AQA – Biological Molecules – AS Biology P2

1. May/2020/Paper_2/No.2

0 2 . 1 Describe how a phosphodiester bond is formed between two nucleotides within a DNA molecule.

[2 marks]

0 2 . 2 The two DNA strands of a particular gene contain 168 guanine bases between them. The relationship between the numbers of guanine bases (G), adenine bases (A), thymine bases (T) and cytosine bases (C) in these two strands of DNA is shown in the following equation.

$$G = 4(A + T) - C$$

Use this information and your understanding of DNA structure to calculate the maximum number of amino acids coded by this gene.

Show your working.

[2 marks]

Answer _____

0 2 . 3 Name the protein associated with DNA in a chromosome.

[1 mark]

0 2 . 4 In the process of semi-conservative DNA replication, the two strands within a DNA molecule are separated. Each then acts as a template for the formation of a new complementary strand.

Describe how the separation of strands occurs.

[2 marks]

2. May/2020/Paper_2/No.5

0 5 . 1 A student investigated starch hydrolysis using the enzyme amylase.

During the procedure, the student:

- treated the starch to make it soluble
- prepared 10 cm^3 of different concentrations (mg dm^{-3}) of starch solution
- added an identical concentration of amylase to each starch solution
- measured the time in minutes to completely hydrolyse starch.

He repeated the procedure and calculated the mean time to completely hydrolyse starch in each concentration of starch solution.

Draw a table the student could use to record all of his results.

You only need to show completed column headings.

[2 marks]

0 5 . 2 Describe the results you would expect the student to obtain.

[1 mark]

0 5 . 3 A competitive inhibitor decreases the rate of an enzyme-controlled reaction. Explain how.

[3 marks]

0 5 . 4 When bread becomes stale, the structure of some of the starch is changed. This changed starch is called retrograded starch.

Scientists have suggested retrograded starch is a competitive inhibitor of amylase in the small intestine.

Assuming the scientists are correct, suggest how eating stale bread could help to reduce weight gain.

[3 marks]

3. May/2020/Paper_2/No.9

0 9 . 1 Describe the processes involved in the absorption and transport of digested lipid molecules from the ileum into lymph vessels.

[5 marks]

0 9 . 2 Describe how the structure of a protein depends on the amino acids it contains.

[5 marks]

4. May/2019/Paper_2/No.1

0 1 . 1 Describe the role of enzymes in the digestion of proteins in a mammal.

[4 marks]

[Extra space]

Scientists investigated how the diet of rabbits affected their digestion and absorption of protein. The scientists fed rabbits an identical mass of food but varied the percentage of protein in the food.

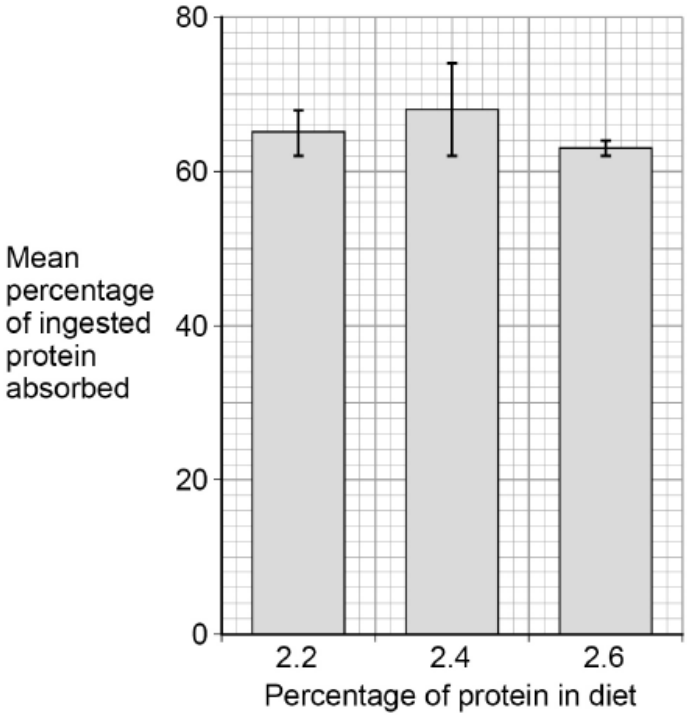
The scientists measured the mean mass of protein fed to the rabbits that was absorbed, which they then expressed as a percentage value.

The scientists' results are shown in **Figure 1**.

The error bars show ± 2 standard deviations.

± 2 standard deviations cover 95% of the data.

Figure 1

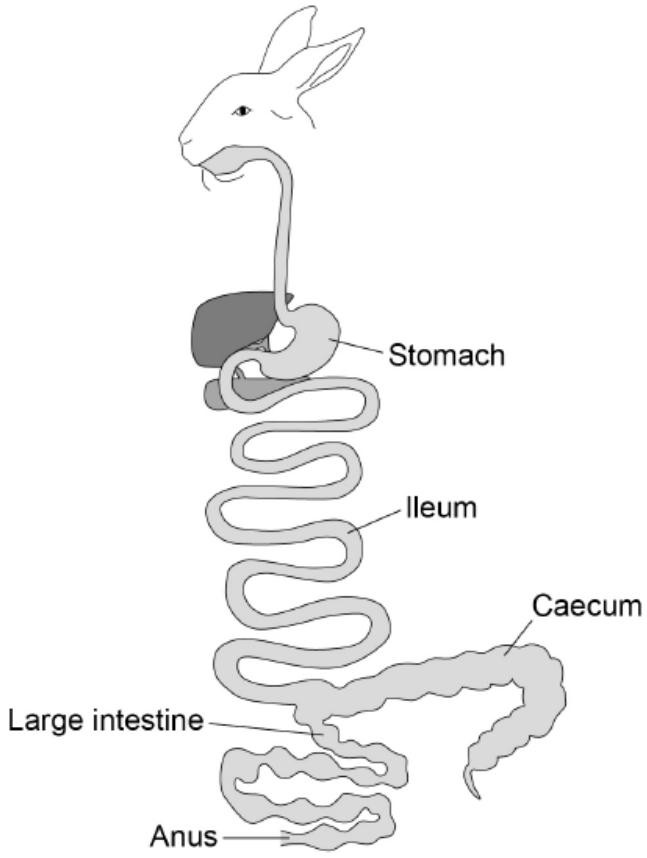


0 1 . 2 What can you conclude about the absorption of the products of protein digestion as the percentage of protein increased in the rabbits' food?

[3 marks]

The digestive system of a rabbit is shown in **Figure 2**.

Figure 2



0 1 . 3 The food eaten by a rabbit is digested mainly by microorganisms in its caecum. The caecum is a section of intestine attached between the ileum and the large intestine. The resulting semi-digested material leaves the anus of a rabbit as soft, caecal droppings. The rabbit then eats these caecal droppings.

Use this information and **Figure 2** to suggest how eating its own caecal droppings helps a rabbit's digestion and absorption of dietary protein.

[3 marks]

[Extra space]