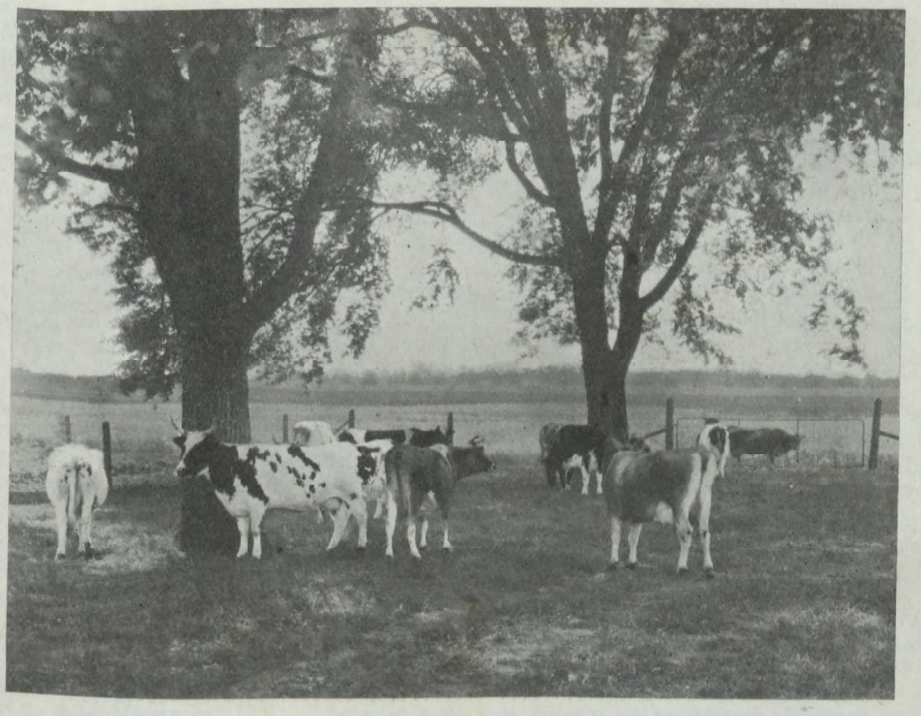
DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

ANIMAL HUSBANDRY DIVISION

REPORT OF THE DOMINION ANIMAL HUSBANDMAN

G. B. ROTHWELL, B.S.A.

FOR THE YEAR ENDING MARCH 31, 1927



"A Shady Corner on an August Day. Ayrshires, Holsteins and Jerseys at the Central Experimental Farm."

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REPORT OF THE ANIMAL HUSBANDRY DIVISION

G. B. ROTHWELL, DOMINION ANIMAL HUSBANDMAN

BEEF CATTLE

As in the past, no breeding beef cattle were maintained at the Central Experimental Farm, Ottawa, during the fiscal year 1926-27, work with beef cattle being confined to steer feeding and experimental shipments of store cattle to Great Britain.

During the winter of 1925-26, as is reported in the Animal Husbandry Division report for that year, thirty-nine steers were fed in two groups, all on the same feed, the object being to determine whether one lot shipped to Great Britain early in the spring via St. John, N.B. would bring greater or less returns than a similar lot fed some six weeks longer and then shipped to Great Britain, via Montreal, P.Q.

The data collected, covering cost of steers and cost of feeding to time of shipment, are given in the following table:—

STEER FEEDING EXPERIMENT, 1925-26

—		Lot 1	Lot 2
Number of steers	No.	20	19
Length of feeding period	days	103	146
Total initial weight (Dec. 14)	lb.	22,140	20,980
Average initial weight	"	1,107	1,104
Total final weight (March 25—Lot 1 (May 8—Lot 2	"	25,950	26,380
Average final weight	"	1,297·5	1,338·4
Total gain for period	"	3,810	5,400
Average gain per steer for period	"	190·5	284·2
Average gain per steer per day	"	1·85	1·94
Total amount meal fed at $34.43 per ton	"	10,280	14,782
Average meal fed per steer	"	514	778
Total silage fed at $3.45 per ton	"	56,760	76,494
Average amount of silage fed per steer	"	2,834	4,026
Total amount of hay fed at $8.00 per ton	"	36,462	49,096
Average amount of hay per steer	"	1,823	2,584
Total cost of feed	$	420·65	583·50
Average cost of feed per steer	$	21·03	30·71
Cost of feed per pound gain	c.	11·02	10·80

From the foregoing table it will be noted that it cost $9.68 per steer to carry lot 2 the extra forty-five days; also that lot 2 made the greatest and cheapest gains. Final deductions on this phase of the experiment will be found in the following two reports of export shipments made in the spring of 1926.

SHIPMENT OF STORE CATTLE TO GREAT BRITAIN, MARCH, 1926

On March 31, 1926, per ss. *Carmia*, there was shipped from West St. John, N.B., Canada, to Glasgow, Scotland, by the Dominion Experimental Farms a consignment of 178 store cattle, originating from the Experimental Farms at Lethbridge, Alta.; Swift Current, Sask.; Rosthern, Sask.; Ottawa, Ont.; Nappan, N.S., and Kentville, N.S. The shipment was consigned to Messrs. Watson and Batchelor of Glasgow, Scotland, and was accompanied by an employee of the Experimental Farms Branch, so that special notes on the shipment and trade conditions were available, this report being based on these and on the reports

and returns made by the consignors supplemented by reports made by W. A. Wilson, Canadian Agricultural Products Representative of the Canadian High Commissioner's Office, London, England.

This was a continuation of previous experimental shipments with the same objects in view with the additional object of gaining information on shipping to Glasgow, Scotland.

The grouping of the cattle was as follows:—

Lot I, from Lethbridge, Alta., consisted of twenty head of good export cattle, weighing at Farm an average of 1,137.5 pounds each.

Lot II, from Swift Current, Sask., consisted of nineteen heavy export cattle of good quality; average weight at Farm, 1,334.5 pounds.

Lot III, from Rosthern, Sask., were medium quality cattle weighing 1,256 pounds each at Farm.

Lot IV, from Ottawa, Ont., were classed as good butcher cattle, well finished from Canadian standpoint, weighing 1,297.5 pounds each.

Lot V, from Nappan, N.S., was made up of sixty-eight head of both local and western steers, the average weight of which was 1,123 pounds.

Lot VI, from Kentville, N.S., was made up of thirty cattle of local breeding, classed as good butcher cattle, averaging 1,155 pounds each.

In table II is given the shrinkage in transit. It will be noticed that the shrinkage is fairly high and variable. This is to be accounted for by the fact that the foreman in charge of the cattle was, unfortunately, indisposed during the greater part of the trip and the cattle were left to the care of inexperienced cattlemen and did not get the care and attention that they would otherwise have got. While unfortunate, nevertheless, this incident serves to prove the statement made in previous reports to the effect that the proper care of the cattle on board ship is a very important consideration indeed.

Table III gives the expenses in shipping these groups of cattle from St. John to Glasgow which compare favourably with cost of shipping from and to other ports.

It was found necessary to hold the cattle in Glasgow five days longer than usual, owing to strike conditions and to the fact that they arrived on a date that would not allow of immediate sale to advantage. It has, therefore, been thought advisable to make two statements of returns, one as in table IV, showing the actual cost, and one as in table IVa, showing the returns had the cattle been held the usual two days previous to sale. The same procedure has been followed in regard to tables V and VI, a duplicate adjusted table being inserted in each case. These corrected results being nearer the conditions met in previous shipments, will be used as the basis of discussion of results.

It will have been noted that the cattle had a bad trip. In addition they met a bad market, due to the very unsettled conditions in Great Britain, consequently it is not surprising that losses were sustained on a number of the groups. The Lethbridge and Rosthern lots were able to show a small profit through having had a very low feed cost during the previous winter. Nappan lot shows the greatest loss. In explanation it may be stated that part of this lot was made up of western steers bought at a high price and shipped to Nappan for winter feeding. They were good quality steers but they, for some reason, did not do well under eastern feeding conditions and this, together with the extremely high price paid, was too great a handicap to enable them to show a profit. This must not be taken as definite evidence that it is not profitable for the maritime

farmer to feed western steers, for it was a decidedly off year, buying prices being high, and selling prices low, and the cattle not doing as well as they should have done under the conditions.

In regard to the comparison of fall versus succeeding spring shipment of steers begun in the fall shipment of 1925 and continued in the early spring shipment of 1926, it may be said that in the case of the similar steers shipped from Lethbridge, those shipped in October, 1925, showed a loss of $6.38 per steer as against a loss of only 12 cents per steer on the steers held over, fed and shipped early in the spring of 1926 via a maritime port. In the case of the Ottawa shipments, fall shipped steers showed a loss of $3.05 per steer against a loss of $5.20 per steer when held, fed and shipped early in the spring of 1926 via a maritime port. This is a reversal of the result at Lethbridge, which may be explained by the fact that owing to cheap feeds, Lethbridge was able to carry their steers over to advantage, showing that the supply of cheap yet nutritious rough feeds regulates the possibilities in winter steer feeding under the present narrow margin between buying price on Canadian markets and selling price in British markets.

TABLE I.—STATEMENT OF EXPENSES SHIPPING 178 HEAD OF CATTLE FROM EXPERIMENTAL STATIONS MENTIONED TO ST. JOHN, N.B.

—	Lethbridge, Alberta	Swift Current, Sask.	Rosthern, Sask.	Ottawa, Ont.	Nappan, N.S.	Kentville, N.S.
Number of steers..... No.	20	19	21	20	68	30
Freight and other rail charges to St. John, N.B..... $	323 72	340 29	373 53	117 24	185 85	165 28
Less excess of way freight to Winnipeg over through freight to St. John..... $	.....	.....	32 62	.....	.....	.....
			340 91			
Average cost per head to land steers in St. John, N.B., from place named..... $	16 18	17 91	16 23	5 86	2 73	5 03

TABLE II.—SHRINKAGE IN TRANSIT FROM VARIOUS POINTS TO GLASGOW

—	Lethbridge, Alberta	Swift Current, Sask.	Rosthern, Sask.	Ottawa, Ont.	Nappan, N.S.	Kentville, N.S.
Average weight at point of origin..... lb.	1,137·5	1,334·5	1,256	1,297·5	1,123	1,155
Average weight at Winnipeg..... "	1,087	.....	.....	.....	.....	.....
Per cent shrink to Winnipeg..... %	4·44	.....	.....	.....	.....	.....
Average weight off boat at Glasgow..... lb.	1,047	1,161	1,120	1,192	1,087	1,041·5
Per cent shrink to Glasgow..... %	7·95	13·00	10·82	8·13	3·20	9·82

TABLE III.—STATEMENT OF EXPENSES SHIPPING 178 HEAD OF CATTLE VIA ST. JOHN TO GLASGOW

—	Lethbridge, Alberta	Swift Current, Sask.	Rosthern, Sask.	Ottawa, Ont.	Nappan, N.S.	Kentville, N.S.
Numbers of steers.....No.	20	19	21	20	68	30
Total charges from Exp. Station to St. John.... $	323 72	340 29	340 91	117 24	185 85	165 28
Stock yards west, St.-John..... $	26 62	25 28	27 94	26 62	90 40	39 92
Handling and loading.... $	14 00	13 30	14 70	14 00	47 60	21 00
Ropes, roping, tools, tagging, men, etc..... $	12 67	12 12	13 20	12 67	43 96	19 72
Insurance $140 per head @ ⅛ per cent..... $	17 50	16 63	18 38	17 50	59 50	26 25
Ocean feed..... $	92 24	85 04	94 90	92 24	302 74	134 93
Excise stamps..... $	20	20	22	12	30	16
Ocean freight..... $	400 00	380 00	420 00	400 00	1,360 00	600 00
Total charges to port of debarkation..... $	886 95	892 86	930 39	680 39	2,090 35	1,007 26
Average per head to port of debarkation..... $	44 35	46 99	44 30	34 02	30 74	33 57

TABLE IV.—RETURNS FROM SHIPMENT

—	Lethbridge, Alberta	Swift Current, Sask.	Rosthern, Sask.	Ottawa, Ont.	Nappan, N.S.	Kentville, N.S.
Number of steers.....No.	20	19	21	20	68	30
Total charges to port of debarkation..... $	886 95	892 86	930 39	680 39	2,090 35	1,007 26
Less returns for surplus fodder..... $	28 85	27 40	30 31	28 85	98 21	43 29
Net charges to port of debarkation..... $	858 10	865 46	900 08	651 54	1,992 14	963 97
Overseas charges—						
Extra charges steamship company..... $	6 25	5 94	6 56	6 25	21 22	9 34
Lairage at Merklands. $	26 67	25 34	28 01	26 67	90 69	40 01
Keep..... $	72 75	69 11	76 39	72 75	247 35	109 13
Herds..... $	9 70	9 22	10 18	9 70	32 98	14 55
Insurance(Tuberculosis) $	.....	3 88	3 15	1 70	1 70	.....
Commission..... $	48 50	46 07	50 92	48 50	164 90	72 75
Total overseas charges... $	163 87	159 56	175 21	165 57	558 84	245 78
Total charges..... $	1,021 97	1,025 02	1,075 29	817 11	2,550 98	1,209 75
Total return..... $	2,321 93	2,478 35	2,623 85	2,507 45	6,993 38	3,214 33
Net return..... $	1,299 96	1,453 33	1,548 56	1,690 34	4,442 40	2,004 58
Gross returns per 100 lb. at Glasgow..... $	11 08	11 23	11 15	10 51	9 46	10 28
Net return per 100 lb., at Glasgow..... $	6 20	6 58	6 58	7 09	6 01	6 42
(Above on off boat weights)						

TABLE IVA—RETURNS FROM APRIL 1926, SHIPMENT ON ADJUSTED BASIS. OVERSEAS CHARGES $5.25 INSTEAD OF $8.25 I.E.—TWO DAYS HOLD OVER IN GLASGOW INSTEAD OF ONE WEEK

—	Lethbridge Alberta.	Swift Current, Sask	Rosthern, Sask.	Ottawa, Ont.	Nappan, N.S.	Kentville, N.S.
Total charges to port of debarkation..... $	886 95	892 86	930 39	680 39	2,090 35	1,007 26
Less returns for surplus fodder..... $	28 85	27 40	30 31	28 85	98 21	43 29
Net charges to port of debarkation..... $	858 10	865 46	900 08	651 54	1,992 14	963 97
Overseas charges . 21/8 —$5.25 per head..... $	105 00	99 75	110 25	105 00	357 00	157 50
Total charges..... $	963 10	965 21	1,010 33	756 54	2,349 14	1,121 47
Total return..... $	2,321 93	2,478 35	2,623 85	2,507 45	6,993 38	3,214 33
Net return..... $	1,358 83	1,513 14	1,613 52	1,750 91	4,644 24	2,092 86
Gross returns per 100 lb., at Glasgow..... $	11 08	11 23	11 15	10 51	9 46	10 28
Net return per 100 lb., at Glasgow..... $	6 48	6 85	6 86	7 34	6 28	6 67

TABLE V.—PROFIT AND LOSS STATEMENT ON VARIOUS LOTS

Lot	1	2	3	4	5	6
——	Lethbridge, Alberta	Swift Current, Sask.	Rosthern, Sask.	Ottawa, Ont.	Nappan, N.S.	Kentville, N.S.
Date of shipment.....Date	Mar., 1926	Mar., 1926	Mar., 1926	Mar., 1926	Mar., 1926	Mar., 1926
Number of steers.....No.	20	19	21	20	68	30
Average cost of steers per head.....$	47 83	55 39	52 04	65 00	67 53	50 42
Total cost of steers.....$	946 60	1,052 41	1,092 82	1,300 00	4,592 61	1,512 63
Average cost of feed per steer.....$	19 96	25 59	15 78	27 75	31 33	39 58
Total cost of feed.....$	409 20	486 21	331 41	555 00	2,130 94	1,187 40
Cost of transportation to and selling in Great Britain at Glasgow....$	1,021 97	1,025 02	1,075 29	817 11	2,550 98	1,209 75
Total cost.....$	2,377 77	2,563 64	2,499 52	2,672 11	9,274 53	3,909 78
Total return.....$	2,321 93	2,478 35	2,623 85	2,507 45	6,993 38	3,214 33
Total profit or loss per lot.....$	−55 84	−85 29	+124 33	−164 66	−2,281 15	−695 45

