckii* ssp. *bulgaricus*
 - (C) *Bifidobacterium bifidum*
 - (D) *Lactobacillus acidophilus*
1. (A) and (B) only
 2. (A), (B), and (D) only
 3. (A), (B), and (C) only
 4. (B), (C), and (D) only

Correct Answer: 3. (A), (B), and (C) only

Solution:

Bifighurt is a probiotic yoghurt product that uses a combination of *Streptococcus thermophilus* (A), *Lactobacillus delbrueckii* ssp. *bulgaricus* (B), and *Bifidobacterium bifidum* (C). These bacteria work symbiotically to enhance probiotic benefits, improve gut health, and provide a balanced taste and texture. *Lactobacillus acidophilus* (D) is not typically used in Bifighurt.

Quick Tip

Use specific bacterial combinations for functional dairy products like Bifihurt to maximize health benefits.

37. Metallic flavor defect in lassi is caused due to:

1. Contamination of milk with zinc or chromium during heating
2. Contamination of milk with nickel or copper during heating
3. Contamination of milk with iron or magnesium during heating
4. Contamination of milk with iron or copper during heating

Correct Answer: 4. Contamination of milk with iron or copper during heating

Solution:

A metallic flavor in lassi arises from the leaching of metals like iron or copper into milk during heating. These metals catalyze oxidation reactions, which produce off-flavors. Avoiding the use of metallic containers or ensuring proper maintenance of equipment can prevent this defect.

Quick Tip

Use stainless steel or food-grade equipment to prevent metallic contamination in dairy products.

38. High acid and high alcohol kumiss should have the following composition:

1. 1.0% Lactic acid and 1.7–2.5% Ethanol
2. 0.8–1.0% Lactic acid and 2.5–3.0% Ethanol
3. 0.7% Lactic acid and 1.0–1.7% Ethanol
4. 0.6% Lactic acid and 0.5–1.0% Ethanol

Correct Answer: 1. 1.0% Lactic acid and 1.7–2.5% Ethanol

Solution:

Kumiss, a traditional fermented dairy product, contains both lactic acid and ethanol. The high acid and high alcohol variant has approximately 1.0% lactic acid and 1.7–2.5% ethanol, resulting from a dual fermentation process involving lactic acid bacteria and yeasts. This composition gives kumiss its distinct tangy and slightly alcoholic flavor.

Quick Tip

Study the fermentation conditions for kumiss to understand the interplay between acid and alcohol production.

39. The isoelectric pH of casein is:

1. 3.6
2. 5.6
3. 4.6
4. 6.6

Correct Answer: 3. 4.6

Solution:

The isoelectric pH of casein, the major protein in milk, is 4.6. At this pH, casein molecules lose their net charge, leading to aggregation and precipitation. This property is utilized in processes like cheese-making and acid coagulation of milk.

Quick Tip

Understanding the isoelectric point of casein is crucial for optimizing dairy product formulations.

40. Ice cream mix is homogenized at 2500 psi:

- (A) To decrease the milk fat globule size
- (B) To form a better emulsion
- (C) To contribute a smoother, creamier ice cream
- (D) To ensure emulsifier and stabilizer are well blended and evenly distributed in the ice cream mix

1. (A), (B), and (D) only
2. (A), (B), and (C) only
3. (A), (B), (C), and (D)
4. (B), (C), and (D) only

Correct Answer: 3. (A), (B), (C), and (D)

Solution:

Homogenization at 2500 psi reduces the size of milk fat globules (A), improves emulsion stability (B), and ensures a smoother and creamier texture in ice cream (C). Additionally, it evenly disperses emulsifiers and stabilizers throughout the mix (D). This process is critical for achieving high-quality ice cream.

Quick Tip

Homogenization ensures consistent texture and quality in ice cream production by optimizing fat dispersion.

41. The shelf life of ice cream at -18 to -29°C is near about:

1. 60 days
2. 180 days
3. 120 days
4. 90 days

Correct Answer: 2. 180 days

Solution:

At temperatures between -18 to -29°C, ice cream can be stored for approximately 180 days. This extended shelf life is due to the inhibition of microbial growth and enzymatic activity at such low temperatures, which helps maintain the product's quality, flavor, and safety.

Quick Tip

Ensure consistent freezing temperatures to maintain ice cream quality and extend its shelf life.

