# THE PROGRESSIVE FARMER

Vol. XXXII No. 9 SATURDAY, MARCH 3, 1917 $1 a Year, 5c. a Copy


## Timely Farm Suggestions

By TAIT BUTLER

### What the Self-feeder Shows

AT ONE of the Nebraska substations, fall shoats ate during the winter, the following amounts of feeds for every pound of gain in weight:

| | | Protein | Carbohydrates | Fat |
|---|---|---|---|---|
| Corn | 2.915 lbs. | .21.86 | 1.9764 | .1341 |
| Alfalfa hay | .278 lbs. | .0295 | .1084 | .0025 |
| Tankage | .235 lbs. | .1269 | ..... | .0298 |
| Skim milk | 2.58 lbs. | .0829 | .1316 | .0052 |
| Total | ..... | .4679 | 2.2164 | .1716 |

The skimmed milk was fed the pigs in the usual way, but the corn, alfalfa and tankage were taken by the pigs from a self-feeder. The nutritive ratio of these feeds in the quantities consumed is 1 to 5.5. Again the pigs give their opinion that the feeding standards as previously worked out by the scientists are correct. The Wolff-Lehmann feeding standard for growing fattening pigs calls for the following nutritive ratios:

| | |
|---|---|
| 2 to 3 months, 50 lbs. | 1 to 4 |
| 3 to 5 months, 100 lbs. | 1 to 5 |
| 5 to 6 months, 150 lbs. | 1 to 5.5 |
| 6 to 8 months, 200 lbs. | 1 to 6 |

which simply means that the scientists estimated that pigs require 1 part of digestible protein to 4 to 6 parts of carbohydrates and fats, according to age and size, and the pigs in the Nebraska Experiment thought the same, as shown by the fact that they ate, on an average, 1 part of protein to 5.5 parts of carbohydrates and fats when the feeds were constantly before them so they could eat as they desired.

### He Got a Poor Grade of Cottonseed Meal

A READER writes: "I was quoted 7 per cent meal at $2 per hundred pounds and 7½ per cent meal at $2.10 per hundred. I ordered 7 per cent meal and when it arrived the tag on the sack reads '20 per cent protein'. I took 7 per cent to mean 7 per cent of nitrogen content and according to method of finding amount of protein given in article on cottonseed meal for mules in last issue of The Progressive Farmer, I should have received meal containing 43.75 per cent protein, instead of only 20 per cent."

Our inquirer is in error only at one point, "7 per cent cottonseed meal" does not mean that the meal contains 7 per cent of nitrogen. That is what such a statement should mean and will when the cottonseed meal and fertilizer manufacturers learn their best interest or the lawmakers learn their duty. But at present "7 per cent cottonseed meal" means that it contains 7 per cent of "ammonia." This means at present that the meal contains 5.76 per cent of nitrogen or 36 per cent of protein. If our reader was quoted 7 per cent cottonseed meal at $2 per hundred pounds and received meal containing only 20 per cent protein, or 3.88 per cent of ammonia (3.2 per cent of nitrogen), he is, on a basis of the nitrogen or protein content, entitled to a rebate of about 90 cents a hundred, but since the larger per cent of carbohydrates in the low grade meal is worth something, possibly a rebate of somewhere around 75 cents, or 80 cents a hundred would be approximately correct.

To reduce the per cent of ammonia to nitrogen, multiply by 14 and divide by 17, for only 14-17 of ammonia is nitrogen, the other 3-17 is hydrogen; or multiply the per cent of ammonia by .82. To change the per cent of nitrogen to ammonia multiply the per cent of nitrogen by 17 and divide by 14, or multiply by 1.2. But this should not be necessary, for ammonia should never be used as a measure of nitrogen. To find the per cent of protein, when the per cent of nitrogen is given, multiply by 6¼, or to find the per cent of nitrogen, when the per cent of protein is given, divide by 6¼.

