Online HorseCollege

Student Workbook

3.H.13 Digestive System

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Contents

Digestive System 3.H.13 Workbook

Students are to complete Horse Care 3.H.09-12 online assessments prior to attempting Horse Care 3.H.13-16 and to follow all recommended safety considerations.

Practical assessments for Horse Care 3.H.13-16 are as follows:

A) Digestive System

B) Respiration System

C) Circulatory System

D) Injuries of the Musculo-Skeletal System

These assessments incorporate the following unit from the SIS30710 Sport Industry Training Package which include the listed elements

RGRPSH401A Relate anatomical and physiological features to the care and treatment of horses

- Identify basic anatomy and physiology of horses
- Relate anatomy and body systems to the performance of racehorses
- Follow illness and injury management plans

Further information about this assessment is available at www.training.gov.au

Digestive System Introduction

This week's topic is the digestive system and all it entails. Without delving deeply into cellular processes this workbook covers the parts of the digestive system and the role they play in the digestive process.

Digestive System

Digestion involves a series of physical, biochemical and biological processes to breakdown food for the extraction of energy and nutrients. It takes about 2-4 days for food to pass through the digestive system.

Horses are herbivores, which means they eat vegetative material e.g. grass. They are trickle feeders grazing for 15-20 minutes at a time for up to 18 hours a day and their digestive system is set up to reflect their grazing habits. Therefore the stomach never becomes full or empty. This is the why it is better to feed little and often rather large, infrequent meals.

Food and nutrients are organic materials and it is from these materials that the digestive system extracts energy for the body's functions. The process of digestion (moving food along the digestive tract) is involuntary, that is it is controlled by autonomic processes.

Parts & functions of the Digestive System

The following parts are in sequence as they would occur in the horse.

Mouth: The front incisor teeth in the mouth bite the foodstuff which is then pushed towards the back of the mouth to be ground up by the molars. Saliva assists to lubricate the food for swallowing. This chewing action is known as mechanical digestion. The average horse has 40 – 42 teeth.

Pharynx: This also plays a part in the respiratory system and is a passage for air, water and food. In the digestive part of its role it passes food to the oesophagus.

Oesophagus: A hollow tube, here the food is moved from the pharynx to the stomach by muscular contractions.

Diaphragm: Whilst the diaphragm doesn't aid in digestion it separates the respiratory and digestive cavities.

Liver: The liver produces bile which aids in the digestion of oils and fats. It also helps to alkalise intestinal contents.

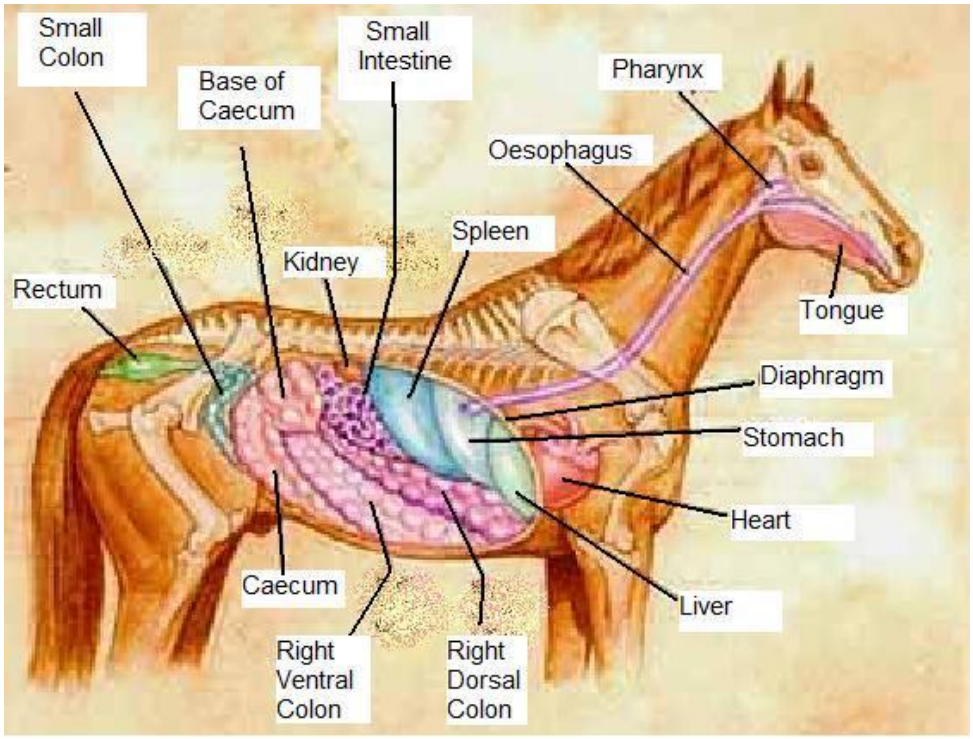
Stomach: The stomach lies slightly to the left behind the diaphragm and liver. It is shaped like a 'J' and muscular in structure. The stomach wall has four layers and food enters through a one way valve. This prevents food from moving back up the oesophagus meaning that a horse cannot vomit. It is a hollow organ which churns food and moves it onto the rest of the digestive system. Horses have a small stomach which empties when it is two thirds full regardless of whether food has been completely processed or not. This can prevent the complete digestion and utilisation of food, giving reason as to why large feeds should be broken down into smaller meals.

