

CUET PG 2026 Food Engineering Question Paper with Solutions

Time Allowed :1 Hour 30 Minutes	Maximum Marks :300	Total Questions :75
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General Instructions

Read the following instructions very carefully and strictly follow them:

- The Question Paper consists of 75 Multiple Choice Questions (MCQs).
- Total marks for the exam is 300.
- The total duration is 90 minutes; a timer on the screen will display the remaining time, and the exam will automatically submit when the time reaches zero.
- For every correct answer, 4 marks (+4) will be awarded to the candidate, and a 1 mark (-1) will be deducted for every incorrect answer.
- Question papers are available in both English and Hindi.

1. Which law states that the energy required for size reduction is proportional to the change in surface area?

- (A) Rittinger's Law
- (B) Kick's Law
- (C) Bond's Law
- (D) Newton's Law

Correct Answer: (A) Rittinger's Law

Solution:

Step 1: Understanding the Question:

The question asks to identify the scientific law that relates the energy needed for size reduction (crushing or grinding) to the increase in the surface area of the particles.

Step 2: Key Concepts and Theories:

In the field of mechanical operations, particularly comminution (size reduction), there are three main theories that estimate the energy requirement:

- **Rittinger's Law:** This law postulates that the energy consumed is directly proportional to the new surface area created. It is most applicable for fine grinding, where a large increase in surface area occurs.
- **Kick's Law:** This law states that the energy required is proportional to the logarithm of the reduction ratio. It is more accurate for coarse crushing of large particles.
- **Bond's Law:** This law provides a middle ground and states that the energy is proportional to the square root of the surface-to-volume ratio. It is useful for a wide range of particle sizes.

Step 3: Detailed Explanation:

- The question specifically asks for the law where energy is proportional to the "change in

surface area.”

- According to its definition, Rittinger’s Law fits this description perfectly. The fundamental assumption is that all energy input is used to create new surfaces.
- Kick’s Law relates energy to the size ratio, not the surface area.
- Bond’s Law is an intermediate theory.
- Newton’s Law relates to motion and force and is irrelevant to this context.

Step 4: Final Answer:

Therefore, Rittinger’s Law is the correct answer as it directly links the energy for size reduction to the change in surface area.

💡 Quick Tip

To easily remember the size reduction laws, associate them with the type of grinding: **Rittinger’s Law** is for **fine** grinding (more surface area), **Kick’s Law** is for **coarse** crushing, and **Bond’s Law** is the **intermediate** or ”work index” law that works for most cases.

2. What does the acronym GRAS stand for in food safety regulations?

- (A) Generally Recognized As Safe
- (B) Government Regulated Approved Substances
- (C) Global Regulation and Safety Standards
- (D) Generally Required Approved Substances

Correct Answer: (A) Generally Recognized As Safe

Solution:

Step 1: Understanding the Question:

The question asks for the full form of the acronym GRAS, which is a key term in food safety and regulations, particularly in the United States under the Food and Drug Administration (FDA).

Step 2: Detailed Explanation:

- The acronym **GRAS** stands for ”**Generally Recognized As Safe.**”
- This is a designation given by the FDA to food additives that experts consider safe for their intended use.
- For a substance to be GRAS, there must be a consensus among qualified experts that the substance is safe. This consensus can be based on a long history of common use in food before 1958 or on extensive scientific procedures and evidence.
- Substances with GRAS status are exempt from the more rigorous pre-market approval process that new food additives must undergo.

Step 3: Analyzing the Options:

- (A) ”Generally Recognized As Safe” is the correct and official definition.

- (B), (C), and (D) are incorrect expansions and do not represent the meaning of GRAS in a regulatory context.

Step 4: Final Answer:

Based on the official definition used in food safety regulations, GRAS stands for Generally Recognized As Safe.

💡 Quick Tip

Remember that GRAS status is about expert consensus on safety, not direct government approval for every substance. This distinction is key. A substance is "recognized" as safe, often due to a long history of use, distinguishing it from newly developed additives that require formal approval.

