

Explanation: Answer the following questions in a complete sentence

1. Comparing the human gene to the cow gene, how many of the codons are exactly the same?

5

2. How many of the amino acids in the sequence are exactly the same?

7

3. Could two humans (or two cows) have some differences in their DNA sequences for insulin, yet still make the exact same insulin proteins? Explain.

they could because some codons code for the same amino acids.

4. Find ALL of the codons that can code for the amino acid **leucine** and list them.

UUA, UUG, CUU, CUC, CUA, CUG

Evaluation: Answer the following questions in a complete sentence

1. Diabetes is a disease characterized by the inability to break down sugars. Often a person with diabetes has a defective DNA sequence that codes for the making of insulin. Suppose a person has a mutation in their DNA and the first triplet for the insulin gene reads T A T. The normal gene reads T A G.

What amino acid does the mutant DNA and the normal DNA code for and will the person with this mutation be diabetic? Explain.

mutant: TAT → AUA → isoleucine

normal: TAG → AUC → isoleucine

Because the AAs are the same, the mutation will not cause the disorder.

2. Another mutation changes the insulin gene to read T C T (instead of the normal T A G). Will this person be diabetic? Explain.

TCT → AGA = arginine; the different AA will cause the protein to be defective and the person will probably have diabetes.