TABLE VA.—PROFIT AND LOSS STATEMENT ON VARIOUS LOTS—WHEN ADJUSTED

Lots	1	2	3	4	5	6
——	Lethbridge, Alberta	Swift Current, Sask.	Rosthern, Sask.	Ottawa, Ont	Nappan, N.S.	Kentville, N.S.
Date of shipment.....Date	Mar., 1926	Mar., 1926	Mar., 1926	Mar., 1926	Mar., 1926	Mar., 1926
Number of steers.....No.	20	19	21	20	68	30
Average cost of steers per head.....$	47 83	55 39	52 04	65 00	67 53	50 42
Total cost of steers.....$	946 60	1,052 41	1,092 82	1,300 00	4,592 61	1,512 63
Average cost of feed per steer.....$	19 96	25 59	15 78	27 75	31 33	39 58
Total cost of feed.....$	409 20	486 21	331 41	555 00	2,130 94	1,187 40
Cost of transportation to and selling in Great Britain.....$	963 10	965 21	1,010 33	756 54	2,349 14	1,121 47
Total cost.....$	2,319 60	2,503 83	2,454 56	2,611 54	9,072 69	3,821 50
Total return.....$	2,321 93	2,478 35	2,623 85	2,507 45	6,993 38	3,214 33
Profit or loss per lot.....$	+2 33	−25 48	+189 29	−104 09	−2,079 31	−607 17

TABLE VIA—SUMMARY LOTS 1-6, ADJUSTED BASIS

Farm	Lot No.	Average weight at farm	Average Glasgow weights off boat	Average selling price Glasgow per head	Price per cwt. Glasgow off boat weights	Appraisal value at farm	Price received at farm	Profit or loss per steer
		lb.	lb.	£-s-d	$	$	$	$
Lethbridge Alta.....	1	1,137·5	1,047	23–18– 9	11·08	5·75	5·97	+ ·12
Swift Current, Sask.....	2	1,334·5	1,161	26–17–10	11·23	6·25	5·96	− 1·34
Rosthern, Sask.	3	1,256	1,120	25–15– 3	11·15	5·75	6·07	+ 9·01
Ottawa, Ont....	4	1,297·5	1,192	25–17– 0	10·51	7·25	6·74	− 5·20
Nappan, N.S....	5	1,123	1,087	21– 4– 1	9·46	6·00	6·08	−30·58
Kentville, N.S.	6	1,155	1,041·5	22– 1– 6	10·28	6·00	6·01	−20·24

REPORT OF AN EXPERIMENTAL SHIPMENT OF STORE CATTLE

Another experimental shipment of store cattle was made by the Dominion Experimental Farms, May 9, 1926. This shipment consisted of 116 head of steers from the Central Experimental Farm at Ottawa, the Experimental Farm at Brandon, Man., and the Experimental Stations at Scott and Rosthern, Sask., and Lethbridge, Alta. This consignment was shipped per ss. *Carmia,* Donaldson Line, from Montreal to Glasgow, Scotland, and consigned to the commission firm of Watson & Batchelor. A representative of the Animal Husbandry Division of the Central Experimental Farm, Ottawa, accompanied this shipment and is responsible for most of the information in this report.

As in the case of the previous shipments, this one was experimental in nature. The reader should become familiar with the data contained in these previous shipments to thoroughly understand the results of this one; the two previous ones more especially, October, 1925, and April, 1926, are referred to, since in these two shipments similar cattle had been shipped, some from grass in the fall and others from Halifax early in the spring before the opening of the Montreal port. The cattle comprising the present shipment had also been kept over for winter feeding.

OBJECTS OF THIS SHIPMENT

1. To obtain further data as to the value of Scotland as a market for Canadian store cattle.

2. To obtain further information *re* the relative economy of shipping winter fed cattle vs. shipping in the fall of the year when these cattle are taken from the grass.

3. To obtain further data on cost of shipping, shrinkage in transit, most profitable weight of cattle to ship, etc.

PLAN OF EXPERIMENT

This shipment of 116 steers was made up as follows: nineteen steers from the Central Expermental Farm, Ottawa; twenty steers from Brandon Experimental Farm; nineteen steers from Scott Experimental Station; forty steers from Rosthern Experimental Station, and eighteen steers from Lethbridge Experimental Station. All of these steers had been fed through the winter at these different Farms or Stations. The two groups from Ottawa and Lethbridge offer a comparison with steers shipped in the fall, since in October, 1925, groups of similar steers were shipped off the grass as long keep stores instead of being kept over through the winter and shipped in spring as short keeps or finished cattle.

Following is a description of the cattle as grouped for export:—

Lot 1.—*Ottawa,* nineteen heavy steers, prime butcher steers, good type, mostly of Shorthorn breeding, although not uniform in colour. Suitable for slaughter.

Lot 2.—*Brandon,* twenty steers, a mixed lot, some good butcher cattle, a few with tendency to be rough. Suitable for short keeps.

Lot 3.—*Scott,* nineteen heavy steers, a lot of prime butcher cattle. Very uniform in colour (red), size and finish. Suitable for killing or short keep.

Lot 4.—*Rosthern,* forty steers, a uniform lot of lighter steers, mostly red. Suitable for short keep. Good butchers in this country.

Lot 5.—*Lethbridge,* eighteen light steers, lacking in breeding, uniformity and finish. Suitable for long keeps.

Table I gives the cost of shipping from the above-mentioned Farms to Montreal; table II the shrinkage in transit from the various points of shipment to Glasgow.

It will be noted from table II that the total shrinkage from the original point of shipment to the time of the sale in Glasgow two days after landing, was very slight, this shrink being only 1.4 for Rosthern cattle. It, however, was 6.2 for Scott cattle, these showing the heaviest shrink, probably due to the fact that they were very restless and wild and did not stand handling very well. The shrinkage on board ship was very light, one lot from Brandon gaining 1.1 per cent. This shrinkage is somewhat lower than the average shrink in previous shipments. This may be partly accounted for because of a few days rest in Montreal where the Western cattle had time to partly recover part of the rail shrinkage and then a smooth passage across with good care and cool weather prevailing. The largest percentage of shrink is usually in rail transportation and the shrinkage on board ship is usually smaller when good weather prevails and when the cattle have comfortable accommodation and are well fed and watered. In the present shipment it will be noted that all lots showed a gain instead of a loss after a rest of two days from landing until the sale.

Table III is a statement of shipping expenses from the various Canadian points to Glasgow. This table needs no lengthy explanations. The ocean freight was $18 per head in the case of the Lethbridge and Rosthern lots as compared with $20 for the other lots. This is the regular freight rate for light cattle as compared with heavies, this because they can be placed five per space on ship board instead of four, as in the case of heavier cattle. It will be noted that the item "ocean feed" is quite high, more so than is customary. Extra feed was taken on account of the general strike in Great Britain at the time of loading. This feed was taken so that the cattle could be supplied with feed on the ship in case unloading was retarded or delayed. The extra unused feed is credited to the cattle in table IV.

Table IV shows the returns from the shipment and Table V the statement of loss on this shipment. These two tables are probably the most interesting to the reader on account of the many unusual factors prevailing at the time these cattle arrived in Glasgow, which affected these returns and consequently turned the expected profits into losses.

It will be seen that every lot shows a loss varying from $2.80 per steer for the Rosthern lot to as high as $26.65 per steer for the Lethbridge lot. There are a number of reasons for and factors contributing to these losses.

These losses should not be regarded as an indication that Glasgow is a poor market for Canadian cattle. On the contrary, in ordinary times Glasgow should be a very good landing place for Canadian steers. Our stores are popular with the Scotch farmer and the market is also good for finished steers, Glasgow being a large consuming center. Accommodation for landing cattle and holding sales are splendid, they being very spacious, and up-to-date. Credit must also be given to the commission firm, Watson and Bachelor, whose representatives went to much trouble in an effort to offset the bearish conditions on the market by advertising widely the sale in advance throughout the country, and taking every possible step to obtain the best prices for these cattle.

The Glasgow cattle market at the time of this shipment was as depressed as it could possibly be. First, the market was oversupplied. The following is a comment made at the time of the sale by a local authority. "The supply of stock was very heavy at the Glasgow Central Markets on Wednesday, May 19, which was the first open market held since the declaration of the General

Strike." (The above sale was held three days previous to the sale of these Canadian cattle). "Presumably it was in anticipation of higher prices following the termination of the General Strike. Sellers were, however, disappointed because a general movement of cattle was maintained throughout the strike period, owing to the fact that adequate arrangements were made to supply the public with food, and there was no shortage of either fresh or chilled meat. In consequence, the May 19 local market was much oversupplied and it was reflected on the Merklands Market (where the present cattle were sold) on May 22."

Besides over 2,000 head of Irish stores were landed in Glasgow the day previous to this sale, and, although these cattle were reshipped to inland markets, they affected the Glasgow market by supplying these local markets with cheap stores and thereby keeping some of the country buyers from coming to Glasgow.

Therefore, as can be seen, these cattle came into a very depressed market, largely owing to the industrial upheaval prevailing at the time and due to the fact that it was already oversupplied, but to make matters still worse, on the morning of the sale the Glasgow markets were all closed, owing to an outbreak of foot and mouth disease just outside the city boundaries.

It was announced immediately before the sale that all cattle were to be sold conditional on restrictions being removed by the following Tuesday, this providing there were no further outbreaks reported. Fifty-two of the 116 cattle were bought by farmers conditionally, but it was not until fifteen days after the sale that these cattle could be removed. In the meantime, some farmers cancelled their orders on account of the uncertainty as to when they could remove these cattle to their farms. Twenty-three of these fifty-two steers were resold and they sold for less than the original price, this on account of their having lost their bloom. Some showed swollen legs and were lame from standing inside on hard cement bricks. Besides this further loss, the fifty-two head had to be kept for fifteen days at the sellers' expense.

These total expenses and losses are all entered in table IV and V and show the exact net return from the sale of the 116 head.

Tables VI and VII were prepared to show the returns which would have been procured had the cattle not been held up on account of this outbreak of foot and mouth disease and if the first sale had held good for every animal. In both these tables cattle are charged with two days feed preceding the sale. It will be noted that the losses are reduced in each lot and under these conditions the Rosthern lot shows a profit of $120.02. The returns appearing in these tables would have been the true returns had it not been for the necessity of keeping some of the cattle over, due to an outbreak of foot and mouth disease.

Under the adverse circumstances one will readily understand why the bidding for these cattle was slow, and, therefore, the returns lower than they would have been in ordinary times. Butchers were not keen about bidding because their supply of meat was heavy and on the other hand, the farmers were bidding on these cattle only because they were very cheap. They did not care about buying cattle which they could not take away to their farms immediately, and, although they were free from foot and mouth disease, they were within the infected area.

"Had these good cattle been sold before these disturbed times, they would have made easily from £1 10s. to £2 10s. ($7 to $12) more per head", the auctioneer stated after the sale. The following remark made before the sale by a salesman from one of the big Commission firms of Glasgow shows that conditions were not too bright: "It is a pity that such good cattle should come so far to meet such a poor market."

The above remarks proved to be accurate because three weeks afterward, when the market had settled and the restrictions were lifted, similar cattle sold for just about the amount mentioned over that which the cattle in the present shipment brought.

In regard to the comparison of profit from fall vs. early succeeding spring vs. late succeeding spring shipment of similar store cattle, started at Ottawa and Lethbridge in the fall of 1925 and concluded in late spring of 1926, the following table gives the results:—

PROFIT OR LOSS PER STEER

—	Fall 1925	Early spring 1926 Via Maritime Port	Late spring 1926 Via Montreal
	$ cts.	$ cts.	$ cts.
Ottawa shipments	3 05	−5 20	−2 96
Lethbridge shipments	−6 38	− 12	−21 13

Owing to the erratic condition of the overseas market in the fall of 1925 and spring of 1926, the above figures cannot be taken very literally. The point to be noted particularly is that the reduction in the cost of feeding through early shipment more than overcomes the extra cost of shipping to a maritime port, and as the early market is usually the best one, it may be concluded that the early spring shipping will pay the best returns in a normal year.

TABLE I.—STATEMENT OF EXPENSES SHIPPING 116 HEAD OF CATTLE FROM EXPERIMENTAL STATIONS MENTIONED TO MONTREAL

—		Lethbridge, Alberta	Brandon, Man.	Rosthern, Sask.	Scott, Sask.	Ottawa, Ont.
Number of steers	No.	18	20	40	19	19
Freight and other charges to Montreal	$	312 65	231 54	541 13	289 58	45 82
Less excess of way freight to Winnipeg over throught freight to Montreal	$	42 20				
		270 45				
Average cost per head to land steers in Montreal from place named	$	15 02	11 58	13 53	15 24	2 41

TABLE II.—SHRINKAGE IN TRANSIT FROM VARIOUS POINTS TO MONTREAL AND TO GLASGOW

—		Lethbridge, Alberta	Brandon, Man.	Rosthern, Sask.	Scott, Sask.	Ottawa, Ont.
Average weight at point of origin	lb.	1,141·0	.....	1,116·5	1,345·0	1,388·5
Average weight at Winnipeg	"	.....	1,250·5	.....	.....	.....
Average weight off cars, Montreal	"	1,033·0	1,140·0	1,041·0	1,189·0	1,248·0
Per cent shrink	%	9·4	8·8	6·7	11·5	10·1
Average weight when loaded on ship, Montreal	lb.	1·091·0	1·194	1·091	1,250	1,293
Per cent shrink from origin to time of loading	%	4·3	4·4	2·2	7	6·8
Average weight when landed, Glasgow	lb.	1·051·0	1·208	1,072	1,226	1,282
Per cent shrink from origin	%	7·8	3·3	3·9	8·8	7·7
Per cent shrink on ship—from loading point to port of debarkation	%	−3·6	+1·1	−1·7	−1·9	− ·8
Average weight time of sale, Glasgow	lb.	.....	1,220	1,100	1,261	1,320
Per cent shrink from origin to time of sale, Glasgow	%	.....	2·4	1·4	6·2	4·8
Per cent shrink or gain from loading Montreal to time of sale, Glasgow	%	.....	+2·1	+ ·8	+ ·9	+2·1

TABLE III.—STATEMENT OF EXPENSES SHIPPING 116 HEAD OF CATTLE VIA MONTREAL TO GLASGOW

—		Lethbridge, Alberta	Brandon, Man.	Rosthern, Sask.	Scott, Sask.	Ottawa, Ont.
Number of steers	No.	18	20	40	19	19
Total charges from Experimental Station to Montreal	$	270 45	231 54	541 13	289 58	45 82
Stock-yard charges, Montreal	$	16 30	18 12	36 24	17 21	17 21
Handling and loading	$	11 70	13 00	26 00	12 35	12 35
Ropes, tools, roping, tagging, men, etc	$	8 37	9 29	18 58	8 82	8 82
Insurance $140 each . ⅛%	$	15 75	17 50	35 00	16 62	16 63
Ocean feed	$	75 99	84 45	168 90	80 23	80 23
Excise stamps	c.	14	16	30	15	15
Ocean freight per head	$	18 00	20 00	18 00	20 00	20 00
Total ocean freight	$	324 00	400 00	720 00	380 00	380 00
Total charges to port of debarkation	$	722 70	774 06	1,546 15	804 96	561 21
Average per head to port of debarkation	$	40 15	38 70	38 65	42 36	29 53

TABLE IV.—RETURNS FROM SHIPMENT

—		Lethbridge, Alberta	Brandon, Man.	Rosthern, Sask.	Scott, Sask.	Ottawa, Ont.
Number of steers	No.	18	20	40	19	19
Total charges to port of debarkation	$	722 70	774 06	1,546 15	804 96	561 21
Less returns for surplus fodder	$	24 10	26 76	53 53	25 43	25 43
Net charges to port of debarkation.	$	698 60	747 30	1,492 62	779 53	535 78
Overseas charges—						
Extra charges steamship company	$	7 40	8 29	16 52	7 88	7 88
Lairage at Merklands	$	33 79	31 49	67 83	28 10	27 49
Keep	$	95 20	80 92	183 14	69 40	66 01
Herds	$	8 72	9 69	19 38	9 21	9 20
Insurance	$	1 46	3 87	5 09	3 63	4 12
Commission	$	43 60	48 45	96 90	46 03	46 02
Total overseas charges	$	190 17	182 71	388 86	164 25	160 72
Total charges from origin to sale in Glasgow	$	888 77	930 01	1,881 48	943 78	696 50
Total charges per head from origin to sale in Glasgow	$	49 37	46 50	47 04	49 67	36 65
Total return	$	1,779 32	2,406 34	4,280 55	2,380 10	2,500 02
Net return	$	890 55	1,476 33	2,399 07	1,436 32	1,803 52
Gross returns per 100 lb., at Glasgow (weight when landed)	$	9 40	9 96	9 98	10 21	10 26
Net returns per 100 lb., at Glasgow (weight when landed)	$	4 70	6 11	5 57	6 14	„7 40

TABLE V.—LOSS STATEMENT ON VARIOUS LOTS

Lot		1 Lethbridge, Alberta	2 Brandon, Man.	3 Rosthern, Sask.	4 Scott, Sask.	5 Ottawa, Ont.
Date of shipment	Date	May, 1926	May, 1926	May, 1926	May, 1926	May, 1926
Number of steers	No.	18	20	40	19	19
Average cost of steers per head	$	47 83	52 72	41 16	62 32	65 00
Total cost of steers	$	860 90	1,054 40	1,646 48	1,184 08	1,235 00
Average cost of feed per steer	$	28 30	34 62	21 62	24 41	37 43
Total cost of feed	$	509 40	692 35	864 72	463 87	711 17
Cost of transportation to and selling in Great Britain	$	888 77	930 01	1,881 48	943 78	696 50
Total cost	$	2,259 07	2,676 76	4,392 68	2,591 73	2,642 67
Total return	$	1,779 32	2,406 34	4,280 55	2,380 10	2,500 02
Loss per lot	$	479 75	270 42	112 13	211 63	142 65
Loss per steer	$	26 65	13 52	2 80	11 13	7 51

TABLE VI.—RETURNS FROM MAY, 1926 SHIPMENT ON ADJUSTED BASIS AS FOLLOWS:

1. Overseas charges based on 2 days hold over in Glasgow.
2. Loss on account of steers having to be resold not considered.

