THE DAIRY.

Will it Pay to add Oil Cake?

Editor "The Farmer's Advocate" :

As feed for milch cows when one has silage, cut straw, clover hay, mangels, oats worth $1.35 per cwt., and wheat worth 75 cents per bushel, would it pay to make up a ration with part oil cake at $1.90 per cwt.? T. L. S.

At the outset we might say briefly that we believe it would pay to buy some oil cake in order to make the grain ration or the entire allowance conform more closely to the requirements of an economical ration. When we consider the oats worth $1.35 per cwt., wheat worth $1.25 per cwt., and oil cake worth $1.90 per cwt., it requires some explanation to bear out this statement. The disparity between the prices of wheat or oats and oil cake seems like a rather difficult proposition to get over. In the first place, with the grain and roughage mentioned, a practical or scientific feeder would probably first figure on the following ration. Silage 40 lbs., mangels 20 lbs., clover hay 10 lbs., oat straw 3 lbs., oats 3 lbs., wheat 2 lbs. Everyone, of course, would not decide on these exact amounts, but the average calculation would be based on figures very similar to these. In this ration there are 27.8 or practically 28 lbs. of dry matter, and the nutritive ratio or the relation between the protein and the carbohydrates and fat is in the proportion of 1 to 8, or in other words there are 8 times as much carbohydrates and fats in the allowance as protein. In economical feeding this ration is manifestly wrong, the animal must digest too much food in order to get the required amount of protein, or in other words too much carbohydrates and fats will pass off wasted in the excrement before the animal's system will be supplied with sufficient protein. To get over this difficulty we would suggest a ration somewhat as follows : silage 40 lbs., roots 20 lbs., clover hay 10 lbs., oats 1 lb., wheat 2 lbs., oil cake 2 lbs. In this ration there are 25¼ lbs. of dry matter, and the nutritive ratio is 1 part of protein to 6.3 parts of carbohydrates and fats. This is sufficiently wide or in other words there is sufficient carbohydrates and fats for the amount of protein in the ration to give it the proper balance. In the majority of cases 25 or 26 lbs. of dry matter is sufficient for an ordinary-sized cow. Readers must not confuse the term dry matter with the total quantity of feed given. There are in all 75 lbs. of feed stuffs in this ration for one cow, but only 25¼ lbs. will ordinarily be dry matter and the remainder moisture.

A study of this ration will reveal the fact that 2 lbs. of oats and the oat straw were omitted from the previous ration and 2 lbs. of oil cake added. The writer has a great abhorrence for the selling of grain or any kind of feed stuffs off the farm, but it is considered that the oat straw and the oats will be incorporated into the ration for the young and growing stock which can utilize a greater quantity of carbohydrates and fats in proportion to the protein they receive than can dairy cows.

A comparison of the food constitutents of oats, wheat and oil cake may not be out of place right here, and before the following table is considered it might be well to explain that the carbohydrates and fats for each grain are included in the one figure. Fats are supposed to be 2¼ times better than carbohydrates in the ordinary ration, consequently, we have multiplied the amounts of fats in the different feed stuffs by 2¼ and added the results to the amounts of carbohydrates in those same feeds. The table follows:

100 lbs.	Lbs. protein	Lbs. carbohydrates and fats
Oats	8.8	58.8
Wheat	8.8	70.8
Oil cake	30.2	47.5

A study of the foregoing table will reveal the fact that in protein content oats and wheat are practically the same, whereas oil cake contains almost four times as much. In carbohydrates and fats wheat is outstandingly superior but the difference between oil cake and oats is not so great, therefore, comparing the value of oats and oil cake there is sufficient excuse we consider for substituting oats with oil cake even with a difference of 55 cents per hundred in price. To make this still more plain we insert the following table:

100 lbs.	Lbs. protein	Lbs. carbohydrates and fats
Oats	8.8	58.8
Oil cake	30.2	47.5

A direct comparison between oats and oil cake is set forth in the previous table, although oats are superior in carbohydrates and fats yet the oil cake contains a larger quantity of protein, almost four times as much, which is a prime requisite in the ration of dairy cows.

