

2. The MSTN gene in cattle codes for the protein myostatin. Myostatin inhibits the growth of muscle tissue.

A mutation can occur in the MSTN gene.

Part of the base sequence of the MSTN gene in two breeds of cattle is shown.

Breed A ...C C C A C G G A G T G T G A G T A G...

Breed B ...C C C A C G G A G T T G A G T A G...

Breed A does not have the mutation and breed B does have the mutation in the MSTN gene.

- (a) (i) Name the type of gene mutation that has occurred in breed B. 1

- (ii) Explain why there would be a major effect on the structure of the protein produced. 1

- (b) Explain why breed B cattle will have an increase in muscle mass. 1



2. (continued)

- (c) The length of pregnancy and birth mass of beef and dairy cattle breeds were recorded.

The results are shown in the table.

Breed of cattle	Product	Average length of pregnancy (days)	Average birth mass (kg)
Aberdeen Angus	beef	285	34.6
Ayrshire	dairy	280	37.2
Hereford	beef	284	35.3
Holstein	dairy	277	38.2
Jersey	dairy	275	36.9

Compare the length of pregnancy and birth mass of beef and dairy cattle.

2

[Turn over