3. Which instrument is primarily used to determine the plasticity of bread dough?

- (A) Farinograph
- (B) Extensograph
- (C) Amylograph
- (D) Viscometer

Correct Answer: (B) Extensograph

Solution:

Step 1: Understanding the Question:

The question asks to identify the specific laboratory instrument used to measure the plasticity of bread dough. Dough plasticity, or extensibility, is its ability to be stretched without breaking, a critical property for bread quality.

Step 2: Key Concepts and Instruments in Cereal Science:

Different instruments are designed to measure specific rheological (flow and deformation) properties of dough:

- **Extensograph:** This instrument measures the dough's resistance to extension and its extensibility (stretchability). A dough sample is stretched until it breaks, and the force required is recorded over time. This directly assesses plasticity and elasticity.
- **Farinograph:** This instrument measures the water absorption of flour and the mixing properties of dough, such as development time and stability. It records the resistance of the dough against the mixing blades.
- **Amylograph:** This instrument measures the gelatinization properties of starch and the activity of alpha-amylase enzymes in flour.
- **Viscometer:** This is a general instrument used to measure the viscosity (resistance to flow) of fluids, not typically the solid-like properties of dough.

Step 3: Detailed Explanation:

- The property of plasticity is directly related to how well the dough can stretch.

- The **Extensograph** is specifically designed for this purpose; its name is derived from "extension," meaning to stretch out.
- The Farinograph focuses on mixing, while the Amylograph focuses on starch behavior during heating. Neither measures plasticity directly.

Step 4: Final Answer:

Therefore, the Extensograph is the primary instrument used to determine the plasticity and extensibility of bread dough.

💡 Quick Tip

Associate the instrument names with their functions: **Extensograph** measures **extensibility** (stretching/plasticity). **Farinograph** relates to flour (*farina* in Latin) and its mixing properties. **Amylograph** relates to starch (*amylum*).

4. What is the process of using alkali treatment on cocoa called?

- (A) Fermentation
- (B) Conching
- (C) Dutching
- (D) Tempering

Correct Answer: (C) Dutching

Solution:

Step 1: Understanding the Question:

The question asks for the specific name of the process where cocoa is treated with an alkali solution. This is a common step in cocoa and chocolate manufacturing.

Step 2: Key Processes in Cocoa and Chocolate Production:

- **Dutching (or Alkalization):** This process involves treating cocoa nibs or cocoa powder with an alkaline solution, such as potassium carbonate. This neutralizes the natural acidity of the cocoa, darkens its color, and creates a milder, less bitter flavor. It also improves solubility.
- **Fermentation:** This is an early step that occurs after harvesting the cocoa pods. It develops the precursor flavor compounds in the cocoa beans.
- **Conching:** This is a lengthy process of mixing, agitating, and aerating liquid chocolate. It refines the texture, removes volatile off-flavors, and develops the final desired flavor profile.
- **Tempering:** This is a controlled process of heating and cooling chocolate to encourage the formation of stable cocoa butter crystals. Proper tempering gives chocolate its snap, glossy finish, and smooth melt-in-the-mouth quality.

Step 3: Detailed Explanation:

- The question specifically mentions "alkali treatment."
- The term for this process is "Dutching," named after its Dutch inventor, Coenraad Johannes

van Houten.

- The other processes—fermentation, conching, and tempering—are distinct steps in chocolate making and do not involve alkali treatment.

Step 4: Final Answer:

The process of using alkali treatment on cocoa is called Dutching.

💡 Quick Tip

Remember the term "Dutch-processed cocoa" which you might see on product labels. This refers to cocoa that has undergone the Dutching process, resulting in a darker color and milder flavor compared to natural cocoa powder.

5. Which treatment is specifically used to remove undesirable microbes from milk?

- (A) Sterilization
- (B) Pasteurization
- (C) Homogenization
- (D) Fermentation

Correct Answer: (B) Pasteurization

Solution:

Step 1: Understanding the Question:

The question asks to identify the specific process used to make milk safe for consumption by eliminating harmful microbes, while aiming to preserve its quality.