Although we consider that with the feed stuffs the farmer has grown this season he should be able to feed his stock to good advantage without the purchase of feeds, yet oil cake or cotton seed meal, which are highly concentrated in protein, may be economically purchased for milking cows, and as we said at the outset of this argument, under the circumstances set forth, we believe it would be profitable to substitute a few pounds of oats with some oil cake. The grain ration for a high producing cow is perhaps not large enough. In such a case it would be well to add two or three pounds of wheat or oats and one pound of oil cake to the amounts already given.

Except the clover hay, all the feed stuffs which our correspondent has may be considered rich in carbohydrates and fats and lacking in protein. Therefore, we believe in order to feed them to best advantage it would be well to purchase a concentrate such as oil cake or cottonseed meal. Although the oat straw does not enter into the calculations regarding the ration advised herein, yet a few pounds per day may be fed where the cows exhibit a desire for it or for an additional quantity of dry roughage. It will not influence the nature of the ration to any great extent, but it will satisfy a craving on the part of the cattle for something drying and filling, especially where silage and roots are liberally fed. In the case of young stock it is even more useful for this purpose.

The Fall Care of Cream and Milk.

Editor "The Farmer's Advocate" :

During the autumn months the care of milk and cream is frequently neglected. Too often the ice-house is empty and water only is available for cooling purposes. Not long since one of our correspondents wrote to say that when his cream can was about two-thirds full, it became yeasty and foamed up like beer or yeast. Incidentally he mentioned that his ice was all gone and the cows not giving very much milk. He wanted to know the cause of this "yeasty" condition of the cream. The explanation is found in these two facts—ice all gone, cows not giving much milk; consequently the cream is held too long on the farm before shipping and at too high a temperature to prevent fermentations of various kinds, including the yeast variety.

The early part of September, up to and including the 15th, was one of the most difficult parts of the whole season of 1915 to keep milk and cream in good condition. We had letters from various parts of the Province complaining of "stringy" or "ropy" milk, "sweet curdled milk," sour milk and cream, yeasty milk and cream, etc. The weather conditions were favorable for the growth of all kinds of undesirable ferments in milk and cream. There are only two methods of controlling these ferments—pasteurization of milk and cream to be used for direct consumption, and the cooling of cream at once after separating to a temperature of 50 degrees F., and keeping at this temperature until shipped or delivered. The question is frequently asked, how cold should milk or cream be kept in order to insure delivery in sweet condition? The answer is, a temperature of 50 degrees F. or lower is necessary in order to keep milk and cream sweet for a reasonable length of time. As there is very little water on the farm so cold as 50 degrees F. (more often it is 60 degrees F. or above) in order to obtain and maintain this temperature of 50 degrees, ice is necessary. A very good rule, where there is no reliable thermometer on the farm, is to always keep ice in the cooling tank. By observing this point a person may know whether or not the water is cold enough for keeping cream and milk sweet. Dairy thermometers have a habit of getting broken or lost on a dairy farm. It is quite safe to say that in the majority of cases if one were to ask for a thermometer at the farm, he should hear, "Oh, we had one but it—"

Next in importance to ice for cooling purposes—and by the way it is none too soon to lay plans for storing next summer's ice supply—is a suitable tank for holding ice and water, and the necessary number of cans for holding the milk or cream. Some allow the melted ice to run away as fast as the ice melts. This is a great mistake, as the water from the melted ice is practically the same temperature as the ice and if this runs out the cooling power of this water is lost, which is a great waste. Water, also is a much better conductor of heat than is air. We need to remember that the problem of cooling milk and cream is one of abstracting or taking heat from a warm substance and transferring it to a cooler body. Water does this more quickly than does air because it conducts heat better and faster. The cooling tank for milk and cream then, should be watertight. When the water becomes too great in bulk for holding the cans, it should be dipped out to the required amount for convenient cooling, and preferably before ice is added; or, when the water is warmest. In every way possible the cold should be conserved, especially when the ice supply is short, as it usually becomes on most dairy farms towards the end of the season.