42. Storage of paneer at higher temperatures leads to:

1. Sour flavor defect
2. Stale flavor defect
3. Flat flavor defect
4. Rancid flavor defect

Correct Answer: 4. Rancid flavor defect

Solution:

Higher storage temperatures cause the fat in paneer to oxidize, resulting in a rancid flavor defect. Lipid oxidation produces off-flavors and odors, negatively impacting the sensory qualities of paneer. Proper refrigeration below 4°C is essential to prevent this defect and ensure freshness.

Quick Tip

Store paneer below 4°C to avoid rancidity and extend its shelf life.

43. Good quality of chhana can be obtained from cow milk when it is coagulated at _____ temperature:

1. 78°C
2. 80°C
3. 82°C
4. 84°C

Correct Answer: 3. 82°C

Solution:

Cow milk coagulates optimally at 82°C for the preparation of high-quality chhana. At this temperature, casein proteins form a uniform matrix, resulting in a soft and smooth texture suitable for traditional sweets like rasgulla and sandesh. Consistent temperature control is key to achieving the desired product quality.

Quick Tip

Monitor coagulation temperatures closely to ensure consistent quality in chhana production.

44. The presence of colostrum in milk leads to _____ body and texture defect in chhana:

1. Pasty
2. Loose
3. Grainy
4. Gummy mass

Correct Answer: 1. Pasty

Solution:

Colostrum contains high protein content, which alters the texture of chhana, resulting in a pasty consistency. This defect makes the chhana unsuitable for traditional sweet preparation. Screening milk for colostrum before processing is essential to prevent this issue.

Quick Tip

Avoid using colostrum milk for chhana production to maintain the desired texture.

45. Presence of colostrum in milk leads to a deeper _____ color and appearance defect:

1. Brown
2. Red
3. Violet
4. Yellow

Correct Answer: 4. Yellow

Solution:

Colostrum in milk contains higher levels of carotenoids and proteins, which contribute to a deeper yellow color in the processed product. This distinct color can make dairy products

like chhana or paneer less appealing. Testing milk for colostrum before processing is essential for maintaining product quality.

Quick Tip

Test milk for colostrum before processing to maintain the visual quality of dairy products.

46. For the production of rasogolla, the cow milk is heated to:

1. 70 to 74°C
2. 75 to 76°C
3. 76 to 80°C
4. 80 to 84°C

Correct Answer: 2. 75 to 76°C

Solution:

For rasogolla production, cow milk is heated to 75 to 76°C before coagulation. This precise temperature ensures the denaturation of proteins, particularly casein, which is essential for forming a spongy texture that absorbs sugar syrup effectively.

Quick Tip

Control milk heating temperatures to achieve the perfect texture in rasogolla.

47. Caseinate is used as a source of:

1. Protein
2. Vitamin
3. Acid
4. Base

Correct Answer: 1. Protein

Solution:

Caseinate, a derivative of casein, is a rich source of high-quality protein. It is used extensively in nutritional supplements, functional foods, and beverages due to its excellent solubility and amino acid profile. Caseinate provides essential nutrients critical for muscle growth and recovery.

Quick Tip

Caseinate is widely used in protein-rich food formulations for athletes and health-conscious individuals.

48. Ghee residue is a by-product of the ghee manufacturing industry, and _____ tonnes are produced per annum in India:

1. 61,000
2. 71,000
3. 81,000
4. 91,000

Correct Answer: 4. 91,000

Solution:

India produces approximately 91,000 tonnes of ghee residue annually. This by-product is rich in proteins, fats, and antioxidants, making it a valuable resource for applications such as animal feed, food ingredient formulation, or even as a raw material for biofuel production.

Quick Tip

Explore innovative uses of ghee residue to reduce waste and add value in the dairy industry.

49. Which of the following byproducts of the dairy industry is used as a natural antioxidant for improving the shelf life of food products?

1. Caseinates
2. Casein
3. Ghee residue

4. Buttermilk

Correct Answer: 3. Ghee residue

Solution:

Ghee residue is known for its natural antioxidant properties, primarily due to its tocopherol content. These antioxidants help prevent oxidative rancidity in food products, extending their shelf life. Its application in food industries is an eco-friendly alternative to synthetic preservatives.

Quick Tip

Incorporate ghee residue in food products as a natural alternative to synthetic antioxidants.