Step 2: Key Processes in Milk Processing:

- **Pasteurization:** A heat treatment process designed to kill pathogenic (disease-causing) microorganisms and reduce the number of spoilage organisms in milk. It uses a relatively mild heat (e.g., 72°C for 15 seconds for HTST) followed by rapid cooling. This process preserves most of the milk's nutritional and sensory properties.
- **Sterilization (e.g., UHT):** A much more intense heat treatment (e.g., 135°C for 2-5 seconds) that kills all microorganisms, including spores. This results in a very long shelf life at room temperature but can cause more significant changes to the taste and nutritional value of the milk.
- **Homogenization:** A mechanical process that breaks down large fat globules in milk into smaller ones. It prevents the formation of a cream layer and ensures a uniform consistency. It does not kill microbes.
- **Fermentation:** A biological process where beneficial microbes (like bacteria in yogurt) are intentionally added to milk to convert lactose into lactic acid, leading to products like yogurt and cheese. It is the opposite of removing microbes.

Step 3: Detailed Explanation:

- The question's focus is on removing "undesirable microbes" to make milk safe.

- Pasteurization is the standard industry process specifically developed for this purpose, balancing safety with quality retention.
- While sterilization also removes microbes, it is a more severe process. Pasteurization is the more common and specific answer for making fresh milk safe.
- Homogenization and fermentation are unrelated to the removal of unwanted microbes.

Step 4: Final Answer:

Pasteurization is the treatment specifically used to remove undesirable microbes from milk.

💡 Quick Tip

Think of the key difference: **Pasteurization** aims to make milk **safe** by killing pathogens, but it still requires refrigeration. **Sterilization** aims to make milk **shelf-stable** by killing all microbes, allowing it to be stored at room temperature before opening.

6. What is the most widely used general test for identifying carbohydrates?

- (A) Biuret Test
- (B) Benedict's Test
- (C) Molisch Test
- (D) Iodine Test

Correct Answer: (C) Molisch Test

Solution:

Step 1: Understanding the Question:

The question asks for a "general test" for carbohydrates, meaning a test that gives a positive result for nearly all types of carbohydrates (monosaccharides, disaccharides, and polysaccharides).

Step 2: Key Concepts in Qualitative Analysis of Biomolecules:

Different chemical tests are used to detect specific types of biomolecules or functional groups:

- **Molisch Test:** This is a highly sensitive chemical test for the presence of carbohydrates. Concentrated sulfuric acid dehydrates the carbohydrate to produce an aldehyde (furfural or a derivative). This aldehyde then condenses with two molecules of a phenol (-naphthol, the Molisch reagent) to form a reddish-purple colored ring. It gives a positive result for almost all carbohydrates.
- **Biuret Test:** This test is used to detect the presence of peptide bonds, which means it is a general test for **proteins**, not carbohydrates.
- **Benedict's Test:** This test is specific for **reducing sugars** (sugars with a free aldehyde or ketone group), such as glucose and fructose. It does not detect non-reducing sugars like sucrose or polysaccharides like starch.
- **Iodine Test:** This test is highly specific for **starch**. It does not give a positive result for simple sugars or other polysaccharides like cellulose.

Step 3: Detailed Explanation:

- Since the question asks for a *general* test for all carbohydrates, the Molisch Test is the most appropriate answer.
- The other tests are specific to certain subgroups (Benedict's for reducing sugars, Iodine for starch) or a different class of biomolecules entirely (Biuret for proteins).

Step 4: Final Answer:

The Molisch Test is the most widely used general test for identifying the presence of carbohydrates.

💡 Quick Tip

To distinguish these tests, remember their specificity: - **Molisch** = **M**ostly all carbohydrates. - **Benedict's** = **B**asic (reducing) sugars. - **Iodine** = Starch (makes you think of potatoes). - **Biuret** = Proteins (detects peptide bonds).

7. Identify the natural toxin commonly found in citrus fruits like grapefruit.

- (A) Solanine
- (B) Cyanogenic glycosides
- (C) Furanocoumarins
- (D) Aflatoxins

Correct Answer: (C) Furanocoumarins

Solution:

Step 1: Understanding the Question:

The question asks to identify a specific natural toxin that is characteristically found in citrus fruits, with grapefruit being given as a prime example.