### Feeding Velvet Beans to Hogs

A READER asks: "Would you advise grinding velvet beans—including the hulls, to be fed to hogs, mixed with corn? Or would you hull the beans and then grind them, not using the hulls at all? It will cost one-tenth of the beans to hull them. What proportions of corn and velvet beans would you advise for feeding hogs, when beans and hulls are used, and also when beans without the hulls are used?"

We would not hull the beans, because the hulls are of value for feeding and the cost of hulling is too great.

Perhaps the best method of feeding would be to put the corn in one side of a self-feeder and the velvet bean meal in another compartment and let the hogs balance their own ration.

If, however, we must mix the feeds for the hogs we must first decide on the nutritive ratio of the ration, or the proportion of protein to carbohydrates. Perhaps about one of digestible protein to six of carbohydrates and fat will be about right for average hogs. Young pigs and heavy milking sows might require a little more protein, or a little larger proportion of the velvet bean meal. At the present prices of feeds it will probably pay to grind both the corn and the beans in the pods.

About as nearly as it can be obtained, or at least nearly enough for all practical purposes, a one to six ratio will be obtained by mixing equal parts of corn and ground beans in their hulls.

When the ground beans without the hulls are used it will require nearly two pounds of corn to one of beans to produce a ration with a nutritive ratio of 1 to 6.

### Balancing a Ration for Dairy Cows

A READER writes as follows: "Please tell me what is a balanced ration for a dairy cow. That is, what per cent of protein, fat and carbohydrates and to what extent will one nutrient take the place of others?"

It must be understood that any standard aiming to represent the requirements of a cow is largely an estimate based on the best information we have, but which at best must be recognized as incomplete as regards any particular case.

The standard most used is what is known as the Wolff-Lehmann, which is as follows:

PER DAY PER 1,000 LBS. LIVE WEIGHT

| | | Digestible Nutrients | | | |
|---|---|---|---|---|---|
| Milk cows yielding daily ..... | Dry matter lbs. | Protein lbs. | Carbohydrates lbs. | Fat lbs. | Nutritive ratio |
| 10.0 lbs. of milk. | 25 | 1.6 | 10.0 | 0.3 | 1to6.7 |
| 16.6 lbs. of milk. | 27 | 2.0 | 11.0 | 0.4 | 1to6 |
| 22.0 lbs. of milk. | 29 | 2.5 | 13.0 | 0.5 | 1to5.7 |
| 27.5 lbs of milk. | 32 | 3.3 | 13.0 | 0.8 | 1to4.5 |

Haecker, of the Minnesota Station, has also suggested a standard, which has been used to a considerable extent in America and is thought to be better, in that provision is first made for the maintenance of the body of the animal and then additions made to the ration according to the quantity and quality of milk produced.

These standards are based on the assumption that a pound of digestible protein from one feed is equal to a pound from any other feed, but it is now known that this is not true.

Armsby, in view of these recently developed facts, has suggested a new standard or new method of computing a balanced ration. At present the data are not available by which the farmer can as conveniently balance his rations by the Armsby method, as he can by the Wolff-Lehmann standard, and the processes are more complicated or difficult for the average person. The Armsby method is probably more nearly accurate, but any approach toward the easier or more simple Wolff-Lehmann standard is an improvement over present common practices, hence we still use the Wolff-Lehmann standard, or the next step in the progress of balancing rations, the Haecker standard.

In the standard given above no other nutrient can take the place of the protein; but the protein can partially, at least, take the place of the carbohydrates. That is, any little excess of protein may be used for supplying heat and energy for which carbohydrates are used. When so used a pound of protein is supposed to be equal to a pound of carbohydrates. As, however, a pound of protein usually costs more than a pound of carbohydrates, it is not generally wise to feed any great excess of protein, which must be used for the purposes for which carbohydrates will serve.