50. Ghee residue can be utilized in the preparation of:

(A) Chocolate

(B) Burfi

(C) Samosa filling

(D) Chapatis

(E) Shrikhand

1. (A), (B), (D), and (E) only

2. (A), (B), and (C) only

3. (A), (B), (C), and (D)

4. (A), (B), (C), (D), and (E) only

Correct Answer: 3. (A), (B), (C), and (D)

Solution:

Ghee residue is versatile and finds applications in various food preparations such as chocolate (A), burfi (B), samosa fillings (C), and chapatis (D). Its rich flavor and nutrient content enhance the sensory and nutritional value of these products. Shrikhand (E) does not typically use ghee residue as an ingredient.

Quick Tip

Leverage the culinary potential of ghee residue in innovative food recipes.

51. The purpose of packaging is:

- (A) To protect a product from contamination of microorganisms
 - (B) To protect a product from damage during transportation
 - (C) To keep the product together
 - (D) To protect a product from environmental changes
1. (A), (B), and (D) only
 2. (A), (B), and (C) only
 3. (A), (B), (C), and (D)
 4. (B), (C), and (D) only

Correct Answer: 3. (A), (B), (C), and (D)

Solution:

Packaging serves as a multi-functional solution that ensures product integrity and safety during its lifecycle. It protects the product from contamination by microorganisms (A), reducing spoilage and extending shelf life. During transportation, it prevents physical damage (B) caused by mishandling or environmental stress. Keeping the product together (C) simplifies logistics and enhances product usability. Furthermore, packaging safeguards against environmental changes such as temperature, humidity, or light (D), maintaining product quality and functionality. These purposes collectively emphasize the critical role of packaging in the product supply chain.

Quick Tip

Select packaging materials based on the product's specific protection requirements, such as barrier properties or durability.

52. Which of the following is NOT required for a packaging material?

- (A) Packaging material should not react with products
- (B) It should be non-toxic and non-tainting
- (C) Should be appealing to product presentation
- (D) Should have printing characteristics
- (E) It should be difficult to open, distribute, reseal, and store

1. (B) only
2. (A), (B), and (C) only
3. (E) only
4. (A), (B), (C), and (D) only

Correct Answer: 3. (E) only

Solution:

An ideal packaging material must meet several requirements to ensure product safety, usability, and consumer satisfaction. Properties such as non-reactivity with the product (A), being non-toxic and non-tainting (B), and appealing presentation (C) are essential to maintain product integrity and consumer trust. Printing characteristics (D) facilitate branding and product information dissemination. However, packaging that is difficult to handle, open, reseal, or store (E) reduces consumer convenience and usability, making it an undesirable feature. Hence, ensuring ease of use is as crucial as maintaining protective qualities.

Quick Tip

Focus on user-friendly designs while selecting or designing packaging materials to enhance consumer experience.

53. Which of the following tests are used to check the quality of packaging material?

- (A) Bursting strength
- (B) Clot on boiling test
- (C) Puncture strength
- (D) Water vapor transmission rate
- (E) Acidity test

1. (A), (B), (C), and (D) only
2. (A), (C), and (D) only
3. (A), (B), (C), and (E) only
4. (B), (C), and (E) only

Correct Answer: 2. (A), (C), and (D) only

Solution:

Quality control tests for packaging materials ensure their performance and suitability for specific applications. Bursting strength (A) measures the material's resistance to rupture under pressure, reflecting its durability during handling and storage. Puncture strength (C) evaluates resistance to perforation, critical for products with sharp or irregular contents. Water vapor transmission rate (D) determines the material's barrier properties against moisture, essential for products sensitive to humidity. Tests like clot on boiling (B) or acidity (E) are unrelated to packaging quality, focusing instead on food or chemical characteristics.

Quick Tip

Always conduct comprehensive quality testing to verify packaging material performance for intended uses.

54. Which of the following is NOT an advantage of plastics in the dairy industry?

1. Only food-grade plastic should be used in milk products
2. Most plastics are reusable
3. Loss of moisture from dairy products is nil
4. Low cost and ease of fabrication

Correct Answer: 1. Only food-grade plastic should be used in milk products

Solution:

In the dairy industry, plastics are widely used due to their several advantages, including reusability (2), cost-effectiveness, and ease of fabrication (4). Additionally, plastics prevent moisture loss (3), maintaining the quality and texture of dairy products. However, the use of

food-grade plastic is a safety requirement rather than an advantage. Food-grade certification ensures that the plastic does not leach harmful substances into the dairy products, aligning with health and safety standards.