—		Lethbridge, Alberta	Brandon, Man.	Rosthern, Sask.	Scott, Sask.	Ottawa, Ont.
Net charges to port of debarkation.	$	698 60	747 30	1,492 62	779 53	553 78
Overseas charges at $5.25 per head..	$	94 50	105 00	210 00	99 75	99 75
Total charges	$	793 10	852 30	1,702 62	879 28	635 53
Total return	$	1,782 96	2,420 87	4,333 84	2,397 05	2,525 45
The adjustment being		3 head-15s.	4 head-£3	7 head-£11	4 head- £$\frac{1}{10}$	5hd.-£5/5
Net return	$	989 86	1,568 57	2,631 22	1,517 77	1,889 92
Gros return per 100 lb., at Glasgow (landed weights)	$	9 42	10 02	10 01	10 29	10 35
Net return per 100 lb., at Glasgow (landed weights)	$	5 23	6 49	6 13	6 48	7 74

TABLE VII.—ADJUSTED PROFIT AND LOSS STATEMENT ON VARIOUS LOTS

Lot		1	2	3	4	5
		Lethbridge, Alberta	Brandon, Man.	Rosthern, Sask.	Scott, Sask.	Ottawa, Ont.
Date of shipment	Date	May, 1926	May, 1926	May, 1926	May, 1926	May, 1926
Numbers of steers	No.	18	20	40	19	19
Average cost of steers per head	$	47 83	52 72	41 16	62 32	65 00
Total cost of steers	$	860 90	1,054 40	1,646 48	1,184 08	1,235 00
Average cost of feed per steer	$	28 30	34 62	21 62	24 41	37 43
Total cost of feed	$	509 40	692 35	864 72	463 87	711 17
Cost of transportation to and selling in Great Britain	$	793 10	852 30	1,702 62	879 28	635 53
Total cost	$	2,163 40	2,599 05	4,213 82	2,527 23	2,581 70
Total return	$	1,782 96	2,420 87	4,333 84	2,397 05	2,525 45
Gain (+) or loss (−) per lot	$	−380 44	−178 18	+120 02	−130 18	−56 25
Gain (+) or loss (−) per steer	$	−21 13	−8 91	+3 00	−6 85	−2 96

REMARKS RE VARIOUS GROUPS

Lot 1.—From Lethbridge, Alta., consisted of eighteen steers. They were the lightest lot, averaging 1,051 pounds. The heaviest steers in this lot, weighing approximately 1,125 pounds, sold for £23 10s. 0d., while the lightest sold for £18 10s. 0d., the whole lot selling for an average of £20 8s. 0d. The comments of Mr. R. McMinn of the Watson and Batchelor firm on this lot were as follows: "Not too good a bunch. Lot needs the shape, and show lack of breeding. This lot will need to go as stockers."

Lot 2.—From Brandon, Man. This lot consisted of twenty steers. They were a mixed lot, some being good butchers, while others were somewhat rough. The best ones sold for £27 0s. 0d., while the lighter and poorer sold for £22 10s. 0d., the whole lot selling for an average of £24 16s. 6d. The comments were as follows: "A very suitable lot for either short keep or immediate slaughter."

Lot 3.—From Rosthern, Sask, consisted of forty steers, most of them red. A very uniform lot except for two very poor ones. A lot of good butchers. The best ones sold for £25 0s. 0d., and the lowest for £20 5s. 0d., the average making £22 1s. 9d. Comments: "Very well bred lot and most suitable for short keep. If the market was good they would sell very quickly. Two poor steers in this lot, lacking breeding and thriftiness, the kind that should not be shipped to this country. These two would have lost less money for their owner had they been sold in Canada rather than exported here, and besides, would not break the uniformity of such a good lot."

Lot 4.—From Scott, Sask. A lot of twenty red prime butcher steers. Very uniform in size, finish and colour, but they were somewhat wild and very badly branded. The top steer in this lot sold for £28 5s. 0d., the lowest £24 5s. 0d., and the average £27 17s. 1d. The following comments were made on this lot: "Very good cattle but badly branded and rather wild, only suitable for slaughter."

Lot 5.—From Ottawa, Ont. A lot of nineteen steers, showing good breeding and very good finish, prime butchers. The best steer, an extra heavy, weighing 1,700 pounds the day of the sale, sold for £34 15s. 0d., too heavy to bring the most per hundred. The lowest price realized in this lot was £25 10s. 0d., for a lighter steer. They averaged £27 3s. 1d. The comments were as follows: "Very nice sellers and suitable for this time of the year. A few may go out as short keeps, but most will be bought for immediate slaughter."

TABLE VIII.—SUMMARY LOTS 1-5

—	Lot No.	Average weight at farm	Average weight when landed at Glasgow	Average selling price per head, Glasgow	Price per cwt. landing weights Glasgow	Appraisal value per 100 lbs. at farm with 3% shrink allowance	Price received at farm	Loss over appraised value at farm per steer
		lb.	lb.	£. s. d.	$	$	$	$
Lethbridge, Alta.....	1	1,141	1,051	20- 8- 0	9 40	5 75	4 46	14 28
Brandon, Man.....	2	1,250·5 (Winnipeg wt.)	1,208	24-16- 6	9 96	7 05	5 90	14 37
Rosthern, Sask.....	3	1,116·5	1,072	22- 1- 9	9 98	6 25	5 53	7 79
Scott, Sask.....	4	1,345·0	1,226	25-17- 1	10 21	6 50	5 79	9 26
Ottawa, Ont.....	5	1,388·5	1,284	27- 3- 1	10 26	7 25	7 04	2 82

TABLE IX.—SUMMARY LOTS 1-5—ADJUSTED BASIS

—	Lot No.	Average weight at farm	Average weight when landed at Glasgow	Average selling price per head Glasgow	Price per cwt. landing weights Glasgow	Appraisal value per 100 lb. at farm with 3% shrink allowance	Price received at farm	Loss over appraised value at Farm per steer
		lb.	lb.	£ s. d.	$	$	$	$
Lethbridge, Alta.....	1	1,141	1,051	20- 8- 0	9 42	5 75	4 96	−8 74
Brandon, Man.....	2	1,250·5 (Winnipeg wts.)	1,208	24-16- 6	10 02	7 05	6 27	−9 75
Rosthern, Sask.....	3	1,116·5	1,072	22- 1- 9	10 10	6 25	6 07	−1 94
Scott, Sask.....	4	1,345	1,226	25-17- 1	10 29	6 50	6 12	−7 43
Ottawa, Ont.....	5	1,388·5	1,284	27- 3- 1	10 35	7 25	7 38	−1 21

OBSERVATIONS RE TRADE

As stated previously in this report, the general market conditions at the time of this sale were depressed, due to the very disturbed condition of the country immediately following the general strike. The Glasgow market in particular was further affected on account of the outbreak of foot and mouth disease. Moreover, the cattle market has not been as good this year as in the past few years and many of the farmers who have fed long keep stores are complaining that they are losing money this year in selling these finished steers which were bought on a higher market one year ago. This was confirmed

by representatives of commission firms, who were interviewed in different cities of Scotland. According to their statements farmers were not getting very much more for their finished cattle than they paid for them as feeders, the difference in many cases not covering the cost of feed. Due to this unfortunate condition of the market, there is a strong sentiment amongst the farmers in Great Britain and particularly those in Scotland, against the present type of Canadian cattle exported. Too many of the Canadian steers are finished, they claim, when exported, and, therefore, are killed at the ports of debarkation and these compete strongly against their finished steers. If Canadian cattle were exported strictly as stores it would be different, from the farmers' standpoint at least, because in that case the butchers would not compete against the farmers in the bidding for these same cattle.

Although the condition of our cattle at landing may not be responsible for this drop in the market, this feeling, nevertheless, exists in Scotland at least, and likely throughout Great Britain as a whole. The farmers like our cattle, providing they are of the right type and finish, but do not like to see them arrive in their country finished and compete against their finished steers.

The following extract published in a London, England, newspaper would indicate that conditions existing in Argentina would more likely be the cause for the lowering of the market; this extract reads as follows:—

The meat war between the leading British and United States packing interests in Argentina for the supremacy of the English market had affected a number of smallller companies engaged in the same trade. Two of these companies, with British and Dutch capital, have sharply curtailed their operations, and a third, composed largely of local capital, has practically closed down.

These companies are represented as awaiting the outcome of the fight between the Swift, Armour and Wilson companies on the one side, and the Vestey interests, representing the British. In the meantime, the Vestey Company is expanding its operations here and building near Buenos Aires one of the largest refrigerating plants in the world. This company has also entered the shipping business for the purpose of maintaining its own refrigerator steamers.

Vestey withdrew last year from the London shipping conference, by which refrigeration space was apportioned among the packers here for shipments to the United Kingdom. It is understood that the British asked for increased tonnage. The conference then dissolved, and a scramble for space followed.

The present industrial conditions in England and the effects of the recent general strike, coupled with unemployment, are held in some quarters in Buenos Aires as partly responsible for the low price of Argentine meat, mostly chilled, now prevailing in the Smithfield market, London.

It is not denied in other quarters of trade, however, that the underlying cause of selling in England at less than the import cost is due to the bitter rivalry between the major packing interests.

Neither is it denied that this warfare, which has been an open secret in business circles in Buenos Aires, is costing the packers heavily.

It would seem that, if the above report is correct, that this exportation of such large quantities of cheap Argentine frozen and chilled meat would likely be more responsible for lowering the price on the English finished steers than the importation of a few, (when compared with the total beef consumption in Great Britain) finished Canadian steers.

REMARKS RE QUALITY AND TYPE OF CATTLE TO EXPORT

While studying the market situation for Canadian cattle in Great Britain and Scotland particularly, many authorities on the trade were interviewed. Those interviewed were commission men, farmers and butchers who had sold, fed and killed Canadian as well as Irish or home bred steers. The striking thing is that the remarks from nearly all of these were similar and summed up they are the following:

The Canadian cattle shipped so far have been very healthy, thrifty and exceptionally good doers in the feed lot. On these points they excel even the best Irish cattle.

As regards type and quality, many of the Canadian cattle are too old when shipped. Cattle over three or three and one-half years are heavily discriminated against by the butchers, because the beef from these older steers is stringy and tough and some butchers catering to a high grade meat trade do not want to buy Canadian beef of any kind on that account.

Canadian cattle, on the average, are too strong in the bone and some show a need of improved breeding. Aberdeen Angus blood was recommended by a number of feeders for this purpose.

One fault strongly objected to in the Canadian cattle is that they are shipped when too heavy and carrying too much finish. The big demand is for the steer weighing from 10 to 11 cwt., making approximately 1,100 to 1,250 pounds or even lighter when marketed. This point was well demonstrated by the fact that some of the steers in the present shipment weighing 12 cwt. (112 pounds per cwt.) sold for £29 5s. 0d., and one extra heavy, weighing 15 cwt., nicely finished and of great quality sold for £34 10s. 0d., and only three days later, under the same market conditions, some home bred steers weighing 10½ cwt. sold for £33 10s. 0d., other Canadian bred of good type weighing 10½ cwt. sold for considerably more per 100 pounds than did the heavy ones. Besides having a better market for lighter finished cattle, the Scotch farmer likes to buy them younger and lighter because they cost less per head and they grow at the same time as they finish.

This strong demand for light and young cattle is somewhat unfortunate for the Canadian producers because expenses being much the same on lights and heavies, it will be difficult, until more difference is made in the transportation rate of heavies and lights, to meet these requirements. But even under present conditions, were these light steers of good quality and breeding and carrying the right finish, they might bring enough to somewhat offset this handicap. Past experimental shipments have shown that very well bred light steers can be shipped with reasonable chances of a profitable sale under the present day conditions, but for the greater percentage of our steers, it would be rather difficult to break even.

KILLING QUALITIES

The Canadian cattle, in order to kill into the best carcasses, should have at least four to five weeks feeding after landing, even in the case of the well finished beasts.

If killed immediately after landing, although the carcass shows a nice outside covering, it will not be well covered over the kidney; this was very noticeable in the dressed meat market.

For the above reasons (old and lacking covering of kidney) the Canadian dressed beef sells for less than the home bred Scotch beef. At the time of this shipment, Canadian carcasses were selling for 8d. to 8⅞d. per pound as against 10d. to 10½d. per pound for home bred carcasses of the same weight.

Branding.—Wherever possible this method of marking steers should be discarded because the overseas trade discriminates against branded cattle. With the Canadian method of branding on the side and oftentimes to the extent of covering some 18 x 18 inches, there is a heavy loss on the value of the hide. Besides this loss it is always an impossibility, due to this permanent mark, to resell as a home bred steer, one that has been fed for some time. This is oftentimes practised with the unbranded and well bred Canadian stores fed in Scotland. Therefore, farmers who anticipate reselling these Canadian stores as home bred will certainly be willing to bid higher for unbranded steers since they are certain of a higher price when they sell them.

The recommendation would seem to be in order that where cattle must be branded for recognition a type of brand that will do little damage to the hide should be adopted.

Breeds.—The most popular breeds of steers with the Scotch feeder are the Aberdeen Angus or well bred Shorthorn. The Herefords are not as well liked, this being particularly true amongst the butchers, the objection being that, although the Hereford steer will give a well covered carcass on the outside, it never shows as well a covered kidney as the two other breeds. The Hereford breed is, apparently, better liked to the south (in England) than in Scotland, judging from the remarks gathered.

THE IRISH VS. CANADIAN CATTLE

The biggest competitor of the Canadian store cattle is the Irish stores. The Irish authorities and farmers, realizing that the Canadians are competing strongly on the markets where, at one time, they met no competition, are doing all in their power to regain control of this market. In order to attain this object, Ireland is taking important steps to improve the quality of her stock and thereby compete more advantageously on that ground with Canada, and it must not be forgotten that Ireland will always have the supreme advantage of having this large market at their door, while Canada is thousands of miles away.

The following from the *Irish Independent* (a Dublin daily paper) May 23, 1926, shows that this small country is following closely the marketing of stores and keeping the news before the people. It reads as follows: *During the three weeks ended May 15, the number of Canadian store cattle licensed out from the landing places for further feeding was 315, all of which were landed in Glasgow in the week ended May 8.*

In a report received by the Home Office from the Imperial Secretary's Department, Northern Ireland, the menace of increased Canadian cattle imports is very real. "Canadian cattle men are making a bold and determined bid to wrest from the Irish exporter the monopoly of the English store cattle market, which he has so long enjoyed. As long as the Canadian product is the finished beast ready for the butcher, there will always be a market for the Irish stores of the right type; but it is quite within the bounds of possibility that a study of feeding and fattening conditions in Great Britain may lead to the production of an eminently suitable type of Canadian store beast to be placed in direct competition with the Irish product."

One can easily see that Ireland does not fear the Canadian competition "so long as the Canadian product is the finished beast". This is believed to be true because not until Canada exports the type of stores wanted by the Scottish farmer will the trade rest on a solid basis. Although the finished Canadian beast may be popular with the butchers, they are not popular with the farmers.

