Vision Empower & XRCVC

Teacher Instruction KIT

Nutrition in Animals

Syllabus: NCERT
Subject: Science
Grade: 7
Textbook Name: NCERT- Science Textbook for class VII
Chapter Number & Name: 2. Nutrition in Animals

1. OVERVIEW

1.1. OBJECTIVE & PREREQUISITES

Objective

- Digestion and various ways of taking in food.
- Components of the digestive tract/alimentary canal in humans

Prerequisite Concept

Components of food

Grade 6, chapter 2 Components of food

Content Index

*Kindly Note: Activities marked with * are mandatory*

2. LEARN

2.1. KEY POINTS

Digestion: sequence by which food is broken down and chemically converted so that it can be absorbed by the cells of an organism and used to maintain vital bodily functions.

The digestive tract begins from the mouth and ends at the anus. It consists of the mouth, or oral cavity, with its teeth, for grinding the food, and its tongue, which serves to knead food and mix it with saliva; the throat, the esophagus; the stomach; the small intestine, consisting of the duodenum , the jejunum, and the ileum; and the large intestine, consisting of the cecum, a closed-end sac connecting with the ileum and colon, which terminates in the rectum. Glands contributing digestive juices include the salivary glands, the gastric glands in the stomach lining, the pancreas, and the liver and its adjuncts—the gallbladder and bile ducts. All of these organs and glands contribute to the physical and chemical breaking down of ingested food and to the eventual elimination of non-digestible wastes. Their structures and functions are described step by step in this section.

2.2. LEARN MORE

https://www.webmd.com/heartburn-gerd/your-digestive-system#1

3. ENGAGE

3.1. INTEREST GENERATION ACTIVITY

Interest generation activity

Activity1: Food and digestion

Materials Required: None

Prerequisites: None

Activity Flow

Ask the students:

- What happens when you overeat? Your stomach feels heavy?
- How do you think food travels from your mouth to the different parts? We are going to learn about digestion and all its different parts.

3.2. CONCEPT INTRODUCTION ACTIVITIES

Digestion and various ways of taking in food

Activity 2: Components of the digestive tract

Materials Required: Tactile or model of digestive system

Prerequisites: None

Activity Flow

- Ask the student how they eat a piece of bread v/s take a pill v/s drink a juice from a straw. Explain to the student the different ways in which food is taken in.
- Once the food is taken in for them to be useful, they are broken down into simpler substances. This process is called digestion.

Components of the digestive tract/alimentary canal and digestive system in humans

- Once the food is taken in, the food passes through a long journey before the unused parts are defecated.
- Ask the student to touch their mouth where the food enters. Tell them that it is the buccal cavity.
- Explain that it contains the teeth and the tongue and the salivary glands.
- With hand over hand method, let the student first identify the position of the rest of the components of the digestive tract and system on one's own body.
- Use a tactile diagram or a model which has a clear and distinctive differentiation of all the components to explain the entire layout of the system.
- Help the students identify all the parts on the model. The students should be able to locate all the parts independently and know which glands are and which organs are.
- Orient the student to the
  -Shape of the organ

-The size
-Positioning in context to the track.

The mouth and buccal cavity

Activity3: The mouth and buccal cavity

Materials Required: model of teeth

Prerequisites*: None*

Activity Flow

- First ask the student to identify what components are there in the buccal cavity: Teeth, tongue, salivary gland.
- We chew the food with the teeth and break it down mechanically into small pieces
- With the help of the teeth model helps the student feel and understand the shape of the different types of teeth, their function and their position in the jaw. Help the student also identify how the teeth fit into the gums and concepts of milk and permanent teeth.
- Also, ask them which teeth do you use for biting and cutting, and which ones for piercing and tearing and for chewing and grinding?
- Important to orient the student that the size of teeth vary in each individual. Also explain the color of teeth and how yellow teeth indicate unclean teeth.

Regions of the tongue for different tastes

Activity4: Regions of the tongue for different tastes

Materials Required: tactile diagram of tongue, samples of – sugar solution, common salt solution, lemon juice, crushed neem leaf or bitter gourd

Prerequisites*: None*

Activity Flow

- Prepare a separate sample each of (i) sugar solution, (ii) common salt solution, (iii) lemon juice and (iv) juice of crushed neem leaf or bitter gourd.
- One by one ask the students to stick out there tongue and keep it in a straight and flat position, their eyes should be closed.
- Use a clean toothpick to put the above samples one by one on different areas of the tongue. Use a new toothpick for each sample.
- Ask them which areas of the tongue could detect the sweet, salty, sour and bitter substances.

- Discuss the tongue, its functions and through a tactile diagram help the student identify the different positions on the tongue related to different tastes.
- Also explain the function of saliva which is secreted from salivary glands, it breaks down the starch into sugars.

- On the tactile or model of the digestive system reinforce the position of the mouth, tongue and salivary glands.

Food pipe

Activity 5: Food pipe

Materials Required: model of digestive system, stretchable tube or nada , safety pin, chudidar/pyjama.

