

cows as cheaply as any one else can for him, and when raised upon the farm there are some advantages over those that are bought. If a farmer is trying to improve his dairy, raising the calves from his cows, if from a good paternal ancestry, is just the way to do it, otherwise he might be able to get the right kind of heifer calves from those having good stock. There is much in making the right kind of a selection of calves, and then a good deal in raising them properly. It requires some time, care and patience to succeed well, but then it will pay. To do the best the calves should be kept separate so they will not suck each other, and in a clean pen. When the principal diet is milk, some attention is necessary to keep them clean by frequent change of bedding, as they should not be allowed to become wet and dirty. Good calves are raised in this country mostly on sour milk. At this season of the year nearly all of the cream can be obtained from the milk if desirable, while it is yet sweet, and this would be better than feeding sour milk. The milk should be warmed and not fed cold. Some care is necessary not to overfeed, especially while the animals are young, as this is liable to produce scours, which is very injurious to the calves. As they grow older more milk can be fed with safety. After a few weeks old a little good hay will be eaten, and many prefer keeping them in the barn perhaps as long as milk is fed to turning them out to grass, finding that in this way they do better. Where raised on sour milk it is usually practised to feed longer, sometimes until fall, when good large calves are obtained. After three or four weeks old it is often a good plan to feed a little provender of some kind, as ground oats, wheat, bran or middlings. This should be commenced in a small way and increase gradually until as much is fed as safe. Calves raised in this way and kept growing right along through the first winter, or indeed until two years old, will be in a fair way to make cows that will please the farmers better than those they are usually able to buy. It will pay to select the best heifer calves and then care for them in the best manner for the needs of the dairy, and if there should be more than is wanted on the farm it will be found more profitable to have a good heifer or cow to sell, rather than have to buy. Some of our dairy farmers make quite a business of raising calves to sell during the season, for which there has been a considerable demand for several years past. This is all right as it enables the farmer to dispose of their sour milk to advantage, but the choice calves intended for the dairy should never be disposed of and inferior ones kept, even if a large present price is offered, as this would be a ruinous practice in the end, and the farmers need just as good stock as those who are wanting to buy.

BEST BREEDS OF HORSES.

On this important subject Mr. W. W. Stevens offers the benefits of his great experience to the readers of the *Indiana Farmer* in terms following: Some farmers may take issue with us upon this subject under consideration, but we have no hesitancy in suggesting that the best breeds for the average farmer to cross his scrub, mongrel or grade mares upon are the heavy draught. They bring a horse that is a sort of "jack of all trades" on the farm, and if a surplus is produced they find a ready market at good prices, and it is not likely that this demand will be supplied for several years to come. And they will sell at any age, from a sucking colt up. Last season we had two half-blood Normans that we were offered \$90 apiece for at weaning time. They could now be turned into ready cash at any day at a considerable advance on the above offer, including cost of keep. In all our large cities there is a grow-

ing demand for stylish draught horses. They are needed for freight waggons, express waggons, omnibuses and heavy carriages.

The two most prominent breeds of draught horses are the Percheron-Norman and Clydesdale. The English draught and Cleveland Bay are good heavy horses and preferred by some, but they do not rank with Norman or Clyde. Their get upon our common stock do not give the satisfaction that the Clydes and Normans do, being deficient, to some extent, in potency, or power to transmit their best points. The average Normans are mostly gray, weighing from 1,800 to 2,200 pounds, and some still more. They have medium sized feet, round bone, very broad, heavy body, good head and neck, heavy quarters, and back a little low. They are generally good walkers, with a natural tendency to trot off at good speed. They mature early and probably make the best cross upon the common mares in the country. Their offspring sell more readily in the city market and command the very best price.

The Clydesdale are in colour mostly bay or brown, with white on legs and stripes on face. They are not so stylish as the Norman, being adapted more especially for heavy draught—any kind of work that takes a dead pull. They have a short neck, good head and back, finely formed hind-quarters, deep rib, round as a hoop, strong flat bone, heavy legs and shoulder more upright than the Norman. They weigh from 1,800 to 2,400 pounds. A cross made by breeding half or three-quarter bred Clyde mares to Norman horses we have found results very favourably. Some of the very best horses in the country have thus the combined blood of these two grand breeds. Clyde horses crossed upon grade Normans make a better animal, some think. It makes very little difference which way the cross is made. In breeding common mares it really matters little which of these two excellent breeds is selected. Which ever is preferred, it should be one that is pure-bred, either imported or having a verified pedigree. Individual excellence should not be overlooked. Where a good heavy draught horse is within the reach of the breeder his services should be procured by all means. The farmer had better pay \$20 or \$25 for a colt from a good thoroughbred than to breed to the country mongrel free of charge. So far as we are individually concerned the fee would have to go the other way in order to induce us to even think about breeding to a scrub. We have no axe to grind in this matter, be it understood, keep no stallion and have no interest in one. We speak from observation and experience and for the good of farmers who are or intend to become horse breeders.

