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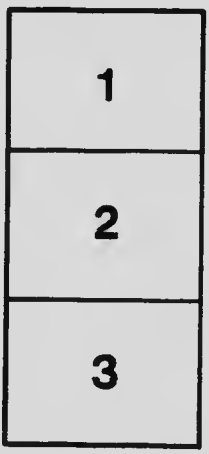

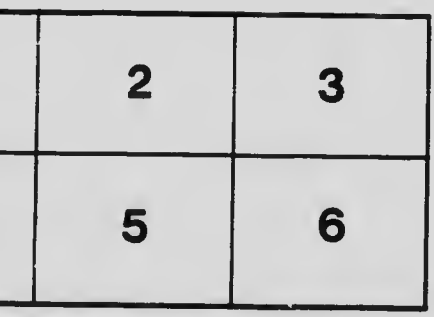

R WINTERING AND WINTER FATTENING OF BEEF CATTLE IN EASTERN CANADA

G. W. Muir, B.S.A., *Animal Husbandman.*

A study of the beef cattle feeding and market situation in Canada reveals a few facts of economic importance to the breeder and feeder (particularly the latter) of beef cattle, which might be summarized as follows:—

First. That a relatively small number of animals as marketed are finished sufficiently to command the top price.

Second. That a very small percentage of animals is marketed between December and April, inclusive.

Third. That prices for *finished* animals are always highest during these months.

Fourth. That the Canadian public discriminates against frozen beef, which means that, were the markets kept supplied with fresh beef more regularly, better prices would obtain.

Fifth. That a relatively small percentage of steers classed as export steers are sufficiently well finished for the trade, hence proper winter finishing of such steers is advisable.

The above facts all point to the possibilities for the breeder and feeder in the way of producing and marketing better grown and better finished steers. *Quality rather than quantity* is what will count.

In developing these possibilities, the economic value of the utilization of rough, unmarketable feeds on the farm and the retaining of the manure thus made for soil improvement must not be lost sight of. The greater the distance from the market the farm is at which these bulky fodder and grain crops are grown, the more economical it is to market them through live stock and thus save on freight rates.

From the breeder's, feeder's and farmer's standpoint the feeds that can be grown in Ontario, Quebec and the Maritime Provinces and marketed economically through beef cattle may be divided into three classes: dry roughages, succulent roughages and grains.

Dry Roughages

Legume Hays.

Undoubtedly in Eastern Canada clover hay is the crop which can be recommended most generally. Not only is it of high nutritive value for beef cattle feeding, but it enters into practically any of the more popular crop rotations, and is a first-class soil improver. On good land, a second and third crop can often be grown. When cut at the right stage, just as it is coming well into bloom, it gives as high a tonnage per acre as any of the legume hays. It is equally suitable for young growing cattle, for stockers and for fattening cattle.

Alfalfa hay cannot be grown in all parts of Eastern Canada as successfully as red clover, and where it is grown, is usually in too great demand for dairy cattle feeding to be available for beef cattle feeding, but, where available, it is considerably more valuable than red clover. Once alfalfa is established in a suitable soil, it can be cropped two and three times a year and has this advantage over red clover that, with proper care, a good stand can be maintained for three or four years. It is particularly valuable for feeding to young animals.

DOMINION EXPERIMENTAL FARMS
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EXHIBITION CIRCULAR No. 106
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Sweet clover is a comparatively new hay crop. Being a biennial, it takes the same place in the rotation as red clover. It is not, however, quite so palatable and the cattle have to be forced to it at first, but they eventually develop a taste for it. Being coarser, unless grown very thickly, it is not as valuable for feeding to young animals as is alfalfa or even good quality red clover. Its odour is against it in dairy cattle feeding but should not affect its value for beef cattle feeding.

Better and more economical gains can be made from a carbonaceous ration balanced by some of these legume hays than from a similar ration balanced by means of high-priced protein feeds such as oil cake and cotton-seed meal.

All of the above legume hays are best sown with a light nurse crop. The following rates of seeding are recommended: red clover, 10 pounds, timothy, 6 pounds, alsike, 2 pounds; or red clover, 10 pounds, timothy, 6 pounds, alsike, 2 pounds, alfalfa, 6 pounds; alfalfa alone at 20 pounds or alfalfa, 10 pounds, timothy, 6 pounds, and alsike, 2 pounds; sweet clover alone, 15-20 pounds, or as alfalfa in a mixture.

For the five years 1916 to 1920, inclusive, the average yield of hay on the Central Experimental Farm, where the red clover, timothy, alsike and alfalfa mixture is used, was 3.6 tons per acre, which was grown at an average cost of $6.40 per ton.

Timothy and Other Grass Hays.