Prerequisites*: None*

Activity Flow

- On the model of the digestive system reinforce the position of the food pipe and its shape.
- With a stretchable tube, explain the movement of the food pipe in terms of the pushing movement and how it pushes food down.
- Explain its functions.

Or

- In addition to stretchable tube, the process of putting 'nada' in a chudidar or pyjama using a safety pin - can be done as an activity and explained.

Stomach

Activity 6: Stomach

Materials Required: model of digestive system, thick leather/fabric material

Prerequisites*:* None

Activity Flow

- On the model of the digestive system, reinforce the position and shape of the stomach.
- Take a thick leather/fabric material and stitch a bag out of it in the shape of the stomach. Let the student feel the thickness of the stomach wall and its shape with the use of this bag.
- You could also stick a thick paper on the inside of the bag to explain the thin inner lining of the stomach.
- As per relevant content explain its functions.

Small intestine and large intestine

Activity 7: Small intestine and large intestine

Materials Required: a cloth piece of length 8m (approx.), threads, velcro ,tactile diagram of liver, pancreas and gall bladder

Prerequisites*: None*

Activity Flow

Small intestine:

- On the model of the digestive system, reinforce the position of the small intestine.
- Take a cloth piece and make it into a 7.5 meter tube. Let the student feel the length and make the student coil the same. With hand over hand technique show the student the coiling to help understand what coiling is. Cut any one section of the tube and stick finger-like threads from the inside. Let the student feel the hanging threads to explain the concept of villi.
- Teacher can also make a tube using velcro and let the student feel the inner surface.
- Explain its functions

Large intestine:

- Can use the cloth tube of the previous activity and make the student identify the length up to 1.5 meter on the same to explain the large intestine and make the student place it on the table in front in the shape of the large intestine. Let the student feel the placement of the same.
- Also on the model of the digestive system reinforce the position of the large intestine. Show the position of the rectum and the anus and explain its functions.
- Explain the functions of the large intestine and how diarrhea is caused.

Liver, pancreas, gallbladder:

- With the use of tactile diagram, explain the shape of these glands and as per relevant content explain their function. On the digestive tract model reinforce their placement.

Digestion in grass-eating animals

Activity 8: Digestion in grass-eating animals

Materials Required: Tactile diagram of digestive system of ruminant

Prerequisites: *None*

Activity Flow:

- Have you observed cows, buffaloes and other grass-eating animals chewing continuously even when they are not eating? Actually, they quickly swallow the grass and store it in a part of the stomach called rumen.
- Here the food gets partially digested and is called cud. But later the cud returns to the mouth in small lumps and the animal chews it. This process is called rumination and these animals are called ruminants.
- After explaining, give them the tactile diagram of the digestive system of ruminants.
- The grass is rich in cellulose, a type of carbohydrate. In ruminants like cattle, deer, etc. bacteria present in rumen helps in digestion of cellulose. Many animals, including humans, cannot digest cellulose.

- Animals like horses, rabbits, etc., have a large sac-like structure called Caecum between the oesophagus and the small intestine. The cellulose of the food is digested here by the action of certain bacteria which are not present in humans.

Feeding and digestion in Amoeba

Activity 9: Feeding and digestion in Amoeba

Materials Required: Tactile diagram of Amoeba

Prerequisites*: None*

Activity Flow:

- Amoeba is a microscopic single-celled organism found in pond water. Amoeba has a cell membrane, a rounded, dense nucleus and many small bubble-like vacuoles in its cytoplasm.
- Amoeba constantly changes its shape and position. It pushes out one, or more finger-like projections, called pseudopodia or false feet for movement and capture of food.
- Give them the tactile diagram of Amoeba, and explain the different parts.
- Amoeba feeds on some microscopic organisms. When it senses food, it pushes out pseudopodia around the food particle and engulfs it. The food becomes trapped in a food vacuole.
- Digestive juices are secreted into the food vacuole. They act on the food and break it down into simpler substances. Gradually the digested food is absorbed.
- The absorbed substances are used for growth, maintenance and multiplication. The undigested residue of the food is expelled outside by the vacuole.
- The basic process of digestion of food and release of energy is the same in all animals. In a later chapter you will learn about the transport of food absorbed by the intestine to the various parts of the body.

2.3 LET'S DISCUSS: RELATE TO DAILY LIFE*

- When do you feel your food is not digested properly?

4. EXERCISES & REINFORCEMENT

4.1 EXERCISES & REINFORCEMENT

Reinforcement

Activity10: Roll through the digestive system

Materials Required: None

Prerequisites*: Digestive system*

Activity Flow:

- Ask the students 'if they ever wondered what happens to a bite of an apple after they have swallowed it?'
- Then ask them to explain the trip that the food makes through our body?
- Let the children explain by what they know from the previous activities.

4.2 IMPORTANT GUIDELINES*

Exercise Reading

It is very important that the children practice their learnings as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

Perform Textbook Activity

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

Provide Homework

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently

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