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SECTION B MLT BS

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PAPER BIO CHEMISTRY

Q3

DIGESTION AND ABSORPTION OF CARBOHYDRATE

.The digestion of carbohydrate begins in the month . the salivary enzyme amylase begins the breakdown of food starches into maltose disaccharide.

.AS the food travels through the esophagus to the stomach no significant digestion of carbohydrate take place the esophagus produces no digestive enzyme but does produce mucous for lubrication.

. THE ACIDIC environment in the stomach stopes the action of the enzyme .

. The next step of carbohydrate digestion takes place in the duodenum the food from the stomach enters the duodenum and mixes with the digestive from the pancreas liver and gallbladder

.Pancreatic juices also contain amylase with continues the breakdown of starch and glycogen into maltose a disaccharide.

.The disaccharide are broken down into ,monosaccharides by enzyme called maltase sucrose and lactase which are present in the small intestine wall

. maltase breaks down maltose into glucose other disaccharides such as sucrose and lactose are broken down by sucrose and lactase respectively.

. the monosaccharides glucose thus produce are absorbed and then can be used in metabolic pathway to produce energy the monosaccharides are transports into the blood stream to be transported to the different cell in the body.

Q2

Steps of glycolysis

step 1 the first step in glycolysis is the conversion of glucose into glucose 6 phosphate the enzyme that catalyses this reaction is hexokinase .

step 2 phosphoglucose losmerase the second reaction of glycolysis is the rearrangement of glucose 6 phosphate g6p fructose 6 phosphate isomerase phosphoglucose isomerase.

Step4 aldose the enzyme aldolase splits fructose 1 6 bisphosphate into two sugar that are isomers of each pther these two sugare age dihydroxyacetone phosphate dhap and glyceraldehyde 3 phosphate gap.

Step 3 phosphofructokinase with magnesium as a cofactor change fructose 6 phosphates into fructo bisphosphate.

Step5 triose phosphate isomerase the enzyme triose phosphate isomerase rapidly inter converts the toolecules dihydroxyacetone phosphate dhap and glyceraldehyde 3 phosphate gap glyceraldehyde phosphate is remived used in next step of glycolysis.

Step 6 glyceraldehyde 3 phosphate dehydrogenase GAPDH dehydrogrnase and adds am inorganic phosphate to glyceraldehyde 3 phosphate producing 1.3 bisphosphoglycerate.

Step 7 phosphoglycerate kinase transfer a phosphate group from 1.3 bisphosphoglyceate tp ADP to from ATP and 3 phosphoglycerate.

Step 8 phosphoglycerate mutase the enzyme phosphoglycerae mutase relocates the p from 3 phosphoglycreate from 3rd carbon to the 2nd carbon 2 phosphoglycreate.

Step 9 enolase the enzyme enolase remove a molecules of water from 2 phosphoglycreate to from phoaphoenol ruguvie acid PEP.

STEP 10 PYRuvate kinase the enzyme pyruvate kinase transfer a p from phosphoenolpyruvate PEP to ADP to from pytuvic acid and ATP RESULT in the step 10.

Q4 step 1 condensation of acetyl coa with oxaloacetate first step of the citric cycle is the joining of the four carbon compound oxaloacetate ooa and a two carbon compound acetyl coa .

Step 2 isomerization of citrate into isocitrate now for further metabolism citrate is convert into isocitrate through the formation of intermediate cis aconitase this reaction is a reversible recation catalysed by the enzyme aconitase.

Step3 oxidative decarboxylation of isocitrate the third step of the citric acid cycle is the first of the four oxidation reduction in this cycle .

Isocitrate is oxidatively decarboxylated to from a five carbon compound ketoglutarate catalysed by the enzyme isocitrte dehydrogenase.

This reaction like the second reaction is a two step reaction

Step 4 oxidative decarboxylation of ketoglutarate this step is another one is the oxidation reduction reaction where ketoglutarate is oxidatively decarboxylated a from a four carbon compound succinyl coa and co2.

Step 5 conversion of succinyl coa into succinate in the next step succinyl coa undergoes an energy conserving reaction in which succinyl coa is cleaved to from succinate .

This reaction is accompanied blationn of guanosine diphosphate GDP to guanosine triphosphate GTP.

STEP 6 Dehydration of succinate to fumarate here the succinate formed from succinyl coa is dehydrogenase found in the intramitochondria space

This is the only dehydrogenation step in the citric acid cycle in which NAD does not participate.

Step 7 hydration of fumarate to malate the fumarate is reversible hydrate to form l malate in the presence of the enzyme fumarate hydratase . as it is reversible reaction the formation of l malate involves hydration where the formation of fumarate involve dehydration.

Step 8 dehydrogenation of l malate to oxaloacetate the last step of the citric acid cycle is also an oxidation reduction reaction where l ,malate is dehydrogenated to oxaloacetate in the presence of l malate dehydrogencase which is present in the mitochondrial matrix.

This is a reversible reaction involving oxidation of l malate and reduction of NAD into NADH.

Q5 THE main different between fats and oils usually derived from animaLS where oils are usually derived fom plants the other differents is fats tend to be solids at room temperature on the other hand oils tend to be liquid at room temperature .

Solid fats and oils provide the same number of calories per gram however oils are generally better for your health than soilds fats because they contain less saturated fats and or trans fats food containing partially hydrogenated vegetable oils usually contain trans fats.

Q1 Dickens shunt a secondary pathway for the the oxidation of d glucose not occurring in skeletal muscle generation reducing power in the cytoplasm outside the mitochondria and synthesis pentoses and few other sugar synonym pentose phosphate pathway Warburg lipman n dinkens lorecker shunt.

The MPH shunt is parallel to the glycolysis pathway and takes place in the cytoplasm a 6 carbon sugar glucose may enter the glycoltic pathway or enter the alternative HMP shunt depending alternative HMP shunt depending on the cell individual need at the time once the glucose enter the HPM shunt it undergoes a series of recation broken down into the oxidative phase and non oxidative phase reversible the oxidative phase is responsabile for converting the intermediate glucose 6 phosphate to 6 phophogluconate using the glucose 6 phosphate dehydrogenase G6PD enzyme the by product of this reaction is the important molecules NADPH 6 phosphogluconate and NADPH gets produced agains as a by produce.

The non oxidative of HMP shunt involves the conversion of ribulose 5 phosphate to ribose 5 phosphate R 5 P through a series of independent reaction it is important to note that no NADPHA Molecules get created in this part of the MPH shunt R 5 p in this recation can be returned to the glycolytic pathway as fructose 6 phosphate this step required the transketolase enzyme with the presence of the thiamine co factore.