

FEED TECHNOLOGY

**Dept of Animal Nutrition,
CoVSc & AH, Jabalpur**

DEFINITIONS

Feed Technology: Application of physical, chemical, biochemical, biological and engineering techniques to increase the nutrient utilization of feed and fodders

Complete feed: Nutritionally adequate feed for animals formulated using specific formula compounded to be fed as the sole ration and is capable of maintaining life and promoting production without any additional substance, except water.

Concentrate: A feed used with another component to improve the nutritive balance of the total feed.

Processing of feed and forages

- To make more profit
- To alter particle size
- To change moisture content
- To change density of feed
- To change palatability
- To increase nutrient content
- To increase nutrient availability

PROCESSING METHODS OF GRAINS

Dry Processing methods		Wet Processing methods	
S.No.	Methods	S.No	Methods
		.	
1.	Grinding	1.	Soaking
2.	Dry Rolling	2.	Steam rolling
3.	Popping	3.	Steam processing & Flaking
4.	Extruding	4.	Pressure cooking
5.	Micronizing	5.	Exploding
6.	Roasting	6.	Pelleting
		7.	Reconstitution

DRY PROCESSING METHODS

Grinding

- Process of particle size reduction
- Simplest and least expensive
- Vary from fine to coarse but medium fine grinding is best

Advantages

- Increase the surface area
- Improves feed utilization
- Mixing different ingredient is aided / segregation is avoided
- Selective feeding is avoided
- Palatability is improved

Dry Rolling

- Rolled or cracked grain are usually prepared by passing the grain through a roller mill.
- Properties of grain under dry rolling and grinding are very similar

Popping or puffing

- Popping is produced by the action of dry heat at 350-450⁰ C for 15-30 seconds
- It cause sudden expansion of the grain which ruptures the starch granules and thus starch is more available to rumen micro flora
- It increase palatability and feed intake by 5-10%

Micronizing

- Process is similar to popping except that heat furnished in the form of infrared energy.

Extruding

- Gelatinization of starch occurs in this process
- Used to prepare fish feed

Roasting

- It is accomplished by passing the grain through flame at 149⁰C
- It inactivates the enzymes or inhibitory factors

WET PROCESSING METHODS

Soaking

- Grains soaked for 12-24 hrs in water is used for animal feeding
- Soaking of some of the cakes eliminates toxic factors soluble in water

Steam rolling

- Grains are subjected to live steam for different period of time depending upon the pressure used prior to rolling
- Pressure preconditioning of grains increases gelatinization of starch to 45-50%.
- Steam rolled grains are less dusty than dry rolled grains

Steam processing and flaking

- This process is a modification of steam rolling
- After steam treatment grains is passed through the roller mill. The tolerance set between the rollers depends upon the flatness of the flakes

Pressure cooking

- Grains are cooked with live steam at 50 psi for 1.5 min in air tight pressure chamber.

Exploding

- The grains are subjected to high pressure steam (250 psi) for about 20 sec and followed by sudden decrease to atmospheric pressure
- This results in rapid expansion of the grain kernal
- It produce a low density product
- It is similar to popped grain

Reconstitution

- Reconstituted grain is a mature grain (10% moisture) to which water is added to raise the moisture level to 25-30%
- The wet product is stored in an oxygen limiting silo for 14-21 days
- It increases the solubility of grain protein

Pelleting

- It is an agglomerated feed formed by forcing or compacting the feed mixture through a die by any mechanical process.

Roughage processing methods

Dry Processing methods		Wet Processing methods	
S.No.	Methods	S.No	Methods
1.	Baling	1.	Green chopped
2.	Grinding	2.	Soaking
3.	Pelleting		
4.	Cubing		
5.	Dehydration		

Baling, field chopping, and cubing are to be done to make handling easy, to reduce the cost of transportation and space required for storage

Chemical treatment

- NaOH
- Calcium hydroxide
- Ammonia
- Urea treatment