

The wide distribution of Percheron mares, already shown, means a more general demand for the best Percheron sires. The number of men who own and are breeding Percherons, now in excess of 6,000 active breeders, will inevitably hasten the production of better Percherons than have heretofore been bred in America. American farmers are excelled by none in the world in intelligence and skill in their live-stock-breeding operations, and the work of so many keen minds cannot fail to bring a wonderful improvement in the breed within the next few years. Careful selection of the best is now possible, although difficulty will still be encountered on account of the area which must be covered in making selections.

Success in breeding live stock is hard to win. This is particularly true in horse-breeding. The development of Percheron breeding in the United States has been hampered by competitors of the breed, by division in the ranks of its supporters, and by much hostile criticism from would-be authorities on breeding problems. These are incidents, history teaches us, in the development of every great breed of live stock. Percherons outnumber all the other pure-bred draft horses in the United States. There has never been a time when the horse-breeding industry was on a firmer foundation, nor a better time for creative breeders to devote their best efforts to the development of better Percherons than the world has yet produced.

### Rations for Farm Horses.

The feeding of farm stock is always one of the most interesting and important problems of the farm. It must be done economically, and the animals must be kept in thriving condition. Horse-feeding seems to be largely limited to hay and oats, as far as rations are concerned, but there are other times when other substances may be very profitably used. Some rations for horses, as they are being fed in Great Britain, are given by Charles Crowther, M. A., Ph. D., of Leeds University, in the July issue of the Journal of the Board of Agriculture, and they, together with the explanations given, contain much useful information which may be of value to horse-owners in America.

In feeding horses, says Dr. Crowther, it is essential to remember that, compared with cattle, the horse has only a very small stomach, which acts most efficiently when about two-thirds full. The horse is thus not well adapted for dealing with bulky food, and should receive its food at regular short intervals, if possible, not more than five hours being allowed to elapse between meals during the daytime.

The ration of the working horse must hence contain a large proportion of concentrated food, the most suitable being oats, barley, maize, beans and peas. A ration composed exclusively of concentrated foods will not prove satisfactory, but must be blended with a certain amount of bulky food. This latter must consist of hay or good straw.

It is economical to chaff hay for horses, as they frequently waste it by littering when supplied long in the rack, though possibly a horse given to bolting food would chew it better in the long state. In general, however, if the greater part of the hay is chaffed and mixed with the grain food, a thorough mastication of the latter will be insured, the mastication will be effected more rapidly, and waste of hay will be reduced to a minimum. Long hay may be placed in the racks for consumption during the night.

The proportion of hay and straw in a horse's ration should be regulated by the demands made upon it for work. During busy times, when horses are working long hours at heavy work, the diet should be of a concentrated character, as horses do not derive the same amount of nourishment from bulky foods that cattle do. In the neighborhood of London (England), where farm horses are frequently engaged almost continuously in carting hay and straw to market, it is not unusual to allow as much as 25 pounds per head per day of oats, with only a small quantity of hay chaff.

Of the grain foods, none is superior to oats, and for the more valuable horses they are commonly regarded as indispensable. Barley and maize may be used with safety if blended with oats, beans or peas. They are more suited, however, for horses working at a slow pace than for those in rapid motion.

Beans are favored for horses that are called upon for sudden exertion or prolonged heavy work. All corn should be crushed or bruised. Sugar also seems to be an energy-producing food of the first rank, and may be conveniently supplied in the form of treacle.

All the hay and grain used must be thoroughly mature and "sweated." In feeding horses, it is a safe rule to remember the saying, "old oats, old hay, and old beans long crushed."

The following data as to food requirements may serve for guidance in constructing rations for horses under various conditions. The "medium

work" may be taken as similar to that done by a horse plowing medium loam soil for a day of eight hours.

The data given are the requirements per 1,000 pounds live weight per day. Ordinary heavy cart horses will weigh more than this, say 1,250 to 1,500 pounds, and the rations must be increased for them correspondingly by about .2-3 lb. digestible albuminoids and 2-3½ lb. starch equivalent.

