APPLICXATION OF ENZYMES IN FOOD INDUSTRY

1. **α - AMYLASE**

a) Wide applications of α-amylases in food industry include baking, brewing, starch liquefaction as well as a digestive aid.

b) They are widely used in baking industry as flavor enhancement and antistaling agent to improve bread quality.

c) During baking, α-amylases are added to the dough for conversion of starch to smaller dextrins, which are subsequently fermented by yeast. It improves the taste, crust colour and toasting qualities of bread.

d) In starch industry, they also find application for starch liquefaction, which converts starch into glucose and fructose syrups.

e) Other applications of α-amylases include clarification of fruit juices, which is carried out in the presence of cellulases and pectinases to improve yield as well as to make the process cost-effective.

2. **CATALASE**

a) This enzyme can be produced from microbial sources such as *Aspergillus niger* and *Micrococcus luteus* and from bovine liver.

b) Microorganisms are usually preferred as sources for enzyme production due to their advantages such as fast growth, easy handling and genetic tuning for obtaining a desired product.

c) This enzyme is mostly used along with other enzymes in food processing industry.

d) Catalase is often used with glucose oxidases for food preservation.

e) Catalase is applied in milk processing industry to eliminate peroxide from milk, to remove glucose from egg white in baking industry and in food wrappers to prevent oxidation and control perishability of food.

f) This enzyme has limited use in cheese production.

3. **PEROXIDASE**

a) Peroxidases are present in plants, microorganisms and animals. They are involved in lignification processes in plants and defence mechanisms against damaged or infectious tissues.

b) This enzyme is used in food industry for producing flavor, colour and texture and improving nutritional quality of food.

c) It can be used for treating phenolic effluents from industries. Thermal inactivation of peroxidases is used in food industry to measure the efficiency of blanching treatment, which further enhances the shelf life of food.

d) The negative effect of peroxidases is that they cause undesirable browning of fruits and off-flavors of vegetables.

4. GLUCOAMYLASES

a) Glucoamylases find wide range of applications in food industry, such as for the production of high-glucose syrups and high-fructose syrups.

b) They also find application in baking industry to improve flour quality, reduce dough staling, as well as to improve bread crust colour and the quality of high fiber baked products.

c) Glucoamylases convert the starch present in the flour to maltose and fermentable sugars.

d) These enzymes are also used for the production of glucose, which upon fermentation with *Saccharomyces cerevisiae* yields ethanol.

e) Glucoamylases play an important role in the production of soya sauce, as well as in the production of light beer.

f) They metabolize dextrins and convert them to fermentable sugars with reduced calorific value and alcohol content in the beer.