Timothy is one of the standard hay crops of Eastern Canada, and consequently is often used in beef cattle feeding. It is not, however, nearly as palatable, as nutritious, nor as economical to grow and feed to beef cattle as is red clover hay. One cutting of one and a half to two and a half tons per acre is all that can be reasonably expected, whereas a good crop of red clover will yield from three to five tons per acre. It works in well in a long rotation but the long rotation is not usually an economical one.

Hay from other grasses and native marsh or slough hay are often available. These, like timothy, are not the best of feeds, but, in certain localities, are often available at reasonable cost, and therefore it is advisable to use them up. While a certain amount will be consumed readily in the dry cured state, it is often advisable and economical, if large quantities are to be consumed, to cut some of the hay and mix it with succulent feeds, such as ensilage or pulped roots, thus making the hay more palatable and digestible.

Straw.

Straw from the various cereals, if of good quality, can be used to advantage in beef cattle feeding. When used as the sole dry roughage, it must, of course, be balanced by plenty of succulent feed such as silage or roots and by a fairly liberal proteinaceous grain ration. As with inferior hay, greater quantities will be consumed if the straw is cut and mixed with ensilage or roots so as to make it more palatable. The use of a little feeding molasses with such coarse roughages to increase their palatability is also often economical. Oat, barley and wheat straw are most valuable and in the order named.

Annual Hay Crops.

In some instances, as where the new seeding has been killed out or where the acreage devoted to hay is not likely to be sufficient for the winter's needs, an additional tonnage of hay can be grown from some form of spring sown crop. The most popular crop for this purpose is oats, though others, such as oats and peas; oats, peas, and barley or vetch; spring rye or some of the millets may be used. Oats are a favourite because they are a crop with which the farmer is acquainted, the seed is cheap, and the yield of hay is sufficiently heavy that, when its quality is considered, it is equal to any of the others, with the possible exception of oats and peas. The oat and pea

or oat, pea and barley or vetch mixture would follow in order given. These may be classed as early to medium crops in so far as date of seeding is concerned. If sown too late in the season, the oats are liable to head out before the crop is sufficiently heavy to give a good yield of hay. If seeding is unusually late, then the millets should be used, as they are a hot weather crop and will give a good tonnage even though sown as late as the end of June. Common millet is most generally recommended. These crops should all be cut for hay just as or shortly after they have headed out. Oats alone should be seeded at the rate of 3 bushels; oats and peas at 2 bushels and 1 bushel; oats, peas and barley or vetches at 2 bushels, ¾ bushel and ¾ bushel; spring rye at 1½ bushels and millets at 20 to 25 pounds per acre, all on well tilled soil.

At the Central Experimental Farm, Ottawa, oat and pea hay has given, in a comparatively dry season, a yield at one cutting of 2.63 tons per acre, at a cost of $9.83 per ton. In a good season and in more humid sections, greater yields might be expected.

Succulent Roughages

Ensilages.

In all localities where corn can be grown at all successfully, corn silage is undoubtedly the most satisfactory succulent roughage for the winter feeding of beef cattle. Properly grown and ensiled, it is one of the most economical crops to grow and to store, at the same time being equally as palatable and nutritious as roots and most other silage crops, besides being one of the most important crops in crop rotations from a soil improving and weed removing point of view. The average yield of corn for ensilage at the Central Experimental Farm for the ten years ending 1920 has been 15 tons per acre and the average cost stored in the silo approximately $2.85 per ton. It has been estimated that, if hay had a market value of $24.30 per ton as in 1920, corn silage was worth $7.65 per ton. With hay at $10.26 per ton, as in 1917, corn silage was worth $3.70 per ton.

In those parts of Eastern Canada where corn cannot be grown successfully, *i.e.*, not a dependable crop, there are other crops which can be used economically as silage crops. Probably chief of these, at least from a tonnage standpoint, is the sunflower. It is a comparatively new silage crop which is gaining rapid favour in the West, as it will grow where corn will not grow and yields a heavy tonnage of fairly palatable silage, though, in the latter respect, it does not equal corn silage or even good pea and oat silage. It takes the same place as corn in the rotation and is planted, cultivated and harvested in the same way, the cutting being done when the sunflowers are about 20 to 30 per cent in bloom. If left till a larger percentage is in bloom, the palatability of the silage is not so good as it is believed to be the heads which cause the rather rancid taste and odour peculiar to sunflower silage. At the Central Experimental Farm in 1921 sunflowers gave the same tonnage and cost practically the same per ton in the silo as did corn. In a feeding test with dairy cows, they gave almost equal results, though corn had the advantage in every respect. They should be equally well suited to feeding beef cattle.

