

Feeding Straw

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Straw is the most common crop aftermath in North Dakota. Straw is a good alternative in rations for cows and sheep if properly supplemented with an energy source like grain and added minerals and vitamins.

Differences in feeding value do exist among the straws. Oats is the most palatable and nutritious; barley straw is second and wheat straw has the lowest nutritional value of the main grains. Millet straw is more palatable and higher in energy and protein. Flax straw is lower in feed value than all the others because of its lower digestibility.

Table 1 Nutrient Contents of Straws							
Straw	DM %	TDN %	NEm (Mcal/lb.)	CP %	ADF %	Ca %	P%
	100% Dry Matter Basis						
Barley	90.0	43	0.38	4.1	52	0.37	0.11
Flax	87.0	37	0.36	4.3	56	0.63	0.06
Millet	86.0	51	0.47	7.0	45	0.44	0.12
Oat	90.0	47	0.45	4.5	50	0.27	0.10
Rye	88.0	41	0.40	3.6	53	0.22	0.08
Soybean	88.0	42	0.44	5.2	55	1.59	0.06
Wheat	90.0	43	0.40	3.6	52	0.19	0.09

Straw one year old could also be considered a feed source. It usually is slightly more digestible and palatable than fresh straw. Rust-infested straw or straw from smut-infested fields apparently present no specific toxicant or irritant to ruminant animals. Nitrate accumulation will not be a factor in grains that have matured adequately to produce ripe seed.

Mature beef cows can utilize a higher percentage of straw in the ration than any other class of farm livestock. Rations utilizing 50 percent straw can be combined with higher protein grass hay, legume hays, and legume-grass hays to result in nutritionally adequate wintering rations for beef cows through the second trimester of gestation. Rations containing up to 60 percent straw by weight have been satisfactory providing high quality roughage comprises the balance of balanced rations. Rations containing about 3/7 straw combined with 4/7 higher quality forage have given very satisfactory performance for wintering

cows at the Dickinson Experiment Station.

Pregnant two-year-old heifers can utilize straw up to 25 percent of their ration. Grain straw can substitute satisfactorily for good quality hay when included up to 20 percent of the ration with only modest reduction in rate of gain when included in ground and mixed growing or backgrounding rations.

Medium to low quality roughages such as straw and late cut prairie hay are less palatable than higher quality forages. For this reason, feeding good or high quality roughages simultaneously but separately from poor quality roughages every day often results in shy or timid animals being forced to eat mostly poor quality roughages. This is undesirable.

The total time required to digest roughages in the ruminant digestive tract varies from about two to six days, with the digesting, fermenting forage releasing nutrients while the forage remains in the digestive tract. Virtually all the fibrous components of forage that can be digested by the cow or sheep must be digested in the rumen and reticulum by ruminal microbes, explaining why lower quality roughages must spend more time in the forepart of the digestive tract. This is why "rumen fill" becomes a major factor in determining upper limits of how much lower quality roughages cattle and sheep can consume.

Higher quality roughages digest more rapidly and move through the tract much faster than low quality roughages, such as straw. Because roughage requires at least three days or more to digest completely, it becomes possible to feed only good quality forages one or two days, then feed only straw or poor roughage on alternate days or on third days.

Critical nutrients (digestible protein and minerals) from higher quality forages are being gradually released from good quality forages to supplement and stimulate the microbial digestion of straw eaten on a different day.

When roughages grinding equipment that can produce a uniform ground mixture good with poor roughages is not available, an alternate days feeding schedule will often be the best alternative for ensuring that all animals in the group receive some good and some poorer quality roughage. Most important, it can help ensure that the timid, smaller, or younger animals in the group get opportunity to consume some good quality roughage.

Consumption of straw can be increased by grinding, but efficiency of

digestion is actually not improved by grinding when compared to straw consumed in long form.

Except for millet straw, the amount of digestible protein provided by straws is essentially zero, since only about 10 percent of the crude protein of mature grain straw is actually digestible and available to cattle. Straw should be assumed to provide no digestible or useable protein to the ration. Unfortunately, experimental trials fail to show nonprotein nitrogen (urea) to be an effective substitute for natural plant/animal protein in rations containing high level straw. Natural protein sources are far more effective in supplementing the lack of digestible protein from straws.

Straw does not provide enough nutrients to deserve any place in the ration of producing dairy cows. However, small amounts could be used in situations of unusual forage shortage for dry cows and for replacement heifer rations.

Reviewing the basic feed requirements of ewes shows alternative feeding programs using straw can be made. A 150-pound ewe needs 3.5 pounds of feed per day during the first 15 weeks of gestation, 4.5 pounds during the last four to six weeks of gestation and 6-7 pounds per day during lactation. Naturally heavier ewes require more feed. If straw is available, it will make the ration considerably cheaper and still meet the ewe requirements. Suggested daily rations with straw are:

Gestation		
First 15 weeks	Last 4-6 weeks	Lactation
1.5 lbs. hay	2 lbs. hay	2 lbs. hay
1.5 lbs. straw	1.5 lbs. straw	1.5 lbs. straw
0.5 lb. grain	1 lb. grain	3.5 lbs. grain

Ideally, hay and straw should be mixed together with the grain to improve consumption of straw. However, if a grinder-mixer is not available, the hay and grain can be fed daily and straw free-choice. If you do not prefer to feed the straw free-choice and rather feed it on a daily basis, feed the straw in the morning and hay in the evening. This should help force the ewes to eat the straw more readily during the day when they are most active.

CAUTION: Ewe lambs that are bred to lamb as lambs may not respond as well as the older ewes to feeding straws.

CAUTION: Excessive over-dependence on straw for a large proportion of the ration, in combination with inadequate good quality

feed and inadequate daily intake of total ration digestible protein, can result in stomach impaction and death. This can happen even when straw is ground. Impaction is most likely to occur after extended periods of 10 days or more of bitter cold weather and in older ruminants that likely are losing some teeth or timid, shy animals low in the social or pecking order.

Low quality grass hay or prairie hay, usually very late cut, can cause the same stomach impaction problem when not adequately supplemented with high quality feedstuffs providing adequate digestible protein

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