RATIONS PER 1,000 POUNDS LIVE WEIGHT PER DAY.

	Total dry matter.	True albuminoids.	Starch equivalent.	Crude albuminoids.	Oil.	Carbohydrates and fibre.
	lb.	lb.	lb.	lb.	lb.	lb.
At rest.....	17-22	0.6	7.0	0.8	0.2	9.0
Light work..	18-23	1.0	9.2	1.2	0.4	9.8
Medium "	21-26	1.4	11.6	1.6	0.6	11.3
Heavy "	23-28	2.0	15.0	2.2	0.8	13.7

The maintenance requirements given for a horse at rest correspond to a supply (per 1,000 pounds live weight) of about 8 pounds of digestible matter, with an albuminoid ratio of about 1 to 8. These requirements can be met by good hay alone. Such a diet, however, fails to keep up that "hard" condition which is necessary if the horse is to be fit for work when called upon. A suitable ration for an idle horse is 8 pounds oat straw, 6 pounds hay, 5 pounds maize, or maize and barley, and 2 pounds beans, or 8 pounds oats substituted for the other grains.

Carrots, Swedes and mangolds are much relished by horses; they are very suitable for idle horses, but to those in work they should not be given in greater quantities than about 8 or 10 pounds a day. A sick horse will often be tempted to eat a few carrots when it will touch no other food.

From the above table it would appear that a heavy farm horse at ordinary work will require a ration supplying about 25 to 30 pounds total dry matter, with a starch equivalent of about 14 or 15 pounds, including about 1½ pounds digestible albuminoids.

The following is probably the simplest example of a daily ration for a farm horse: 20 pounds hay, and 12 pounds oats.

As a rule, however, a simple diet like this is not the most serviceable. Occasional changes of food are advantageous. With a more complex diet, the animals will be found to thrive better, and in many cases, also, the expense is reduced.

A mixture of maize and beans, in the proportion of 2½ of the former to 1 of the latter, gives about the same albuminoid ratio as oats, and it will be found that 15 pounds of the maize-beans mixture affords the equivalent amount of nourishment to 19 pounds of oats.

The following are examples of suitable daily rations for farm horses at average work:

- 1.—18 pounds hay, 8 pounds maize or partly barley, 2 pounds bran, 1½ pounds beans.
- 2.—12 pounds hay, 5 pounds oat straw, 6 pounds oats, 5 pounds maize, 2 pounds beans.
- 3.—18 pounds hay, 12 pounds oats, 1½ pounds beans.

A full ration for a heavy horse at the busiest time of the year would be 9 pounds oat straw, 6 pounds hay, 12 pounds oats, 3 pounds beans or peas, 1½ pounds linseed.

Farm horses fed on oat straw and oats alone—the plan followed in many northern and western districts—require a very variable quantity of oats, depending upon the character of the straw, which in some localities has a high nutritive value, whilst in others its quality is very low. In any case, the oat straw is given ad libitum, and the quantity of oats required to supplement it will vary from 14 to 24 pounds, according to the quality of the straw, the quality of the oats, the size of the horse, and the character of the work to be done.

Mares suckling foals find all the nourishment they require in an early-summer pasture. Should an indoor ration be required for a mare with foal, the following is a very suitable one: 21 pounds hay, 4 pounds maize meal, 5 pounds oats, 3 pounds bran, 3 pounds beans. Half the hay might be given long, and the other half should be chaffed and mixed with the maize meal and bran damped, and the oats and the crushed beans given dry.

The foal will graze with the mare, and soon share with her any indoor food she may be getting, and thus prepare itself for weaning. When weaned (about five months old), it should get a little trough food, consisting of ½ pound oats and ¼ pound linseed cake, a day.

