	A buminoids or flesh formers.	Oil.	Carbohy- drates or heat givers.	
9 lb. Meal 28 tb. Mangolds 20 lb. Hay	lb. 1.12 .336 1.8	lb, .45 .028 .5	lb. 5.26 2.29 8.2	
Total	3.256	.978	15.75	
In 100 lb. Meal In 100 st. Mangolds	12 17	5 1	58 114	

Experiments in cattle feeding.

How to feed cows most economically and advantageously in winter is a problem of great importance to dairy farmers. For that reason we call attention to some remarks on the subject in the Live Stock Journal Almanack by Mr. Primrose M'Connell, a writer who has had the advantages of scientific training and experience as a dairy farmer on an extensive scale. Mr. M'Connell compares three varieties of foodturnips, silago, and cooked mashes. The first he values at 10s. per ton, the second at 15s, and the third at 26s. 8d. in its moist state. The estimate for turnips is a common one, and that for silage is based on the assumption that the consuming value (1) of a ton of average hay is £3, and that the green grass which would make one ton of hay would make four tons of silage. (2) The mash is composed of 4 lb. straw chaff, 4 lb. bran, 2 lb. bean meal, 2 lb. ground oats, and 36 lb. water. One shilling per ton is allowed for cooking these ingredients, and this brings the cost of the dry matter to £4 per ton. To compare the three kinds of food equal values are taken by given analyses of one ton of turnips, two-thirds of a ton of silage, and one eight of a ton of dry mash, as follows :---

		Albuminoids	. Fats.	Carbo- Fats. hydrates.		
1	Ton	Turnips 1.4	0.20	7.1	0.60	
ž	"	Silage 1.5	0.04	9.0	1.60	
ţ	"	Dry mash 1.7	0.35	4.5	0.36	

The albuminoids are the most valuable of these food constituents, and the mash contains 21 per cent more of them than the turnips, and 13 per cent. more than the silage, for the same cost. Taking the fats also into consideration, and leaving the carbo-hydrates out of account, Mr. M'Connell estimates that ten shillings worth of the mash is worth as food 28 per cent. more than turnips and 33 per cent. more than silage costing the same money. In addition he contends that it is more casily digested, and that there is a great saving in the animal economy through giving food warm, as well as an increase in the flow of milk. Lastly, there is an advantage in being able to use for food, with the least possible waste, such bye-products as cavings, tail corn, and chobs, as well as inferior hay, and all kinds of straw. In wintering

(1) Consuming value, is the value set upon hay, roots, &c., by the valuers when the tenant is entering on his new occupation. The landlord's interest in the manure enters so largely into this value that it is almost impossible to make the matter clear to any one not acquainted with the queer system of "valuations" prevalent in England. A. R. J. F.

(2) Observe that, when the writer puts the value of silage at $50 \circ_{10}$ more than the value of turnips, he is not talking of green corn silage, but of grass. A. R. J. F.

70 cows, Mr. M'Connell has found the cost of cooking not to exceed fifteen pence for each cow.

Another cattle-feeding question is dealt with L- Sir John Lawes in the Scottish Agricultural Gazette. He set himself to ascertain whether a farmer would do better by selling the produce of an acre of oats or by converting it into beef. Experiments carried out at Rothamsted show that 3365 lb. oats (84 bushels of 40 lb.) and 5040 lb. straw, assumed to be grown on one acce, with 1960 lb. decorticated cotton cake, will produce 958 lb. in the live weight of oxen. Taking twothirds of this as carcase weight (a fuir computation, as the proportion of dead to live weight in the increase only is larger than that of a whole bullock), there would be 639 lb., which, at 6d. per lb., would amount to £15 19s. 6d. If we deduct £5 5s for the cake there will remain £10 14s. 6d. as the return from the consumption of the oats. Now, oats weighing 40 lb a bushel would be worth about 20s. a quarter, and the assumed crop of ten and a half quarters would come to £10 10s. We have, then, a balance of 4s. 6d. and the manure on the side of feeding the crop to set against the straw in the event of the produce being all sold off the land.

FROM A FARM WORKED BY PROXY-I. THE SIN (?) OF SELLING HAY.

On page 640 of the COUNTRY GENTLEMAN, in the article on "Plowing under Clover," to which I replied in my last, Mr. Terry also says: "Unless Dr. Chamberlain can show me how to get \$10 to \$20 per ton out of the hay, and keep the manure on the farm. I am afraid I shall plow under some clover for manure next year. I would not think of selling clover hay, even at present high prices, to be taken off the farm. To the good farmer it makes little difference what the market price of hay is, as he would never take clover to market."

Is this then a law of the Medes and Persians, that cannot be changed ? There seems to be a popular impression that it is a sin to sell hay and that it is the unpardonable agricultural sin to sell clover hay. Several years ago I tried to show, in these columns, that this idea is not well founded, and that the wisdom or unwisdom of selling hay, or any other crop, depends simply upon relative prices. I have not changed my mind. Is it then always an agricultural sin to sell hay, and is it far worse to sell clover than timothy, or fur worse to sell either of them than wheat, potatoes, &c.? A clear scientific statement of the "manure value" of each crop will help to answer these questions. I give the figures below as given by the great chemist Wolff, and deduced by him as an average of a large number of careful chemical analyses. They show simply the number of pounds per ton of the several fertilizing elements drawn from the soil, and I have added the total cash values of those elements. Strong land, in good heart like Mr. Terry's, would perhaps yield in a good season, the following amounts of the four crops in question, viz. : Clover, 21 tons; timothy, 21 tons; potatocs, 225 bushels (63 tons); wheat, 331 bushels (one ton); and at the present average prices of superphosphates in Ohio the cash exhaustion per ton and per acre will be as stated below :

TABLE SHOWING SOIL EXHAUSTION BY CROPS.

Loss per ton	in	Pounas	and	Dollars.—
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Grop (1 lon.)	Nitro- gen.	Potash.	Phosphoric Arid.		Loss per Acre.
Clover hay	39.4 lbs.	36 6 lbs	11.2 lbs.	\$3.92	\$22.30
Timothy hay	31.0	40.4	14.4	9.82	24.55
Potatoes	6.8	11.4	32	2.28	1539
Wheat	41.6	10.6	15.8	10.58	10.58

Now, it will be noticed above that, in clover and timothy