As to the value of the Canadian stores that find their way to the feed lots, it is universally agreed that the Canadian bullock is a much better feeder than the Irish bullock. All of the cattle feeders interviewed were unanimous in their praise as to the health, thrift and feeding ability of the Canadian stores. They would always feed Canadian beasts if they could get them young enough and of the right weight and degree of finish; but they can not always get them and therefore cannot depend on our cattle for a continuous supply.

Canadian cattle in the feed lots or on the pastures start to gain immediately as compared with Irish, which take weeks before they start to gain. Even after the long ocean journey, the Canadian beasts always arrive in better condition. There are no piners (poor doers) among Canadian steers.

The Irish authorities, being well aware of the present competition and the possibility of an increased competition, are taking every step to improve their cattle. The new regulations providing for the use of good pure-bred bulls of the Angus and Shorthorn breeds should show their effects in the future in improving the beef making ability of their stores.

Canada should not lose sight of what is being done by this competition. There is room for much improvement in our cattle, also, and therefore every move made in that direction would certainly strengthen our chances of establishing more strongly our cattle on the British market.

DEDUCTIONS

From the many interviews with authorities on the cattle trade in Great Britain, and in Scotland more especially, it would seem that the following deductions on this trade would be in order.

(1) *Canada Should Cater More to the Farmers' Trade.*—In order to establish the Canadian trade on a firm basis, the Canadian shippers should endeavour to ship more stores of the right type than have been shipped. The Canadian cattle trade is none too popular with the Scotch farmers, because they are not getting enough of the kind of cattle that they expected.

The Scotch farmers want a well bred, young and unfinished steer weighing from 1,000 to 1,200 pounds. They claim that so far too many of the Canadian export steers are finished, and as these are killed at the port of entry, are thus competing against their home-fed cattle. This seeming competition is probably unimportant compared to the real competition from the enormous quantity of very cheap chilled beef imported from the Argentine, but, nevertheless, not every farmer sees it that way. Therefore, in order to gain the sympathy of the British farmer, which may be needed in future transactions, it might be well to keep this in mind and cater more to this trade, which could be made profitable if more of the right kind of cattle were exported and especially if lower ocean freight rates could be obtained on strictly store cattle.

2. *Younger Cattle Should Be Exported.*—There is much complaint against the older grades of Canadian cattle. The butcher, who is the ultimate buyer of these steers, is discriminating most strongly against them. They cut too hard in the flesh and are tough in fibre, therefore not popular with the consumer. No cattle over three or three and a half years old should be exported. The old stunted steers, even if they are of the popular weight, are not liked.

These old steers, whether heavy or small and stunted, hurt the Canadian trade for the better class of steers. These old cattle fall into the class of cheap beef and must be sold in direct competition with the Argentine cheap beef, a very unwise competition to attempt when it can be avoided.

(3) *Branding.*—Branding should be discontinued whenever possible. On the western range, where it is absolutely necessary to brand cattle for identification, the type of brand that will do the least damage to the hide of the animal should be used.

Reasons for discarding branding where possible:—

(*a*) There is a direct loss on the value of the hide, varying from ten shillings to fifteen shillings or even one pound when hides are badly damaged.

(*b*) A branded animal, when fed in Great Britain, even if well bred and of right type and weight, cannot be resold for a home-bred bullock. Therefore, since the Canadian-bred steer in most cases undersells the home-bred ones, and further, since the farmer knows that a good Canadian unbranded steer can be resold as home-bred stock, he will be willing any time to bid higher for the good unbranded steer, even in excess of the loss already mentioned on the value of the hide.

(4) *Horned Cattle.*—Canadian horned cattle are not discriminated against as much as Irish horned cattle, because they are much quieter in the feed lots or on pastures, but dehorned cattle ship much better over our long rail distances, and for that reason, if for no other, they should all be dehorned.

(5) *Time to Ship the Different Kinds of Cattle.*—There are certain times of the year when different kinds of cattle meet with a better demand in Scotland. It would seem that if a certain number of heavy cattle must be exported that the best time is in the fall of the year. Heavy cuts do not sell well in summer time.

Long keep stores can be shipped almost any time, but find a better market in early spring at the beginning of the grass season in Great Britain or in the fall before winter feeding.

Short keeps may be shipped almost any time also, but particularly late in the fall before the Christmas trade.

The finished home-fed cattle are mostly marketed in Scotland after the winter feeding season, early in the spring, and also after the grass season in the fall of the year. Therefore, the time for Canada to ship a limited number of finished cattle would be between these two heavy marketing periods of home-fed stock.

CONCLUSION

Every shipment should be carefully graded before embarkation. Eliminate the poor ones. One or two poor steers hurt the trade for the good ones. These poor steers will lose less for the shipper if sold in this country and they will not hurt the Canadian trade overseas.

It seems to-day that the big competitor of Canadian cattle in Great Britain is the cheap Argentine beef. Therefore Canadian cattlemen should produce an article that will sell above this Argentine beef and will not come in direct competition with it. British authorities on the trade—butchers, commission firms, and farmers—think it is possible for the Canadian cattlemen to avoid the competition, providing cattle are shipped that will produce a high grade beef. To produce this high grade beef, Canadian cattle must be,—

1. *Young.*

2. *Well bred;* many are still lacking in breeding and some are somewhat rough in the bone, according to the opinion of some butchers.

3. *Shipped as stores,* either as long or short keeps, because they yield a better carcass after they have been fed for some time in Great Britain. They are better covered, more particularly at the loin and on the inside of the carcass.

4. *Unbranded,* because they can be fed and many resold as home-bred and home-fed cattle.

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GRAZING WESTERN CATTLE

Summer operations with beef cattle during 1926 were confined to the grazing of cattle on the Connaught Rifle Ranges. During April and May, 1926, cattle were purchased as follows:—

Place	Number of steers	Weight	Cost	Freight	Total
		lb.	$ cts.	$ cts.	$ cts.
Winnipeg, Man.	25	26,470	1,672 78	230 20	1,902 98
"	28	24,000	1,423 79	224 00	1,647 79
"	31	27,170	1,619 72	228 35	1,848 07
"	30	26,100	1,546 08	228 35	1,774 43
South March, Ont.	20	21,639	1,460 63	.....	1,460 63
Total	134	125,379	7,723 00	910 90	8,633 90

Conditions on the range were excellent throughout the season and these cattle did remarkably well, much better, in fact, than western cattle grazed on the same pasture the previous year, but the latter cattle were somewhat handicapped in that they were not brought down from the West until late in the season and almost immediately suffered from the heat and flies. The 1926 cattle had a much better start by being on the range so much earlier.

Ninety of these cattle were selected out and exported to Glasgow on September 24. These met a very fair market, which, in addition to the good gains they had made on pasture, enabled them to return a very fair profit as will be seen from the following report on this shipment:—

SHIPMENT OF STORE CATTLE TO GREAT BRITAIN, SEPTEMBER, 1926

On September 24, 1926, per ss. *Carmia*, there was shipped from Montreal, Canada, to Glasgow, Scotland, by the Central Experimental Farm, Ottawa, Canada, a consignment of ninety head of store cattle. The cattle were consigned to Messrs. Watson and Batchellor, Ltd., Live Stock Agents, Glasgow, Scotland, for sale, and they reported fully on the shipment, no officer of the department having accompanied the cattle. In addition, a report was obtained from Mr. W. A. Wilson, Canadian Agricultural Products, Representative, attached to the High Commissioner's Office, London, England.

The shipment was experimental in nature, being a continuation of similar shipments, with the reports of which the reader should be familiar to fully appreciate the deductions afforded in this case.

OBJECTS OF THIS SHIPMENT

(1) To determine the possible profits from Eastern grazing of Western cattle with the ultimate object of shipping them to overseas market.

(2) To determine the relative profit from shipping such steers in the fall after a summer's grazing vs. holding over, winter feeding them and shipping in the spring.

(3) To get further data on the cost of shipping, shrinkage in transit; most profitable weight of cattle to ship, etc.

PLAN OF SHIPMENT

One hundred and fourteen western steers were purchased on the Winnipeg market in April, 1926, and twenty eastern steers were purchased locally in early May, 1926. These were pastured on the Connaught Rifle Ranges until time of shipment, at which time ninety representative animals were selected out, the remainder being held over for winter feeding and early spring shipment. The ninety steers shipped were graded into lots at Montreal as follows:—

Lot 1.—Nineteen black cattle of Aberdeen-Angus extraction of fair to good quality and considered suitable for the store cattle trade.

Lot 2.—Twenty roans and reds of Shorthorn and Hereford extraction; good store cattle except for a few slightly rough ones.

Lot 3.—Twenty-four roans and reds of Shorthorn and Hereford extraction, classed as heavy, short keep stores or butcher cattle; some rough, rangy ones in the lot.

Lot 4.—Twenty-seven roans and reds of Shorthorn and Hereford extraction, not so heavy as the previous group, a little more uniform, with more fleshing. Would be classed as good butchers on Canadian markets.

The data obtained from the shipment are given in tables herewith. For the most part, these tables are self-explanatory, but in some cases amplification is necessary.

In table I it will be noted that an average weight ex Winnipeg is given. This is not an actual weight as the animals were not shipped in the same grouping as they were purchased, and it was practically impossible to keep the identity of the individuals, even had there been facilities for weighing them at the range, which was not the case. However, the total weight of all the steers purchased was available, and taking the reloading weights in stock yards at Montreal as being on a par with the purchase weights in stock yards at Winnipeg and Ottawa, it was found that the steers had gained an average of two hundred and six pounds each during the pasture season. As the younger, lighter steers would be growing as well as laying on fat, it is safe to assume that they made as good gains on the average as the older, heavier steers, therefore two hundred and six pounds was deducted from the average reloading weights at Montreal of each group to arrive at the average weight per group at Winnipeg.

The average cost of all the one hundred and thirty-four steers landed on the ranges at Ottawa was $6.88 per hundredweight, or an average of $64.43 per head, as will be seen from a glance at table V. To use the figure $64.43 as the average cost per steer in every group would not be fair to the light weight steer, consequently the average cost per cwt., $6.88, was applied to the average weight per steer as calculated in table I to arrive at the original cost of the steers per group, as given in table III.

It will also be noticed in table IV and in the summary, table V, that results have been figured by two methods: first, on the basis of the actual ocean freight paid; and second, on the basis of paying the same amount of freight, but according to the weight of the animals rather than on a per head basis. This has been done with a specific purpose, to which later reference will be made.

DEDUCTIONS FROM SHIPMENT

In so far as table I is concerned, it is quite evident that western steers will make good gains under eastern grazing conditions, provided the grazing area is good, as was the case in this instance, for two hundred and six pounds gain in one hundred and fifty days is quite gratifying. It will be noted also that the shrinkage in transit is very low, and in this connection, the best results

are shown by the lighter cattle in good store condition as compared to the heavier cattle with a higher degree of finish, a fact which has been fairly well substantiated in previous shipments.

The information given in table II is similar to that obtained from previous shipments and shows the average cost of shipment and sale under existing conditions to remain about the same. The last line in this table shows the cost per hundred pounds of shipping cattle for sale on British markets. This is given to enable the prospective shipper to see at a glance whether the home market or the overseas market would be the most profitable. Knowing through market reports the price on the home market and the overseas market for the class of cattle he has for sale, he can readily determine whether the advance in price on the overseas market is sufficient to cover the cost of shipment and leave him a fair margin of profit or not. It will be noted that under the present flat rate for ocean rate the lighter steers require a larger margin of profit. A graduated ocean freight rate (as suggested later on) would mean that the existing discount or handicap as affecting the light weight steer would be, at least, partially removed.

Table III is a profit and loss statement for the shipment. It should be stated before discussing the results tabled that the cattle met a depressed market. Conditions due to the coal strike, such as have not been experienced for thirty years, were still operating, reducing the consumption of meat, which, in turn, had its effect on the overseas cattle trade. However, in spite of this depressed market, all the groups made a profit over cost of purchase, handling, shipping and sale. It will be seen by reference to table V that this profit amounted to $650.21 for the shipment. In this connection, it is of interest to note that the cattle sold on the average for practically the same net price in Glasgow as they cost landed on the pasture at Ottawa, so that the value of the gain in weight made by the cattle was sufficient to pay for the cost of reshipping and selling them and still leave a fair margin for profit.

The summary table IV presents the results in abbreviated form, from which it will be seen that lot I, the lightest steers in the group, brought the third highest price per steer, the highest price per pound, Glasgow weights, returned the highest net price per pound at farm, and made the highest profit per steer. The comments of Messrs. Watson & Batchellor on this lot were to the effect that they were only a fair quality of store cattle on the whole, some being rather wild and branded and others a little rough.

Lot II, another group of comparatively light steers, brought the lowest prices per head, the second lowest price per pound, Glasgow weights, the second lowest net price at the farm, and the second lowest profit per steer. This hardly agrees with the comments of Messrs. Watson & Batchellor to the effect that they were "very suitable for stores with the exception of four or five which were a bit rough."

Lot III, the heaviest steers, brought the highest price per head, but the lowest price per pound; the lowest net price at the farm and the lowest profit per steer of any lot. These steers were apparently too heavy and in too high condition to sell to advantage as stores and were not sufficiently well finished to bring the best price as butcher cattle. In addition, some were rough and inclined to be leggy, therefore of undesirable type.

Lot IV, consisting of medium to heavy weight cattle of good type and with a good degree of finish, brought the second highest price per head and per pound, as well as the second highest price at the farm and the second highest profit per steer. The comment of Messrs. Watson and Batchelor on this lot is significant,

i.e.: "A number of these cattle were too heavy for store purposes and hardly fat enough for beef; it is rather difficult to get a fair price for 'between' classes, nevertheless a few of the shortlegged kind in this lot were good."

One of the outstanding features of this shipment is that brought out in relation to lots I and II. Here we have practically ideal types and weights of store cattle such as we are told and experimental shipments prove the British feeder desires for his feed lots. While they give a fair margin of profit, they do not give a sufficient margin of profit over the heavier steers to encourage greater shipments of steers of these weights. The flat ocean freight rate for large and small steers alike, with the exception of the small concession of $2 per head if the cattle are under one thousand pounds and five are put in the place of four, seems to be one of the drawbacks to a greater increase in the trade in this class of cattle. As long as a one thousand-pound steer or over takes the same rate as the thirteen hundred or fourteen hundred-pound steer, shippers will not send the good but lighter weight store cattle that would be in demand as stores but that cannot be economically shipped now on account of the relatively high freight rate. As a demonstration of the effect of the equalization of the freight rate on the basis of weights, parts of tables III and IV have been made out in duplicate showing the relative profits on each lot, first with the flat ocean freight rate of $20 per steer operating, and second, with the same total freight charge distributed over the various lots on basis of weights of the steers in the lots. It will readily be seen that with freight rates applied on basis of weight, the lighter weight steers make a much better showing. Good heavy cattle, i.e., lot IV, have nothing to lose; while extra heavy cattle that are neither good stores or good butcher cattle and which would be better left at home are discounted.

So long as the steamship companies plying in the trade were able to get full cargoes, even at the high prevailing rate of $20 per animal, regardless of weight, it has seemed useless to discuss lower rates. Now, however, that the trade has fallen off and steamers cast off with only half their cattle space filled, the owners may be inclined to listen to reason and compromise by giving a graded rate on a basis of live weight of cattle, such rate to be low enough to permit of eight or nine hundred-pound cattle being shipped with some chance of profit for the shipper. With this in mind, the following schedule of rates is suggested:

Weight of cattle Average of car load as shipped to boat	Ocean freight
900 lb. or under	$15 00
900– 950 "	15 75
950–1,000 "	16 60
1,000–1,050 "	17 50
1,050–1,100 "	18 25
1,100–1,150 "	19 15
1,150–1,200 "	20 00
1,200–1,250 "	20 85
1,200–1,300 " or over	21 60

The above scale of rates was arrived at approximately by applying the present $20 rate to the cattle in this shipment by distributing it over the various lots according to their weights. It will be seen that the lighter weight cattle would be carried at a rate slightly lower than the existing lowest rate, but, on the other hand, the heavier cattle, i.e., twelve hundred pounds or over, would carry a correspondingly higher rate so that the total revenue to the steamship companies from a shipment remains practically the same as it is now. It is true that in time there might be a tendency to ship more lighter cattle, but we have every reason to believe these would meet with more favour and increase the demand, thus resulting in greater volume of trade and consequently in greater returns to the steamship companies.

