

Farm Crops and Their Relation to Improved Stock Raising.

by

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Farm Crops and Their Relation to Improved Stock Raising.

Need of the proper kind of stock breeders.

Influence of food and care upon the character of a herd of animals.

Selecting a herd.

What to feed,
variety needed.

Digestibility of foods.

Feeds for Horses:-

timothy,
straws,
clover hay,
alfalfa,
oats,
corn,
ground linseed,
grass.

Feeds for Cattle:-

oats,
farm grown protein feeds,
cowpea hay,
corn stover,
silage,
rye pasture.

Feeds for Swine:-

nitrogenous food for the brood sow,
corn meal,
oats,
peas,
skim milk,
pasture,
forage plants.

Feeds for Sheep:-

oats,
barley,
timothy,
silage.

Our agricultural population is in need of more first class breeders of plants and animals. But there are only a few of our breeders who have done much to improve their stock. One who so improves his stock as to increase their productiveness has done much for his people. To become of value to the world as a breeder one must have energy and perseverance and an art and love for the business. He should start with that one breed of animals or plants which he best likes to work with, and stick to his work until good results come. Working always with one standard of excellence and a definite end in view.

A great many of those who go into the business have but little knowledge of the laws of breeding and are not inclined to study or give any more of their attention to the work than will be necessary in order that they may get a higher price for their product than the other farmer who is just as good a breeder but does not keep pedigree stock.

Although we do not all have the art and ability to become stock improvers we can keep improved stock and without understanding all the practices and laws of breeding, if we would know and exercise the value feed and care has toward maintaining the excellencies of a herd, we can then afford to keep pure bred stock.

In selecting a herd, after deciding upon the type or breed you wish to raise, select or have an expert stock judge select your herd from animals that can be bought at a reasonable price. Your bull should be the best that your means will allow. You can well afford to pay a large sum for a bull that shows good breeding and that will stamp his character upon his progeny.

If you start out with improved stock or with fairly good stock, and expect to improve your herd, it will be necessary that you

understand the influence of feed upon your stock. Animals are endowed with a plasticity of the organization that enables them to adapt themselves to the conditions under which they are placed. As a result of a favorable change in the conditions to which animals are subjected, important modifications of the system are obtained, which we recognize as improvements in the general make-up of the animal, while deterioration and the loss of valuable characteristics follow when the prevailing conditions of life are unfavorable to the full and healthy development of the organization.

A variety of food is required by animals so that each organ concerned in the process of nutrition may perform its fair proportion of work, and thus secure a healthy development, resulting in a symmetrical balance of the system. The great development in fattening quality and in early maturity, that characterizes the modern meat producing breeds of stock has been secured by a liberal supply of nutritious food during the period of growth, in connection with a judicious system of breeding that has fixed and made dominant the desirable modifications thus obtained.

Improvements that have been effected by years of good care and abundant food supply may be lost in a comparatively short time by placing the animals under less favorable conditions and lessening their food supply.

Our experiment stations have done much to determine the value which different feeds have in the production of flesh and milk, and the relation of feed to the vigor of the animals and the demands of different breeds of animals.

Feeds for horses.

Improper feeding and watering will doubtless account for over one half of the digestive disorders met with in the horse, and hence the

horse breeder should have the proper ideas in reference to what and how to feed.

The age and health of the animal will of course modify the digestibility of foods as will also the manner and time of harvesting, preserving and preparing the foods. Too much food increases the amount of waste which the vital organs of the animal must throw off, calling for an unnecessary expenditure of vital force. It is for this reason that too much food may make an animal poor.

Foods for the horse must be wholesome, clean, and sweet, the hours of feeding regular, and the mode of preparation found by practical experience to be the best must be adhered to.

