Livestock Farming

Handout 7

Examples off Roughages and Concentrates Commonly Used

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Examples of roughages and concentrates commonly used:

The following roughages are available:

Hay from legume plants	Lucerne is the best-known legume hay. It is very palatable and is usually beneficial in nearly all rations. It contains high protein levels in general, but is relatively poor in energy. It combines well with feed like maize silage, maize and molasses. There is no restriction on the levels of inclusion. As a result of its high calcium content it should however be avoided during the dry period in cows that are prone to milk fever. Pea hay is mostly of a poorer quality than Lucerne hay especially because most of the seeds had been removed. The same principles apply regarding the feeding of it. If hay from peas is stringy, it should preferably be ground to increase intakes.
Grain and grass hays	These hays have lower protein and calcium levels than legume hays. The growing stage, during which crops are cut for hay, has a large influence on the spontaneous intake and nutritional value of it. In lactating cows, the levels of inclusion are usually limited because of its lower quality.
Pasturages	Grazing is normally the cheapest source of roughage for cattle. Factors that limit weight gain from grazing are mainly the energy content and the high moisture content of crops. The protein content of rye grass clover grazing is usually high. Kikuyu has low levels of calcium. Other pasturages on the other hand have high levels of potassium and should be avoided.
Straw	This comprises the stalks and leaves of crops that remain once the seed had been threshed out. Grain straws are the best-known low-grade roughages. It is low in protein, energy and minerals. Of the most common small grains, oat straw is probably the most valuable, followed by barley and corn straw. Maize straw and grain sorghum straw are just as good as oat hay or even better. Straws should be ground in order to get good intakes. The low

	nutritional value of straws limits its inclusion levels. Small grain straws should preferably not be used in rations. With the necessary supplementation straws can be used to a limited extent in the feeding of replacement heifers. In the Western and the Southern Cape small grain straws are often upgraded by treating it in an oven or in a stack with ammonia. That way the energy and protein content, as well as the palatability are improved considerably. It is not normally necessary to grind ammoniated straw. In the case of feedlot cattle, it should not make out more than 40% of the ration. When ammoniated straw is used, it is important for the levels of phosphorus, magnesium, zinc, cobalt, selenium and copper, as well as vitamin A and E to be supplemented.
Silage crops	This is the cheapest method of storing roughages. Maize is mainly used for this. Good quality silage can also be made from most grass types and legume plants. Silage has high moisture levels and as a result it is bulky. The crude protein level in silage is often higher than that of hays. It is excellent feeding for young animals older than 9 months. There is no limit on its inclusion in rations. Mouldy silage often contains fungi with dangerous toxins and it should therefore not be fed to animals.

Table 1.2 - The following concentrates are available:

Barley	On its own or together with another small grain barley it can replace up to 70% maize, provided it is of a good quality.
Blood meal	This is a good source of protein. Palatability can be a problem, especially when it is given together with meat meal (tankage).
Bone meal	This comprises bones that have been cooked, dried and ground and it is primarily given as a source of calcium and phosphorus. It is also a good source of trace elements.
Brewer's grains (barley)	This is the residue after the brewing of Lager beer and is a mixture of barley, maize and brewer's yeast. The product is very tasty, and it is also safe to use it.

Chicken manure	Two types are available - manure obtained from laying hens and from broilers. As a rule, the manure obtained from laying hens does not contain bedding and it has a higher protein content than manure obtained from broilers, which contains bedding, like sawdust and paper. Chicken manure is most suitable when used in rations of growing animals older than 6 - 9 months of age. Vaccinate all animals against botulism before using manure.
Grain sorghum	It is recommended that grain sorghum should be crushed in a roller mill because it is crushed too fine in a hammer-mill. The dustiness will make it less palatable. In theory it can replace maize.
Fish meal	This is a good source of protein. Palatability could be a problem when animals are not used to it.
Groundnuts	In cases where the levels of inclusion are too high, diarrhoea and a decrease in the butter fat percentage and protein are found.
Groundnut oil cake meal	It is high in protein and palatable, but there is a large risk of aflatoxin.
Lupine seed	It is relatively rich in protein and high in energy.
Maize	Yellow as well as white maize is suitable as fodder, with the best results when it is coarsely ground or rolled. The high starch content limits the daily portioning.
Meat meal (tankage)	Meat meal has a high percentage of protein, but palatability could be a problem, especially when it is used together with blood meal.
Oats	It has high fibre content but is very palatable and can replace maize in young animals.
Soybeans	It is high in protein and energy as a result of a high fat content. It is not recommended for inclusion in rations for calves and dairy cows and which also contain urea.
Sunflower seed	As a result of the high oil content the seed has a high energy potential, but protein is relatively low. It could lower the butterfat and protein in milk and could also cause diarrhoea in cases of high inclusion levels.

Triticale	The energy and the protein levels are about the same as in wheat.
Urea	Urea is not actually a source of protein, as it is in fact a concentrated form of nitrogen. Microbes in the rumen can use it to build up microbe-protein. Urea is very quickly catabolised into ammonia in the rumen and too much urea could cause so much ammonia to come into the bloodstream that the animal could die from it. The use of urea in rationing for animals on tame pasture is not usually recommended.
Wheat	The energy value of wheat is slightly less than that of maize. In cases of high intake acidosis occurs sooner than is the case with maize.
Wheat bran	It is relatively low in energy with about 14 per cent protein and it is also high in phosphate.