

QUESTION ONE

Different adaptations enable different animal groups to survive successfully in their habitats.

You are required to describe and give reasons for how your chosen biological process is carried out by your three animal groups. You may use clearly labelled diagrams in your response.

Name of animal group one: Humans

Describe and give reasons for how your chosen biological process is carried out by this animal group.

- molars, canines and incisors present for ripping and tearing (canines and incisors) and chewing (molars).
- omnivores which allows humans to get the nutrients needed for survival (meat and vegetation)
- limited sideways jaw movements to chew ~~to~~ why?
- amylase enzymes begin break down of ~~starch~~ food in mouth. // to vague
- stomach has pH of ≈ 2 (HCl) to break down food.
- thick mucus lining of stomach protects it from acid.
- liver produces bile ^{for?} and pancreas produces enzyme rich pancreatic juice to break down proteins, carbohydrates.
- small intestine absorbs nutrients into bloodstream by villi with increased surface area and blood supply
- large intestine (colon) absorbs water from waste.
- waste is egested out of the rectum and anus. //
- diet has high nutritional value in order to carry out daily lifestyle activities.

+ explanations
 clear descriptions/reasons for adaptations relating to nutrition

Name of animal group two: Dog

Describe and give reasons for how your chosen biological process is carried out by this animal group.

- sharp molars, canines and incisors for ripping and tearing meat. ||
- carnivorous (meat eating)
- up and down movement only of the jaw - why?
- no digestion occurs in mouth - why?
- stomach has HCl ~~as~~ with pH of less than 1 to break down protein - why?
- enzymes ~~from~~ break down protein in meat.
- digestion occurs very quickly because only protein ~~is~~ needs to be broken down.
- small intestine is short, as very quick digestion.
- nutrients absorbed ~~through~~ in small intestine.
- water absorbed in large intestine.
- waste egested through rectum. ||
- energy rich food for strong muscles.
- strong muscles and energy needed to hunt and catch prey. /

~~Clear linking of structure to functions shown above.
Explains reasons for adaptations.~~

Does not repeat, similarities between animals generally concentrates on differences and diversity.

Name of animal group three: Cattle

Describe and give reasons for how your chosen biological process is carried out by this animal group.

incisors for cutting grass and flat molars for chewing and grinding food. ||
 sideways jaw movement (molar), for chewing grass.
 diastema is a ~~small~~ pocket in mouth which holds regurgitated ^{food} fresh grass. - why?
 Food travels to Rumen first where microorganisms begin to break down food. pH of 5-7 is ruminant for survival of micro-organisms. ||
~~Food~~ solid food is sent back up to mouth (regurgitated) from the reticulum. ~~why?~~
 Food containing micro-organisms is then re-chewed and swallowed for maximum break down. ~~Food~~ mostly broken down food travels to omasum where micro-organisms break down further and travels to abomasum where nutrients are absorbed by protruding villi. ||
 travels to abomasum where and large intestine where water is absorbed.
 excreted through rectum as waste.
 low nutritional value so cattle eat all day to get nutrients needed. ||
 takes a long time to digest because of regurgitation and long journey.

diastema
 rumen
 reticulum
 omasum
 abomasum.

clear linking of A2
 structures & functions.
 & reasons for these adaptations.

QUESTION TWO

Clearly discusses reasons for diversity in relation to survival in the niche/habitat/environment.

Discuss the reasons for the diversity in the structure and function for the biological process in your three animal groups.

Nutrition is a very important biological process for humans, dogs and cattle. Nutrition gives those animals the energy and nutrients they need to carry out their ~~lifelong~~ roles and everyday actions.

Dogs and humans have ~~the~~ similar teeth qualities as they both have incisors and canines for eating meat. However, dogs have sharper teeth than humans because they tear and rip only ~~the~~ meat. Humans chew meat with molars after tearing and ripping it. Humans also chew ~~plants?~~ grass as cattle do which is why both cattle and humans have fairly flat molars.

~~This clear comparative contrasting of dentition adaptations & functions~~

Humans ~~and cattle both~~ begin digesting their food with the saliva in their mouth. Dogs on the other hand begin digestion when the food reaches the stomach. Cattle and humans chew their food to begin the break down whereas dogs 'wolf' down their food without chewing.

Cattle and humans have sideways jaw movements because they chew and grind their food whereas dogs ~~do not have any sideways jaw movement.~~

Clear relating of biological ideas to niche of animals.

Humans, dogs and cattle all have different pH levels in their stomachs because they have different foods to break down. Dogs only have protein which is

why the pH is so low (less than pH 1) as it is more efficient at a lower pH. Humans have a reasonably low pH level in their stomachs because they need to break down protein and carbohydrates etc. Cattle have a slightly acidic to neutral pH level in their ~~stomach~~ rumen as this allows the enzymes to be most efficient and survive. Clear analysis of contrast of stomach pH's related to environment.

Humans, dogs and cattle have different speeds at which they digest because of processes the food must go through to have all the nutrients absorbed. Cattle take a long time to digest their food as it must be chewed twice, once when it is first grass and again when it is regurgitated ~~and~~ cud. The cud then has to travel through the four chambers (rumen, reticulum, omasum and abomasum) of the cattle's stomach. Dogs have a fairly short digestion time because of the strong HCl in ^{its} stomach and only having to break down ~~the~~ protein. Humans take a medium length time ~~to~~ to digest their food because they have many different foods to break down but ^{like the dog,} ~~only~~ only have ^{one} ~~stomach~~ chambered stomach unlike ~~the~~ cattle. Clear analysis of reasons for diversity.

Humans, dogs and cattle all have diversity in the structure and function of carrying out nutrition. This is due to the ~~diversity~~ difference in their diets. Dogs need energy rich meat to supply their large muscles with energy to hunt and catch their prey. Cattle however do not need high energy foods as they

Extra paper for continuation of answers if required.
Clearly number the question.

Question
number

are not as active as dogs. Humans need a variety of food to allow them to carry out all other life processes and lead active lives. Nutrition ensures the survival and efficiency for each of these animals lives.

This candidate has fully understood the intent of the question & communicated clearly & succinctly & incorporated several aspects of nutrition. The animal groups selected showed clear functional & structural adaptations to cope with survival in diverse habitats.

The reasons for diversity are clearly related to survival & the challenges & opportunities presented by the environments.

G P 17. Nutrition E.

Humans, Dogs, Cattle

The 3 groups selected show clear diversity in structure & function for the chosen system.

The candidate understands the biological process and has applied this understanding to the diversity of structure & function for nutrition.

This candidate understood the question & wrote clear, accurate & concise answers, using appropriate terminology.

For this candidate drawings would have provided a less wordy way to demonstrate knowledge.

This is not an essay paper & this candidate has not wanted

time rewriting a prepared essay style response which may not fit exact meaning of the questions.

This candidate ~~described~~ ^{discussed} structures & their functions that related to the entire nutrition process. There is minimal incorrect or irrelevant information.

The reasons for diversity are clearly discussed & related to the challenges & opportunities presented by the niches/~~of~~ ~~the 3 groups~~. habitats/environments of the 3 groups & the significance of these adaptations in terms of survival. The candidate justifies, relates & analyzes the information.

This candidate clearly answered the question & has shown understanding by linking biological ideas.