PHOSPHATE OF LIME FOR CATTLE.

Dr. G. C. Caldwell, writing in the *Irish Farm, Forest and Garden*, says: Phosphate of lime is a compound of phosphoric acid and lime. The opinion prevails among those who have given the subject most careful study, by experiment and observation, that it is not the phosphate of lime as a whole that is so liable to be wanting in the food of cows or young animals, as one of its constituents, the lime; and, if that be the case, a piece of chalk will serve just as well to supply the deficiency as does the more expensive prepared phosphate. That there may be more danger of a scarcity of lime, especially if the ration be a rich one, or an extremely poor one, is shown by the following comparison: For 100 parts of phosphoric acid in bone there are 120 parts of lime; but in corn meal, bran, malt, sprouts, cotton seed, meal, mangolds, and milk, there are, respectively, only 18, 6, 10, 9, 44 and 80 parts of lime; but in hay of the grasses, clover, and wheat straw there are respectively, for 100 parts of

phosphoric acid, 220, 860, and 120 parts of lime. So large is the excess of lime in the hay that with a fair proportion of it, together with some concentrated food with its excess of phosphoric acid there will be no reason to fear that the ration is not well balanced in its mineral matters. But on rations made up mostly of straw, grain and roots it is evident enough that the balance might not be well preserved, and that a piece of chalk might be useful, where the animals could lick it; and the same might be the case with a young animal fed on milk and fine feed. Where the water of the country comes from limestone rocks and is hard, an ample supply of lime would doubtless be taken up in the water drank, to make up for any lack in the fodder. A case in illustration of this occurred in Germany; a herd of cows having only a very pure, soft water to drink, were seriously affected with the disease called there bone-brittleness; when the herd was supplied with hard water the disease disappeared, but only to reappear when the cattle were put back on the soft water again.

The Island of Jersey has one head of cattle to every two acres.

The best breed is good care, good water, good feed and good barn.

Young and growing animals are the most profitable for the farmer.

Oats is the best feed for horses and colts in all conditions. It contains the elements for bone and muscle, for growth and strength. With the great increase in horse breeding in the Western States, we are glad to see the increased acreage of oats; besides, it is a healthy feed when ground and mixed with corn for other stock.

Trim the feet of your young horses to prevent trouble if neglected. Give them every attention if you expect to make first-class horses of them to sell at top prices. Don't tell the buyers they have never been half fed and never had a curry-comb on them, for if you have thus neglected your own stock, tell it not in Rome for humanity's sake and for your own good name. If you raise horses, take proper care of them, feed, water, shelter and curry them, or or sell them to some one who will.

The French work their stallions six or eight months in the year, thus preserving their health and vigour, while at the same time paying a revenue to their owners instead of being a heavy expense. It is also certain that regular work is an antidote for bad temper, and that stallions would be much easier to handle and have better dispositions were they subjected to sufficient labour to keep them in good health. A stallion in service should be in as hard condition as when in training if his colts are to be sound and healthy, a condition which they are not likely to be in if the stallion is a sleek, fat animal, with fat taking the place of muscle.

In the course of an article on the subject of food for horses, the *American Cultivator* says: Ground grain is the cheapest form in which nutriment can be given to working horses. But to produce the best effect, it should be mixed with cut hay, not to give greater bulk, for this the horse's stomach does not require, but to make the food more porous in the stomach, so that the gastric juices may more freely work through it. Meal alone, especially of corn which has scarcely any chaff, will compact in the stomach and be less easily digestible. The heavy chaff of oats is one of the reasons this grain is so valuable for horses feed. Another is that the oat abounds in nitrogenous or muscle-forming food, and is therefore worth more per pound where strength is required than corn or oil meal, whose chief constituents are carbonaceous or fat producing.