

NCERT Solutions For Class 7 Science Chapter 2 - Nutrition in Animals

Fill in the Blanks-

- (a) The main steps of nutrition in humans are **ingestion, digestion, absorption, assimilation, and egestion**.
- (b) The largest gland in the human body is the **liver**.
- (c) The stomach releases hydrochloric acid and **digestive** juices which act on food.
- (d) The inner wall of the small intestine has many finger-like outgrowths called **villi**.
- (e) Amoeba digests its food in the **food vacuole**.

[Also Check – Chapter 2 – NUTRITION IN ANIMALS -Class 7 – Complete Notes](#)

Mark 'T' if the statement is true and 'F' if it is false

- (a) Digestion of starch starts in the stomach. (T/F)
- **Answer- False**
 - **Explanation- Starch digestion primarily begins in the mouth with the action of the enzyme amylase in saliva.**
- (b) The tongue helps in mixing food with saliva. (T/F)
- **Answer- True**
 - **Explanation- The tongue assists in mixing food with saliva during chewing, which is an essential part of the initial digestion process.**
- (c) The gall bladder temporarily stores bile. (T/F)
- **Answer- True**
 - **Explanation- The gallbladder stores bile produced by the liver and releases it as needed to aid in the digestion of fats in the small intestine.**
- (d) The ruminants bring back swallowed grass into their mouth and chew it for some time. (T/F)
- **Answer- True**
 - **Explanation- Ruminant animals like cows have a unique digestive process where they bring back swallowed food (cud) from their stomach to chew it again, aiding in the digestion of cellulose-rich grass.**

[Also Check - Chewing the Cud- The Ruminant Digestive System](#)

Tick (✓) mark the correct answer in each of the following-

(a) Fat is completely digested in the

(i) stomach (ii) mouth (iii) small intestine (iv) large intestine

Answer- (iii) small intestine

Explanation- The majority of fat digestion occurs in the small intestine. Bile produced by the liver and stored in the gallbladder is released into the small intestine to emulsify fats, and pancreatic enzymes help break down fats into fatty acids and glycerol. This process is crucial for the complete digestion and absorption of fats.

(b) Water from the undigested food is absorbed mainly in the

(i) stomach (ii) foodpipe (iii) small intestine (iv) large intestine

Answer- (iv) large intestine

Explanation- While some water absorption occurs in the small intestine, the majority of water absorption from undigested food takes place in the large intestine (colon). The large intestine reabsorbs water from the indigestible food residue, forming semi-solid feces before elimination from the body.

[Also Check - Rapid Revision – Class 7 Science -Chapter 2 – Nutrition in Animals – Complete Notes](#)

Match the items of Column I with those given in Column II-

Column I	Column II
Food components	Product(s) of digestion
Carbohydrates	Sugar
Proteins	Amino acids
Fats	Fatty acids and glycerol

What are villi? What is their location and function?

- Villi are tiny, finger-like projections found on the inner walls of the small intestine.
- Location- They are located in the small intestine, specifically in the inner lining of the small intestine.
- Function- Villi greatly increase the surface area available for absorption. They absorb digested food components such as glucose, amino acids, and fatty acids into the bloodstream, facilitating their distribution to various parts of the body for growth and energy production.

[Also Check - Class 7- Chapter 2 - Nutrition in Animals - 4 Worksheets Solved and Unsolved](#)

Where is the bile produced? Which component of the food does it help to digest?

- Bile is produced in the liver.
- Bile helps to digest fats by emulsifying them, breaking them down into smaller droplets for easier digestion.

Name the type of carbohydrate that can be digested by ruminants but not by humans. Give the reason also.

- The type of carbohydrate that can be digested by ruminants (such as cows and buffaloes) but not by humans is cellulose.
- Reason- Ruminants have a specialised digestive system that includes a part of their stomach called the rumen, which contains bacteria capable of breaking down cellulose into simpler forms, such as simpler sugars. Humans lack the necessary enzymes and bacteria to digest cellulose effectively.