The length of time required by the stomach digestion in the horse varies with the different feeds. Hay and straw pass out of the stomach more rapidly than oats. It would seem to follow then that oats should be given after hay, for if reversed the hay would cause the oats to be sent forward into the intestines before being fully acted upon by the stomach, and as a result produce indigestion. Experience confirms this. There is another good reason why hay should be given first, namely, it requires more time in mastication and can not be bolted, as are the grains. In either instance water must not be given soon after feeding, as it washes the food from the stomach before it is fitted for intestinal digestion. Do not engorge the horse with bulky feed before putting him to hard work, neither should he be given much to eat immediately after coming in from a hard day's labor, but should be allowed to rest for an hour or two before being fed, and in all cases avoid feeding musty foods.

The best hay for horses is timothy, and it should be about one year old, of a greenish color, crisp, clean, fresh, and possessing a sweet, pleasant aroma.

Prairie hay is similar in composition to timothy hay, both being rich in carbohydrates. It contains a very low per cent of digestible protein, there being less than one per cent, or about the same as in wheat straw. It is entirely safe to feed and is in proper favor in the West for horses. Like timothy it has a small leaf surface, therefore curing easily and being comparatively free from dust.

Straw is not extensively fed in this country and when used at all it should be finely cut and mixed with hay or ground and crushed grain. Wheat, rye, and oat straw are most extensively used, and of these oat straw is the most easily digested and contains the most nourishment. While straw has some value as a feed it is nevertheless true that much more grain is needed when hay is replaced by straw. In winter idle work horses can utilize some straw, but such feed is so largely indigestible it is requiring too much of a horse to force him to gain a large part of his sustenance from it.

Clover hay has not been held in high favor as a roughage for horses for two principal reasons. First, clover with its large leaf surface often goes in the mow or stack so moist that fermentation, which is caused by the multiplication of bacteria, takes place. During this oxidation or slow burning process, particles of blackened partially carbonized leaves are produced, which finely divided matter rises in the air in clouds of dust whenever the hay is moved. Some of it enters the nostrils of the horse and is drawn into the lung cells, there setting up an irritation which often brings on a disease known as heaves. Secondly, there is a prevalent notion among horsemen, well founded or otherwise, that clover hay produces a softer flesh, and a horse so fed sweats more freely than one fed timothy.

Bright, well-cured clover should be of considerable value for work horses but in feeding this hay it must be borne in mind that it

is much richer in protein than the ordinary fodders and the non-leguminous hays, which makes it obvious that the grain ration with clover as roughage should be correspondingly more starchy. Clover when fed with corn should give a good balance of nutrients for the work animal. Could it be fed in a moistened condition to keep down any dust it would doubtless be a satisfactory ration, in fact, a better ration than timothy and corn if the hay is fed in a limited quantity.

Alfalfa, which belongs to the same family as clover, meets with the same objections. It is likely to be dusty, and causes horses to drink much water, increasing the action of the kidneys.

A recent bulletin however, issued by the Utah Station, shows very favorable results from alfalfa when fed to work horses. One horse in each of the two draft teams was fed timothy hay and the other horse in each team was fed alfalfa, for a period of three months, from January to April. The grain ration consisted of bran and shorts. The horses weighed about 1400 pounds each. During the first period one horse on alfalfa gained 4 pounds and the other lost 8 pounds. One horse on timothy lost 47 pounds and the other 77 pounds. During the second period, from April until June, the horses which had been fed timothy were given alfalfa and those fed alfalfa were given timothy. One horse on alfalfa gained 50 pounds and the other gained 25 pounds. One horse on timothy gained 5 pounds and the other lost 65 pounds. The feeds were again reversed during each of two later periods with results in both favoring alfalfa. During most of the time the horses were at moderate work. Alfalfa is wonderfully relished by horses and if the dust commonly associated with the hay can be prevented alfalfa will prove a valuable feed for horses.

Oats are the best of all grain feeds for horses, as the ingredients necessary for the complete nutrition of the body exist in them in the

best proportions. Oats are easily digested and have a large proportion of their nutrients converted into bodily tissue. New oats are indigestible and care must be taken in selecting oats that are one year old, plump, short, hard, clean, bright, and sweet. The value of wheat bran as a horse feed is variously estimated. It is not to be depended upon, if given alone, but may be fed with other grains, and serves to keep the bowels open.