Quick Tip

Ensure that only certified food-grade plastics are used in the packaging of consumable products to maintain safety and compliance.

55. In Modified Atmosphere Packaging ----- gases are used:

1. N_3 , CO_2 , and H_2
2. N_2 , CO , and O_2
3. CO , CO_2 , and O_2
4. N_2 , CO_2 , and O_2

Correct Answer: 4. N_2 , CO_2 , and O_2

Solution:

Modified Atmosphere Packaging (MAP) uses a combination of gases, including nitrogen (N_2), carbon dioxide (CO_2), and oxygen (O_2), tailored to the specific requirements of the food product. Nitrogen acts as a filler gas that prevents oxidative reactions. Carbon dioxide inhibits microbial growth, while oxygen is sometimes retained in small quantities for respiration of fresh produce. This blend of gases significantly extends the shelf life and maintains the quality of perishable food items.

Quick Tip

Customize gas mixtures in MAP based on the nature of the product to achieve optimal preservation results.

56. Modified Atmosphere Packaging increases shelf life by:

1. 50–100%
2. 50–400%

3. 50–300%

4. 50–200%

Correct Answer: 2. 50–400%

Solution:

The use of Modified Atmosphere Packaging (MAP) can extend the shelf life of food products by 50–400%, depending on the product's type, storage conditions, and gas mixture used. This preservation method slows down microbial growth, reduces oxidation, and minimizes moisture loss. For fresh produce, MAP helps maintain freshness by delaying ripening. Similarly, it protects processed foods by creating a barrier against environmental factors, significantly extending usability and reducing food wastage.

Quick Tip

Implement MAP strategically for high-perishability foods to reduce spoilage and improve supply chain efficiency.

57. The effective pH range for benzoic acid used as a chemical preservative in milk and milk products is:

1. 2.5–4.0

2. \geq 5.0

3. 4.0–5.0

4. 2.0–3.0

Correct Answer: 1. 2.5–4.0

Solution:

Benzoic acid is most effective as a preservative in acidic conditions, specifically within the pH range of 2.5–4.0. In this range, the acid remains undissociated, which enhances its antimicrobial properties by disrupting the cell membranes of microorganisms. This makes it suitable for acidic foods such as milk products like yoghurt and cheese, where it inhibits the growth of molds, yeasts, and some bacteria without affecting the taste or quality.

Quick Tip

For optimal preservation, maintain the pH of food systems within the effective range of the chosen preservative.

58. Which of the following herbs are NOT used in the preservation of milk and milk products?

1. Cinnamon, cloves, and red chili
2. Saffron, cloves, and black pepper
3. Ginger, cardamom, and cloves
4. Saffron, cloves, and green chili

Correct Answer: 4. Saffron, cloves, and green chili

Solution:

Herbs like cinnamon, cloves, and black pepper are traditionally used in preserving milk and milk products due to their antimicrobial and antioxidant properties. These herbs inhibit spoilage organisms and extend product shelf life. However, saffron and green chili lack the significant preservative qualities required for dairy products, making them less effective in this context.

Quick Tip

Incorporate proven antimicrobial herbs for natural preservation to reduce dependency on synthetic preservatives.

59. The main end product (metabolite) of homofermentative lactic acid bacterial cultures during milk fermentation is:

1. Acetic acid
2. Lactic acid
3. Propionic acid, CO₂, and ethanol
4. Lactic acid, acetic acid, propionic acid, CO₂, and ethanol

Correct Answer: 2. Lactic acid

Solution:

Homofermentative lactic acid bacteria (LAB) primarily produce lactic acid as the main metabolite during milk fermentation. This process lowers the pH, making the environment unfavorable for spoilage organisms and pathogens. The production of lactic acid also contributes to the characteristic tangy flavor and texture of fermented dairy products like yogurt, cheese, and kefir, ensuring safety and sensory appeal.

Quick Tip

Select homofermentative LAB strains for efficient lactic acid production and consistent fermentation results.

