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POTATOES AS LIVESTOCK FEED

by

Dairy Husbandry and Animal Husbandry Departments

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Many thousands of tons of cull potatoes are available each year for livestock feed. In years of large yields potato prices are low and a considerable tonnage of surplus potatoes of the lower grades is available to livestock feeders. In Germany and some other countries heavy-yielding varieties of large potatoes are grown for feeding purposes. In normal times 40 per cent of the potato crop grown in Germany is fed to farm animals in comparison with only 5 per cent in the United States. Feeders in this country evidently are not so generally acquainted with the value of potatoes in comparison with other feeds.

Digestible Nutrient Value. The dry matter, digestible crude protein, total digestible nutrients, calcium, and phosphorus content of potatoes and some other feeds are compared below:

Feed	Dry Matter Per cent	Digestible Crude Protein Per cent	Total Digestible Nutrients Per cent	Calcium Per cent	Phosphorus Per cent
Potatoes	21.2	1.1	17.3	0.01	0.05
Corn silage	28.3	1.3	18.7	0.07	0.06
Carrots	11.9	0.8	9.6	0.06	0.06
Sugar beets	16.4	1.2	13.8	0.03	0.04
Green corn	24.0	1.2	16.3	0.06	0.05
Green alfalfa	25.4	3.4	14.7	0.40	0.06
Pasture grass and clover	24.4	2.6	16.1	0.24	0.19
Alfalfa hay*	90.0	9.2	49.7	1.27	0.20
Ryegrass hay	87.4	3.6	44.7	0.30	0.20
Barley*	90.0	7.5	78.8	0.05	0.36
Millrun	90.0	12.9	69.7	0.10	1.00
Beet molasses	80.6	2.5	58.8	0.05	0.02

\* Oregon analyses. All other analyses taken by special permission of The Morrison Publishing Company, Ithaca, N.Y., from "Feeds and Feeding," 20th ed. F. B. Morrison.

It will be noted that potatoes are quite similar in feeding value to average corn silage. Being low in dry matter, most of which is starch, they are classed as a succulent feed and like all the root crops are low in protein content. However, they are 50 per cent to 100 per cent higher in total digestible nutrient value than other root crops such as mangels, common beets, turnips and rutabagas. Potatoes contain only one-fourth to one-third as much digestible protein as pasture grasses and clovers and green legumes but have about the same total digestible nutrient value.

In comparison with alfalfa hay, potatoes contain about one-third as much total digestible nutrients and one-ninth as much digestible protein. Potatoes are worth then approximately one-third as much per ton as alfalfa hay. Another way to compare the value of potatoes with alfalfa hay is to figure that the price of potatoes per bushel in cents should be the same as the price of alfalfa hay per ton in dollars. For example, if alfalfa hay is selling at \$12.00 per ton, potatoes are then worth 12 cents a bushel for dairy cattle feed. At 60 pounds per bushel this is equivalent to \$4.00 per ton for potatoes or one-third the price of alfalfa as above stated.

It will be noted from the table that potatoes are very low in calcium but have about the same amount of phosphorus as other feeds of similar dry-matter content. Potatoes do not contain appreciable amounts of vitamins A or D.

#### Feeding Dairy Cattle

Feeding Trials. Potatoes have been fed to dairy cattle in recent feeding trials at the North Dakota and Idaho Experiment Stations.\* In both cases potatoes were compared to corn silage. The results of the feeding trials show that raw potatoes were almost equal to corn silage for milk production when fed at the rate of 20 to 35 pounds daily along with a hay and grain ration.

Potatoes are not as palatable as corn silage but if the amount offered is small at first cows will eat gradually increasing amounts. In the Idaho trials 30 pounds of potatoes were fed daily to Holsteins and 25 pounds to Jerseys. Some Holsteins ate as much as 40 pounds. On the basis of 1000 pounds of live weight the average consumption was 23 pounds.

Potatoes did not cause cows to go off feed. Individual cows differ in the amount of potatoes they can eat. Potatoes are more laxative than corn silage and it is important that the manure of the individual animals be watched and the amount fed be regulated thereby. If the manure becomes thin the amount of potatoes fed should be reduced to prevent scours or bloat.

Raw Potatoes Best for Cattle. In another Idaho feeding trial cooked potatoes were compared to raw potatoes for dairy cattle. In so far as milk and butterfat production was concerned there was no difference between the raw and cooked potatoes. However, when the cooked potatoes were fed, digestible trouble such as scours or bloat was quite common. No digestive disturbances resulted after the cows became accustomed to raw potatoes.

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\* North Dakota Bul. 245; Idaho Bul. 216.

Effect on Dairy Products. There is a common belief that potatoes cause an off-flavor in milk and salviness in butter. The experiments at North Dakota and Idaho do not show this to be true. The milk produced when potatoes were fed had good average flavor equal to that when corn silage was fed. Butter made from milk produced by the potato-fed cows had normal body and texture with no evidence of salviness or potato flavor.

