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BIOLOGY

ORGANISMS RESPOND TO CHANGES IN ENVIRONMENTS

Level & Board	AQA (A-LEVEL)
TOPIC:	CONTROL OF BLOOD GLUCOSE
PAPER TYPE:	SOLUTION - 2
TOTAL QUESTIONS	5
TOTAL MARKS	27

Control of Blood Glucose - 2

1.

(a)

Release of glucagon

Leads to formation of glucose in liver cells

From amino acids/fatty acids

(b)

Mutant mice mRNA suggests make a lot of the enzyme

Mutant mice use kidney / intestine cells to make glucose

Normal mice do this much less / normal mice use liver cells.

(c)

Differences significant

Probability of difference being due to chance less than 0.01 / 1%

2.

(a)

To show the effect of the inhibitor / drug

To show the effect of yoghurt on its own does not affect blood glucose

(b)

Food is a factor affecting blood glucose / different foods contain different amounts of starch / glucose / sugar / carbohydrate

To keep starch / fibre intake the same / similar

3.

(a) An inhibitor would result in less enzyme substrate complexes formed, this results in breakdown of glucose resulting in a lower concentration of blood glucose as less maltose is being broke down into glucose.

(b) A small sample size was used which is an unrepresentative.

4.

(a) In hepatocytes, glycogenesis occurs where glucose is converted to glycogen. This causes a decrease in glucose concentration in the cell in comparison to the plasma thus maintaining a concentration gradient.

OR

Formation of glycogen

Glucose concentration in cell / liver falls below that in blood plasma which creates / maintains glucose concentration / diffusion gradient

Glucose enters cell / leaves blood by facilitated diffusion / via carrier protein / channel protein

(b) Insulin sensitivity similar to / not (significantly) different from those with diabetes

Overlap of SDs

Their sensitivity (to insulin also) improved by GBS

(c)

Sensitivity to insulin does increase

But large SD / large variation after GBS

So some showing no / little change / get worse

Do not know what sensitivity to insulin is of non-diabetics who are not obese

5.

(a)

Glucose oxidase and peroxidase;

Both enzymes required

Dye with colour A

(b)

Concentration is given as a range for each colour / measurement is not precise

Only measures glucose concentration above normal / above 170 mg 100 cm^{-3} in blood

170 mg 100 cm^{-3} is an average figure / concentration for loss to urine varies between people

Difficult to match colour against chart / colour match is subjective

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- Completed Medicine (M.B.B.S) in 2007
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