Not only should the cooling tank be watertight, but it should be airtight as nearly as possible. We mean by this that it should be so built that the air will not affect the contents of the tank. This means that good insulating material should be used in constructing the tank. The thickness of the walls should be at least 3 to 4 inches and it should have a tight lid. The American creamerymen have a regular campaign on for providing suitable tanks at cost for cooling farmers' cream. We need a similar campaign in Canada. There is no one thing we could do at so little cost, that would so much benefit the creamery business, as inducing patrons to put up a supply of ice each winter, and supplying the farmers with suitable cooling tanks at cost. The writer knows of at least one dairy supply firm which is prepared to go into the business of supplying cream-cooling tanks, if they receive any encouragement from creamerymen and cream producers. Goodness knows, we need to do something in Ontario to improve the quality of our butter if the prize list at the Canadian National Exhibition is any criterion of the quality of butter produced in the Province as compared with butter made in the sister Province of Quebec. This is not saying that there is no good butter made in Ontario, nor exhibited at the C. N. E., because there is a lot of good butter made and the scores at the Exhibition showed good average quality, but the most of it wasn't good enough to win in a keen competition. The only creamery that figured high in the judging was one of the very few whole-milk creameries in the Province of Ontario. Our Ontario creamerymen need to wake up. We believe that our buttermakers are skilful and equal to those in Quebec or those in any other province, but the Ontario men are not supplied with enough first-class raw material to turn out a quantity of first-class or superior manufactured goods. This leads us back to the question we started to discuss at the beginning of this article—proper and sufficient cooling of the milk or cream at the farm. Here lies the chief weakness of the creamery business. This end of the business has been largely neglected. A former creamery instructor said that so long as Butter Manufacturers were paid a certain rate per pound for manufacturing, regardless of whether the butter graded good, bad or indifferent, there was little hope for improvement in the quality of butter made in Ontario creameries. He argued that so long as the manufacturer got just as much money for making a pound of poor butter as he got for making a pound of good butter, the manufacturer was not going to sit up nights worrying over the quality of cream received, or the quality of butter manufactured. There is no doubt something in this argument, although we are inclined to think that most of the creamery managers have sufficient pride in their creameries to always desire that the goods manufactured shall be of best quality. However, human nature is much the same the world over, and so long as the other fellow, (in this case the dairy farmer) pays the bill, or bears the loss, why need the butter manufacturer worry?

Cream grading has been suggested as the cure-all for poor butter. No doubt it would accomplish much towards the desired end, but Ontario farmers do not take kindly to the principle involved, and few creamerymen have had the courage to apply the system very strictly in their business, because of its probable effect in causing loss of patronage. He (the creameryman) knows too well that if he refuses to accept cream, or pays a lower price than current rates, the cream producer simply sends his product to another creamery and the manufacturer is the loser. The Ontario farmer is accustomed to an educational rather than a coercive policy, and he prefers to be coaxed rather than driven.

One other practical point in cooling cream from the separator. Each lot of cream should be set in ice water as soon as possible after separating and be cooled to 50 degrees F. or lower before it is mixed with the cream of previous separations. The pouring of warm cream into the cooled cream causes fermentations to start that cannot be controlled in the larger bulk; but if the small lot is thoroughly chilled first, these ferments are paralysed, or rendered non-effective in most cases.

Usually a pail is used to hold the cream from each lot separated and this may be set in the cream tank and the cream cooled in this pail by having a stiff wire fastened on the side of the tank, one end of which hooks over the pail handle. This will prevent the cream upsetting in the water. In twelve hours, or by the next milking, the cream will be sufficiently cooled to empty in the shipping can which sets in the ice water. While it may be all right to run the cream from