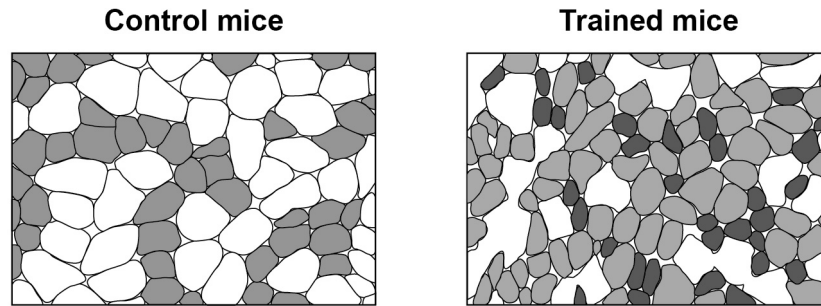


0 3

Scientists investigated the effect of regular exercise on skeletal muscle fibres in mice. The scientists compared the muscle fibres of mice after six weeks of regular exercise (trained mice) with those of mice that had not exercised (control mice). The scientists stained the muscle fibres from both sets of mice to show succinic acid dehydrogenase activity. The darker the stain the greater the succinic acid dehydrogenase activity.

Figure 3 shows a typical set of results they obtained.

Figure 3



0 3 . 1

Succinic acid dehydrogenase is an enzyme used in the Krebs cycle.

Suggest **one** reason for the difference in the staining between the muscle fibres of the control mice and the trained mice.

[1 mark]



0 3 . 2

The scientists then compared the length of time that the control mice and the trained mice could carry out prolonged exercise. The trained mice were able to exercise for a longer time period than control mice.

Explain why.

[3 marks]

0 3 . 3

The scientists determined the mean diameter of muscle fibres in trained mice using an optical microscope to examine sections of muscle tissue. The circular area (πr^2) of one field of view was 1.25 mm^2 . The diameter of this area was equal to the diameter of 15 muscle fibres.

Using this information, calculate the mean diameter in μm (micrometres) of muscle fibres in this section of tissue.

[2 marks]

Answer = _____ μm

Question 3 continues on the next page

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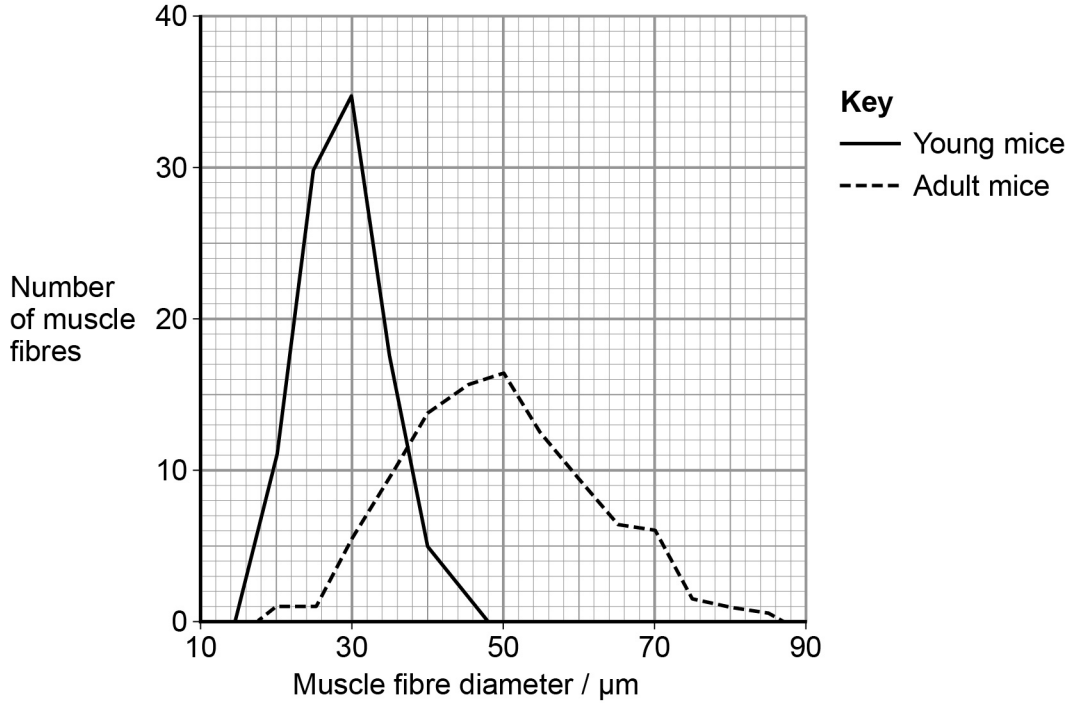


0 3 . 4

The scientists also compared the diameter of samples of muscle fibres taken from young mice and adult mice.

Some of their results are shown in **Figure 4**.

Figure 4



Describe **two** differences between these samples of muscle fibres.

[2 marks]

1 _____

2 _____

8