The second outstanding feature of this shipment is the reference *to "between" class cattle.* By "between" class cattle, the British dealer and feeder mean cattle that are either *too old, too heavy and too well finished* to make profitable investments as store cattle, and yet are not sufficiently well finished to make good butcher cattle.

It has been evident in previous shipments but never more so than in this one that these cattle advisedly called "between" class labour under a decided handicap. In this instance, the state of the market makes matters worse, but at no time is the trade so brisk for them as for the well-conditioned store or the well-finished bullock. On the latter, the possible profits are fairly evident, while the "between" class animal is ever a doubtful proposition and is discounted accordingly.

N.B.—Since the above scale was compiled, the ocean freight rate on store cattle has been lowered to $15 per head, operative from March 1, 1926. It is understood that this is temporary only, consequently the above recommendations will still apply in the event of a return to the regular $20 rate.

TABLE I.—GAINS IN WEIGHT ON PASTURE AND SHRINKAGE IN TRANSPORTATION TO GLASGOW

Lot		1	2	3	4
Number of steers	No.	19	20	24	27
Average weight ex Winnipeg April, 1926	lb.	860	851	1,026	960
Average gain on pasture	"	206	206	206	206
Total weight arrival Montreal (all lots)	"	.....	(100,600)	.....	.....
Total re-loading weights Montreal (all lots)	"	.....	(102,720)	.....	.....
Total gain in Montreal (all lots)	"	.....	(2,120)	.....	.....
Average weight at Montreal (re-loading weights)	"	1,066	1,057	1,232	1,175
Average weight at Glasgow (sale weights)	"	1,067	1,081	1,225	1,170
Shrink (−) or gain (+) Montreal to Glasgow	"	+1	+24	− 7	− 5
Per cent shrink (−) or gain (+)	%	.....	+2·2	−·57	−·42

TABLE II.—COST OF SHIPPING 90 HEAD OF CATTLE FROM OTTAWA TO GLASGOW VIA MONTREAL

Lot No.		1	2	3	4
Number of steers	No.	19	20	24	27
Total charges from Ottawa to Montreal	$	43 11	45 38	54 45	61 26
Stock yards at Montreal	$	8 36	8 81	10 57	11 84
Handling and loading	$	12 35	13 00	15 60	17 55
Ropes, tools, tagging, men, etc	$	19 14	20 15	24 19	27 22
Insurance, $140 per head at ½%	$	16 62	17 50	21 00	23 63
Ocean feed	$	64 70	68 10	81 72	91 93
Ocean freight	$	380 00	400 00	480 00	540 00
Excise stamps	cts.	06	07	09	10
Total to port of debarkation	$	544 34	573 01	687 62	773 53
Less return for surplus fodder	$	17 95	18 90	22 68	25 51
Net charges to port of debarkation	$	526 39	554 11	664 94	748 02
Average per steer	$	27 71	27 71	27 71	27 71
Overseas Charges:					
£1 s5 d2 or $6.10 per head — Extra charges per Donaldson Bros., Ltd	$	8 36	8 80	10 56	11 88
£1 s5 d2 or $6.10 per head — Lairage at Merklands	$	18 43	19 40	23 28	26 19
£1 s5 d2 or $6.10 per head — Keep	$	32 25	33 96	40 74	45 83
£1 s5 d2 or $6.10 per head — Herds	$	9 21	9 70	11 64	13 10
£1 s5 d2 or $6.10 per head — Insurance	$	1 53	1 62	1 94	2 18
£1 s5 d2 or $6.10 per head — Commission	$	46 08	48 50	58 20	65 47
Total charges to time of sale	$	642 25	676 09	811 20	912 67
Average per steer	$	33 80	33 80	33 80	33 80
Average per 100 lb. live weight	$	3 17	3 20	2 74	2 88

TABLE III.—PROFIT AND LOSS STATEMENT ON VARIOUS LOTS

(1) With Actual Ocean Freight Rates. (2) With Ocean Freight on Basis of Weight.

Lot		1	2	3	4
Number of steers	No.	19	20	24	27
Average cost per head	$	59 17	58 55	70 59	66 66
(At $6.88 per cwt. which includes freight to Ottawa).					
Total cost	$	1,124 23	1,171 00	1,694 16	1,799 82
Average cost of feed (5 months pasture at $1.00 per month per steer)	$	5 00	5 00	5 00	5 00
Total cost of pasture	$	95 00	100 00	120 00	135 00
Total cost of handling at 50c. per steer	$	9 50	10 00	12 00	13 50
Total cost to time of shipment	$	1,228 73	1,281 00	1,826 16	1,948 32
Average per steer	$	64 67	64 05	76 09	72 16
(1) Ocean freight actually paid	$	380 00	400 00	480 00	540 00
(2) Ocean freight on basis of weight	$	355 12	370 62	518 26	556 00
Charges other than ocean freight in shipping to and selling in Great Britain	$	262 25	276 09	331 20	372 67
(1) Actual total cost of time of sale	$	1,870 98	1,957 09	2,637 36	2,860 99
(2) Total cost with ocean freight on basis of weight	$	1,846 10	1,927 71	2,675 62	2,876 99
Total return	$	2,039 42	2,100 05	2,768 14	3,078 54
(1) Actual profit per lot	$	168 44	142 96	130 78	217 55
(2) Profit per lot with ocean freight on basis of weight	$	193 32	172 34	92 52	201 55
(1) Actual profit per steer	$	8 86	7 15	5 45	8 05
(2) Profit per steer with ocean freight on basis of weight	$	10 17	8 62	3 86	7 46

TABLE IV.—SUMMARY

Lot No.	Class of steers	Average farm weights	Average Glasgow weight	Average selling price per head Glasgow	Price per cwt. Glasgow	With actual freight rates			With freight on basis of weights	
						Cost per cwt at farm	Price recv'd at farm	Profit per steer	Price recv'd at farm	Profit per steer
		lb.	lb.	£ s. d.	$	$	$	$	$	$
1	19 black cattle, fair to good stores	1,066	1,067	22- 2- 7	10 06	6 06	6 89	8 86	7 02	10 17
2	20 roans and reds, good stores, few slightly rough	1,057	1,081	21-13- 0	9 71	6 05	6 73	7 15	6 87	8 62
3	24 roans and reds, heavy short keep stores, some a bit rough and rangy	1,232	1,225	23-15 -7	9 41	6 17	6 61	5 45	6 49	3 86
4	27 roans and reds, heavy short keeps; not fat enough to butcher and too fat for profitable stores	1,175	1,170	23-10- 2	9 74	6 14	6 82	8 05	6 77	7 46

SUMMARY TO DATE (SEPTEMBER, 1926)

Total steers purchased	No.	134
Total weight when purchased	lb.	125,379
Average weight when purchased	"	935
Average cost when purchased	$	64 43
Average cost per 100 lb. when purchased	$	6 88
Cost of 90 steers at $64.43	$	5,798 70
Pasture, 5 months at $1.00 per month per steer	$	450 00
Handling at Ottawa at 50c. each	$	45 00
D. A. Campbell account	$	778 50
Total	$	7,072 20
Returns—draft—Watson & Batchelor	$	7,722 41
Profit	$	650 21
Average weight of steers (134) in April	lb.	935
Average weight Montreal (90) Sept. 24th	lb.	1,141
Gains on pasture (5 months)	lb.	206

WINTER STEER FEEDING, 1926-27

After the shipment of ninety steers overseas on September 24, 1926, there remained on the range a group of forty-four head that was being held over for winter feeding. One of these, while bought and paid for, was never actually delivered to the Range by the vendor, as he became too wild, but remained in a nearby field with some other cattle. It was accordingly sold to a local butcher for seventy dollars, he to take the animal away himself, which he was not able to do until he had shot it.

On the final roundup in the fall it was found that one steer was missing and no trace of it could be found. There were therefore forty-two head brought in to winter quarters on Thursday, December 2, 1926. They were given the intradermal tuberculin test and all horned steers were dehorned on Tuesday, December 7. They were weighed up on Wednesday, December 8, at 9 a.m. on half feed, making a total of 44,630 pounds or 1062.6 pounds per steer. Final reading of the test was made on December 11, one steer from each lot reacting.

The remaining steers were divided into two groups on Monday, December 13, as follows:—

Lot 1.—Consisting of twenty reds, weighing a total of 21,540 pounds or an average of 1,077.0 pounds per head.

Lot 2.—Consisting of nineteen roans and one black, weighing a total of 21,010 pounds or an average of 1,050.5 pounds per head.

These were put on experimental feeding with two objects in view:—

(*a*) To obtain data as to the relative economy from the feeder's standpoint of heavy vs. light grain feeding of steers intended for export the following spring.

(*b*) To determine whether two year old steers carried through the winter on a light grain ration so as to be only of good store quality in the spring will appeal to the British buyer more than similar steers that have been grain fed sufficiently heavily to put them in the between or fat class.

Procedure.—Lot 1, weighing an average of 1,077 pounds, was fed a standard roughage ration of range hay, cut mixed feed and corn silage, and a grain mixture, the latter being fed right from the start of the experiment, commencing at the rate of one pound per steer per day, and increased one pound per week until a maximum of six pounds per day was fed, this amount being continued to the end of the experiment.

Lot 2, weighing, an average of 1,050 pounds, was fed a similar standard roughage ration, but did not receive any grain until February 1, then they received the same mixture at the rate of one pound per steer per day, increasing one pound per week until a maximum of three pounds per day was reached.

The following was the average daily ration fed:—

	Lot 1	Lot 2
Hay	11·8 lb.	11·8 lb.
Ensilage	30·0 "	30·0 "
Meal	5·33 "	1·3 "

The hay consisted of rather poor quality range hay that cost all of eight dollars per ton to put before the steers but that did not look like being worth that much. The meal mixture consisted of:—

Wheat bran	100 lb.
Ground oats	100 "
Cotton seed meal	100 "
Barley meal	100 "
Pea meal	100 "
Salt	10 "

Other charges against these steers for purpose of obtaining the total cost that are not shown in the following table, are pasture, seven months at $1 per month, and handling, 50 cents per steer.

STEER FEEDING EXPERIMENT, 1926-27

—		Lot 1 Heavy Grain Ration	Lot 2 Light Grain Ration
Number of steers	No.	20	20
Length of feeding period	days	100	100
Total initial weight (Dec. 13, 1926)	lb.	21,540	21,010
Average initial weight (Dec. 13, 1926)	lb.	1,077	1,050·5
Total cost per group	$	1,459 12	1,426 88
Total final weight (Mar. 23, 1927)	lb.	25,390	23,905·0
Average final weight (Mar. 23, 1927)	lb.	1,269·5	1,195·25
Total gain for period	lb.	3,850·0	21,895·00
Average gain for period	lb.	192·5	144·75
Average gain per day per steer	lb.	1·92	1·44
Total meal fed at $34 per ton	lb.	10,660	2,610
Total silage fed at $2.85 per ton	lb.	60,000	60,000
Total range hay fed at $8 per ton	lb.	23,612	23,612
Total cost of feed for period	$	366 17	229 32
Average cost of feed per steer	$	18 31	11 47
Cost of feed per pound gain	$	9 51	7 92
Net sale value at Farm at $7.50 per lb. (no shrinkage)	$	1,904 25	1,792 87
Profit over feed	$	78 96	136 67

From the above it will be seen that while the light fed cattle in lot two did not make as great gains as did the heavily fed cattle in lot one, nevertheless they made creditable gains and made their gains at greater profit than the heavily fed steers. It is true that they were not quite as well finished as the heavily fed steers yet they were sufficiently well finished, and of sufficiently good quality to command a price equal to that offered for the better finished cattle. Provided the steers are not being sold in too discriminating a market and provided good succulent roughages are available, it would appear profitable to withhold grain feeding during the first month or two of stall feeding. These cattle were shipped overseas in their respective lots and are reported on in the following section.

REPORT OF AN EXPERIMENTAL SHIPMENT OF STORE CATTLE

A further shipment of store cattle was made by the Dominion Experimental Farms on March 26, 1927. This shipment consisted of 102 head of cattle drawn from the Experimental Farms at Ottawa, Ont., Lethbridge, Alta., and Scott, Sask., and was shipped via ss. *Carmia* from St. John's, N.B., to Glasgow, Scotland, consigned to the Commission firm of Watson & Batchellor. Arthur Newman, Assistant Superintendent, Lethbridge, Alta., accompanied the shipment and is responsible for much of the data and observations included herewith.

The shipment was experimental in nature with the same objects in view as in other shipments. (See Bulletin 62, N.S., and Animal Husbandry Division Reports for 1925-26-27.)

The cattle were grouped as follows:—

Lot. 1.—Twenty-two black cattle, mostly good stores, with a few grading fair.

Lot 2.—Twenty whitefaced cattle of mixed weights, classed as short keep feeders and good butchers.

Lot 3.—Twenty cattle of mixed breeds, including one Highland, classed as short keep feeders and good butchers.

Lot 4.—Twenty cattle, all reds, heavy butcher type, fairly well forward in flesh.

Lot. 5.—Twenty roans, classed as excellent store cattle, with one exception.

Table I gives the shrinkage in transit from which it will be seen that the average shrinkage in transit from feeding pens to time of sale at Glasgow was 7.5 per cent.

Table II gives the cost of shipping from Canada via St. John to Glasgow. In spite of the reduction in ocean freight from $20 to $15 ($5) each for heavy steers, and from $18 to $13.50 ($4.50) each for light steers, the transportation and sale charges are still heavy, amounting on the average to 36.59 per cent of the total sale price of the cattle, much too high a percentage with the present price of cattle on the British market to allow of profitable shipping.

Table III gives the profit and loss statement on these cattle, from which it will be seen that all groups suffered a loss. The western groups suffered heavily through having been purchased at a high price in the late fall. The steers in the eastern shipment were purchased in the early spring of 1926 and were summered cheaply and yet made good gains, which accounts for the smaller losses with these groups. The good showing of Lot 5 under such adverse conditions is due to the fact that they were fed very lightly on grain during the winter feeding period and yet were of such good type and quality that they made extra good gains.

Table IV is a summary of the previous tables, from which it will be seen that the highest price per pound at Glasgow was obtained for the lightest groups of steers. The western groups were all numbered individually and weighed separately at home and at Glasgow, thus enabling the compilation of a special table on the relative price of the light and heavy cattle. This table is attached hereto, from which it will be seen that throughout the whole shipment the lighter cattle brought the best price per pound. In spite of the fact, however, that the two lighter groups of cattle met the British market demands exceptionally well as regards breeding, size, type and finish, the condition of the market was such that even these good light cattle could not be shipped overseas at a profit. The poor condition of the market was due in part to the reduced purchasing power of the consuming public, but more largely to the dumping of Argentine chilled beef on the market. The effect of this dumping on the market can be readily realized when it is stated that this chilled beef could be purchased at the time these cattle were sold for approximately the same price per pound as was being received for the live cattle. In the face of these conditions, it is not to be wondered at that there have been few, if any, shipments of cattle overseas since this shipment was made.

All of these cattle could have been sold at home, at the time that they were shipped overseas, at prices which would have yielded a substantial profit in the case of the eastern steers and greatly reduced the losses in the case of the western steers. Since the date of shipping the cattle, prices on the home markets have advanced still higher and at the time of writing this report (May 18, 1927) prices and conditions would indicate a continued demand for good cattle for home consumption and the United States feeder trade.

After all, our market to the south is our natural outlet, and if conditions across the border are such that United States buyers can afford to pay the Canadian breeder and feeder profitable prices in spite of the tariff, then that is the market that we should cater to for the time being, keeping in mind, however,

that as conditions change we may again find it to our advantage to fall back on the British market to dispose of our exportable surplus. There is no doubt that having the British market available during the time that the embargo has been lifted has been of untold benefit to the Canadian breeder and feeder of beef cattle, for the export business was just sufficient to relieve the home market at a time when it was badly in need of relief.

It is fortunate that the requirements on the United States and British markets are practically the same. They both demand young, thick, blocky, well-fleshed, medium-weight steers, and both prefer to finish them at home. It is again fortunate that Canada, and particularly Western Canada, is better suited to the raising of such cattle than to the finishing of them.

It would seem, therefore, that even though for economical reasons the British market is closed to us for the present time, still that is no reason for a letting down of the bars in so far as the quality of the stock produced is concerned. Rather there should be a raising of the standard of breeding through the use of better sires so that we may better meet the requirements of the export market be it the United States or Great Britain.