Other outstanding crops for silage in place of corn are green oats or peas, oats and vetch mixture, or, in fact, a mixture of any of the cereals such as wheat, oats, rye and barley. Even the clovers, including red clover and sweet clover, and alfalfa have been used when the season was such that they could not be used as hay or pasture. They are not, however, as suitable as are the cereals. Possibly sweet clover being the least suitable for hay and yielding a heavy tonnage is best suited for silage purposes. Cut sufficiently green and well tramped into the silo, these crops, particularly the cereals, make an excellent class of silage much relished by the cattle, being more palatable than sunflower silage. In districts suited to corn or sunflowers, the cereals and legumes mentioned would hardly yield sufficiently heavy to compete

with the former, but in most districts where corn and sunflowers can not be grown, the cereals or sweet clover would grow sufficiently heavy to yield an economical crop. At the Central Experimental Farm, Ottawa, a crop of peas, oats and vetches sown at the rate of 2 bushels oats, ½ bushel peas and ½ bushel vetches gave a yield of 6.14 tons per acre at a cost, stored in the silo, of $3.32 per ton. This silage was relished very much by the cattle but there was not enough to run a comparative test. A glance at the analysis given on the last page of this circular will show that O.P.V. silage has a higher analytical value than any other class of silage. Any cereals or legumes used for silage purposes can be grown in their regular place in the rotation. One objection is that they are not intertilled, therefore are not as useful as the cultivated silage crops in keeping down weeds, but this is partly offset by the fact that the crop is taken off early and after-harvest cultivation can be practised. They should be cut when just heading out while the stalks are still juicy, then be put into the silo immediately. Being hollow-stemmed crops, they require extra tramping in the silo to exclude the air in the stems and may even require the addition of water if natural moisture is lacking. If it so happened that crops of sunflowers, cereals or legumes were ready for the silo at the same time these crops could be mixed together as they went into the silo and as good or a better class of silage would be likely to result than if any one of these crops were put in alone.

Silos for the storage of the above crops can be put up at fairly reasonable cost in any part of Eastern Canada. Stave, cement, cement block or pit silos may be used equally successfully, the choice depending on local conditions as regards site, availability of material, etc.[1]

A point worthy of mention in connection with these ensilage crops is that, if at silo filling time a silo were not available they could all, with the exception of sunflowers, be cured into fodder. While not as good as corn ensilage, corn fodder, nevertheless, makes a fairly good rough feed. It, of course, requires more handling and there is some waste in the large stalks, unless it is run through a cutting box, which is the ideal way to feed it. The crops mentioned other than corn and sunflowers can all be made into hay.

Roots.

Where silage can be grown successfully, it is usually so much more economical to grow and store than roots that it is not advisable to grow the latter in any great quantity for beef cattle feeding unless for developing and finishing very young or baby beeves. Where other forms of succulent feeds can not be grown, however, it is advisable to grow the necessary acreage of roots for a little succulent feed in the ration of beef animals is needed. Turnips (Swedes) are usually looked upon as the best class of root for fattening stock and possibly rightly so. In some cases, however, it is difficult to grow them on account of club root disease. When there is no danger of this disease, turnips will usually yield as heavily as mangels, at less cost, and will give a little greater feeding value than mangels. Where turnips can not be grown, mangels or half sugar mangels, should be grown and practically equally good results will be obtained.

Besides entailing considerably more manual labour than a silage crop, roots require storage space safe from frost, which is rather hard to secure on most farms. They are, however, valuable in the rotation and ration and use should be made of them wherever conditions warrant the same. Like the intertilled silage crops, they are valuable in the rotation in which they take the same place. If sufficient moisture is likely to be present in the soil, the roots can be sown ridged up, but usually it is safer to sow them on the flat, in rows 30 inches apart and thin them to 9 inches between plants in the row. Mangels require 5-6 pounds of seed per acre and turnips 4 pounds.[2]

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1 *See* Circular 102, "Silo Construction."

2 *See* Pamphlet No. 10, "Root and Storage Cellars."

Grains

Home-grown Grains.

The economy of or profits to be obtained from beef cattle feeding as with any other line of live stock feeding depends upon the amount of home-grown feeds available that can be utilized. All of the previously mentioned roughages should be home-grown and the larger the percentage of home-grown grain feeds the greater the profits that may be expected. It is true that it is often economical to purchase some concentrates, but this applies particularly to the purchase of high grade protein-rich concentrates, which can not be produced on the farm.

