

DEPARTMENT OF ANIMAL NUTRITION

NON-GENETIC MANIPULATION OF RUMEN FERMENTATION



NON GENETIC RUMEN MANIPULATION

Definition:-

Manipulating the rumen fermentation which involves the maximizing The feed efficiency or increasing the productivity by physical methods, chemical method or by microbes

WHY WE NEED RUMEN MANIPULATION?

1. To enhance fibrolytic activity : To increase fibre degradation mainly through manipulation of ligno-cellulosic bonds.
2. To increase microbial protein synthesis : A major portion of the amino acid reaching duodenum are of microbial protein origin.
3. Reduction in Methanogenesis : Methane generation in the rumen is a wasteful process as 5-10% of GE intake of ruminants is converted into methane.
4. Prevention of acidosis : In high grain fed animals the level of lactic acid can be controlled to avoid acidosis and inhibition of feed utilisation due to lowered PH of the rumen liquor.

PROBIOTICS

- Also known as microbial feed additives which are used for the Intestinal microbial balance
- The micro organisms used as probiotics should has following properties such as
 - Resistance to low pH and bile salt
 - Production of lactate and anti microbial agents
 - Able to survive ,colonize and multiply at faster rate
 - Viable product can be formed by industrialization
 - Must produce beneficial effects in host animal

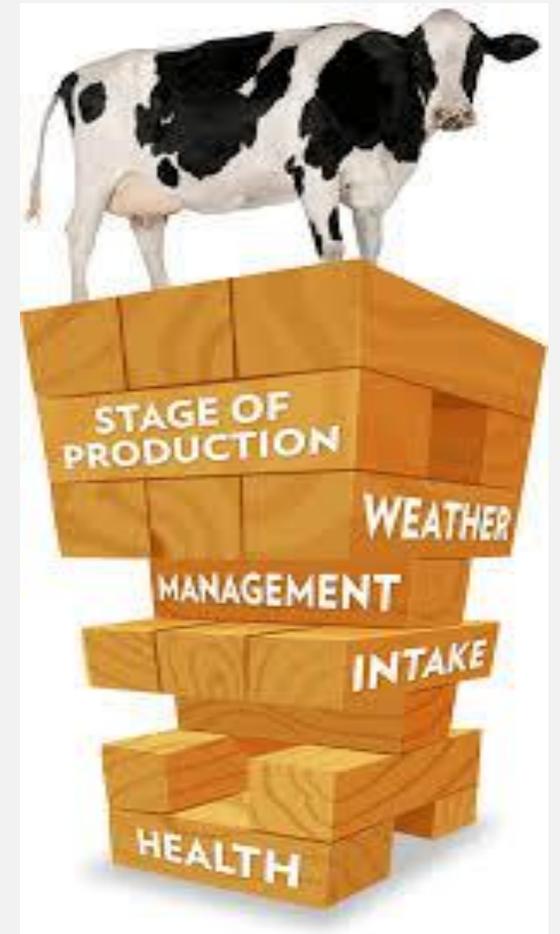


UTILISATION OF PROBIOTICS IN FARM ANIMALS

- Growth promotion
- Improved feed conversion efficiency
- Better absorption of nutrients
- Improved metabolism of carbohydrates calcium and Synthesis of vitamins
- Neutralization of anti nutritional factors
- Elimination or control of intestinal micro organisms
- Microbial enzyme production
- Stimulation of specific and non specific immunity

ADMINISTRATION OF PROBIOTICS MOST EFFECTIVE UNDER

- After the birth to encourage the Beneficial rumen microbial flora
- Antibiotic treatment
- Presence of enteric pathogen such as salmonella , E coli, coccidia
- During environmental or managerial stress
- In adult cattle it is effective under following conditions
 - Ketosis
 - Antibiotic treatment
 - Difficult calving
 - Bloat



PROBIOTICS FOR NEONATAL RUMINANT

- It involves the drenching or dosing of the Soon after the birth or Inclusion of direct fed microbial products in the either the milk or milk replacer
- **Objectives :-**
 - Avoid establishment of enteropathogens
 - Rapid adaptation of solid feed by acceleration the development of normal intestinal flora
 - Stimulate the early development of rumen



PROBIOTICS FOR GROWING RUMINANT

- **Effect of probiotic feeding on growing ruminant :**
 1. With help of yeast feeding it helps to increase Microbial flora along with cellulytic bacteria
 2. Percentage of enterodinomorphid bacteria decrease and Dasytricha Increased in the rumen of yeast culture Fed animal
 3. Yeast fed animals have low ammonia nitrogen content and high protein synthesis
 4. Yeast act as oxygen scavenger
 5. It helps in better animal performance
 6. Postive response of milk production
 7. Nutrient digestibility

DEFAUNATION

- The process of Making the rumen of animals free from rumen protozoa is known as Defaunation
- It reduces the ruminal methane production and increase the protein out flow
- Methods of defaunation:-
 1. Isolation of new born animals
 2. Chemical method
 3. Dietary manipulation

ISOLATION OF NEW BORN ANIMALS

- Separate the new born animals from their dam
- Preventing them from the adult Ruminant animals
- The new born animals should be seperated after two to three days of birth

CHEMICAL METHOD

- Sodium Lauryl Sulphate, copper sulphate and mannoxol are the common Chemicals widely used to defaunate
- Chemicals Which are used as defaunting agent are introduced in the rumen of animals either by orally , stomach tube or through rumen fistula.

DIETARY MANIPULATION

- The ciliate protozoa are very much sensitive to change in rumen pH
- The activity ciliate protozoa is adversely affected when the pH of the rumen fall below 5.8 and the rumen pH fall below 5.0, the ciliate protozoa are be completely eliminated.
- Therefore, offering high energy feed (especially cereal grains like barley, maize to the starved (for 24 hours) animals, creates acidic condition in the rumen and rumen pH fall below 5.0. This fall in rumen pH eliminate the ciliate protozoa completely and the animal becomes defaunted.

THANK YOU

REFERENCE-

A. SANTRA AND S. A. KARIM

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