TABLE I.—SHRINKAGE IN TRANSIT

Lot	No. 1	No. 2	No. 3	No. 4	No. 5
Experimental Station	Scott, Sask.	Lethbridge, Alta. (Wh. faced)	Lethbridge, Alta.	Ottawa, Ont.	Ottawa, Ont.
Number of steers.....No.	22	20	20	20	20
Average weight at point of origin.... lb.	1,097	1,209·5	1,202·5	1,269·5	1,195
Average weight at Winnipeg..... lb.	1,017	1,145·5	1,131	.....	.....
Per cent shrink to Winnipeg..... %	7·30	5·3	6·95	.....	.....
Average weight reloaded at Winnipeg lb.	.....	1,188	1,165	.....	.....
Average weight arrival at Montreal. lb.	994·5	1,100	1,110	1,167·0	1,105·0
Per cent shrink to Montreal..... %	9·35	9·07	7·70	8·08	7·54
Average weight at St. John..... lb.	990	1,100	1,117·5	1,145	1,078
Per cent shrink to St. John..... %	9·76	9·07	7·07	9·81	9·80
Average weight at Glasgow..... lb.	1,011	1,108	1,114	1,173	1,120
Per cent shrink to Glasgow..... %	7·84	8·40	7·36	7·61	6·28

TABLE II.—COST OF SHIPPING 102 HEAD FROM POINTS MENTIONED TO GLASGOW VIA ST. JOHN

Lot	No. 1	No. 2	No. 3	No. 4	No. 5
Experimental Station	Scott, Sask.	Lethbridge, Alta.	Lethbridge, Alta.	Ottawa, Ont.	Ottawa, Ont.
Number of steers.....No.	22	20	20	20	20
Total charges to St. John..... $	311 57	346 13	341 53	103 81	100 24
Charges, stock-yards at St. John.... $	17 98	16 40	16 40	16 43	16 43
Handling and loading at 50 cents each $	11 00	10 00	10 00	10 00	10 00
Ropes, tools, tagging, men, etc..... $	13 86	12 60	12 60	12 60	12 60
Insurance, $140 per head at ¼%..... $	19 25	17 50	17 50	17 50	17 50
Ocean feed..... $	114 02	104 00	104 00	103 88	103 87
Excise stamps..... $	0 20	0 20	0 20	0 11	0 11
Ocean freight, 22 at $13.50 and 80 at $15..... $	297 00	300 00	300 00	300 00	300 00
Total to port of debarkation..... $	784 88	806 83	802 23	564 33	560 75
Average to port of debarkation..... $	35 67	40 33	40 10	28 21	28 03
Overseas Charges:					
Extra charges per Donaldson Bros. $	8 72	7 97	7 97	7 94	7 94
Lairage at Merklands..... $	19 80	18 00	18 00	18 00	18 00
Keep..... $	40 08	36 42	36 42	36 42	36 42
Herds..... $	10 69	9 72	9 72	9 72	9 72
Insurance..... $	.....	1 32	1 32	0 96	0 48
Commission..... $	53 46	48 60	48 60	48 60	48 60
Total charges to date of sale in Glas. $	917 63	928 86	924 26	685 97	681 91
Total charges to date of sale in Glas. per head. $	41 71	46 44	46 21	34 30	34 10

TABLE III.—PROFIT AND LOSS STATEMENT ON VARIOUS LOTS

Lot No.	1	2	3	4	5
Experimental Station	Scott, Sask.	Lethbridge, Alta. (Wh. faced)	Lethbridge, Alta.	Ottawa, Ont.	Ottawa, Ont.
Number of steers.....No.	22	20	20	20	20
Cost of steers..... $	1,716 00	1,107 40	1,107 40	1,309 12	1,276 88
Cost of feeding..... $	.....	496 40	496 40	516 17	379 32
Cost of shipping overseas..... $	784 88	804 53	804 53	562 54	562 54
Cost of sale..... $	132 75	122 03	122 03	121 64	121 64
Total cost to Glasgow..... $	2,633 63	2,530 36	2,530 36	2,509 47	2,340 38
Less surplus fodder..... $	33 70	30 66	30 66	30 66	30 66
Net cost to Glasgow..... $	2,599 93	2,499 70	2,499 70	2,478 81	2,309 72
Total return Glasgow..... $	2,270 98	2,208 50	2,203 64	2,359 53	2,268 36
Total loss per lot..... $	328 95	291 20	296 06	119 28	41 36

TABLE IV.—SUMMARY

Lot No.	Class of Steers	Average farm weights	Average Glasgow weights	Average selling price	Price per cwt. at Glasgow	Cost per cwt. at Farm less 3% shrink	Price received at Farm less 3% shrink
		lb.	lb.	£ s. d.	$	$	$
1	22 black cattle, fair to good stores.	1,097·0	994·0	22- 0- 0	10 38	7 32	5 92
2	20 white faces, mixed weights, classed as short-keep feeders and good butchers.....	1,209·5	1,108·0	23-15- 0	9 96	6 88	5 63
3	20 mixed breeds, classed as short-keep feeders and good butchers.	1,202·5	1,114·3	23-14- 0	9 89	6 87	5 60
4	20 reds, heavy butcher cattle well forward in flesh.....	1,269·5	1,173·0	24- 5- 6	10 05	7 41	6 92
5	20 roans, classed as good stores of the right type.....	1,195·0	1,120·0	23- 6- 9	10 12	7 14	6 96

TABLE V—REPORT OF SHIPMENT OF WESTERN STEERS SHOWING PRICE VARIATIONS DUE TO BREED, WEIGHT AND CONDITION

Lethbridge Steers Reported by Breed

Lot	Number of steers	Average weight feed lot	Appraised value feed lot per cwt.	Average value feed lot 3% shrinkage	Appraised value Winnipeg per cwt.	Average value Winnipeg off car weights + 2% fill	Appraised value Montreal per cwt.	Average value Montreal off car weights + 2% fill	Average weight off boat Glasgow	Average shrinkage to Glasgow	Average value Glasgow	Average price per lb. Glasgow	Average price per lb. Lethbridge 3% shrinkage
			$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	lb.	lb. %	$	cts.	cts.
Hereford	24	1,200	5 97	69 30	7 37	83 59	7 75	86 80	1,097	103 8·0	114·61	10·47	9·85
Shorthorn	9	1,217	6 08	71 21	7 27	84 44	7 75	90 11	1,138	78 6·4	115·15	10·35	9·76
Angus	7	1,211	6 03	70 78	7 35	85 12	7 75	88 22	1,125	89 7·3	117·99	10·48	10·04
Price by weights				*Lethbridge Cattle 40 Head—Reported by Weights*									
1,000—1,100	5	1,061	.....	61 77	.....	75 50	.....	76 20	965	97 9·1	106·18	10·85	10·03
1,100—1,200	12	1,146	.....	66 65	.....	80 59	.....	84 17	1,053	93 8·2	111·47	10·75	10·01
1,200—1,300	16	1,241	.....	72 78	.....	85 44	.....	90 53	1,143	98 7·9	117·47	10·42	9·83
1,300—up	7	1,331	.....	76 82	.....	92 64	.....	97 44	1,242	89 6·7	120·21	9·88	9·42
Average	40	1,206	5 84	70 03	7 25	83 87	7 80	88 04	1,111	94 7·8	114·74	10·68	9·59
				Scott Cattle 22 Head—Aberdeen Angus—Reported by Condition									
Well Fleshed	7	1,174	.....	.....	7 50	83 67	7 60	83 00	1,088	86 7·3	119·07	10·94	10·46
Medium Fleshed	11	1,087	.....	.....	6 50	67 19	7 60	76 82	986	101 9·4	105·70	10·72	10·03
Thin Fleshed	4	990	.....	.....	6 50	60 81	7 60	69 90	924	66 6·6	88·69	9·59	9·24
Average	.....	1,097	.....	.....	6 83	71 30	7 60	77 50	1,011	85 7·7	103·72	10·25	10·00

DAIRY CATTLE

The breeding of dairy cattle continues to form one of the major divisions of the live stock work conducted by the Animal Husbandry Division at the Central Experimental Farm. This is undoubtedly as it should be in view of the fact that dairying is one of the foremost branches of agriculture and is gradually increasing in importance from year to year.

At the close of the fiscal year, March 31, 1927, there were on hand 167 head of pure-bred dairy cattle made up as follows:—

——	Milch cows	Heifers	Bulls	Totals
Ayrshires	30	35	12	77
Holsteins	24	31	12	67
Jerseys	12	7	4	23
				167

This is approximately the same number as was on hand at the same time the previous year. The fact that there is no increase in numbers in spite of natural increase, is due to the closing out of the Bang (tuberculosis) herd, which is reported on elsewhere in this report, to the rigid selection which is being practised, and to the many sales and transfers of bulls.

AYRSHIRES

Central Experimental Farm Ayrshires are now well and favourably known practically from coast to coast, through the publicity that they have received in the show ring and through official records they have made. A combination of fair size, good type and consistent profitable production is the ideal that is being kept in mind, and a glance over the herd serves to show that it is being realized in no small degree. Of the 34 calves born during the year, only two were sired by the senior herd sire, "Ottawa Lord Kyle 2nd"—77050—, as every opportunity was being taken to use the good imported bull, "Shewalton Mains Supreme"—83930— before he succumbed to tuberculosis in the Bang herd. As a result, the latter bull sired 21 calves, while a son of his, "Ottawa Supreme 10th"—91809—, out of the great old producing and grand champion show cow, "Auchinbay Mina 5th," sired the other 11 calves. The quality of the calves from each bull was very good, those from the old "Supreme" bull being quite outstanding in many cases, while those from "Ottawa Supreme 10th" will undoubtedly make history for their sire. Of the 34 calves born, two were abortions, one died of white scours, while two others, twins, small and of undesirable type, were disposed of. The herd was not shown at any of the exhibitions during the year. No animals have been added to the herd by purchase, and there have been no transfers of females to Branch Farms or Stations from the herd during the year.

The bulls used in service in the herd during the year were:—

Age	Name	Reg. No.	A.R. No.	Class
5½ years	Ottawa Lord Kyle 2nd	77050	9	A
2½ years	Ottawa Supreme 10th	91809	21	AA
2 years	Ottawa Supreme 12th	92925	105	A
2 years	Ottawa Supreme 15th	94145	299	A
16 mos.	Ottawa Lord Kyle 35th	98029	187	A
14 mos.	Ottawa Supreme 20th	99327	19	AA

The five young bulls listed above are outstanding individuals themselves and are from four of the best show and producing cows in the herd, consequently the results should be of considerable interest from an Ayrshire breeding standpoint.

Production for the year has again been well maintained. The average of the five best cows, including one two-year-old, is 11,166 pounds milk, testing 3.8 per cent fat at an average age of eight years, while the average of the whole herd of 29 cows is 8,111 pounds milk, testing 3.89 per cent fat at an average age of six years. In both cases this is quite an increase over the previous year. It is to be noted that there are no exceptionally large individual records, but rather a relatively high standing on the part of the majority of the cows in the herd, thus creating a high average for the herd, which is the most profitable form of production. Comparing the three breeds, using the average production of the herd as a basis, Ayrshires again take second place in economy of milk production, third place in economy of fat production, and second place in profit over feed consumed.

HOLSTEINS

The Holstein herd continues to show improvement in uniformity of type and higher per cent fat in the milk. The two-year-old dry heifers reported last year as being a particularly likely lot with one or two exceptions lived up to expectations and are doing very well at the pail as well as holding their type. The dry two-year-old heifers this year again show much promise, while the yearlings include a few outstanding heifers. Of the thirty-four calves born during the year, twenty-four were sired by the senior herd sire, "Agassiz Sir Pietje" —51064—, seven by "May Echo Perfect," —52577—, and three by the young bull "Agassiz Priscilla Pietje" —63094—. The type and quality of the calves was good throughout, those from the older "Agassiz" bull being easily the best Holsteins ever bred at the Central Experimental Farm. The younger "Agassiz" bull was sold after breeding three cows as being of undesirable type, not passing inspection for Advanced Registry, but the three calves he sired were of quite good type and quality. Of the thirty-four calves dropped, there were no abortions, one died shortly after birth from white scours, one succumbed owing to rear presentation at calving, and two, small undesirable twins, were disposed of, so that from a reproduction standpoint, the health of the Holstein and Ayrshire herds was about equal, and may be considered good. No exhibition work has been carried on with Holsteins during the year, but the herd is now in a position to give a fairly good account of itself in the show ring. No additions have been made to the herd by purchase and there have been no transfers of female stock to Branch Farms or Stations during the year.

The bulls used in service during the year were:—

Age	Name	Reg. No.	A.R. No.	Class
6 years	Agassiz Sir Pietje	51064	5	XX
1 year	Ottawa Pietje Fayne	66931	141	X

The latter bull is an excellent son of the former one, out of the great producing and reproducing cow, "Grace Fayne Aaggie" —48612—, with records of 668 pounds of milk and 34 pounds of butter in seven days, and 21,473 pounds milk and 1,040 pounds of butter in 305 days at six years of age, dropping a calf again inside the year. Her average per cent fat over four yearly lactations during which she produced 34 tons of milk was 3.94 per cent. There are in the herd as well three excellent daughters of this great cow, each one from a different sire, and it is around this group that Holstein breeding operations are being centred at the present time, making the Holstein breeding work a most interesting problem.

The milk production of the Holstein herd is somewhat lower this year than usual, but to compensate this, the average per cent fat is higher. The yearly average of the five best cows was 14,362 pounds of milk, testing 3.71 per cent fat, at an average age of 5.8 years. The average production of the whole herd of 24 cows reported on is 10,985 pounds milk, testing 3.55 per cent butter fat, at an average age of 5.5 years. It will be seen that the tendency in this herd is towards slightly less milk production but considerably higher per cent fat, a change in a direction in which there was considerabl room for improvement. A comparison of breeds on the same basis as in the case of Ayrshires places Holsteins first in the economy of milk production, first in the economy of fat production, and first in profit over feed consumed.

JERSEYS

The Jersey herd is improved in quality but reduced in size as compared to last year. The improvement has been brought about by rigid culling, while the decrease in numbers is due first to unfortunate losses, two cows succumbing to metritis and one to " Johnnes Disease ', a disease to which the Jerseys are subject, but which is comparatively rare in Canada, and second, to very poor reproducing powers. Of the 14 calves born during the year, 11 were sired by the senior herd sire, "Castlehill Sybil's Gamboge No. 12271, A.R. No. 1, Class A, and 3 by "Ottawa Gamboge" No. 25942, A.R. 26, Class A. The quality of the calves saved was excellent, but unfortunately the number was small. Of the 14 calves born, five were abortions, and four died at or shortly after birth, apparently from infection of congenital origin. Incidentally, the above data, coupled with that of previous years, would go to show that Jerseys fed, housed and handled in the same way as the Ayrshires and Holsteins, are more susceptible to disease than are the latter breeds.

Exhibition work with Jerseys has not been taken up. No additions to the herd have been made by purchase, and no transfers of female stock have been made to branch Farms or Stations during the year. The only bull used in service during the year has been the senior herd sire, "Castlehill Sybil's Gamboge" No. 12271, but another herd sire will have to be procured at once.

Owing to trouble within the herd, the Jerseys have not made their usual good showing. The average production of the five best cows is 7,413.4 pounds of milk, testing 5.23 per cent fat, at an average age of 4.8 years, while the average production of the whole herd of 13 cows is 5,669 pounds of milk, testing 5.2 per cent fat at an average age of 5.4 years. The above average of the five best cows is considerably higher than that of the previous years, while that of the whole herd is somewhat lower than that of the previous year, yet it is very creditable under the conditions and considering the increase in the number of milkers in the herd. In a comparison with the other breeds, Jerseys stand third in economy of milk production, second in economy of fat production, and third in profit over feed consumed.

As the conditions under which breeds of dairy cattle are kept exert a definite influence on their relative economy of production, it will not be out of place to repeat in this report a section from the report of this division for the year ending March 31, 1926, covering this point.