Precautions on Feeding. Potatoes should be run through a root cutter, cut with a shovel or crushed before feeding to prevent cows from choking. Sunburned potatoes and potato sprouts contain a considerable amount of solanin, which is poisonous and should not be fed to livestock. Potatoes that have been frozen may be thawed out and fed immediately. Partly decomposed potatoes should not be fed in large quantities. Since potatoes have a laxative effect they should be fed with non-laxative feeds. Plenty of hay and some concentrates tend to keep down digestive disturbances. For good producing dairy cows fed 25 to 30 pounds of potatoes daily a legume hay and a concentrate mixture containing about 16 per cent crude protein is desirable.

#### Feeding Hogs

Cooked Potatoes Best for Hogs. Potatoes should be cooked before being fed to hogs as it greatly increases their feeding value and palatability. Four hundred twenty-five pounds of cooked potatoes are required to replace 100 pounds of barley, corn or wheat, when fed at the rate of four pounds to one pound of grain. It requires 600 pounds of raw potatoes to replace 100 pounds of grain as compared to 425 pounds of cooked potatoes, or a saving of 30 per cent. Owing to increased palatability, pigs can be induced to consume enough cooked potatoes to make proper gains or growth without the use of an excessive amount of grain. Potatoes should be cooked until they are mealy and the skins burst. Cooking potatoes as for table use is not sufficient for hogs. No more water should be used in cooking than is absolutely necessary. Adding water increases the amount of water the pigs have to consume, which will in turn decrease the amount of potatoes they can consume and thereby decrease the gains. Potatoes can be cooked in a barrel with steam by running a steam hose to the bottom of the barrel and covering the barrel with gunny sacks. Another convenient way is to cook them in the scalding vat by adding about two inches of water in the bottom of the vat and covering the potatoes with gunny sacks to keep in the steam. The water the potatoes were cooked in should be poured off as it is bitter and unpalatable.

Potatoes Require Grain Supplement. As indicated above, cooked potatoes give the best results when fed at the rate of four pounds of potatoes to one pound of grain. Where a farmer has a very large amount of potatoes and a limited amount of grain, he can feed more potatoes than four to one but the feeding value of the potatoes will be decreased and the daily gains will be less. Pigs will not get fat on potatoes alone.

Cooked potatoes can be fed to all classes of hogs but the proportion of grain to potatoes should be varied to suit their needs. It is not advisable to compel weanling pigs to consume more than two pounds of potatoes to one of grain. For fattening pigs the best proportion is four pounds of potatoes to one pound of grain. For the breeding herd a higher proportion of potatoes may

be used, that is, about six pounds potatoes to one pound of grain. Weanling pigs or fattening pigs should be fed all they will consume but for the breeding herd only enough should be used to keep them in good breeding condition. Barley, corn or wheat are best suited to feed with potatoes for fattening pigs, while oats are suitable for the breeding herd.

Uncooked Grain is Best. Do not cook grain with potatoes as cooking grain decreases its feeding value. The grain can be mixed with the potatoes after they are cooked or, preferably, spread on top of the potatoes in the trough.

Precautions. Bulky feeds such as bran, millrun, etc., should not be fed with potatoes. Skim milk or buttermilk can be fed with potatoes, but such feeds replace the potatoes of the ration rather than the grain. Care should be taken that the potatoes are not allowed to sour before feeding.

Fattening pigs need some protein to balance the ration of grain and potatoes, also they need some alfalfa meal for vitamins. Half a pound of tankage or fishmeal daily, per pig, is sufficient and about 1/4 pound alfalfa meal will balance the ration.

#### Feeding Beef Cattle and Sheep

Potatoes used as a feed for either beef cattle or sheep should be fed in the same general way as corn silage. Cattle or sheep should be started gradually on potatoes, which are not very palatable. The feeding of large amounts of raw potatoes generally causes scours. The manure should be watched and the quantity of potatoes adjusted accordingly. In cattle feeding, potatoes can be fed at the rate of 20 to 40 pounds per head, depending on the size of the cattle. Fattening steers weighing about 1000 pounds best utilize potatoes when fed at the rate of 20 to 25 pounds per head along with grain and hay. Mature beef cattle can be wintered on 30 to 40 pounds of potatoes fed with all the legume hay or mixed hay they will consume. Sheep make the best use of potatoes when fed with legume hay at the rate of 1 to 2 pounds per head.

Various experiments with feeding potatoes to beef cattle and sheep show that they have about 80% of the feeding value of corn silage when fed in limited amounts and used as a substitute for grain or other feeds in the ration.

Inasmuch as potatoes are a succulent feed low in protein and in vitamins A and D, a well-cured legume hay or good mixed hay should be fed with them. For fattening purposes it is necessary to feed grain as a part of the ration.

When cull potatoes and small potatoes are fed to cattle or sheep it is usually a good practice to slice or chop the potatoes in order to make them more palatable and to avoid choking. It is not profitable to cook potatoes for beef cattle or sheep.

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