

Lecture 11

MISCELLANEOUS SOURCES OF PROTEIN

LEAF PROTEIN

Plant protein contains fair amounts of protein. The protein can be concentrated by crushing and disintegrating the leaves or by precipitating protein concentrate from the leaf juice with the aid of heat or acid. The concentrate so formed may contain up to 60% protein.

SINGLE CELL PROTEIN refers to bacteria, yeast, fungi and algae are microorganisms. Biomass containing up to 50% or more can be produced from each of these micro organisms are termed single cell protein. (SCP).

Hatching waste: It is a mixture of egg shells; infertile and unhatched eggs called chicken that are cooked, dried and ground prior to use.

INSECT MEALS

They include larva of insects, whole insects and earthworm. They can replace plant protein or parts of the fish used in the diet.

Milk and milk by product: they include skimmed milk, condensed butter milk, dried whole milk. They are excellent source of protein but are usually too expensive to be included in the feed.

PROCESSING OF FEEDS

There are several ways of processing feed stuffs. This can be classified into dry and wet processing or cold and hot processing.

COLD PROCESSING METHODS

GRINDING: The particles may be finely, moderately or coarsely ground. However, fine ground may lead to wind loss, tends to form ball in the GIT when mixed with saliva, reduces palatability in cattle, and reduces digestibility and absorption due to faster rate of passage in GIT. May cause ulcer in pig, feed bloat in cattle. Moderately ground is good for pig and poultry. Grinding

of grains for cattle may probably not necessary but sorghum has to be crushed coarsely because its waxy coats may prevent digestions. Fine ground grains for dairy cattle will result in low butter, fats and milk.

ROLLERMILL GRINDING

Rollermills act on grain by compressing it between two corrugated rolls that can be screwed together to produce smaller and smaller particles. Rollermils are not used with roughages.

HAMMER MILLS

A hammer mill processes feed with the aid of rotating metal bars (hammers) that blow the ground product through a metal screen. The size of the product is controlled by changing the screen size. These mills will grind anything from coarse roughage to any type of grain. The products size will vary from particles similar to cracked grain to a fine powder.

SOAKED GRAIN

Grain is soaked for 12-24 hours. The soaking, sometimes with heat, softens the grain which swells during the process making a palatable product that should be rolled before using in finishing rations.

RECONSTITUTION

It is similar to soaking and involves adding water to mature dry grain to raise the moisture content to 25-30. It is stored in oxygen, limiting silo for 14-21days prior to feeding. This procedure works well with sorghum.

HIGH MOISTURE GRAIN

Grain is harvested at a high moisture content of (25-35%) and stored in a silo or treated with chemical to avoid spoilage. It may be ground before ensiling or ground or rolled before feeding. This is an important method when weather conditions do not allow sun drying.

ACID PRESERVATION OF HIGH MOISTURE GRAINS

Thorough mixing of 1.1.5% propionic acid, mixture of acetic propionic acids or formic and propionic acids into high moisture (20-30%) whole corn or other cereal grains retards molding and spoilage.

HOT PROCESSING METHODS

Most of these methods are associated with high cost and maintenance problem of equipment.

STEAM ROLLING

The steaming is accomplished by passing steam through a tower above the roller mill. The grains are subjected to steam for only a short time (3-5minutes) prior to rolling. Most results had only little or no improvement on animal performance as compared to dry rolling but use of steam does allow production of larger particles and fewer fines.

STEAM FLAKING

Grain is subjected to high moisture steam for a sufficient time to raise the water content to 18-20%, and the grain then rolled to produce a flat flake. This process is beneficial in term of weight gain efficiency.

PELLETING

Pelleting is accomplished by grinding the feed and then forcing it through a thick die. Feedstuffs are usually but not always steamed to some extent prior to pelleting. Pellets can be made in different diameters, lengths and hardness and are commercially available. It is good for pig and poultry.

ADVANTAGES

1. It reduces dustiness
2. It reduces loss in the fine particles ingredients during transportation.
3. It reduces feed wastage particularly in fish, pig, poultry
4. Bulking reduction
5. It increases the utilization of fibrous feed component of the ration
6. Partial cooking of starch results in making it more susceptible to enzymatic action and improves digestibility of starch

DISADVANTAGES

1. It increases cost of production
2. Improper pelleting procedure may cause feed spoilage
3. Ration high in fat are not good in pelleting

TOASTING

Maize is usually the target. The maize is passed through a roaster. The moisture constant will be reduced to about 5% but the bulkiness is increased by 15%.

Results of livestock feeding trials with roasted maize used for pigs, consistently shown an improvement in the rate of gain to about 8-12% and improvement in feed efficiency to about 9-10%.

COOKING

It is usually done for two reasons:

1. To destroy the antinutritional factors in feed stuffs
2. To increase the utilization of starch granules present.