60. The pH-neutral, water-soluble, low molecular weight substance, which is non-bacteriocin and resistant to nuclease, protease, and lipolytic enzymes, is:

1. Reuterin
2. Bacteriocins
3. Nutmeg
4. Cardamom

Correct Answer: 1. Reuterin

Solution:

Reuterin is a bioactive compound produced by *Lactobacillus reuteri*. It is pH-neutral, water-soluble, and effective against a broad spectrum of microorganisms, including bacteria, fungi, and protozoa. Unlike bacteriocins, Reuterin is resistant to enzymatic degradation by nucleases, proteases, and lipases, making it a robust preservative in dairy products. Its versatility and natural origin make it an attractive alternative to synthetic preservatives.

Quick Tip

Utilize Reuterin for its broad-spectrum antimicrobial activity to enhance the safety and shelf life of food products.

61. The most important bacteriocins used as bio-preservatives include:

1. Nisin, pediocins, bifidin, and sakacins
2. Nisin, reuterin, bifidin, and sakacins
3. Nisin, pediocins, bifidin, and reuterin
4. Reuterin, pediocins, bifidin, and sakacins

Correct Answer: 1. Nisin, pediocins, bifidin, and sakacins

Solution:

Bacteriocins are antimicrobial peptides produced by bacteria that inhibit the growth of other microorganisms. Among the most important bacteriocins used as bio-preservatives are:

- Nisin: Widely used in food preservation, it is effective against gram-positive bacteria, including spore-forming organisms such as *Clostridium* species.
- Pediocins: Produced by *Pediococcus* species, these are especially useful in controlling *Listeria monocytogenes*, a significant foodborne pathogen.
- Bifidin: Produced by bifidobacteria, it contributes to the inhibition of harmful bacteria while promoting gut health.
- Sakacins: Produced by *Lactobacillus sakei*, these are particularly effective in meat preservation.

These bacteriocins work by disrupting bacterial cell membranes, leading to leakage of cellular contents and eventual cell death. They are natural, safe, and efficient for extending shelf life and ensuring food safety.

Quick Tip

Leverage bacteriocins like nisin and pediocins to control pathogens and spoilage microorganisms in food products naturally.

62. *Lactococcus lactis* ssp. *lactis* produces which of the following antibacterial substances during fermentation:

1. Pediocins

2. Bifidin
3. Nisin
4. Sakacins

Correct Answer: 3. Nisin

Solution:

Nisin is an antimicrobial peptide (bacteriocin) produced by *Lactococcus lactis* ssp. *lactis* during fermentation. It is one of the most studied and widely used bio-preservatives in the food industry. Nisin is effective against gram-positive bacteria, particularly spore-forming pathogens such as *Clostridium* and *Bacillus* species, which can cause spoilage or foodborne illnesses. Its mode of action involves binding to bacterial membranes, creating pores that disrupt the proton motive force and cause cell death. Due to its safety and efficiency, nisin is approved by regulatory agencies worldwide and is frequently used in dairy products, canned foods, and beverages.

Quick Tip

Incorporate nisin into preservation strategies for its high efficacy against gram-positive spoilage organisms.

63. Which of the following is not a natural inhibitory substance found in raw milk?

1. Lactoferrin
2. Nisin
3. Immunoglobulins
4. Lysozyme

Correct Answer: 2. Nisin

Solution:

Raw milk contains several natural inhibitory substances that contribute to its antimicrobial defense:

- Lactoferrin: Binds to iron, making it unavailable for bacterial growth, thus inhibiting pathogens.

- Immunoglobulins: These are antibodies that provide passive immunity and target specific pathogens.
- Lysozyme: Breaks down bacterial cell walls, particularly in gram-positive bacteria, leading to cell lysis.

Nisin, however, is not naturally present in raw milk. It is a bacteriocin synthesized by certain bacteria, such as *Lactococcus lactis*, during fermentation. While highly effective as a bio-preservative, it must be added externally to raw milk or dairy products.

Quick Tip

Focus on enhancing the natural inhibitory properties of raw milk for safe and minimally processed products.

