

ratio; which reminds me that the nutritive ratio of 1 to 5.3, which Mr. Lloyd affixes to the high oil cake used in our experiments, is largely incorrect. It is evidently built upon the assumption that all the nitrogenous substances in roots exist in the form of albuminoids; whereas, Mr. Lloyd must surely be aware that experiments of Messrs. Lawes and Gilbert and others have shown them to consist largely of amides, with some nitric acid, which are without any feeding value at all. Instead, therefore, of calculating the albuminoids in the high oil cake as Mr. Lloyd has calculated them—at 2.69—it will be much nearer to put them at 2.00, in which case the ratio would work out to about 1 to 7.2, and would therefore not support the 1 to 5.5 standard of Wolff, as Mr. Lloyd asserts it does.

But, whatever our individual opinion, it is clear that the question is exceedingly complicated, and one not likely to be firmly and satisfactorily settled otherwise than from the data of many reliable experiments; and if it should ever be recognised that the humble efforts of the Norfolk Chamber have aided, even in the smallest degree, the desired results, none will be more pleased than their promoters. F. J. COOKE.

Flitcham Abbey, Lynn.

P. S.—I observe that Mr. Speir objects to the plan of the experiments, although, as he asserts, he writes in support of Mr. Lloyd, who says that the plan is an ideal one. Does Mr. Speir, perhaps, think it an error not to have consulted him upon the conditions of the experiment in preference to Sir J. B. Lawes?

GOOD AND POOR FEEDING PASTURES.—Mr McAlpine, in an address at the annual dinner of the Edinburgh Agricultural Discussion Society, on Monday night, said: In looking at pastures one often saw a grass which was very luxuriant, and one would naturally suppose that such a pasture would be a good feeding pasture. But, perhaps, alongside this same pasture one would come upon another pasture in which the grass appeared comparatively short and of little value. But if they asked the practical farmer about it, he might tell them that the luxuriant pasture was the poor feeder, and the comparatively stunted pasture had twice the feeding value of the other. Now, why was that? No doubt it was because in the one case the nitrogenous food and the air manufactured products were in those proportions which led to the formation of nutritive albumen, whereas in the other case (that of the rank pasture) the growth, was forced by excess of nitrogen to the non-albuminoid, and comparatively in nutritious compounds were manufactured. It was of the first importance that the clover which derived its nitrogen indirectly from the air should form a due proportion of every pasture, so as to give the proper nutritive ratio of albuminoid and carbohydrate compounds. When the grasses obtained the upper hand the clover had to succumb, and the proper balance of food was destroyed. (*En. Ag. Gazette*).

Value of dung—Mr. Hillman, in the *Country Gentleman*, exceeds Mr. Brown, of Guelph in the value he puts on dung, and leaves even M. Ville far behind:

"When Prof. Roberts reports his well-taken-care-of manure as worth only \$2.45 per ton, I think he has barely quoted one-third of its value, and I speak from personal experience, as I also have had the good fortune to handle barnyard manure, properly saved and liberally mixed with organic absorbents. Considering the full value of such manure, I could not place it less than from \$8 to \$10 per ton, and even that value is doubtlessly much below the actual benefits that accrue to us in the course of years. When barnyard manure is left in a heap and exposed to sun and rain, fermentation sets in; the organic matter becomes consumed, a good many plant-food elements become washed out, besides the nitrogen,

phosphoric acid and potash, and here I believe Prof. Roberts to be perfectly correct, when he states that the value of such manure does not exceed \$1.42 per ton, thus representing only a small fraction of its original value."

DIETARIES FOR COWS.

Some very interesting communications have appeared in these columns on this subject of late. The fact seems to be impressed upon us that, after all that has been done by chemists in laying down precise rules for the feeding of animals, a nice observance of the habits and feeding powers of stock; a watchful eye to see that a nice equilibrium is maintained, that while a cow is giving a lot of milk she does not lose flesh, or lay on flesh at the expense of milk, and above all that the constitution is not subjected to any undue strain, so that if she be a good healthy cow she may transmit the same qualities to her offspring—these must still remain the first qualities demanded of the good stock-feeder.

That many farmers succeed in this matter goes without saying, men to whom the terms "albuminoids" and "carbohydrates" are as unknown tongues. I do not say that scientifically calculated rations are useless, quite the contrary; but in the matter of stock feeding, practice must take precedence of science. From the various kinds of feeding stuffs on the market, the farmer may select that which is cheapest and best without the aid of the chemist. The chemist is very useful in protecting the farmer from fraud in the matter of adulterated foods, but as this is not relevant to the point at issue, it may be passed over.

"P. M.C." presumes that the German standards are calculated on the digestible proportions of the food only. He is right in his presumption. It is, however, the "digestible proportions" calculated from actual experiments with stock, and not on the theoretically digestible proportions. (Wolff's "Landwirtschaftliche Fütterungslehre," p. 219.) It must be borne in mind that in the German experiments amides have been reckoned as albuminoids, hence making the albuminoid ratio higher than if only true albuminoids had been used in the calculations.

Dr. Wolff admits that it is scarcely correct to do so, but seeing the imperfect knowledge at present (1885) possessed of these substances, his figures must stand as they are till some better can be substituted for them. It seems to be the opinion now that amides discharge the same functions in the animal economy as carbohydrates, hence their classification with albuminoids must necessarily be incorrect.

Warrington ("Chemistry of the Farm," p. 108) reduces Wolff's standard of 1:5 diet for milch cows to 1:6.7, deducting amides. I think that "P. M.C." is only just in his contention that what may be a suitable ration for a German cow may not be so for an English one. The experiments of Sir John Lawes and those of the German chemists differ widely in many cases, more particularly in the sheep-feeding experiments. Breed, climate, soil, and many other circumstances enter as factors into the question, and preclude any possibility of obtaining exactly similar results from stock-feeding experiments, however carefully conducted. We in England breed for flesh more than our German neighbours, as the light fore-quarters of their stock indicate a much less decided tendency to heavy flesh than our own breeds.

It is matter for regret that we are indebted almost entirely for our knowledge on these matters to the Germans. We might echo Carlyle's words, "But here as in so many other cases, Germany, learned, indefatigable Germany, comes to our aid."

The invaluable experiments and researches of Sir John Lawes are well nigh all that we can show in this important department of science.

BAUER.

(*Eng. Ag. Gazette*).