Step 2: Key Concepts of Natural Toxins in Foods:

Many plants produce chemical compounds as a defense mechanism, some of which can be toxic or have pharmacological effects on humans.

- **Furanocoumarins:** This class of organic chemical compounds is notably present in plants like celery, parsnips, and particularly in citrus fruits like grapefruit. They are famous for the "grapefruit juice effect," where they inhibit a key human enzyme (CYP3A4) in the intestines, which is responsible for metabolizing many medications. This inhibition can lead to dangerously high levels of certain drugs in the body.
- **Solanine:** A glycoalkaloid poison found in species of the nightshade family, such as potatoes (especially in green parts) and tomatoes.
- **Cyanogenic glycosides:** Compounds that can release hydrogen cyanide upon enzymatic breakdown. They are found in foods like cassava, almonds, and the pits of many fruits like apples and apricots.
- **Aflatoxins:** These are mycotoxins produced by certain molds (*Aspergillus* species) that can

grow on food commodities like peanuts (groundnuts), maize, and cottonseed. They are not produced by the plant itself.

Step 3: Detailed Explanation:

- The question specifically links the toxin to grapefruit.
- Furanocoumarins are the well-known compounds responsible for the interaction between grapefruit and various medications.
- The other toxins listed are found in different food sources and are not characteristic of citrus fruits.

Step 4: Final Answer:

The natural toxin commonly found in citrus fruits like grapefruit is Furanocoumarins.

💡 Quick Tip

Associate the toxin with its most famous source: **Furanocoumarins** → **Grapefruit** (drug interactions). **Solanine** → **Green Potatoes**. **Cyanide** → **Cassava/Almonds**. **Aflatoxin** → **Moldy Peanuts**. This makes them easy to recall.

8. Which part of an egg contains the blastodisk?

- (A) Egg white (Albumen)
- (B) Egg shell
- (C) Egg yolk
- (D) Chalaza

Correct Answer: (C) Egg yolk

Solution:

Step 1: Understanding the Question:

The question asks to identify the location of the blastodisk within the structure of a bird's egg. The blastodisk is crucial for embryonic development.

Step 2: Key Components of an Egg:

- **Egg Yolk:** The yellow, central part of the egg. It is rich in fats, vitamins, and minerals and serves as the primary food source for the developing embryo.
- **Blastodisk (or Germinal Disc):** A small, circular, whitish spot on the surface of the yolk. This area contains the genetic material from the hen. If the egg is fertilized, this spot is called a blastoderm and is where the embryo begins to develop.
- **Egg White (Albumen):** The clear liquid that surrounds the yolk. It is primarily composed of protein (albumin) and water, providing protection and additional nutrition for the embryo.
- **Egg Shell:** The hard, protective outer layer of the egg.
- **Chalaza:** Two rope-like structures that anchor the yolk in the center of the albumen.

Step 3: Detailed Explanation:

- The blastodisk is fundamentally part of the yolk's structure, appearing as a distinct spot on its surface.
- It is not located in the egg white, shell, or the chalaza. The chalaza merely holds the yolk in place.

Step 4: Final Answer:

The blastodisk is located on the egg yolk.

💡 Quick Tip

You can often see the blastodisk yourself when you crack open an egg. Look for a small, light-colored spot on the surface of the yolk. If it's a small, solid-looking dot, the egg is likely unfertilized (blastodisk). If it looks more like a ring or a bullseye, the egg is fertilized (blastoderm).

9. What is the sensory outcome resulting from the decomposition of fats in milk?

- (A) Sweet taste
- (B) Rancidity
- (C) Bitterness
- (D) Sourness

Correct Answer: (B) Rancidity

Solution:**Step 1: Understanding the Question:**

The question asks for the specific term used to describe the unpleasant flavor and odor that develops when fats in milk break down.

