investigated, and many feeders have not the time nor ability to carry out experiments that will give reliable results. Thanks, however, to the wonderfully painstaking researches of two German investigators, we are now able to estimate, more or less accurately what is the final value to the animal of digested food from various materials. It would be out of place at this time to discuss in detail the results of these researches; but, using the data obtained, it is possible to calculate with a reasonable degree of accuracy the maintenance and production value of foods. The production value represents the power of the digested portion of the food to produce increase of body weight, milk, or work. The results obtained are comparative. Warington's Chemistry of the Farm contains the following table of calculated results:

COMPARATIVE VALUE OF ORDINARY FOODS FOR RUMINANT ANIMALS.

	For Maintenance.		For Production.	
	Value of 1,000 lbs. Expressed as Starch.	Quantities Equivalent to 1 lb. of Starch.	Value of 1,000 lbs. Expressed as Starch.	Quantities Equivalent to 1 lb. of Starch.
	Lbs.	Lbs.	Lbs.	Lbs.
Cotton cake (hulled)	944	1.06	825	1.21
Corn	859	1.16	825	1.21
Wheat	823	1.21	783	1.28
Linseed cake	842	1.18	733	1.36
Barley	755	1.32	721	1.39
Peas	796	1.25	702	1.42
Oats	676	1.48	626	1.60
Wheat bran	635	1.57	578	1.73
Brewers' grains (dried)	634	1.58	533	1.88
Mixed hay (best)	536	1.87	359	2.79
Mixed hay (medium)	506	1.98	337	2.97
Clover hay (medium)	459	2.18	319	3.13
Oat and barley straw	412	2.43	207	4.83
Potatoes	212	4.72	202	4.95
Wheat straw	357	2.80	96	10.41
Corn silage	131	7.63	92	10.87
Mangels	87	11.49	76	13.16
Swedes	86	11.63	75	13.33
Turnips	68	14.71	59	16.95

According to these figures, always supposing the foods to be fed in a properly-balanced ration, 1,000 pounds of cotton cake would be equal to 944 pounds of pure starch for maintenance, or 820 pounds if used for production purposes. Or that 1,000 pounds of turnips are equal to 68 pounds of starch for maintenance. Further, that 1.16 pounds of corn, or 11.49 pounds of mangels will give equal results for maintenance; and that 1.21 pounds of corn, and 13.16 pounds of mangels will give the same results when fed for production purposes. Of course, the succulency value of mangels and turnips cannot be estimated in this way.

The different rank which fibrous foods take is clearly shown. It appears that two pounds of oat or wheat straw may replace 1 pound of corn, if the steer or sheep is merely on a maintenance diet, but that 1 pound of corn will have as great an effect as 4 pounds of oat straw or 8 pounds of wheat straw when fed to growing or fattening animals.

These figures are very similar to the results of Danish experiments in fattening pigs, where it was found that 4 pounds of potatoes or 7 to 8 pounds of mangels would replace 1 pound of meal from the cereal grains. American experiments show that 4½ pounds of potatoes are equivalent to 1 pound of corn meal. In some old French experiments, 5 pounds of turnips, or ½ pound of peas or barley were reckoned equal to 1 pound of best meadow hay.

The table teaches us that an equal weight of corn and oil cake will have nearly similar feeding value if supplied to an animal receiving a sufficient amount of proteids in its diet, as, for example, if the animal is pasturing on grass or clover. In some English experiments, clover was consumed on the land by sheep receiving 728 pounds of cotton cake, or 728 pounds of corn meal per acre. The average gain in weight of ten sheep, in eight annual trials, was 362½ pounds when receiving the cake, and 356¼ pounds when fed with an equal weight of corn meal.

It is evident that the figures in the above table give us a good basis for the comparison of food both for maintenance and production purposes. For various reasons, the coarse foods give better results for maintenance than for production. Furthermore, these figures show that many foods can be substituted for each other without altering the value of the whole diet. For instance, it is quite clear that sheep or cattle on grass will do as well with corn as supplementary food as if it had been composed of the expensive cotton cake or linseed cake. It is also evident that 1.28 pounds of wheat are as good as 1.42 of peas, or 1.60 of oats, or 1.73 of bran, when fed for growth, milk, or work, always supposing that the required amounts of proteid in the diet is maintained, as would be the case, for instance, if clover hay formed the main part of the ration.

