

professor of cattle feeding at the Model Farm, where all the profits are sunk in the manure heap, the manure then being wasted? After all, there is a cry throughout the country that stock-raising doesn't pay. We have now presented the stockman's view of the argument: How about the profits, or rather the losses of the poor farmer? Such statements as these are being puffed up by the live stock organs as a proof that the country is prospering in the live stock business. Such stockmen and their organs neither know nor care anything about our dairying interests, and it is therefore no wonder that the "scrub" must go in order to build up their industry. The "scrub" is a dairying animal, and of course it must therefore go out of the beefing business—except so far as the pedigreed animal can be proved to be superior to the grade in the production of beef, taking into the calculation the original cost of the animals, the rate of gain of flesh per day, and the cost of production, including risks, etc. Many grade steers have produced better results than the thoroughbreds, for which the "scrub" part must receive credit; for like produces like, you know, amongst pedigreed animals, and therefore no thoroughbred can produce the superior of itself. Did it ever occur to those organs that if the "scrub" goes, the grade must go too? When this time comes, how can we produce cheap beef, and compete in the world's markets, with high-blooded, high priced animals?

Let us now bear in mind that Mr. McRoberts bought those 70 steers from the farmers. How much profit did these farmers make? The steers designated as two years old would be about two years and five months old, for they would be dropped in April or May and sold say in September—say 880 days old. His mixture of two and three year olds averaged 1,120 lbs., so that it would be a liberal allowance to say that the two year olds would weigh an average of about 1,000 lbs. That is, they gained an average of about four-fifths of a pound per day, making due allowance for the weight at birth. It is evident that steers which make this average gain have had something more luxurious than straw stack accommodation, for the "runts" only weigh about 700 or 800 lbs. at this age. The average price paid for Mr. McRoberts' steers was \$45, or say \$40 for the two year olds; that is to say, the farmer gets exactly five cents a day for raising a steer from calfhood till it is two years and five months old, granting that it is worth nothing at birth. Now, when it is considered that such steers when well fed in winter consume from 18 to 24 cents per day, it will surely be under the mark to say that it would require 10 cents per day to keep them in fair growing condition, which would be \$18 for six months' feeding. But the farmer gets 5 cents per day or \$18.25 for a year's operation, so that practically he gets nothing for his pasturing. Taking average circumstances and conditions into consideration, we think it would be a fair statement to say that the \$32 per head gained by Mr. McRoberts represents the sum lost by the farmer; in other words, if the farmer fed his own stock, even if he understood his business as well as Mr. McRoberts, he would gain during the period of liberal feeding just what he lost during the two years and five months of low feeding, or he has just the manure left to represent his profit.

All these circumstances point out the necessity for a more liberal system of feeding, a

more economical method of saving the manure, and the breeding of the best class of animals. Select large, roomy, native or grade cows, and put them to the best thoroughbred bulls of the best beefing breed, not the best according to the evidence of pedigrees alone, but the best in the eye of an experienced, impartial judge. Bear the following facts in mind: Any beef animal is a "scrub" for dairy purposes, and any dairy animal is a "scrub" for beef. The Jersey, for instance—one of the most valuable of breeds, is a beefing "scrub," while the Hereford, or the Polled Angus, also many of the Shorthorns, are the veriest "scrubs" in the eyes of all sharp-sighted dairymen.

Mr. McRoberts says he never read a work on cattle feeding in his life, and yet he is one of the most scientific cattle feeders we have ever met. We commend his system to all intelligent farmers. He says he worked out his system by repeated experiments, but he might have saved himself all this cost and trouble by spending a few winters' evenings in the study of the nutritive values of the different products of the farm. He should not stigmatize other investigators in the same field, the only difference being that their experiments and accounts are more thorough and accurate than his, and therefore deserve the appellation of "scientific." He is a special friend of the clovers, not caring much about the grasses, which conclusion also rests on a scientific basis, and we therefore recommend his permanent pasture mixture to the careful attention of our farmers, viz.: Two parts timothy; 1 part white clover, 1 part alsike, and 1 part red clover. This formula makes a very nutritious pasture, but does not give as long a pasturage season as the ordinary permanent pasture mixtures, and, besides, variety is quite an element as well as nutriment. He finds a great advantage in harrowing the pastures, which spreads the droppings of the animals and equalizes the growth of the plants.