Small Intestine: This is where most of the nutrients and water are absorbed from food. It is a muscular tube with glandular lining which food is transported by muscular wave movement. Fats, proteins and carbohydrates are absorbed and transported by the blood to be utilized by the body.

Parts & functions of the Digestive System (cont.)

Large Intestines: Consists of the caecum and the large colon. The caecum is sometimes referred to as the 'hind-gut' and contains bacteria which can breakdown cellulose and fibre through fermentation. This fermentation process produces heat. Due to this bacteria diet changes must be made slowly so that the bacteria can adjust to the different chemical structure of new feedstuffs. The purpose of the large colon is to absorb carbohydrates which were broken down from cellulose in the caecum. The small colon absorbs water and is the place were fecal balls are formed.

Rectum: Is the holding chamber for waste matter.



Accessory Glands

The accessory glands of the digestive system are those that place a role in the breakdown and distribution of nutrients.

Liver

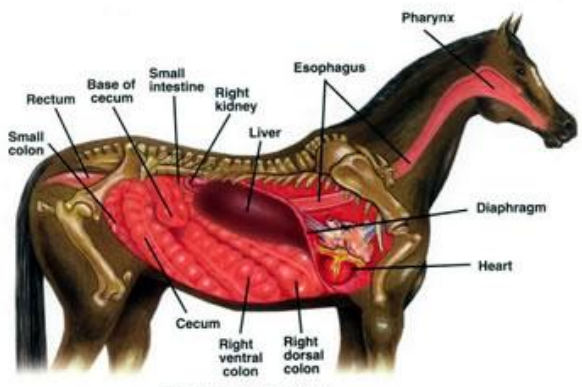
Primarily the liver is involved in functions relating to blood but it also is involved in the storage of nutrients and metabolism. The liver creates glycogen from sugar which is used for metabolism. Its storage qualities lie in being able to store the glycogen for future use, in addition protein is created from amino acids which can be sent throughout the body for growth or stored. In fact the liver can convert substances into both simple and complex compounds which assist in the regulation of nutrients to the body and also in protecting the body from poisons.

Pancreas

Located in the abdomen the pancreas produces secretions that aid in digestive processes. Some of the secretions produced travel to the duodenum and help to counterbalance the acid stomach contents. The pancreas produces enzymes to assist with the breakdown of carbohydrates, fats and proteins and also produces the hormone insulin which controls blood sugar level.

Salivary Glands

Saliva plays an important role in the digestive process. There are three glands which produce saliva and it is made up of 99.5% water and .5% salts and organic material. It is produced in larger qualities when eating to moisten the food so that it can be swallowed easily. The enzymes in saliva help to breakdown starch.



Right Lateral View

Extension Lesson

How does the digestive system of a horse differ from that of a human?

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Here is a ten minute video that takes you through the components and functions of the parts of the digestive system:

http://www.youtube.com/watch?v=8lqk7igz9L4

Another video about the digestive process of horses, this one is in 3D:

http://www.youtube.com/watch?v=maWXVKI-gq4&feature=related

Recommended Reading

Publication:-	Author:-
Veterinary notes for horse owners	Captain M. Horace Hayes
The BHS veterinary manual	P. Stewart Hastie

Websites:-

www.cyberhorse.net.au/cgi-bin/tve/displaynewsitem.pl?20031203digestivesystem.txt

en.wikipedia.org/wiki/Equine_anatomy#Digestive_system

www.youtube.com/watch?v=8lqk7igz9L4

www.youtube.com/watch?v=maWXVKI-gq4&feature=related

References

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Veterinary notes for horse owners	Captain M. Horace Hayes
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Websites & Images:-

www.cyberhorse.net.au

en.wikipedia.org

www.candlewoodequine.com