Step 2: Key Concepts of Food Spoilage Flavors:

Different chemical changes in food lead to distinct sensory outcomes:

- **Rancidity:** This term specifically refers to the off-flavors and odors resulting from the breakdown of fats and oils. There are two main types:
 - **Hydrolytic Rancidity:** Caused by the hydrolysis of fats into free fatty acids. This is common in dairy products due to the enzyme lipase and results in a "soapy" or "goaty" flavor.
 - **Oxidative Rancidity:** Caused by the oxidation of unsaturated fatty acids, leading to a "stale" or "cardboard-like" flavor.
- **Sourness:** This is primarily caused by the production of acids, most commonly lactic acid from the fermentation of sugars (lactose in milk) by bacteria.
- **Bitterness:** This can be caused by various compounds, often from the breakdown of proteins into bitter-tasting peptides.
- **Sweet taste:** This is characteristic of sugars and is not a spoilage flavor.

Step 3: Detailed Explanation:

- The decomposition of fats (lipids) directly leads to the formation of free fatty acids and other breakdown products.
- These compounds have strong, unpleasant sensory characteristics that are collectively known as **rancidity**.
- Sourness in milk is due to carbohydrate (lactose) breakdown, not fat breakdown.

Step 4: Final Answer:

The sensory outcome resulting from the decomposition of fats in milk is rancidity.

💡 Quick Tip

Link the macronutrient to the spoilage term: - **Fat** breakdown → **Rancidity** - **Carbohydrate** (sugar) breakdown → **Sourness** (from acid) - **Protein** breakdown → **Pu-trefaction** or **Bitterness** This simple association helps in quickly answering questions about food spoilage.

10. Which parameter can be affected by nozzle pressure during spray drying?

- (A) Moisture content
- (B) Particle size
- (C) pH value
- (D) Color only

Correct Answer: (B) Particle size

Solution:**Step 1: Understanding the Question:**

The question asks which property of the final powder is directly influenced by the nozzle pressure in a spray dryer.

Step 2: Key Concepts of Spray Drying:

Spray drying involves three main stages:

1. **Atomization:** The liquid feed is dispersed into a spray of fine droplets using an atomizer (e.g., a pressure nozzle or a rotary atomizer).
2. **Drying:** The droplets are introduced into a stream of hot air, which causes the moisture to evaporate rapidly.
3. **Separation:** The dried powder particles are separated from the air stream, usually using a cyclone separator.

Step 3: Detailed Explanation:

- The **nozzle pressure** is a critical parameter in the atomization stage. It directly controls the force with which the liquid is pushed through the nozzle orifice.
- A **higher nozzle pressure** results in higher fluid velocity and shear forces, which break the liquid into **smaller droplets**. These smaller droplets then dry to form **smaller powder**

particles.

- Conversely, a **lower nozzle pressure** produces **larger droplets** and, consequently, **larger (coarser) powder particles**.
- Other parameters are affected by different factors:
- **Moisture content** is primarily controlled by the inlet/outlet air temperature and the feed rate.
- **pH value** is a property of the initial liquid feed and is generally not changed by the physical process of spray drying.
- **Color** can be affected by heat, but particle size is the most direct and primary consequence of changing nozzle pressure.

Step 4: Final Answer:

Nozzle pressure during spray drying directly affects the particle size of the resulting powder.

💡 Quick Tip

Remember the cause-and-effect relationship in spray drying: **Pressure** controls **Atomization**. High pressure means high energy, which breaks the liquid into very fine droplets, leading to a fine powder. Low pressure means less energy, larger droplets, and a coarser powder.

11. What is the full form of NOEL in toxicological studies?

- (A) No Observed Effect Level
- (B) Normal Observed Exposure Limit
- (C) National Organic Exposure Level
- (D) Non-Operational Exposure Limit

Correct Answer: (A) No Observed Effect Level

Solution:

Step 1: Understanding the Question:

The question asks for the correct expansion of the acronym NOEL, a fundamental term used in toxicology and risk assessment to define safe exposure levels for chemical substances.

Step 2: Key Concepts in Toxicology:

Toxicological studies aim to determine the dose at which a substance causes harm. Key benchmark doses are established from these studies:

- **NOEL (No-Observed-Effect Level):** This is the highest dose or exposure level of a substance in a study at which there are **no detectable effects** (adverse or otherwise) in the test population when compared to a control group.
- **NOAEL (No-Observed-Adverse-Effect Level):** This is the highest dose at which there are **no statistically or biologically significant adverse effects** observed. This is more commonly used in risk assessment than NOEL because it focuses specifically on harmful outcomes.