RELATIVE EFFECT OF TYPE OF FARMING ON BREEDS

In studying the foregoing comparisons of the three breeds maintained, the effect of the unusual conditions at the Central Experimental Farm must not be lost sight of. The conditions are these: The Farm is comparatively small, some 475 acres in all, of which only some 185 acres may be considered as being

used for the regular production of crops for live stock feeding. This area is under a three-year rotation of crops and produces large yields of grain, hay, silage, root and soiling crops, but comparatively little pasture. These crops are hauled in and either fed to the cows direct or stored for later feeding. That is, an intensive system of farming is followed, the feed being brought to the cows for consumption, rather than letting the cows go to the fields to gather their own feed, as is the case on most farms during a large part of the season at least. These are conditions that do not prevail on the average farm throughout the country, particularly in newly settled and rough areas, and yet they are conditions to which the Holstein as a breed is admirably adapted. They are big cows and will consume large quantities of roughages and turn them to good account, but if they are obliged to forage for their feed over large areas of scanty pasture, they are at a disadvantage. The Ayrshire, on the other hand, is an exceptionally good forager, coming by this attribute honestly through having been originated in the hilly pastures in Scotland. On this account, Ayrshires will make a good living where Holsteins might fail. Being comparatively easy keepers, the Ayrshires are possibly inclined to lay on a little too much body fat when subjected to the intensive farming conditions so suitable to the Holstein. The Jersey breed folows the Ayshire fairly closely as regards the effect of type of farming on the relative amount and economy of production. These points should be kept in mind when comparing the relative economy of production and profit over feed as discussed in the foregoing sections.

ADVANCED REGISTRATION OF DAIRY BULLS

As was reported in the report of this division for the year ending March 31, 1926, the Advanced Registration of Dairy Bulls scheme was followed up from the start and the results to date have been most gratifying. At the close of this fiscal year bulls bred or owned at the C.E.F. had been entered in the Advanced Registry as follows:—

——	Class A	Class AA
Ayrshires	24	4
Jerseys	3	.....
	Class X	Class XX
Holsteins	8	1

In the case of Ayrshires this showing places the Central Experimental Farm Ayrshire herd at the top of the list insofar as the production of Advanced Registry bulls is concerned inasmuch as there have been more Advanced Registry bulls bred and developed in this herd than in any other single breeding herd. A creditable showing has also been made in the Holstein and Jersey herds.

One outcome of this excellent Advanced Registry showing is that there has been increased inquiry for breeding bulls with Advanced Registry backing and all surplus bulls were readily sold. It was also much more satisfactory to make sales, particularly by mail, when the animals were covered by an Advanced Registration certificate, for then the buyer had the opinion of a disinterested third party, *i.e.*, the Advanced Registration inspector, as to the value of the calf.

This work is to be followed up closely inasmuch as junior herd sires either already entered in the Advanced Registry or with Advanced Registration qualifications as soon as they become old enough, are in use in all three dairy herds.

SALES OF BREEDING STOCK

The rigid selection of females in the various herds in an endeavour to improve the type and production of the herds, means that there are not many females available for sale as breeders. As a consequence, the bulk of the sales are made up of bulls which are sold at very reasonable prices, considering their type and breeding. Many of the sales are made to parties in outlying districts who are purchasing pure-bred sires for the first time, consequently, this policy has a tendency to open up new markets for pure-bred breeding stock, both male and female. During the year twenty-six breeding bulls were sold, this number being made up of fifteen Ayrshires, nine Holsteins and two Jerseys. In the case of the Ayrshires, four were Class A bulls and one a Class AA bull. The Holsteins were for the most part sold while under age for Advanced Registration inspection.

TUBERCULOSIS ERADICATION AND THE BANG HERD

The health of the herd from a tuberculosis standpoint has been good. There have been no reactors in the main herd since September, 1924. However, as the Bang herd was still in existence on a nearby farm, an Accredited Herd Certificate has not been issued for this herd to date, even though it has the necessary three clean test standing.

There were no additions to the Bang herd during the year, and as the numbers in the herd had fallen quite low, due to a number of the animals having been removed on account of having reached an advanced stage of tuberculosis, it was decided to close it out at the close of the fiscal year. As a consequence, it is possible at this time to give a further report on the operation of this Bang herd, covering the period from November 1, 1921, to March 31, 1927. A statement covering the period from December 1, 1916, to November 1, 1921, will be found in the report of this Division for the year ending March 31, 1922, with which the reader should become familiar to thoroughly appreciate this one, as in this previous statement the reason for establishing the herd and the methods followed are outlined in detail.

FINAL STATEMENT ON BANG HERD

Cost of Operation and Returns, November 1, 1921, to March 31, 1927

Milk valued at	$2.25 per cwt.
Manure valued at	$2.00 per ton
Calves valued, according to breeding, at one week of age.	
Prices charged for feeds (Average cost during period)	
Meal mixtures	$32 00 per ton
Silage	3 30 "
Roots	3 75 "
Hay	7 40 "
Green feed	6 25 "
Beet pulp	32 00 "
Pasture	2 00 per month
Straw (bedding)	4 00 per ton

TABLE I—COST OF OPERATION AND RECEIPTS FROM BANG HERD, NOVEMBER 1, 1921, TO MARCH 31, 1927

Receipts—		
Value of milk	$17,939 25	
Value of calves	4,360 00	
Value of manure	1,791 00	
Gross returns		$24,090 25
Expenses—		
Feed	$ 6,326 00	
Pasture	390 00	
Straw	298 00	
Rent of buildings	406 25	
Labour	6,500 00	
Gross expenses		$13,920 25
Profit		$10,170 00

From the foregoing financial statement, it will be seen that the operation of the Bang herd has been fairly profitable during the period mentioned.

The following table gives a list of the cows in the Bang herd, the calves they produced since November 1, 1921, value of same and disposal:—

TABLE II—PROGENY

Name of Cow	Number calves born alive	Value	Number calves that died	Number calves that never reacted	Number reacting	Number in herd	Number sold
Helena Keyes Posch	4	$ 300	1	4		2	1
Ottawa Pietertje Ormsby	1	60			1		
Korndyke Canary Butter Maid	2	250		2		2	
Ottawa Woodcrest Lyn	2	200		2		1	1
Canaan Beauty 2nd	1	50	1	1			
Lulu Posch Regina	2	125		2			2
Maud of Fernbrook 5th	3	175	1	3		1	1
Lyon Segis Helena Keyes	1		1	1			
Culcaigrie Dot	1		1	1			
Dunlop Betsy	2	30		2			2
Ottawa March Posch	3	250		3		1	2
Catlin's Barbara	4	550		4		3	1
Old Hall Maggie 9th	5	450	1	5			4
Starlight of Fredericton	3	130	1	3		1	1
Midnight Jewel DeKol	4	500		4		2	2
Johanna Helena Keyes	4	265		4		3	1
Morningside Bessie	3	225		3		2	1
Lady Segis Jewel	3	220		2	1	1	1
Sarah Ann Pontiac	3	230		3		1	2
Lady Hartog Burke	2	350		2		2	
Total	53	4,360	7	51	2	22	22

It will be seen that fifty-three live calves were dropped, of which number seven died before reaching the age of six months. It is noteworthy that of the fifty-three calves born alive, only two to date have reacted to the tuberculin test. In these two cases, the animals were from dams that were in advanced stages of tuberculosis, and consequently may very well have contracted tuberculosis in utero. The remainder of the calves have either been retained in the herd as breeders, been sold for breeders, or been sold for veal. Twenty-two individuals dropped in the Bang herd are in the main herd at the present time, and two or three particular individuals alone are worth sufficient individually and in breeding value to warrant having carried on the Bang herd during the last four and a half years. It will be seen also that much better results in the saving of calves were obtained in the last four and a half years than in the previous period reported on in 1922.

Table III gives the post mortem results on all animals slaughtered from the Bang herd and also on a number that died in the Bang herd on which it was possible to obtain a post-mortem.

TABLE III

Cow	Date reacted	Date killed, died or disposed of	Total months in Bang Herd	Post Mortem Results
Helena Keyes Posch	Feb. 8, 1918	K.—Nov. 11, 1925	81	Lesions in mediastinals, lungs and liver; quite definite but not advanced.
Ottawa Pietertje Ormsby	May 2, 1918	K.—Aug. 14, 1922	51	Generalized case—spreader—carcass condemned.
Korndyke Canary Butter Maid	May 19, 1919	K.—Oct. 30, 1924	59½	Retro-pharyngeal glands extensively caseous, small lesions, mediastinals and bronchials.

TABLE III—*Concluded*

Cow	Date reacted	Date killed, died or disposed of	Total months in Bang Herd	Post Mortem Results
Ottawa Woodcrest Lyn..	Mar. .., 1920	D.—April 19, 1924	49½	Died of digestive trouble, both bronchials, all mediastinals caseous.
Canaan Beauty 2nd.....	Mar. .., 1920	K.—Feb. 1, 1924	47	No visible lesions.
Lula Posch Regina.....	April 23, 1920	K.—Oct. 30, 1924	54	No glands affected, but generalized case of pearly tuberculosis, possible spreader, condemned carcass.
Beauty of Oaklawn.....	April 23, 1920	K.—Mar. 27, 1922	23	Both bronchials purulent open lesions; abscess in liver, doubtful if T.B., carcass O.K.
Dalwhatswood Blossom 2nd.....	June 18, 1920	K.—Feb. 1,1924	43½	Bronchials, mediastinals, lungs and mesenteric all badly infected. Open case, bronchial gland size of goose egg —a spreader.
Maud of Fernbrook 5th..	Nov. 15, 1920	K.—Nov. 11, 1925	60	Slight lesions in lungs, bronchials, mediastinals and retro-pharyngeal glands, abscess on liver.
Lyon Segis Helena Keyes	Feb. .., 1920	K.—Nov. 11, 1925	69	Lesions in lungs, liver and bronchials, abscess on liver, not very extensive.
Culcaigrie Dot.....	May 15, 1920	K.—Nov. .., 1923	36	Generalized case, carcass condemned.
Hairshaw Tibbie.....	Nov. 15, 1920	K.—June 20, 1923	31	Bronchials, mediastinals, lungs, pleura, peritoneum, portal, mesenteric, liver, udder all affected, open gen, eralized case, but cow id good condition—a spreader, carcass condemned.
Dunlop Betsy.....	Nov. 15, 1920	K.—Oct. 30, 1924	47½	Retro-pharyngeal gland had extensive caseo—calcified lesions, none in other parts of body.
Ottawa March Posch....	Feb. .., 1920	K.—Oct. 30, 1924	56	Retro-pharyngeal,mediastinal, bronchial and mesenteric glands affected.
Beauty Tensen.....	Nov. 15, 1920	K.—Mar. 27, 1922	16½	No lesions found in any of usual glands.
Catlin's Barbara.....	July 12, 1920	Living.....	80½	Held over for another calving.
Old Hall Maggie 9th.....	Nov. 15, 1920	Living.....	76½	Sent to Research Station, Hull, Que.
Starlight of Fredericton.	Dec. .., 1920	K.—Aug. 10, 1926	68½	Severe generalized case of tuberculosis. One of the worst.
Midnight Jewel DeKol..	April 23, 1920	Living.....	81½	Sent to Research Station, Hull, Que.
Johanna Helena Keyes..	May 17, 1921 Purchased	D.—May 28, 1926	60½	No post mortem for T.B. lesions.
Morningside Bessie.....	May .., 1924 Purchased	D.—Feb. 24, 1927	33	Lesions in bronchial and mediastinal glands and on lungs.
Lady Segis Jewel.....	Nov. .., 1923 Purchased	D.—April 20, 1926	29	Slight T.B. lesion in mediastinal gland only.
Sarah Ann Pontiac.....	Nov. .., 1923 Purchased	K.—Mar. 25, 1927	40	Generalized case tuberculosis.
Lady Hartog Burke.....	Mar. .., 1924	Living.....	36	Sent to Research Station, Hull, Que.
*Ottawa Lady 2nd.....	.....	K.—May 4, 1927	16⅔	Lesions in the retro-pharyngeal, bronchial, mesenteric, and altoid glands.
*Ottawa Francy Bos DeKol.....	.....	Living.....	16⅔	Sent to Research Station, Hull, Que.
*Korndyke Posch Canary	.....	Living.....	16⅔	Sent to Research Station, Hull, Que.
*Ottawa March Francy..	.....	Living.....	16⅔	Sent to Research Station, Hull, Que.

*Non reactors. Sent to Bang Herd Nov. 11, 1925.

It will be seen that there was considerable variance as regards condition of the animals at death. One animal, "Helena Keyes Posch," that had been in the herd eighty-one months, was only comparatively slightly infected. Another, "Sarah Ann Pontiac," only in the herd forty months, proved to be a generalized case of tuberculosis. Still another, "Hairshaw Tibbie," only in the herd thirty-one months, and in good condition at time of slaughter, proved to be a generalized case also—a spreader of the worst kind. These results are in accord with those obtained up to November 1, 1921, and go to show that the factor of resistance to the disease is linked up with the individual resistance of the animal and not dependent on the proximity and severity of the infection.

The remnants of the herd have now been turned over to the Health of Animals Branch Research Station, Hull, P.Q., for use in their tuberculosis experimental work.

In summarizing, it may be said that the conclusions arrived at in our previous report are borne out by the results obtained in the last four and a half years with the exception that the Accredited Herd System of the Health of Animals Branch has made and is making such repaid strides, and there are so many Accredited areas throughout the country with more being projected each year, that it is now questionable if it is a good policy to maintain a Bang herd. In the first place, every Bang herd in a community is a source of danger in that community, no matter how carefully it may be guarded. Secondly, there are so many fully accredited herds and districts that it is not so difficult as it was to obtain breeding stock with which to replace any losses within a herd.

SUMMER FEEDING

The heifers and some of the dry cows of all three dairy breeds were pastured on the vacant land in the vicinity of the Connaught Rifle ranges during the grazing season of 1926. Ample area and a good grass season were responsible for these cattle being stabled in the fall in excellent condition.

As in other years, the main herd of milch cows was carried under rather intensive farming conditions. That is, owing to a shortage of land, the herd of some fifty or more milch cows has only seven acres of pasture, which after the first month or six weeks, becomes little better than a parade ground. These are therefore charged up with not more than two months' pasture in the year. Corn silage and clover hay of the previous year's crops form the bulk of the roughage fed during the summer months. These are supplemented by soiling crops of wide and varied character. Grain of necessity must be fed throughout the summer months, and consists of a well-balanced, home-mixed grain mixture made up of such feeds as bran, ground oats, gluten feed, distillers' or brewers' grains, cottonseed meal or oil cake meal, the particular grains used depending on their economy at the time they were purchased. The dry cows of the milk herd are for the most part given a pasture separate from the milk cows and not fed any grain, for their liberal grain rations throughout their lactation periods ensures their coming through in good condition.

WINTER FEEDING

The winter ration consisted largely of the corn silage and roots with a somewhat limited supply of mixed alfalfa and clover hay. Were a larger area of land available for the growing of roughages for dairy cattle, more pure alfalfa hay could be grown, thus supplying much more of the protein that now is supplied in the form of costly protein-rich concentrates. The addition of larger amounts of well-cured protein, mineral and vitamin carrying roughages would, in turn, have a decidedly beneficial effect on the health, production and reproduction of the herd.

As it is, mineral deficiencies in the ration through lack of sufficient pasture and lack of sufficient leguminous roughages for winter feeding, have to be made up by adding minerals to the ration. The grain ration is made up of bran, which is very rich in phosphorus, and such other feeds as have already been mentioned as being used in summer feeding. To the mixture thus obtained is added one per cent of iodized salt and two per cent of bone char as outlined in the previous report of this Division.

The roughage is fed at the rate of from 25 to 35 pounds of corn silage and from 8 to 10 pounds of hay daily, this being supplemented by from 25 to 40 pounds of roots daily in the case of the fresh, heavy-producing cows.

The grain ration is fed at an average rate of one pound for every 3½ pounds of milk produced, the fresh heavy producing cows getting slightly more and those that are advancing in their lactation period slightly less. Dry cows and dry two year old heifers get roughages only unless grain is needed to put them in good condition for freshening. Yearling heifers are cheaply wintered on silage and mixed or range hay, this being sufficient to carry them through in good growing condition, when they came in in good condition in the fall, and were properly cared for as regards eradication of lice, etc., early in the winter Partial clipping and the eradication of lice soon after stabling go a long way in reducing the cost of wintering heifers.

The system of feeding followed should be of interest to many readers, inasmuch as many enquiries are received regarding the best time to feed, *i.e.*, whether dairy cows should be fed two or three times a day. The procedure is as follows: The men come to the barns at 5.30 a.m. and the first thing they do is scrape down any manure on the cow stands into the gutter and then spread the bedding around a little where necessary, making as little stir and dust as possible. Then, they proceed with the milking. As soon as the milking is finished, the cows are fed one-half their daily silage ration with one-half their daily grain ration on top. While feeding is going on, other men are cleaning out the gutters behind the cows. The men then go to breakfast and when they return they give the cows a feed of hay,—rather less than half the daily ration. If roots (mangels) are being fed, they are given whole on top of this hay and the cows do their own pulping, except in the case of animals with poor teeth, in which case the roots are pulped for them. It is usually found more practical to give the cows the whole of their daily ration of roots at this time. While the cows are eating their hay, the stalls are bedded down with straw and the stables are swept up. The cows are then groomed, the aim being to get this work all done as early as possible in order to let the cows lie down and rest, which they may do from 10 or 10.30 a.m. until on in the afternoon if they so desire. They are not disturbed any more than is necessary during this time unless it is to turn them out in the yard for an hour or so on fine, sunny days. If this is done, it should be when the sun is at its height, so that the cows may get the full beneficial effect of the sunlight on mineral metabolism within the animal.