64. How will you detect the presence of urea in milk?

1. When adulterated milk is treated with HCl and Resorcinol powder and boiled in water, it will give a red color
2. When adulterated milk is mixed with para-dimethyl amino benzaldehyde, it will become deep yellow colored
3. When adulterated milk is treated with para-phenylenediamine hydrochloric acid, it will give a dark blue color
4. When adulterated milk is treated with ferric chloride solution and concentrated sulfuric acid, violet color develops at the junction of two layers

Correct Answer: 2. When adulterated milk is mixed with para-dimethyl amino benzaldehyde, it will become deep yellow colored

Solution:

Urea is a common adulterant added to milk to increase its nitrogen content artificially, which mimics higher protein levels. Its presence can be detected using para-dimethyl amino benzaldehyde (DMAB). When milk containing urea is treated with DMAB, a chemical reaction occurs that produces a distinct deep yellow color. This reaction is based on the formation of a complex between urea and DMAB in an acidic medium, providing a simple

and reliable test for urea adulteration.

Quick Tip

Conduct routine tests for urea and other adulterants to maintain the quality and safety of milk products.

65. The following reaction is used for the detection of _____ adulteration in milk sample:



1. Sodium carbonate
2. Urea
3. Sugar
4. Hydrogen peroxide

Correct Answer: 1. Sodium carbonate

Solution:

Sodium carbonate, a common alkaline adulterant, is sometimes added to milk to neutralize acidity resulting from bacterial activity. The presence of sodium carbonate can be detected by adding silver nitrate (AgNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) to the milk sample. In an alkaline medium, this reaction produces a yellow coloration, which confirms the presence of sodium carbonate. This test helps ensure that milk is free from such chemical adulterants, which can compromise its safety and quality.

Quick Tip

Verify milk for alkaline adulterants like sodium carbonate to prevent health hazards.

66. The following reaction is used for the detection of _____ adulteration in milk sample:



1. Urea
2. Sugar
3. Formaldehyde
4. Water

Correct Answer: 2. Sugar

Solution:

Sugar is sometimes added to milk as an adulterant to artificially increase its density and improve the appearance of dilution. The presence of sugar can be detected using hydrochloric acid (HCl) and resorcinol powder. When the milk sample is treated with these chemicals and boiled, a reaction occurs that forms a red-colored compound, confirming the presence of added sugar. This reaction is specific to certain sugar derivatives and serves as a reliable method for identifying sugar adulteration.

Quick Tip

Conduct targeted chemical tests for common milk adulterants like sugar to ensure product authenticity.

67. At birth, calves will normally have_____ temporary incisors ready to appear through the gums of the jaw:

1. Two
2. Four
3. Eight
4. Twelve

Correct Answer: 3. Eight

Solution:

Newborn calves typically have eight temporary (deciduous) incisors ready to emerge through their gums. These include four central incisors and four lateral incisors, which are crucial for the calf's initial grazing and feeding needs. As the calf matures, these temporary incisors are

gradually replaced by permanent teeth. Monitoring the eruption of these teeth is important for assessing the age and developmental milestones of calves, which can influence feeding strategies and general care.

Quick Tip

Track dental development in calves to monitor their growth and dietary readiness.

68. Match List-I with List-II:

List-I (Name of the Breeds)	List-II (Origin State of the Breed)
(A) Sahiwal	(I) Madhya Pradesh
(B) Tharparkar	(II) Maharashtra
(C) Nimari	(III) Punjab
(D) Dangi	(IV) Hyderabad

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
2. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
3. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Correct Answer: 4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Solution:

The correct matches are:

- (A) Sahiwal - Punjab (III): Known for its high milk production, Sahiwal is a superior dairy breed originating from Punjab.
- (B) Tharparkar - Hyderabad (IV): A dual-purpose breed, Tharparkar is suitable for both milk production and draught purposes.
- (C) Nimari - Madhya Pradesh (I): This breed is primarily used for agricultural labor due to its strong build.
- (D) Dangi - Maharashtra (II): Adapted to hilly terrain, Dangi is valued for its strength and ability to work in rugged conditions.

These breeds reflect the specific adaptations and utility based on their geographic and climatic origins.

Quick Tip

Understand the unique traits of cattle breeds to optimize their use in dairy and agricultural applications.

69. Arrange the following breeds of buffaloes according to decreasing order of their lactation yield:

(A) Jaffarabadi

(B) Mehsana

(C) Bhadawari

1. (A), (B), (C)

2. (B), (A), (C)

3. (C), (A), (B)

4. (C), (B), (A)

Correct Answer: 1. (A), (B), (C)

Solution:

The lactation yield of buffalo breeds varies significantly based on genetic traits and management practices. Among the listed breeds:

- Jaffarabadi buffaloes have the highest lactation yield due to their superior genetics and large body size.
- Mehsana buffaloes are known for their consistent milk production, placing them second.
- Bhadawari buffaloes, while valued for their milk's high fat content, have lower overall lactation yields compared to the other two breeds.