Corn is not suitable as an exclusive feed for young horses as it is deficient in salts. Corn is better given ground and fed in quantities of one or two quarts at a feed, mixed with crushed oats or wheat bran. No grain is more likely to produce what is called acute indigestion than corn, if it be not properly fed. Its feeding must be commenced in small quantities and very gradually increased.

Ground linseed is occasionally fed with other foods to keep the bowels open and to improve the condition of the skin. It is of particular service during convalescence when the bowels are sluggish in their action.

Grass is a natural food for horses. It may be composed of a great variety of plants, differing widely as to the amount of nourishment contained, some plants being almost entirely without value as food and being eaten only when there is nothing else obtainable, while other plants are positively injurious or even poisonous. None of the grasses are sufficiently nourishing to keep the horse in good condition at hard work. Horses fed solely on grass are "soft", sweat easily, purge, and soon tire on the road or when at hard work. To growing stock grass is indispensable and there is little or no doubt that it acts as an alternative when given to horses accustomed to grain and hay. The stomach and intestines undergo rest, and their action is re-invigorated if the horse is turned to grass for a time

each year. It is also certain that during febrile diseases, grass acts as a medicine, lessening the fever and favoring recovery. Wounds heal more rapidly than when the horse is on grain, and some chronic disorders disappear entirely when a horse is upon grass.

Feeds for cattle.

A cow that is giving a large amount of milk requires to be fed a balanced ration more than any other of our farm animals.

The solids of milk contain a large percentage of protein and this protein must be supplied in the feed in a somewhat concentrated form.

Oats and timothy hay do not take the important place in feeding the cow that they do in feeding the horse. All cows should be permitted to do their best, which can only be done when external conditions are made favorable for a maximum production, and here is where man's skill makes itself manifest in supplying her wants most perfectly.

At the present time and with the crops usually grown, the purchase of protein feeds is a necessary thing. The question of how to get away from the heavy expenditure for the so-called concentrates or commercial feeds which the feeder must necessarily buy to furnish the protein to his feeding ration is one of great importance for the consideration of dairy men. Protein feed is absolutely necessary to successful dairying. This feed must either be bought or raised on the farm, and until a very short time ago the idea of raising all of the protein feed necessary for a herd of cows appeared to be highly preposterous and even yet it seems almost impossible to most dairymen.

The desirability of raising a part or all of the protein feed necessary for the dairy herd will be apparent to every man concerned in the dairy business. The principal protein-bearing foods which are raised in different sections of the country are alfalfa, cowpeas, soy beans,

and clover, each one being supposedly better suited to a particular locality than the others, though this is only partially true. With these feeds it is not only possible but practical to produce a good and well balanced ration for dairy cows. In fact either cowpea hay or alfalfa combined with corn chop will make a ration sufficiently nearly balanced for all practical purposes. This would make it possible for all the feed necessary for the dairy herd to be raised on the farm, and would cut down the feed bills.

Cowpea hay is very similar to alfalfa in composition and practically equal to it in feeding value. At the Tennessee Station these two forage plants produced milk equally well, but the cowpea hay was said to be somewhat cheaper. Cowpeas are a valuable crop both as a supplement feed with corn and as a soil renovater.

Red clover is a substitute for alfalfa, though its lower protein content makes it necessary to use a protein concentrate, such as linseed meal, when corn stover is made part of the roughage.

Soy bean hay frequently yields as high as three tons per acre in the South. It is somewhat coarse in stem, though palatable and a rich source of protein. Its composition is similar to alfalfa and cowpea hay. The meal from soy beans is the only grain feed raised on the farm deserving first place on account of the exceptionally high protein content. Soy beans are also rich in oil, which makes it the more necessary to use a limited quantity.

Corn stover properly cured is relished by cows and has a higher food value than farmers ordinarily give it. The Utah Station found that stalks fed in combination with corn and alfalfa gave larger returns per unit of dry matter fed than alfalfa and corn without the stalks. With a given yield of corn there accompanies it practically the same weight of stover, which being a by-product is cheaper than alfalfa. Putting together then 10 pounds of corn, 10 pounds of stover

and 12 pounds of alfalfa, the mixture will contain 25.86 pounds of dry matter, with a ratio of 1 : 7.0, which is somewhat less protein than the German standard calls for, but it conforms very closely to Woll's suggested standard, which as has been shown, is more in accordance with American investigations. Well cured corn stover possesses a food value infinitely above that of stalks left standing in the field, when a large portion of the starchy matter changes to crude fiber in addition to the loss due to weathering.