- **LOAEL (Lowest-Observed-Adverse-Effect Level):** This is the lowest dose at which an adverse effect is observed.

Step 3: Detailed Explanation:

- The acronym NOEL directly translates to **No-Observed-Effect Level**.
- This level is a crucial starting point for regulatory agencies to calculate a safe exposure level for humans, such as the Acceptable Daily Intake (ADI), by applying safety factors.
- The other options are incorrect and do not correspond to standard toxicological terminology.

Step 4: Final Answer:

In toxicological studies, NOEL stands for No-Observed-Effect Level.

 Quick Tip

Remember the hierarchy: **NOEL** (no effect at all) → **NOAEL** (no *adverse* effect) → **LOAEL** (the first dose with an *adverse* effect). The NOAEL is the most important value for setting safety limits for food additives and contaminants.

12. "Arka Rakshak" is a triple-resistant variety of which commonly processed vegetable?

- (A) Potato
- (B) Tomato
- (C) Onion
- (D) Brinjal

Correct Answer: (B) Tomato

Solution:

Step 1: Understanding the Question:

The question asks to identify the vegetable to which the variety "Arka Rakshak" belongs. It also provides a clue that it is "triple-resistant."

Step 2: Key Concepts in Crop Breeding:

Agricultural research institutes develop new crop varieties with desirable traits like high yield, better quality, and resistance to diseases. The names often indicate the research institute (e.g., "Arka" from IIHR, Bengaluru, whose campus is near the Arkavathi River).

Step 3: Detailed Explanation:

- **"Arka Rakshak"** is a high-yielding, hybrid variety of **tomato** developed by the Indian Institute of Horticultural Research (IIHR) in Bengaluru.
- It is named "Rakshak," which means "protector," because of its significant disease resistance.
- The "triple-resistant" trait refers to its resistance to three major tomato diseases: 1. Bacterial wilt 2. Tomato leaf curl virus (ToLCV) 3. Early blight - This variety is also known for its good

fruit quality (firmness, deep red color, and long shelf life), making it suitable for both fresh consumption and processing into products like ketchup and puree.

Step 4: Final Answer:

"Arka Rakshak" is a well-known triple-resistant variety of tomato.

💡 Quick Tip

In Indian agriculture, variety names often have prefixes indicating their origin. For example, "Pusa" varieties are from the Indian Agricultural Research Institute (IARI) in Pusa, Delhi, while "Arka" varieties are from the Indian Institute of Horticultural Research (IIHR) in Bengaluru. Recognizing these prefixes can sometimes help you identify the crop type.

13. Which preservative is typically used at a concentration of 4-5% in commercial vinegar?

- (A) Citric acid
- (B) Acetic acid
- (C) Lactic acid
- (D) Benzoic acid

Correct Answer: (B) Acetic acid

Solution:

Step 1: Understanding the Question:

The question asks to identify the main active chemical compound responsible for the preservative properties of vinegar, which is typically found at a 4-5

Step 2: Key Concepts of Food Acids and Preservatives:

- **Vinegar** is, by definition, an aqueous solution of acetic acid and trace compounds. It is produced through a two-step fermentation process: first, yeast converts sugars into alcohol, and second, bacteria of the genus *Acetobacter* convert the alcohol into acetic acid.
- **Acetic acid** (CH_3COOH) is the key component that gives vinegar its sour taste and its preservative properties. It works by lowering the pH, creating an acidic environment that inhibits the growth of most spoilage-causing bacteria and molds.
- **Citric acid** is the primary acid in citrus fruits and is used as a flavoring and preservative in beverages and other foods.
- **Lactic acid** is produced during the fermentation of milk (yogurt) and vegetables (sauerkraut).
- **Benzoic acid** is another chemical preservative used in acidic foods like soft drinks and pickles, but it is not the defining component of vinegar.