The greatest of all fattening grains, corn, can only be grown in limited areas in Eastern Canada and in these localities it should be made the most of. Corn has a good second, however, in barley. The acreage of barley grown in Eastern Canada has fallen off in the last year or two in spite of the fact that it is a paying crop, particularly for fattening purposes. The yield of barley in pounds per acre is higher than that of oats in each of the five Eastern Provinces and its feeding value for fattening purposes is fully 10 per cent higher than that of oats. It would be well for the prospective feeder to put in a good area of this crop and watch the results. Oats, the standard grain crop of the East, are better for growing than for fattening stock, but, nevertheless, can be made good use of for the latter purpose, too. Peas are not grown as a straight crop as much as formerly, consequently are not often available. They can be made use of, however, by sowing a small quantity in a mixture of other grains such as oats and barley. The resulting crop is easy to harvest and, when ground, makes an excellent feeding mixture. Care must be taken to use varieties that will ripen at approximately the same time. A good mixture would be Banner or O.A.C. No. 72 oats, 1¾ bushels; O.A.C. No. 21 barley, ¾ bushel; Arthur peas, ½ bushel.

Purchased Grain.

If the above home-grown grains must be supplemented by purchased feeds of like nature, then corn will generally be found to be the grain that will best meet the demand, market barley and oats usually being much too high in price. Another commodity which may be considered in this connection is elevator screenings. Provided the quality is good (and they should be bought by sample only), they may be considered as being nearly equal to oats and within fifteen per cent of the value of barley. Success with this commodity depends on the quality of the screenings and the price which, in turn, is affected by the freight rates, making it almost prohibitive to the feeder in the Maritime Provinces, but worth investigating on the part of those in Ontario and Quebec.

If protein-rich concentrates are needed to balance the ration of home-grown feeds, oil cake meal or cotton-seed meal should be chosen, and the higher the percentage of protein the better the buy, provided the price is at all proportional. Where there is a lack of succulence in the ration, oil cake should be the first choice. If there is plenty of succulence in the ration, then the choice would depend on which was the cheapest per pound of protein contained when being used in the early part of the feeding period and per pound of digestible nutrients contained when being used during the finishing period.

The following table gives the total dry matter as well as the total digestible protein, carbohydrates and fat of the various feeds mentioned. The column to the right of the table gives the total digestible nutrients in one ton of each feed. These figures are, within certain limits, an indication of the relative value of the respective feeds. How do they agree with your preconceived idea of their relative values?

DIGESTIBLE NUTRIENTS IN FEEDS MENTIONED IN CIRCULAR

Dry Roughages

Feed	Total Dry Matter per 100 lbs	Digestible Nutrients in 100 lbs.			Total Digestible Nutrients in one ton
		Protein	Carbo-hydrates	Fat	
	lbs	lbs	lbs	lbs	lbs
Clover hay	87·1	7·6	39·3	1·8	1,018·
Alfalfa hay	91·4	10·6	39·0	0·9	1,032·
Sweet clover hay	91·4	10·9	38·2	0·7	1,014·
Clover and mixed grass hay	89·9	4·7	39·9	1·3	950·
Timothy	88·4	3·0	42·8	1·2	970·
Orchard grass	88·4	4·7	41·1	1·6	988·
Swamp grasses	90·2	3·5	40·1	0·8	908·
Mixed grasses	87·2	4·3	44·3	1·2	1,026·
Straw (oats)	88·5	1·0	42·6	0·9	912·
Straw (barley)	85·8	0·9	40·2	0·6	850·
Straw (wheat)	91·6	0·7	35·1	0·5	738·
Oat hay	88·0	4·5	38·1	1·7	928·
Peas and oats hay	83·4	8·3	37·1	1·5	976·
Peas, oats and barley	83·5	9·2	36·9	1·8	1,002·0
Rye hay (early bloom)	91·8	6·4	46·0	1·1	1,098·
Millet hay (common)	85·7	5·0	46·0	1·8	1,100·
Fodder corn	81·7	3·0	47·3	1·5	1,074·

Succulent Roughages

Corn silage (C.E.F.)	23·83	·98	12·29	2·11	360·
Sunflower silage (C.E.F.)	25·62	·99	13·03	1·31	339·
Peas and oats silage (C.E.F.)	29·97	3·05	13·80	1·28	365·
Clover silage	27·80	1·30	9·50	0·50	238·
Alfalfa silage	24·60	1·2	7·80	0·6	208·
Sweet clover silage (C.E.F.)	24·92	1·61	8·04	·24	203·8
Mangels	9·40	0·8	6·4	0·1	148·
Turnips (Swedes)	10·9	1·0	7·7	0·3	188·

Grains

Dent corn	89·5	7·5	67·8	4·6	1,714·
Barley	90·7	9·0	66·8	1·6	1,588·
Oats	90·8	9·7	52·1	3·8	1,408·
Peas	90·8	19·0	55·8	0·6	1,524·
Screenings (C.E.F.)	88·62	10·20	44·94	5·03	1,329·
Oil cake meal	90·4	31·7	37·9	2·8	1,518·
Cotton seed meal, choice	92·5	37·0	21·8	8·6	1,564·