

	Albumin- oids. Lbs.	Carbo- hydrate equiva- lence. Lbs.
12½ pounds hay	0.47	5.95
5 pounds oat straw	0.07	2.17
22 pounds corn meal	1.71	15.75
Furnished	2.25	23.87
Required	2.25	12.15

Excess of non-nitrogenous matter..... 11.72

These two rations show very forcibly that either the practice of feeding corn meal alone, with hay and straw, is a bad one, or the feeding standards are worthless.

It will be noticed, that the proportions given on page —, have 1000 for their first term, this must always be so because the tables are computed for animals weighing 1000 pounds, this being so the determination of what a given animal requires, when its weight is known, is very simple.

Rule for determining the digestible matter required by an animal of any weight: Multiply the number of pounds of albuminoids, and carbo-hydrate equivalence, found in table B, for the desired condition, in which the animal is, by the live weight and move the decimal point three places to the left.

For example: A steer weighs 1250 pounds, and it is proposed to fatten this animal, what amount of nutrients (that is digestible albuminoids and carbo-hydrate equivalence), are required? In table B, it is seen that "oxen fattening," require daily 3.0 of albuminoid, and 16.5 pounds of carbo-hydrates and fat per 1000 pounds live weight. Applying our rule, we get $3 + 1250 = 3750$: removing the decimal three places gives 3.75 pounds of albuminoids; in the same way, $16.5 \times 1250 = 20625.0$, remove the point three places, = 20.62 pounds of carbo-hydrate equivalence required.

To form a trial ration, take 1% of live weight of animals in hay, and 1% in corn fodder, then take about one-third of one per cent of one of the following concentrated feeding stuffs, cotton-seed, gluten, linseed, or malt sprouts, and half the quantity of shorts, and make up the ration with corn meal and middlings. A few trials will give a combination coming close enough to the standards.

	Albumin- oids. Lbs.	Carbo- hydrate equiva- lence. Lbs.
12½ pounds of hay	.46	5.95
12½ pounds of corn stover	.27	5.11
4½ pounds of cotton seed meal	1.41	1.90
2½ pounds of shorts	.30	1.18
5 pounds of middlings	.67	2.88
7 pounds of corn meal	.55	5.01
	3.66	22.09

There are reasons for believing that this ration is fully as economical for the American farmer as one corresponding exactly with the German standard. Our conditions differ from theirs. Corn is our standard grain, is cheaply produced in the West, and must constitute a considerable portion of our rations here, and hence a little less of albuminoids and more of carbo-hydrate equivalence must be used. I am satisfied, from the feeding experiments that have been conducted on our college farm, that a considerable variation from the foreign standards may be economical, and that instead of a nutritive ratio of 1 : 5.4 for cows giving milk, we can do better with a ratio of 1 : 6 or 7. This may perhaps be considered a pretty wide variation, but I believe the cheapness which we can produce starchy foods more than compensates for any loss that may result in quantity or quality of milk from the reduced quantity of albuminoids. The factor of cost of foods has been too much overlooked in American investigations, so that in pointing out the errors of the too common practice of feeding corn meal exclusively, we have tended toward the other extreme.

[CONCLUDED.]

Second Prize Essay.

WHAT IS THE AVERAGE COST TO THE FARMER TO RAISE A STEER TO THE AGE OF THIRTY MONTHS, SAID STEER TO BE SOLD FAT AT THAT AGE? HOW MUCH PROFIT IS DERIVED? IF THERE IS A PROFIT, HOW CAN IT BE INCREASED?

BY JAMES LOVELL.

Assuming that the question is average cost to the average farmer to raise an average steer, a suitable steer for that purpose should be a well-bred grade of a breed of cattle that will mature early, and with proper usage lay on flesh rapidly; no doubt, we have several breeds of cattle that will fill the bill in these respects. The weight of such a steer, as the one under consideration, will be about 1200 lbs., and would be worth, at say 4c. per pound, \$50, and the cost of raising such an animal would be about as follows, supposing that the calf came in the spring—as is usual with the average farmer—say 1st of April:

The first cost of such an animal we put for bull service,	\$2 00
We will suppose said calf is fed new milk for four weeks, and worth say, altogether 300 lbs., at 60c. per cwt.	1 80
Say four months skim milk, 20 lbs. daily, at 30c. per cwt.	4 80
A little grain will be required, and also pasture for the first summer, would cost altogether say	3 00
Making a total cost for the first seven months of	\$11 00
Six months winter feeding—hay ¾ ton, \$6; straw, \$1	7 00
Grain, say 3 pints oats daily, \$2.50; bran, \$1.	3 50
Second summer pasture for yearlings say	5 00
Second winter feeding—hay 1½ tons, \$12; straw, \$2.	14 00
Grain or roots, worth say	3 00
Third summer for pasture	8 00
	\$40 50
Making a total cost of	\$52 10

Under this system (the one usually followed by most farmers) there will be no profit in fattening steers at that age. The cattle will be ready for market in the fall of the year, when the prices are always somewhat lower, and consequently will nearly always be unprofitable to the producer.