But, unfortunately, experience proves that clover hay does not form the main part of the ration of ordinary farm animals. For various reasons, timothy is still grown in considerable quantities, and its hay, the straws, and even roots and silage, are comparatively low in protein materials. Consequently, whenever these form a large part of the ration of a cow giving milk, or a young animal which is to be pushed ahead rapidly, more protein must be added to the diet than if the roughage was made up principally of clover or alfalfa hay. It is here that the mill by-products, such as bran, gluten meal, gluten feed, oil cake, which are rich in proteid substances, are of the greatest value. Every dairyman has a large quantity of cheap roughage which he desires to feed. These materials do not contain enough protein. Added protein, supplied in the form of materials rich in this constituent, will not only make up this want, but may improve the digestibility of the whole ration, and thus materially increase the dairyman's returns.

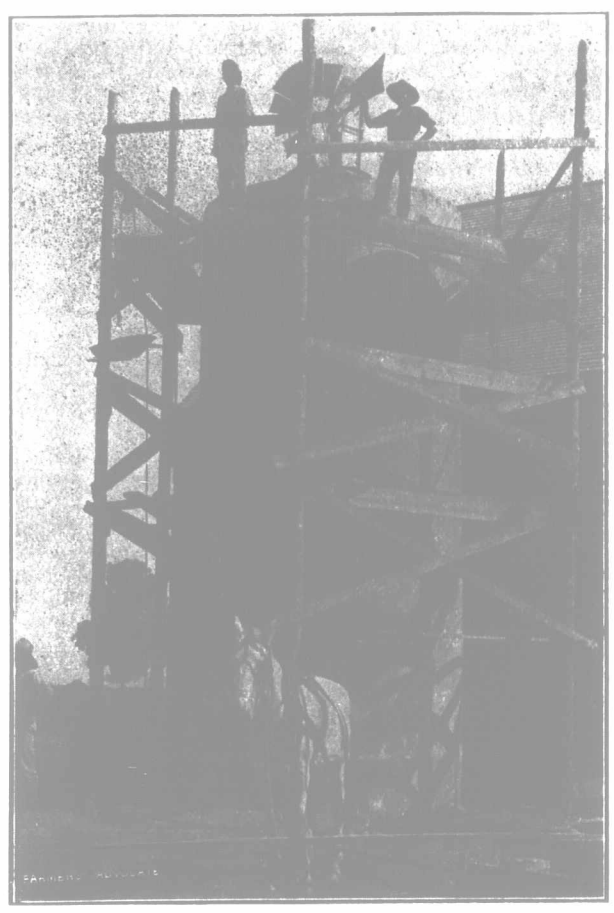
Chilled Beef from Australia.

The arrival of a cargo of chilled beef from Australia, said to be in tip-top condition, has been heralded in London as foreshadowing the relief of the British meat market from "the danger of being throttled by the American beef trust." Previous attempts to bring chilled beef from Australia had failed, the time of transportation being so great that the meat was invariably condemned upon its receipt.

THE FARM.

An Economical Small Silo.

The accompanying illustration of a round cement silo, on the farm of G. W. Nichols, Wentworth County, Ont., is from a photograph submitted by John Jackson, who also supplies the following details:



Erecting Cement Silo.
On farm of Geo. W. Nichols.

The size is 10 ft. 6 in. inside, by 27 ft. 6 in. high. Walls are 8 in. at bottom, and 5 in. at top. The cost of construction, not counting teaming, the material, or board of men, is as follows:

4 loads of sand, at 25 cents	$ 1.00
500 feet gravel (crushed stone), at $3.00 per cord	11.70
25¼ barrels of cement, at $1.30 (cheap)	32.82
1 extra man, three days, at $1.50	4.50
Contractor, 5½ days, at $5.00	27.50
Iron for reinforcing	3.45
1 load of small field stone	
	$80.97

Of course, if everything were paid for, it would run up quite a few dollars more, but in the long run, it would be cheaper than wood. Mr. Jackson considers it a first-class job.