This ranking is critical for dairy farmers aiming to maximize milk production efficiency.

Quick Tip

Select buffalo breeds based on lactation yield and milk composition to meet specific dairy production goals.

70. Buffalo population in India is:

1. 120 million
2. 85 million
3. 140 million
4. 150 million

Correct Answer: 2. 85 million

Solution:

India has a buffalo population of approximately 85 million, accounting for the largest buffalo population in the world. Buffaloes are a crucial component of India's dairy industry, contributing significantly to the production of milk and milk products. They are preferred for their higher fat content milk, which is ideal for making butter, ghee, and traditional dairy products. This large population underscores the importance of buffalo husbandry in India's agricultural economy.

Quick Tip

Encourage sustainable buffalo rearing practices to support India's growing dairy demands.

71. The native state of Surati buffalo breed is:

1. Bihar
2. Maharashtra
3. Uttar Pradesh
4. Gujarat

Correct Answer: 4. Gujarat

Solution:

The Surati buffalo, originating from Gujarat, is known for its high milk yield and resilience to local climatic conditions. This breed is particularly valued for its adaptability and contribution to dairy production in the state. The Surati buffalo plays a significant role in supporting rural livelihoods through milk production and draught power.

Quick Tip

Focus on native breeds like Surati buffalo for sustainable dairy farming practices in their respective regions.

72. The dual-purpose breed of cow is:

1. Sindhi
2. Mehsana
3. Sahiwal
4. Tharparkar

Correct Answer: 4. Tharparkar

Solution:

The Tharparkar cow is a dual-purpose breed native to Rajasthan. It excels in both milk production and agricultural draught work. Adapted to arid climates, this breed is capable of surviving harsh conditions while maintaining productivity. Its ability to thrive with minimal resources makes it a valuable asset in mixed farming systems.

Quick Tip

Dual-purpose breeds like Tharparkar are ideal for regions where both milk and draught power are critical.

73. Which of the following element is NOT present in milk:

1. K

2. Fe
3. Mg
4. Ca

Correct Answer: 2. Fe

Solution:

Milk is rich in essential minerals such as potassium (K), magnesium (Mg), and calcium (Ca), which are crucial for maintaining bone health and electrolyte balance. However, it contains negligible amounts of iron (Fe), making it insufficient as a primary source of dietary iron. This is why milk-based diets are often supplemented with iron-rich foods like spinach or meat to meet nutritional requirements.

Quick Tip

Incorporate iron-rich foods into diets alongside milk to ensure balanced nutrition.

74. Better quality chhana is prepared from:

1. Cow milk
2. Buffalo milk
3. Sheep milk
4. Camel milk

Correct Answer: 1. Cow milk

Solution:

Cow milk is preferred for preparing chhana, particularly for delicate Indian sweets like rasgulla and sandesh. Its lower fat content and balanced protein composition yield a softer and more elastic chhana, ideal for such applications. Buffalo milk, although richer in fat, produces a firmer and denser chhana, which may not be suitable for certain sweets.

Quick Tip

For soft-textured sweets, opt for cow milk due to its balanced fat and protein levels.

75. Match List-I with List-II:

List-I (Name of the Bacteria)	List-II (Shape of Their Cell)
(A) Coccus	(I) Spherical
(B) Bacillus	(II) Rod-shaped
(C) Vibrio	(III) Curved rods
(D) Spirillum	(IV) Coiled threads

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
2. (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
3. (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Correct Answer: 1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution:

The morphology of bacterial cells is crucial for their identification and classification:

- Coccus (I): Spherical bacteria, such as Staphylococcus and Streptococcus.
- Bacillus (II): Rod-shaped bacteria, like Escherichia coli and Bacillus subtilis.
- Vibrio (III): Curved rod bacteria, such as Vibrio cholerae.
- Spirillum (IV): Spiral-shaped bacteria, such as Spirillum volutans.

Understanding these shapes helps in diagnosing diseases and developing targeted treatments.

Quick Tip

Learn bacterial morphologies for accurate identification and microbial research.