Silage is as much more palatable to farm animals than dry cured fodder, as canned fruit is more palatable than dried fruit to the human family. Silage is superior to corn fodder for milk production, as shown in a New Jersey test, where the same weight of dry matter in each was compared. Silage gave 12.8 per cent more milk and 10.4 per cent more butter than cured corn fodder. An acre of silage produced 258 pounds more milk at an extra cost of \$.91. Other tests have also shown the superiority of silage over dry fodder for milk production. Silage is more palatable and more easily masticated than dry fodder, and is consumed with little or no waste. It has a characteristic flavor which is very much to the liking of cows.

Rye sown early the previous fall will make a good growth and will provide an abundance of green pasture three or four weeks before grass is ready.

Blue-grass pasture has no superior for milk production, partly because of its composition and partly because it is more relished than other grasses. No matter how good cows are fed in winter they increase their milk flow when turned on an abundance of fresh blue-grass in the spring. The one objection to blue-grass is that it stops growth during the hot dry months of mid-summer. Mixed grass pastures are in favor because they furnish variety and usually produce more food per acre. If one grass fails on account of dry weather another

variety may grow more luxuriantly in its stead.

Steers may be started in fattening by feeding green corn fodder in the fall while the animals are yet on grass, and as the feeding continues fodder may be fed from the shock. Corn is a highly carbonaceous feed and contains but little protein and some clover or alfalfa hay should be fed along with it to supply the necessary amount of protein. When fattening a large number of cattle, corn with a little cotton-seed meal is the best grain feed that can be obtained. For the first part of the feeding period more profitable gains will be made if the stock are supplied liberally with protein feeds, but for finishing up the steers an almost exclusive corn ration will put the steers in prime condition for market.

Feeds for swine.

As a fattening food corn has no superior and probably no equal. The very qualities however that make it unsurpassed for this purpose, render it wholly unsuitable for dams carrying young. Weak pigs are sure to be the result of an almost exclusive corn diet during the time the vital organs and their organization are in process of formation. The brood sow should have plenty of nitrogenous food during her pregnant period, and for several weeks before farrowing all corn feeding should be stopped and plenty of slop and bran mash given.

Corn meal has been compared with wheat meal and the two feeds proved to be of nearly equal value in producing gain. Feeding a mixture of the two gives better gains than either fed alone.

Many trials have shown middlings to be superior to corn, and a mixture of the two superior to the middlings fed alone. The results of an experiment by Jordan, at the Maine Station, showed that middlings had twice the feeding value of wheat bran.

In the average of several trials we find that it required eight

per cent more barley meal than corn meal to produce a given gain.

Ground oats gave excellent results when fed in a ration consisting of one-third ground oats and two-thirds corn meal: whole oats gave poorer returns than ground oats.

Peas are superior to corn both for putting on more gain in the same length of time and for requiring less feed per pound of gain.

Kafir corn meal falls from eighteen to thirty-three per cent below corn meal in value for pig feeding. This grain though rich in carbohydrates lacks protein and is therefore not suitable for feeding alone to young pigs.

Skim milk has high value as a hog feed, especially for young pigs. It contains minerals that are of especial value for bone building. Skim milk has different values when fed in connection with corn meal, according to the proportion fed with the meal. When from one to three pounds of skim milk is fed with one pound of meal 327 pounds of skim milk saves 100 pounds of meal and when 3 to 5 pounds of skim milk is fed to 1 pound of meal 446 pounds of skim milk saves 100 pounds of meal. Buttermilk will give as good returns as skim milk for feeding pigs.