Fats, to a large extent may serve the same purposes as carbohydrates. That is, to a certain extent they are interchangeable. Perhaps the best way to put the case is that a little excess of fat over and above that called for in the standards can be used for the purposes served by carbohydrates. When so used it is calculated that 1 pound of digestible fat is equal to 2¼ pounds of digestible carbohydrates. In other words, in calculating the nutritive ratio of a ration the fat is multiplied by 2.25 and the result added to the carbohydrates. The protein is then divided into the sum of the carbohydrates and fat to obtain the ratio. For instance, the nutritive ratio of the ration for a dairy cow giving 16.6 pounds of milk a day, using the standard as given above, is obtained by the following processes:

11 + (.4x2.25) ÷ 2 = 5.95.

The ratio is stated as 1 (of digestible protein) to 5.95 (of digestible carbohydrates and fat). It is stated in the standard as 1 to 6, in round numbers.

In making up the ration, a deficiency of dry matter, if not too great, need not cause any concern, if the required digestible nutrients are present in palatable form. Likewise a small excess of fat need not cause any serious concern. The most important point is to see that there is enough digestible protein, and, next, that there is sufficient digestible carbohydrates and fats.

For dairy cows, especially, lime is important, and our Southern feeds grown on lands deficient in lime may not contain sufficient. For this reason the addition of lime or calcium phosphate in the form of ground phosphate rock may be a valuable addition to the ration.

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Those who are advising the Southern farmer to produce his own food and feed supplies, with a garden, cows, pigs, poultry and forage crops are giving good advice, but a man may do all these and be a failure, if he does not do more—if he neglects to give a full measure of attention to soil fertility. It is only a partial correction of the fatal error in Southern agriculture.

## PASTURE PROBLEMS

**A Discussion of the Essential Factors in Getting and Keeping Good Pastures**

IN PRECEDING issues we have discussed Bermuda grass and lespedeza. These two plants—one or the other, or both—which grow almost everywhere in the Cotton Belt, must fill the largest place in our pastures, but both have weaknesses and must be supplemented by other plants.

It is generally agreed that two plants, even when growing at the same time, furnish more grazing than either alone. They may, at least, if well selected, furnish a better balanced ration than any one plant alone. but there is another reason why Bermuda and lespedeza should be supplemented by other plants.

Both these are warm weather plants. Lespedeza has no superior in warm, moist weather and Bermuda withstands dry weather better than any other Southern pasture plant in general use. But they both start growing rather late in the spring and make little growth after the first killing frosts in the fall, because, as stated, they are both warm weather plants. We must, therefore, find plants to supplement Bermuda grass and lespedeza, that will make an earlier and later growth than either of these.

Throughout the Southern half of the Cotton Belt, especially on the sandy soils of the coastal plain, we doubt if there is anything better than bur clover. In the northern half, or at least the northern third of the Cotton Belt, we are inclined to think white clover, hop clover and Carolina clover, all small growing true clovers, especially the first, are better. Or, should we say, that in the northern parts of the Cotton Belt, these small true clovers should be added to bur clover?

So far as we know, the seed of the small yellow hop clover is not on the market and the seed of both bur and white clover are high-priced. They are also somewhat uncertain of growth, when sowed on land for the first time. We are not, therefore, advising that large expenditures be made for these seeds, but we do advise sowing some of these seeds and giving the plants a start, or a chance to get a start in every pasture. When they are grown on the farm, larger seedings may be made and there is really no reason why any man cannot from a small start soon have his pastures well set with these plants, in all those sections where they are known to do well.

There are also many other plants which may be used to produce earlier pasturage than is supplied by Bermuda and lespedeza. They are not, perhaps, of so general application, but still, some of them have quite a large range of usefulness.

For moist lands, perhaps redtop and alsike clover are the most generally useful. For higher lands, orchard grass and white clover may serve better, and if the land be rich enough oat grass, meadow fescue and red clover may do well for a few years, especially if lime is present or can be applied.

The securing of late fall grazing is a more difficult problem, owing to the usual dry weather. There are plants, like Dallas grass, or Paspalum dilatatum, which do well during the dry weather of fall, but few of them stand well both dry weather and hard freezing. Many believe the best provision for dry late fall grazing is a pasture of Bermuda, lespedeza and clover, which has not been grazed too closely.