But let us consider another way of producing such a steer—a way of working that I am of the opinion will, in every instance, produce better results—and that is by having the calves come in the fall of the year. All things being equal at the start, a fall calf will, in the competition, have a decided advantage over the spring calf. With the average farmer, a spring calf usually gets somewhat stunted during the first summer. They do fairly well for the first few weeks until they are turned out to pasture in the heat, and the flies torment them while they are young and tender, and by the time they really begin to eat enough grass to do some good, the cold chilly weather of autumn is on, and the result is, that such calves usually go into winter quarters in a somewhat reduced condition.

The margin of profit on feeding stock at the present time is no doubt small, and we cannot afford to waste feed by keeping animals in such a way that increase of weight is obtained at only certain seasons of the year. Early maturity should be constantly aimed at to make the business profitable. Constant and rapid growth is required, and this is particularly important during the first year, for, if allowed to fall away then, there is a loss of time and profit that cannot be regained afterward, for a young animal will always give better returns for extra care and feed than an old one. And, without doubt, the

steady and even advancement towards maturity, that is essential, can be more surely obtained in a fall calf. Give such a calf comfortable quarters and a little more generous supply of feed the first six or seven months, and it will have a strength and vigor of frame that will enable it to obtain the full benefit of the pasture when turned out in the spring, and if, in addition, a feeding trough is provided and a little grain fed daily, a gain in size and weight will be secured that will well repay the trouble and expense.

The plan of feeding, now under consideration, would require three winters' and two summers' feed; but the animal would be fit for market in the spring when beef always commands a higher price, and if, by a little extra feeding, we can produce a superior animal that will weigh 1500 lbs., and would sell for about 4½ cts. per lb., \$71.25, it is certainly the most profitable course to adopt. We will suppose the fall calf to come 1st of November, and the cost of raising to be as follows:—

Bull service	\$2 00
Six weeks new milk worth @ 60c. per cwt.	2 50
Four months skim milk worth @ 20c. per cwt.	4 80
Hay, ¼ ton, \$2; grain and flax seed meal, \$3.	4 00
First summer feeding would cost for six months pasture say \$4; a little grain in addition, \$2.	6 00
Second winter—1½ tons hay, \$12; straw, \$1; grain, \$3; bran, \$1; flax seed meal, \$1.	18 00
Second summer—pasture, \$6; additional for a little grain, \$2.	8 00
Third winter—hay, \$14; straw, \$1; grain, \$6.	21 00
Making a total cost of	\$66 30

The gain in this case being a direct profit of \$4.95, or as compared with the spring calf, of \$7.05. There is nothing charged in either case for labor and attendance, as the manure should balance that account. Of course, the system of feeding can be somewhat changed according to the position and circumstance of the individual farmer; some may find it more profitable to substitute roots for a part of the grain ration in the winter; but, under any circumstances, the profits in fattening cattle will be mostly indirect. A market is provided at home for bulky products, that otherwise would have to be hauled in small quantities to town, and there disposed of. And a lot of valuable fertilizer is produced that keeps the land in a high state of fertility, and therefore, on the stock farm better crops of hay and grain are always produced, and it is from this source we must look for a large share of the profit.

A woolen mill is being built at Fish Creek eight miles South of Calgary, which will be in working order before the shearing season.

Professor Samuel Johnston, Michigan Agricultural College, says:—I should prefer to buy wheat, bran, oil-meal and other commercial foods for cattle rather than commercial fertilizers.

In a paper read before the meeting of the improved Stock Breeders' Association, at Iowa City, Hon. L. S. Coffin said that as the result of his experience, the sheep is the one domestic animal that never dies in debt to its owner.

The testimony accumulates that it is better to feed milch cows but twice per day; as it is alleged that well-fed cows can put in their time resting and remasticating their food more profitably than to spend it in any other way. The man who thinks a cow ought to be cantering all over a half-bare pasture to get a livelihood, doubtless does not believe the above.

Up in Wyoming a few years ago one of the flash cattle companies that have now gone to the wall, took it into their heads that they were going to revolutionize the future beef market by stopping the increase by spaying all the cows. They sent for a professional torturer, and in one day they had 300 animals operated upon. In ten days thereafter 250 of their caponed cows lay dead on the plains. Their loss was a just one, while their offence against humanity was revolting.