It is possible that pigs may make fair gains on pasture alone, but no station except the Utah Station, where alfalfa was grazed, has yet shown that it can be done. Pigs that are fed grain while running on grass will make much greater gains than those fed grain in a lot and supplied with grass by soiling. There is also a saving of grain of about 10 per cent when feeding on pasture. Trials in feeding pigs on pasture show that a great saving of grain per pound gain was made when feeding only half a grain ration for the first half of the feeding period and then finishing them on full feed.

Stewart fed pigs averaging seventy-five pounds each with corn meal,

two quarts of short cut clover hay being added to each day's allowance, and the whole wet with hot water and allowed to stand for ten to twelve hours before feeding. Another lot received meal prepared in the same way but without the clover mixture. The lot getting the clover hay showed the best appetite, the greatest thrift, and made the steadiest gains. The pigs getting meal gained 110 pounds in 120 days, while those having clover hay mixed with their meal gained 143 pounds or thirty per cent more.

Of the different forage plants alfalfa is most satisfactory for hogs, first because it can be made a permanent pasture, second because it is richest in protein, making an excellent combination with corn, and third because it has tender leaves and a small stem which makes it easily masticated, besides being greatly relished.

Rape is a most valuable forage to start pigs upon their fattening period. At the Wisconsin Station, Craig made several trials in feeding two lots of hogs, one lot was fed on grain alone and the other on grain and rape, the pigs being allowed the run of a rape field. These trials, with others of the same kind, show the gains to be nearly the same whether rape is fed or not, but one acre of rape proved to be equivalent to 2600 pounds of grain in pig feeding. Since rape can be used as a catch crop and costs but 2 or 3 dollars an acre for seed and planting, and nothing for harvesting, the value of this crop in swine feeding is apparent.

Feeds for sheep.

In their capacity to consume food sheep resemble cattle. They have the four stomachs, one connected with another, the paunch or first being very capacious so that large quantities of bulky food, like hay, can be digested and assimilated. It is customary to figure that eight or ten average size sheep will consume as much as one

two-year-old steer. The proportion of roughness to grain most suitable for fattening sheep is about the same as for fattening cattle; though sheep will fatten on a somewhat larger proportion of hay. On account of their small size they consume less perfectly the coarsest fodder, as whole corn stalks, for which reason such fodder is sometimes first run through a cutting machine. Sheep grind their food, however, much more thoroughly than do cattle, thus making it possible to feed grain without grinding or soaking it.

Oats are relished by sheep and when they may be had at a price per hundred pounds no greater than the price of corn, oats should form at least a part of the grain ration. Oats contain the digestible nutrients in a proportion very close to the requirements for lambs. Should the grain ration consist entirely of oats, then somewhat less roughage would be consumed because of the hull. If oats are fed with timothy hay, not more than half the oil-cake recommended for corn feeding will be required.

Barley is commonly fed to sheep in countries not well adapted for corn growing. Common barley contains considerable crude fiber because of the hull, and for that reason is not quite as valuable as corn for feeding purposes. Experiment tests indicate that 5 per cent more barley than corn is required for one pound of gain, which means by weight and not by the bushel. Were barley worth 40 cents per bushel corn would be worth about 60 cents per bushel.

Timothy, prairie and sorghum hay are similar in feeding value to corn stover, and when any of these are used as roughness for sheep, some commercial protein food should be mixed with the corn, if it is the only grain fed.

Silage, on farms where it may be had, should be fed to lambs in limited quantity. Each lamb should have about two pounds of corn

silage and one-half a pound of dry hay per day for roughness. Because of its succulence silage keeps the intestinal tract in a healthy condition and is especially desirable for sheep during the early part of the fattening period.

Oat straw has the most value as a food of all the straws fed. The legume crops clover and alfalfa while making a most valuable hay almost indispensable to profitable feeding, are also restorers of soil fertility, adding nitrogen to the land while the crop is growing, and if the hay is fed to stock a greater part of the plant-food taken from the land may be returned in the form of manure. I know of no green feed more common or more important than Indian corn, one of the most widely known and the most useful grains in the world. It surpasses all other farm crops as feed for fattening animals. Oats is one of the leading feeds for giving health and energy to stand the most severe exertions.