Why do we get instant energy from glucose?

- We get instant energy from glucose because it is a simple sugar that can be rapidly absorbed into the bloodstream. Once absorbed, glucose can be transported to various cells in the body, where it is readily used for energy production through cellular respiration. This quick conversion of glucose into energy provides an immediate energy boost to the body.

Which part of the digestive canal is involved in-

(i) absorption of food - The small intestine is involved in the absorption of food.

(ii) chewing of food - The mouth and its associated structures (teeth and tongue) are involved in the chewing of food.

(iii) killing of bacteria - The stomach is involved in killing bacteria due to its acidic environment.

(iv) complete digestion of food - The small intestine is primarily responsible for the complete digestion of food.

(v) formation of faeces - The large intestine (specifically the colon) is involved in the formation of faeces.

Write one similarity and one difference between the nutrition in amoeba and human beings.

Similarity between nutrition in amoeba and human beings-

Both amoeba and human beings undergo a process of digestion to break down complex food into simpler substances for absorption and utilisation.

Difference between nutrition in amoeba and human beings-

- **Amoeba-** Amoeba is a single-celled organism that takes in food through the process of phagocytosis, where it engulfs food particles and digests them within food vacuoles. It has a simple, direct method of obtaining and digesting food.
- **Human Beings-** Humans are multicellular organisms with a complex digestive system. They ingest food through the mouth, where it undergoes both mechanical and chemical digestion. Food is then absorbed in the small intestine through structures like villi, and nutrients are transported throughout the body via the circulatory system.

Match the items of Column I with suitable items in Column II-

- (a) Salivary gland - (iii) Saliva secretion
- (b) Stomach - (iv) Acid release
- (c) Liver - (i) Bile juice secretion
- (d) Rectum - (vii) Release of faeces
- (e) Small intestine - (ii) Storage of undigested food
- (f) Large intestine - (vi) Absorption of water

Can we survive only on raw, leafy vegetables/grass? Discuss.

No, we cannot survive solely on raw, leafy vegetables or grass. While these foods provide some nutrients, they lack several essential nutrients required for human survival. Here are a few reasons why a diet solely based on raw, leafy vegetables or grass would be inadequate-

- **Lack of Complete Proteins-** Leafy vegetables and grass do not provide complete proteins that contain all essential amino acids needed for bodily functions and tissue repair. Protein deficiency can lead to muscle wasting and other health issues.
- **Insufficient Energy-** These foods are relatively low in calories and may not provide enough energy for daily activities. Maintaining energy balance is essential for overall health.
- **Nutrient Deficiencies-** A diet limited to raw, leafy vegetables and grass would lack essential nutrients like vitamins (e.g., B vitamins, vitamin D, vitamin B12), minerals (e.g., iron, calcium), and fats. Deficiencies in these nutrients can lead to various health problems.
- **Fibre Overload-** While fibre is important for digestive health, an excessive intake of fibre from raw vegetables and grass can lead to digestive discomfort and malabsorption of other nutrients.
- **Digestibility-** Humans have a limited ability to digest cellulose, the main structural component of plant cell walls found in grass. Ruminant animals like cows have specialised digestive systems with symbiotic bacteria to break down cellulose efficiently, but humans lack this adaptation.

Extended Learning Activities and Project

Visit a doctor and find out- (i) Under what conditions does a patient need to be on a drip of glucose?

Patients may need a glucose drip, also known as intravenous (IV) glucose, under various medical conditions. Some common situations include-

- **Dehydration-** When a patient is severely dehydrated due to conditions like vomiting, diarrhoea, or excessive sweating, an IV glucose solution can help replenish lost fluids and electrolytes.
- **Surgery-** Before and after certain surgeries, patients may receive glucose IVs to maintain blood sugar levels and provide necessary nutrients.
- **Diabetic Ketoacidosis (DKA)-** In cases of uncontrolled diabetes, particularly DKA, **glucose IVs may be used to stabilise blood sugar levels.**
- **Malnutrition-** Patients with severe malnutrition or those unable to eat and drink may receive IV glucose to provide essential calories and nutrients.

