CATTLE FEED

The formulation of cattle feed largely depends on the various of cattle, milk yield, dairy ration etc. It is also important that the availability of the basic raw materials and their prevailing prices must be kept in mind while formulating the cattle feed.

Feed Ingredient Characteristics

Feed and ingredient characteristics are determined by the following factors:

1. Protein
2. Density
3. Fat
4. Fibre
5. Texture

6. Starch or carbohydrates
7. Moisture

The quality of pelleted feed will vary as the factors of ingredients vary. In order to keep pellet quality constant, ingredient characteristics or quality must be consistent, or compensating adjustments made.

Protein & Density

Ingredients with high natural protein will plasticize under heat, which will cause good quality pellets. Ingredients or feeds with high density have high production rates. When low protein and high density are the factors, high

production rates and poor pellet quality can be expected. Some examples of this type of ingredient are alfalfa meal, ground corn cobs, cottonseed hulls and corn gluten feed.

Fat

The fat content of an ingredient or feed can mean either natural fat or fat added. Both are an aid in increasing production rates. The pellet quality could be seriously affected with the addition of too much fat, normally 2% or more. The added fat can be of two kinds - animal fat or vegetable fat. Animal fats are presently the most commonly used in commercial feeds.

Fibre

High fibre creates production rate problems, as fibre is hard to compress into a pellet. Because of the natural binders inherent to fibre, a good quality pellet result.

Texture

When referring to texture, three general areas need to be considered: coarse, medium and fine. Fine or medium ground materials provide greater surface area for absorption of moisture from steam, resulting in better lubrication and increased production rates. Also, more particles are exposed to steam, resulting in possible chemical changes that may be needed for quality. The starting density can be increased when it includes a mix of medium and fine ground material. Very coarse grinds or large particle sizes provide natural breaking points in pellets, creating more fines.

Starch

High starch formulations or ingredients are difficult to produce a tough, durable pellet. The natural glutamines can be activated only with high temperatures and moisture. The gelatinized material acts as a binder to produce the desired pellet quality. If, for some reason, the natural starches in a feed have been gelatinized before pelleting, poor pellet quality can be predicted. An example would be the drying of corn at high temperatures, which would cause pre-gelatinization

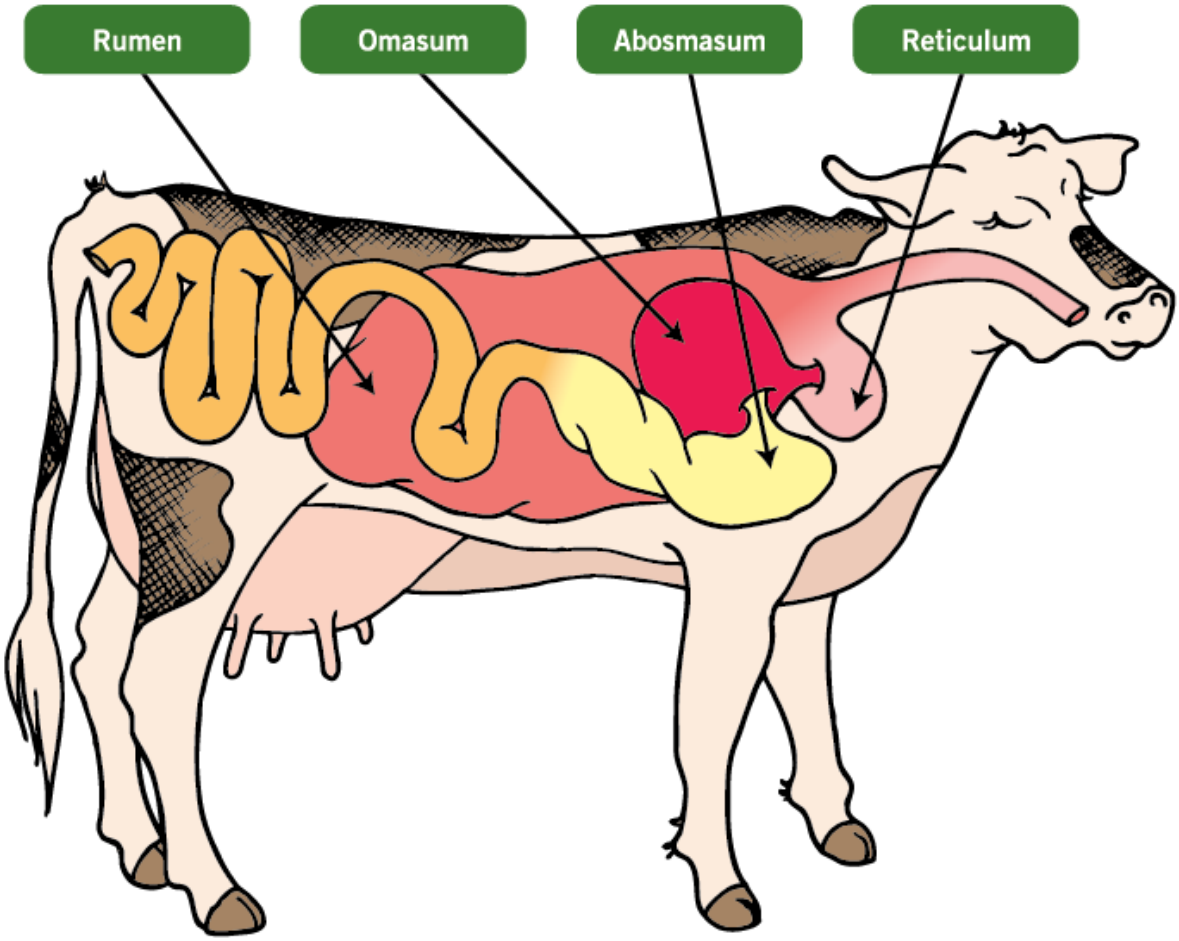
Moisture

Sufficient inbound moisture added prior to pelleting can be desirable in reaching good pellet durability. As stated earlier, many of today's ingredients, such as brewer's grains, are of a very dry nature and added moisture will supplement the pellet mill stream additions if it has an opportunity to soak in prior to reaching the pellet conditioning chamber.

BASIC DIGESTIVE ANATOMY AND FUNCTION

An understanding of the components and development of the digestive tract of cattle is important to understand cattle nutrient requirements and how best to meet these. The majority of feed available to grazing animals is high in fibre. That is, the feed contains large structural carbohydrates such as cellulose. Very few animals, and no mammals, have the enzyme systems necessary to digest fibre. However, certain microorganisms do have these enzymes. Ruminants are mammals that have evolved a specialist digestive system that enables them to utilise high-fibre diets such as grass. This digestive system makes use of fibre-digesting microorganisms. The majority of these microorganisms live in the rumen and reticulum. Ruminants such as cattle and sheep are more efficient at

converting grass into meat (and wool) than simple stomach animals such as pigs. However, the ruminant digestive system is less efficient than the monogastric digestive system at digesting high-energy diets, such as grain.



- Ruminants, such as cattle and sheep, have a complex digestive system. They have four stomachs and each does a different job (this is different to monogastric such as pigs and people that only have one stomach)
- The rumen changes as the animal grows
- Balancing the nutrient requirements of both the rumen microorganisms and the animal is essential for good animal performance. Chewed food is transferred from the mouth to the rumen via the oesophagus. The oesophagus also conveys partially digested food (the cud) from the rumen to the mouth where it is further ground by chewing to make it easier to digest.