Problems in Every Land.

Since last I wrote similar notes, it has been my privilege to cross our continent again — this time largely through the United States, passing through the great corn belt of Illinois, Iowa, Nebraska and Kansas, where corn fields are seen of as large areas as the wheat fields of our Canadian West, or even the Dakotas to the south. I learned that while corn was the staple crop, yet stock-raising was carried on to a limited extent, with wheat and clover for a change in the rotation. By this method the soil fertility is being maintained to a considerable extent.

In discussing this feature of soil deterioration on these fertile plains with farmers as I passed along, it appeared to me that this factor had not yet assumed a very serious aspect with them, as most of them appeared to think the soil had fertility enough stored up for almost another generation.

To the Canadian dairyman or stockman the absence of large farm buildings was especially noticed, and instead the good-sized corn-crib was evident on every farm.

The irrigated lands of Utah, Idaho and Oregon demonstrate to us the great possibilities, agriculturally speaking, that is before those States. To pass from sage brush and desert country into a veritable paradise, made possible by drawing the water from some of the numerous mountain streams and spreading it over the land of fertile valleys to me was wonderful. Stacks of cured alfalfa, green fields of this wonderful plant ready to cut, innumerable stacks of grain, fruits and vegetables in abundance, were seen on these irrigated lands—lands which a few years ago were as barren as the unwatered lands surrounding these oasis belts, but in whom someone had confidence in their productiveness and had the courage and grit to enter in and settle in that desert country. During the past few years the United States Federal Government has spent millions to redeem much of this land, and is being rewarded.

What a change when one passes through the Sierras into some of the valleys on the Pacific Coast. Verdure everywhere is seen, in valley and hillside, a striking contrast to those last-mentioned States, which lie between the Rocky and Sierra range of mountains, which have practically no rainfall, while on the Coast there is almost an excess at times. The farmers on the Coast have certainly a fine, genial climate, comparatively speaking, similar to that of that greatest live-stock country in the world, Great Britain. Here young stock lives practically 12 months in the fields, and dairy cattle can graze almost all the time. It appeared to me that the young stock reared in that clime had more size and ruggedness than much of our Eastern stock. This is due, no doubt, to the absence of confinement necessary during our uncongenial winters.

While I appreciated much that I saw, and do not think that this is the only spot of God's beautiful earth in which man may live, yet I return believing there are possibilities yet to be worked out in our old Province of Quebec which, if energetically and wisely done, will enable her to double her production within a very short time.

In almost every section I visited I found the agriculturist had problems to face, no matter how favorable the locality or how fertile the soil, problems which must largely be solved by himself, and necessitating thrift, industry and unanimity. Truly we have a great continent, with the husbandman as its greatest benefactor.

Huntingdon, Que. W. F. STEPHEN.

Uncomfortable Implement Seats.

Editor "The Farmer's Advocate":

If you will permit, I would like this appeal inserted in your columns. A little lad stood beside his father, and after hearing a machine agent fan the air for half an hour on the relative merits of a certain mower, he made the remark that the mower was all right but the seat. That has conveyed to my mind what I am about to say.

Although we, as farmers, are thankful to those who have given us the labor-saving devices of the day—the mower and binder especially, which are quite preferable to the "turkey-wing" and mulley, quaint and olden—we have not lost sight of the fact that our bodies are our first consideration, and that they must be protected.

If an agent would approach me in the field, after I had spent an hour on the seat of a merry-go-round, or mower, not to say anything of our 10½ lands, I don't think I would be in a very pleasant mood to listen to his anglings, unless, of course, it was just after dinner.

Most of the seats which my body has become acquainted with, and it doesn't take long for that, are certainly, as they say to the boy with the cigarette, "Another nail in your coffin."

I cannot see why it is that the manufacturers don't completely revise their seating accommodation, and thus save a fellow a few of the jolts and bumps, which are, no doubt, the cause of much of the heart trouble, kidney trouble, on down the list of ailments, even to "house-maids' knee." I