(ii) When does a patient need to be given glucose?

The duration of glucose administration through an IV drip varies based on the patient's condition. It may range from a few hours to several days or more. The duration is determined by the underlying medical issue and the patient's response to treatment. A doctor will closely monitor the patient and make adjustments as necessary.

(iii) How does glucose help the patient recover?

Glucose administered through an IV provides a direct and easily absorbable source of energy for the body. It can help patients recover by

- **Restoring Blood Sugar Levels-** In cases of low blood sugar (hypoglycemia), IV glucose rapidly increases blood sugar levels, preventing complications like seizures and unconsciousness.
- **Rehydrating and Nutritional Support-** IV glucose solutions often contain electrolytes and other nutrients, helping to rehydrate the body and provide essential nutrients when oral intake is insufficient.
- **Supporting Metabolic Processes-** Glucose is a primary source of energy for cells. It fuels metabolic processes, allowing the body to function properly, repair tissues, and fight infections.
- **Stabilising Critical Conditions-** In severe conditions like diabetic ketoacidosis, where the body's metabolism is disrupted, IV glucose helps correct the imbalance and stabilise the patient.

Remember to consult a healthcare professional for accurate and detailed information regarding medical treatments like glucose drips. This project will provide valuable insights into the use of glucose in medical contexts and its role in patient recovery.

Understanding Vitamins

(i) Why are vitamins necessary in the diet?

Vitamins are essential organic compounds that the body requires in small quantities to maintain various physiological functions and overall health. They are necessary in the diet for several reasons-

- **Coenzymes-** Vitamins often act as coenzymes, which means they assist enzymes in carrying out biochemical reactions in the body. These reactions are critical for processes like energy production, metabolism, and the synthesis of essential molecules.
- **Antioxidant Protection-** Some vitamins, such as vitamin C and vitamin E, function as antioxidants. They help protect cells from oxidative damage caused by harmful molecules called free radicals, thereby reducing the risk of chronic diseases.
- **Growth and Development-** Vitamins play a vital role in the growth, development, and maintenance of tissues and organs. They are particularly crucial during periods of rapid growth, such as childhood and pregnancy.
- **Immune System Function-** Certain vitamins, like vitamin C and vitamin D, support the immune system's ability to fight infections and diseases.
- **Preventing Deficiency Diseases-** A deficiency of specific vitamins can lead to various deficiency diseases. For example, vitamin C deficiency causes scurvy, while vitamin D deficiency can lead to rickets. Consuming an adequate amount of vitamins helps prevent these conditions.
- **Overall Health-** Vitamins contribute to overall well-being by maintaining healthy skin, eyes, bones, and teeth, as well as regulating various bodily functions.

(ii) Which fruits or vegetables should be eaten regularly to get vitamins?

Different vitamins are found in various foods, so it's essential to have a balanced diet that includes a variety of fruits and vegetables to ensure an adequate intake of vitamins. Here are some examples of fruits and vegetables rich in specific vitamins-

- Vitamin C- Citrus fruits (oranges, lemons, grapefruits), strawberries, kiwi, bell peppers, and broccoli.
- Vitamin A- Carrots, sweet potatoes, spinach, kale, butternut squash, and apricots.
- Vitamin K- Leafy greens (spinach, kale, collard greens), broccoli, Brussels sprouts, and cabbage.
- Vitamin E- Nuts (almonds, hazelnuts), seeds (sunflower seeds), spinach, and broccoli.
- Vitamin D- While vitamin D is mainly synthesized by the body when exposed to sunlight, it can also be found in small amounts in fatty fish like salmon and mackerel.
- Vitamin B-complex- Whole grains, beans, lentils, poultry, fish, and leafy greens provide various B vitamins like B1, B2, B3, B6, and B9.

Consuming a diverse range of fruits, vegetables, and