Raising Calves—Value and Uses of Skim Milk.

The fly and sultry season has already set in, and great care should be exercised in the management of young stock. The beneficent effects of sunlight notwithstanding, the calves should now have shade to protect them from the scorching heat, and if the flies display their usual viciousness, young stock should be sheltered in dark stables during the fly portion of the day; for there is no profit in converting milk into flies through the medium of the calf's blood.

The artificial method of calf-raising is the outgrowth of our dairying system, and various sorts of disorders are now the rule, not the exception, scouring being one of the most troublesome of these disorders. Many farmers regard skim milk as having little nutritive value, and they have therefore adopted the practice of feeding it in larger quantities than whole milk. This is one of the main causes of scouring. The other leading causes are irregularity in feeding, not feeding often enough, and giving cold milk, in place of warming it to 98°—the temperature of the blood. Removing the causes is the best remedy, but severe attacks may be removed by putting a tablespoonful of lime-water into each feed of milk. This liquid is prepared by placing a lump of lime about the size of a hen's egg into a gallon jar of water and shaking thoroughly. An egg stirred in the milk is also an excellent remedy; so is parched flour. Over-feeding is more injurious than under-feeding, and far more cruel. If you can't strike the mark, aim under rather than above.

There are other evil practices in calf raising, chief amongst which is the feeding of grain.

Many an excellent cow is ruined in her calfhood by not being taught to masticate her food thoroughly. The grain is fed ground or boiled until the animal finds out that its teeth and jaws are more for ornament than use. The calf should be taught to chew unground oats when it is three or four months old. The teaching of this practice may be found a little troublesome at the very outstart, but all your pains will be amply rewarded. The simple neglect of this duty is the cause of so many disorders of the digestive organs, and the effects upon the quantity and quality of the milk will be seen in another article under the title of "Abnormal Conditions of Milk." Oats are the best grain to feed with skim milk, for they contain a large percentage of fat which is missing in the milk; they are apt to be masticated more thoroughly than other grains, and they furnish bulk, which is of great importance in young animals—especially those intended for the dairy. In feeding for prizes, however, the case is different; for the more you ruin your calf the greater will be the certainty of your getting prizes and free advertising.

The existing low prices for cheese, and the great value to be attached to skim milk, as has been proved by numerous experiments recently conducted in feeding calves and pigs, should tend to revolutionize our live stock and dairying systems. Farmers cannot afford to ignore the value of chemistry in its bearing upon cattle foods and rations. This science has pointed out the relative values of farm products and has taught us how to combine these products into properly balanced rations. Accurately conducted experiments, combined with sound judgments, have corroborated the facts established by the chemist, and the results have been that many products which have formerly been regarded as waste have been proved to be the most nutritive. If science had led the van of civilization, instead of fashion, we should now have more stalwart men and scrubber looking, though healthier and more valuable stock.

The most nutritious stock-foods raised by the ordinary farmer are bran, shorts, and skim milk. These are all by-products, and their values are not yet well enough known. Where the value of skim milk is fully appreciated, farmers are changing from cheese to butter-making. But there is still a general lack of knowledge in the economical utilization of skim milk. Prof. Henry, of the Wisconsin Experiment Station, has been conducting some very interesting and practical experiments in the feeding of milk thoroughly skimmed by the use of Cooley cans. In one experiment with 16 calves, he found that the skim milk brought him 35 cents per 100 lbs. He lays it down as a rule that 25 to 30 cents per 100 lbs. can be realized for skim milk, counting oats at 1c a lb., hay at \$8 per ton, and bran at \$12 per ton, providing you can get \$4 per 100 lbs. of growth in the calf. Now, whole milk at the cheese factories only brings about 80 cents per 100 lbs. One hundred pounds of milk ought to make at least 3½ pounds of butter, which, if of good quality, will bring 18 cents per pound, or 63 cents in all, so that the butter and skim milk will bring nearly a dollar in place of 80 cents, besides, the farm is enriched by 95 percent of the nutritive value of all the food consumed by the calves; in other words, instead of exhausting your farm by disposing of all the raw products, you only dispose of five percent of the fertility taken from the soil by marketing your productions on all fours. If this business does not pay, your only alternative is the use of commercial fertilizers, if you wish to keep up the fertility of your farm.