

Feed Additives and their use in animal nutrition

Dept of Animal Nutrition,
CoVSc & AH, Jabalpur

Defination

- Feed additives is an ingredient or combination of ingredients added to the basic feed mix or parts there of to fulfill the specific need
- Usually used in microquantities and requires careful handling and mixing
- It is used to improve rate of gain, feed efficiency, preventing and controlling disease, prevention against untoward enviromantal influences.

Types of feed additives

- Nutrient feed additives
 - E.g. amino acids, minerals and vitamins
- Non nutrient feed additives
 - E.g. antibiotics, hormones, immunomodulators, enzymes, probiotics,

Advantages

- Increase feed quality and feed palatability
- Improve animal performance
- Improve the final product
- Economise the cost of animal protein

Antibiotics

Two Types:

- Non Ionophore antibiotics e.g. Chlortetracyclin, zinc bacitracin etc.
- Ionophore antibiotics e.g. monensin, lasalocid, salinomycin etc.
- Difference in between two is there mode of action
- Non ionophore antibiotics
 - Stimulation of microorganisms which favors nutrient synthesis
 - Suppression of organisms which compete for critical nutrients
 - Inhibition of toxin producing bacteria
- Ionophore antibiotics
 - Form hydrophobic complex with inorganic cations like sodium potassium and calcium
 - Mainly active against gram +^{ve} organisms bcoz outer membrane of gram -^{ve} bacteria are impermeable to such complexes
- Ionophore and nonionophore have been used in non-ruminants and preruminants while, only ionophore are successfully used in adult ruminants

Arsenicals

- E.g. 3-nitro-4hydroxy phenylarsonic acid (3 nitro), P-amino phenylarsonic acid (arsanilic acid)
- it improves the growth of broilers
- Such birds have bright red combs and wattles as it enlarges the cappillaries due to its dilator effect

Copper supplements

- Routinely used in pig diet as growth promoter
- Level at 250mg/kg in diet produce soft fat
- It also causes partial defaunation in ruminants

Hormones

- It is secreted by endocrine glands into the blood for transportation to target organ and tissue. Two types
- Anabolic hormones: Somatotropin, thyroxin and Androgens
 - They stimulates growth of endochondrial bones and epiphysis of long bones
 - Also aid in nitrogen retention during protein metabolism
- Catabolic Hormones: Oestrogens, glucocorticoids
 - They inhibit skeletal growth and also degrading protein and amino acid

Immunomodulators

- They are obtained from organisms or synthesized chemically which are capable of enhancing the defence mechanism
- Vitamin C, Vitamin E, Levamisole, quaternary ammonium compounds, chitin

Enzymes

- Cellulase, xylanase, protease, hemicellulase
- it is usually used with some unconventional feed stuff

Probiotics

- Parker coined the term Probiotics
- It is live culture of non pathogenic organisms which beneficially affect the host animal by improving its intestinal microbial balance.
- E.g. *lactobacillus acidophillus*, *L. casei*, *L. bifidus*

Prebiotics

- E.g. MOS, FOS
- complex carbohydrates extracted from yeast cell wall
- MOS blocks the attachment of harmful bacteria and prevent their colonization
- FOS enhance the growth of probiotic bacteria which reduces harmful bacteria

Acidifiers

- E.g. Formic acid, Propionic acid

Antioxidants

- E.g. Vitamin E, Vitamin C (Natural)
- Butylated hydroxyanisole (BHA), Butylated hydroxytoluene (BHT) (Synthetic)

Sequestrants

- E.g. EDTA, citric acid
- They are metal scavengers binds with certain metals (copper and iron) which acts as catalyst in oxidation process.