Step 3: Detailed Explanation:

- The standard identity for commercial vinegar requires it to contain a specific concentration of acetic acid, which is typically between 4- Therefore, the preservative found at a 4-5

Step 4: Final Answer:

Acetic acid is the preservative typically used at a concentration of 4-5

💡 Quick Tip

Remember the direct definition: Vinegar is essentially diluted acetic acid. When you think of the sharp smell and taste of vinegar, you are sensing the acetic acid. This fundamental connection makes it easy to answer any question about vinegar's primary chemical component.

14. In food engineering, what does a Farinograph measure?

- (A) Dough extensibility
- (B) Dough mixing properties
- (C) Starch gelatinization
- (D) Viscosity of liquids

Correct Answer: (B) Dough mixing properties

Solution:**Step 1: Understanding the Question:**

The question asks for the primary function of a Farinograph, a specialized instrument used in the baking and milling industries.

Step 2: Key Instruments in Cereal Science:

- **Farinograph:** This instrument is essentially a recording dough mixer. It measures the torque (resistance) required to mix a dough at a constant speed. The resulting graph, called a farinogram, provides crucial information about the flour's properties.
- **Extensograph:** Measures the dough's ability to stretch (extensibility) and its resistance to stretching.
- **Amylograph:** Measures the gelatinization temperature of starch and enzyme activity by recording the viscosity of a flour-water slurry as it is heated.
- **Viscometer:** A general-purpose instrument for measuring the viscosity of fluids.

Step 3: Detailed Explanation of Farinograph Measurements:

The Farinograph measures several key **dough mixing properties**, including:

- **Water Absorption:** The amount of water required to produce a dough of a standard consistency.
- **Dough Development Time (DDT):** The time it takes for the dough to reach its maximum consistency (peak of the curve).
- **Dough Stability:** The length of time the dough maintains its maximum consistency during mixing.
- **Mixing Tolerance Index (MTI):** The degree of softening of the dough after a specified mixing time.

All these parameters relate to how the dough behaves during mixing.

Step 4: Final Answer:

A Farinograph is used to measure the mixing properties of dough.

💡 Quick Tip

A simple way to remember is to break down the word: "**Farina**" is Latin for flour, and "**graph**" refers to the chart it produces. So, it's a machine that creates a graph based on flour (dough) properties, specifically during mixing.

15. Which antinutritional toxic constituent is associated with *Aspergillus flavus* in groundnuts?

- (A) Solanine
- (B) Aflatoxin
- (C) Oxalate
- (D) Phytate

Correct Answer: (B) Aflatoxin

Solution:

Step 1: Understanding the Question:

The question asks to identify the specific toxin produced by the mold *Aspergillus flavus*, particularly when it contaminates groundnuts (peanuts).

Step 2: Key Concepts of Mycotoxins and Antinutrients:

- **Mycotoxins:** These are toxic compounds produced by certain types of fungi (molds). They can contaminate crops in the field or during storage. *Aspergillus flavus* is a common mold that produces a potent class of mycotoxins.
- **Antinutrients:** These are compounds naturally present in foods (especially plant-based foods) that can interfere with the absorption of nutrients. Oxalate and phytate are common examples.
- **Natural Toxins:** These are toxic compounds produced by the plant itself, often as a defense mechanism (e.g., solanine).

Step 3: Detailed Explanation:

- ***Aspergillus flavus*** is a species of mold that is well-known for producing a family of toxins called **aflatoxins**.
- Groundnuts are particularly susceptible to contamination by this mold, especially under warm and humid storage conditions.
- Aflatoxins are highly toxic and are among the most carcinogenic (cancer-causing) substances known. They primarily affect the liver.
- Let's analyze the other options:
- **Solanine** is a natural toxin found in nightshade plants like potatoes.
- **Oxalate** and **Phytate** are antinutrients found naturally in many plants, including legumes

and grains, but they are not toxins produced by mold.

Step 4: Final Answer:

The toxic constituent associated with *Aspergillus flavus* in groundnuts is aflatoxin.

 Quick Tip

Remember the strong link: **A**spergillus **f**lavus produces **A**flatoxin. The names themselves provide a clue. This toxin is a major food safety concern, especially in peanuts and corn.