During severe weather it should be fed twice or three times daily, and, in any case, when brought in at night it should be supplied with a rack of hay and one of the following trough mixtures:

- (1) 1 pound of oats and ½ pound linseed cake, or
- (2) ½ pound oats, ½ pound bran, and ½ pound crushed beans. The oats should be crushed or bruised.

Bruised oats, bran, cut hay and pulped turnips, moistened with treacle and water, make an excellent mixture. A hot mash of bran, beans and hay is also productive of good results.

Except in very bad weather, foals are much better running out during the day than kept in confinement, not so much for the sake of the food they find as for the exercise, which is so essential for the normal development of the body and limbs.

During the winter of its second year, the colt may be gradually introduced to light work, say about three half-days a week, and during the following autumn it may be fully broken in to the heavier work of the farm. On no account, however, must the young horse be overworked, or irreparable damage may be done to the slowly-hardening framework of its body.

## LIVE STOCK

### Our Scottish Letter.

We are still troubled in Great Britain with outbreak of foot-and-mouth disease, traced directly to Irish sources. So far, in Scotland, we have happily escaped. No single case has occurred north of Tweed or Solway, but Northumberland and Cumberland have both been badly hit. Since I wrote, a fortnight ago, fresh outbreaks have taken place in Ireland, and also in Leicestershire, where it was not before reported. The outbreak in Leicestershire has been marked at Mr. Stokes's place at Market Harborough. Mr. Stokes is one of the most extensive dealers in hunting horses in England. As such, he must be in constant communication with Ireland, where the best Hunters are bred. In this way the disease may be carried through the boots or clothing of men passing hither and thither between the two countries in search of horses, and of necessity, going over fields which may be infected. This suggests an unsuspected line of contact between two points—the point of origin, and the point where the disease manifests itself. It is to be hoped the clue thus furnished may be followed up, and mastery of the disease be secured.

The situation in Northumberland is rather serious. It would seem as if the infected cattle from Ireland had gone there in somewhat extended numbers. Their presence has given to that county a most unenviable notoriety in connection with this recrudescence of foot-and-mouth disease. The annual show was held at Tyne-mouth this week, but, as neither cattle, sheep nor swine were permitted to be shown, it was rather a depressing event. Next week the Durham County show is to be held, under like conditions. The great center in Northumberland is, of course, Newcastle-upon-Tyne. This is a very hilly city, and horses for its streets must be weighty, active animals. The cabs that ply for hire in Newcastle have each a pair of horses—a fact which tells its own tale. The towns in Durham are also steep and hilly, with sharp gradients, and in both counties Clydesdales of an exceptionally heavy type are in demand. Small, fancy horses are of no use where heavy loads and steep gradients have to be faced; and the Clydesdale, with his unusual combination of weight and activity, fills the bill better than any of his rivals. The Seaham Harbour stud did much to popularize the heavier Clydesdale in these northern counties of England, and generally, the horses winning this week were of this big order. Mr. Brydon still carries on the Seaham Harbour stud, and stock of his old horse, Silver Cup 11184, with foals by his younger horse, Bonnie Buchlyvie, were much in evidence. Hunting horses of an unusually good type are bred in Northumberland, and the show of such in saddle was worth going far to see. For the rest, the show at Tyne-mouth had to depend on such minor attractions as dairying and cognate items.

### THE HIGHLAND SHOW.

This year the Highland and Agricultural Society made an invasion of the County of Fife, and held its annual show at the small county town of Cupar. The zeal of Lord Ninian Crichton Stuart, the president, and the local committee was contagious, and for the first three days of the show the old place seemed to become all alive. The fourth day, however, was a failure, the attendance falling away greatly, and the Cupar show of 1912 closed its gates with drawings some £1,400 less than had been secured eight years earlier at the Perth show, with which it must compare in the circuit. Still, in spite of these things, the Cupar show was an unqualified success, save for the absence of all English exhibits and from all exhibits from Scots owners which had been in England at the unfortunate Royal Show, held at Doncaster. But it turns out that even that event was not so disastrous as had been anticipated.