WELCOME

ENTREPRENEURSHIP- ANIMAL NUTRITION

DEPARTMENT OF ANIMAL NUTRITION

TOPIC - ENZYMES USED IN RUMINANT NUTRITION

ENZYMES

DEFINITION:-

- Enzymes are proteins that function as biological catalysts. A catalyst is a substance that speeds up a chemical reaction but isn't changed by the reaction.

- Enzymes catalyze all aspects of cell metabolism.

PROPERTIES OF ENZYMES

- Enzymes are highly specific to the reactions they catalyze
- They alter or speed up the rates of chemical reactions that occur in a cell.
- They remain unchanged after a chemical reaction.
- They are affected by temperature.
- They are affected by pH.
- They catalyze reversible reactions.

Classification

Types	Biochemical Property
Oxidoreductases	The enzyme Oxidoreductase catalyzes the oxidation reaction where the electrons tend to travel from one form of a molecule to the other.
Transferases	The Transferases enzymes help in the transportation of the functional group among acceptors and donor molecules.
Hydrolases	Hydrolases are hydrolytic enzymes, which catalyze the hydrolysis reaction by adding water to cleave the bond and hydrolyze it.
Lyases	Adds water, carbon dioxide or ammonia across double bonds or eliminate these to create double bonds.
Isomerases	The Isomerases enzymes catalyze the structural shifts present in a molecule, thus causing the change in the shape of the molecule.
Ligases	The Ligases enzymes are known to charge the catalysis of a ligation process.

XYLANASES

→ Xylanases are hydrolytic enzymes which random cleave the beta 1,4 backbone of the complex plant cell wall polysaccharide xylan

Chemical Nature

1) 1,4-beta-Xylanase

Mode Of Action

Maintain the foregut digesta viscosity (Directly proportional to molecular weight) by:

1) Hydrolysis of higher molecular weight arabinoxylans (wheat) into low molecular weight compounds

2) By reducing digesta viscosity maintain water intake of birds resulted in maintain excreta (Not wet and sticky droppings produced)

→ Improved litter quality

→ Improved digestion and absorption

Amylase

→ Chemical Nature

Alpha amylase(1,4-alpha-D-glucan glucanohydrolase) Beta amylase(1,4-alpha-D glucan maltohydolase)

Mode Of Action

It assist in digestion of starch in early-weaned animals

Increased availability of carbohydrates • Increased in available energy

Adding adequate activity levels of alpha-amylase, beta- glucanase and xylanase to broiler starter and grower soya bean diets with a 3% reduction in dietary ME

→ Allowed full restortation of growth performance of broilers → It also improve digestibility of nutrients or to reduce the ANFS.

Rennin

rennin, also called chymosin, protein-digesting enzyme that curdles milk by transforming caseinogen into insoluble casein;

In animals that lack rennin, milk is coagulated by the action of pepsin as is the case in humans

LIPASE

Lipase is an enzyme the body uses to break down fats in food so they can be absorbed in the intestines. Lipase is produced in the pancreas, mouth, and stomach.

Beta-Galactosidace

It neutralize certain antinutritive factors in noncereal feedstuffs.

Chemical Nature

*B-galactosidase, also called lactase, beta-gal or B-gal, is a glycoside hydrolase enzyme that catalyzes the hydrolysis of ß-galactosides into monosaccharides through the breaking of a glycosidic bond.

REFERENCE :-

https://images.app.goo.gl/8obtXoxazJEq9J1VA

(McAllister et al. 2001)

THANK YOU