Feeding is started again between 2.30 and 3 p.m., at which time the cows receive the other half of their daily silage and grain ration. While they are feeding, the stables are again cleaned out and the bedding shaken down, making as little dust as possible. At 4 or 4.30 p.m., milking is started and as soon as it is finished, the cows receive their final feed for the day, which consists of hay—a good heavy feed being given to carry them through with something to ruminate on during the long period between this feeding and the first one next morning. The last thing before the men leave the barns, the cow stalls are again cleaned down and the bedding rearranged. In the course of the evening, the herdsman takes a look through the stable to see that everything is in order, and at this time, he sees that all the hay fed earlier is within reach of the cows so that they may finish it up.

The only variation from this procedure is when some cows are milked three times daily. This is done only with extra heavy milking cows and then only for a period of one or two months when the heaviest flow of milk is on. Cows milked three times a day are milked first thing in the morning, at 1 p.m., and again at 9.30 or 10 p.m. As a general rule, they are not given any extra feeding during the day, but usually they receive either a pail of mash or a feed of dry grain and pulped roots at the time of the evening milking.

The foregoing is a fairly well ordered system of feeding and is not by any means new, as it is one that is practised by many leading dairymen. It is really twice-a-day feeding, with two feeds being given at a feeding. As such, it has many advantages over three-times-a-day or morning, noon and night feeding. Some of these advantages might be enumerated as follows:—

First. Allows a period between feeds during which the cows may be at absolute rest and therefore make the best use of their feeds. The cows' four capacious stomachs and faculty of rumination lend themselves most admirably to this system of feeding, while on the other hand, they are liable to be upset by too continuous or too frequent feeding and disturbance.

Second. This system of feeding, particularly on the small or average-sized farm where the same men have to do both the inside and outside work, releases the men for out-door work around the farm during the late morning and early afternoon period. It also enables the chores to be finished up promptly at night.

Third. It has the advantage that all dusty feed, such as hay, is fed after milking, and therefore the barn air is not dust laden at milking time.

CALF FEEDING

The increased demand from the United States during the latter part of this fiscal year for both dairy cows and their products, milk and cream, and the fact that there is every evidence of a continuance of the same, means that there will be a keen demand and therefore a period of high prices for both in the near future. As a consequence, it is bound to be profitable for our dairy farmers in Eastern Canada to raise their heifer calves. The degree of profit will depend on two things: the quality of the calves raised and the economy and thoroughness of the raising. The quality of the calves raised will, in turn, depend on the quality of the bulls used, so that the best bulls obtainable should be placed at the head of the herd and only the calves from the better cows in the herd raised. It costs just as much to raise a poor one as a good one, so it is poor economy to raise the former. The economy and thoroughness of the raising depends to a large extent on the methods of feeding, consequently an outline of the method followed in calf raising at the Central Experimental Farm, where the calves are always in nice bloom and develop into good large cows, will not be out of order at this time.

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The calves are taken away from their dams as soon as dropped as a general rule. This makes for less trouble later on on the part of both the calf and its dam than when the calf is left to suckle its dam for a day or two. The precaution is taken, however, of feeding the calf its own dam's milk so long as that milk is not fit for human consumption. By so doing, the calf gets a feed of the first milk or colostrum, which has a very beneficial effect on the digestive tract of the young calf, as it acts as a purgative and cleans it out. If for any reason it should not be possible to give the calf a feed of this first milk or colostrum, then it should receive a feed of milk from some other comparatively fresh cow. If this is not available either, the same results can be obtained by giving a dose of castor oil in the milk that is available. Up to two ounces may be given in this way. The feeding of the colostrum or giving of castor oil has the effect of rapidly cleansing the intestinal tract and thus warding off a possible attack of white scours. If white scours develops, the milk ration is materially reduced or cut out completely, depending on the severity of the case, and a further dose of castor oil is given, followed later by a milder purgative, such as milk of magnesia. At the same time the calf is given a rectal injection of normal salt solution, i.e., one ounce of salt in one quart of warm water. A few drops of Lugol's solution added to the water will also have a beneficial effect. This treatment, when used promptly on first sign of sickness, will usually check the progress of the disease. Care should be taken with any calf and especially with one that does not seem too hearty not to feed it too heavily the first week or two. Too much milk is often worse than too little. Ten to twelve pounds per day of whole milk is usually sufficient for the largest calves. One thing that should be kept in mind is that, apart from the colostrum, any milk that is not fit for human consumption is not fit for calf feeding. Milk from a diseased udder is usually teeming with bacteria and is not fit for food for any animal unless first pasteurized. Similarly, old milk, sour milk, bloody milk, etc., are not fit to feed to calves.

Whole milk feeding is continued for the first four to eight weeks, depending on the strength and vigour of the calf, the strong, healthy calf being better able to use skim-milk at an early age than the weak, sickly one. The change from whole milk to skim-milk is made gradually over a period of one or two weeks. At the same time that the skim-milk is being introduced to the ration a little calf meal that is rich in fat is introduced to take the place of the fat removed from the whole milk in the cream.

This very necessary fat is supplied in the form of flax seed meal scalded until it forms a jelly. The pure flax seed meal may be used for very young calves gradually introducing other ingredients until a balanced calf meal is being fed. Such a meal may be composed as follows:—

No. 1—	
Flax seed meal	1 part
Ground sifted oats or feeding oat meal or oat middlings (good quality)	2 parts
Fine ground corn	2 parts
No. 2—	
Flax seed meal	1 part
Ground hulless oats	2 parts
Ground peas	1 part
Ground sifted oats	1 part

While the pure flax seed meal is the best for very young calves, owing to the extra labour involved, when there are calves of different ages, in making up separate lots of calf meal, all calves are fed on the same calf meal, using one such as the above, and starting the calves on it very gradually. The meal is prepared by stirring it into a pail of scalding hot water, being careful to avoid lumpiness, until sufficient thick gruel or porridge is obtained for the feeding of the calves on hand. Sufficient is made up at one time, usually in the morning,

to feed the calves that night and the next morning. It will hold its heat fairly well if covered, but if it becomes cold, it is soon warmed up again when put in the warm skim-milk. The calves are started with about a tablespoonful of this thick gruel or porridge at a feed, gradually increasing the amount fed until they are getting a good sized cupful at a feed at three to four months of age. It is fed in the skim-milk and the calves get from twelve to fifteen pounds of skim-milk per day. Care is taken that the calf meal is made up uniformly from day to day, and that the amount fed is uniform from day to day, and always at the same temperature. This is accomplished by using a measuring cup for the scalded calf meal and a quart measure for the skim milk.

Where skim milk is not available, the same procedure may be followed, simply carrying the whole milk feeding for a little longer period, gradually reducing the amount and substituting with water until at three to four months of age the calf is only getting enough whole milk to colour and flavour the drink enough to make the calf take it.

At the same time that the calves are being introduced to the skim milk and calf meal, they are taught to eat a little of a dry grain mixture. This is made up of a number of grains, usually somewhat as follows:—

Ground oats	1 part
Bran	2 parts
Distillers' grains (corn)	1 part
Oil cake meal	1 part

This is started in very minute quantities and increased up to two pounds per day at four to five months of age. The calves are also taught to eat hay *ad libitum* at as early an age as possible. The hay consists of second cut alfalfa saved as well as it is possible to save it, i.e., carrying as much of the leaf as possible. When such hay is available, there need be no anxiety as to mineral deficiency for alfalfa carries large quantities of lime and it and the bran provide plenty of phosphorous. If, on account of lack of alfalfa or other legume hays, it is felt that minerals are lacking in the ration, two per cent edible steamed bone meal or two per cent bone char, the latter obtainable from the sugar refineries, is added to either the calf meal or the dry grain ration.

As long as the calves are getting plenty of skim milk, other succulence is not very necessary in the ration until the calves are four or five months old.

At this time or earlier, if necessary, the calves should be taught to eat either silage or roots, beginning with very small quantities and increasing the amounts as the capacity of the calves to handle the same, increases.

Under this ideal system of feeding the calves will make rapid growth while still young when the growth can be made cheapest. The feeder will need to watch carefully to see that these calves do not begin to lay on fat, rather than grow. At the first sign of this, usually evidenced by excessive thickness around the throat and by excessive development of the udder in heifers, the grain ration should be reduced or cut out entirely and the calves carried along on a good roughage ration of hay and silage or roots. Particular care should be taken in this connection for thickness in the throat if allowed to continue may become permanent and fleshiness in the udder in young calves may lead to early breaking down of the udder in these animals later.

It will be found that if the calves are well started in life, particularly during the first six months, that they will require little, if any, grain feeding thereafter, until approaching first calving, to develop them into big, strong dairy cows, that will make profitable producers or command profitable prices when offered for sale.

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COMPARISON OF HOME-MIXED VS. COMMERCIALLY PREPARED DAIRY FEEDS

There being considerable inquiry as to the feeding value and economy of commercial dairy feeds, it was decided to conduct trials along these lines using as a start a commercial dairy feed quite widely advertised in the fall of 1926, namely, the Quaker Dairy Ration, comparing it with a home-mixed dairy ration.

The Quaker Dairy Ration was guaranteed to contain not less than 18 per cent crude protein, 5 per cent crude fat and not more than 12 per cent crude fibre, and to be made up of oilcake meal, cottonseed meal, steamed bone meal, hominy feed, gluten feed, oat feed, Standard recleaned screenings, barley meal, salt and calcium carbonate. The proportions of these numerous ingredients are not stated. The cost was $39.25 per ton, f.o.b. Ottawa.

The home-mixed ration was made up as follows:—

Bran	200 lbs.	.....	$26 00 per ton
Ground oats	200 "	.....	0 60 per bush.
Dried brewers' grains	400 "	.....	28 60 per ton
Cottonseed meal	100 "	.....	45 00 "
Oil meal	100 "	.....	49 50 "
Bone char	22 "	.....	15 00 "
Salt	11 "	.....	29 50 "
Ground lime stone	11 "	.....	10 00 "
Average cost			$32 00 per ton

Representative samples of these two feeds were taken and submitted to Dr. F. T. Shutt, Dominion Chemist, for analysis, with the following results:—

——	Quaker Dairy Ration	C.E.F. 1926-27 Mixture
Moisture	8·41	7·93
Protein	19·49	19·05
Fat	5·62	3·14
Carbohydrates	49·63	50·54
Fibre	10·51	12·17
Ash	6·34	7·17
	100·00	100·00

From the above and Dr. Shutt's remarks, quoted herewith, it will be seen first that "this feed (Quaker Dairy Ration) meets its guaranteed analysis very satisfactorily," and second, that "judged solely from the analytical data, this feed (C.E.F. 1926-27 mixture) would be slightly inferior to the Quaker Dairy Ration; it contains about .5 per cent less protein, nearly 2.5 per cent less fat and about 1.5 per cent more fibre."

A group of cows consisting of ten Holsteins and six Ayrshires were designated for the experiment, which was divided into three periods, during which the following rations were fed:

——	Holsteins	Ayrshires
Period 1—Feb. 7-27	Corn silage	Corn silage.
	Roots	
	Clover hay	Clover hay.
	C.E.F. meal	C.E.F. meal.
Period 2—Feb. 28 to March 20	Corn silage	Corn silage.
	Roots	
	Clover hay	Clover hay.
	Quaker Dairy Ration	Quaker Dairy Ration.
Period 3—March 21 to April 10	Corn silage	Corn silage.
	Roots	
	Clover hay	Clover hay.
	C.E.F. meal	C.E.F. meal.

The amount of meal to be fed per cow per day was determined at the start of the experiment and continued throughout the experiment. The roughage rations of silage, roots and hay were kept constant throughout. The milk was sampled for butterfat test over a four day period during the third week of each period. The third week in each period only was used for computation of data, the first two weeks being allowed for transition from one ration to another.

The following gives the data obtained:—

QUAKER DAIRY MIXTURE VS. C.E.F. MEAL MIXTURE

Period		I	II	III	Average I and III
Experimental Ration		C.E.F. Meal	Quaker Dairy Ration	C.E.F. Meal	C.E.F Meal
Number cows in experiment	No.	16	16	16	16
Duration of test	days	7	7	7	7
Milk produced first 7 days	lb.	3,687·50	3,607·00	3,208·00	3,447·75
Milk produced second 7 days	"	3,869·00	3,530·50	3,219·00	3,544·00
Milk produced last 7 days	"	3,598·50	3,289·50	3,143·50	3,371·00
Average per cent fat last 7 days	%	3·76	3·42	3·78	3·77
Total fat produced last 7 days	lb.	135·22	112·55	119·00	127·11
Total hay consumed at $8.40 per ton	"	1,092·00	1,092·00	1,092·00	1,092·00
Total silage consumed at $2.85 per ton	"	3,780·00	3,780·00	3,780·00	3,780·00
Total roots consumed at $4.15 per ton	"	3,920·00	3,920·00	3,920·00	3,920·00
Total Quaker Dairy Ration consumed at $39.25 per ton	"	.....	952·00	.....	.....
Total C.E.F. meal consumed at $32 per ton	"	952·00	.....	952·00	952·00
Total Quaker Dairy Ration consumed per 100 lb. milk	"	.....	28·94	.....	.....
Total C.E.F. meal consumed per 100 lb. milk	"	26·45	.....	30·28	28·36
Cost of meal fed	$	15 23	18 68	15 23	15 23
Cost of roughage fed	$	18 11	18 11	18 11	18 11
Total cost of feed	$	33 34	36 79	33 34	33 34
Feed cost to produce 100 lbs. milk	$	0 93	1 12	1 06	0 99
Feed cost to produce 100 lbs. fat	$	24 65	32 69	28 02	26 33
Profit over feed with fat at 40 cents per pound	$	20 74	8 23	14 26	17 50

DEDUCTIONS FROM THIS EXPERIMENT

From the foregoing data it will be observed that in spite of the fact that the Quaker Dairy Ration was shown chemically to contain the most nutrients, nevertheless the C.E.F. meal ration produced 71.5 pounds or 2.5 per cent more milk and 14.56 pounds or 12.9 per cent more fat. The only logical explanation

of the failure of the Quaker Dairy Ration to produce milk and fat as efficiently as the C.E.F. meal ration is that the proteins, carbohydrates, and fats, more particularly the protein, were neither of as good quality nor as digestible as those in the C.E.F. meal ration. Quality of the proteins in a ration is an important consideration in buying feeds, and it stands to reason that one would hardly expect to find as good quality protein in a mixed feed sold as a vehicle to dispose of low grade by-products, such as oat feed and standard recleaned screenings, as one would find in a mixture of standard by-products, such as is used in the C.E.F. meal. In this connection, it must be kept in mind that the ingredients of this commercially mixed feed are stated, but the proportion is not stated, so that the feed may be made up quite largely of the lower quality by-products mentioned above.

The second point of importance is that in addition to being somewhat inferior from a production standpoint, in spite of a higher analysis, the Quaker Dairy Ration has the added disadvantage of being more expensive than a good home-mixed ration. It will be noted that there was a difference in cost per ton of $7.25 in favour of the C.E.F. meal, both the Quaker Dairy Ration and the C.E.F. meal being charged at carload prices. This increased cost, together with the poorer quality of the Quaker Dairy Ration, increased the feed cost of milk production 13 per cent, and the feed cost of fat production 24 per cent when this ration was used.

It would appear, therefore, that if the dairyman who must purchase concentrates to balance his home-grown feeds would purchase standard mill feeds and factory by-products of known quality and mix these in the proper proportions, he would find the procedure more economical than to purchase ready mixed feeds that may analyze well but be made up of such poor quality products that poor results are obtained. It is only fair to state, however, that the case against commercial mixed feeds is one of price rather more than it is one of quality. In this instance, fair returns were made which would have been profitable had the feed been purchased at a price any where near in comparison with its value.

COMPARISON OF CORN SILAGE AND ROOTS VS. ROOTS ALONE

This experiment was conducted to obtain further data *re* the relative value of corn silage and roots for feeding dairy cattle. Four Ayrshire cows and six Jersey cows were designated for this experiment which was divided into three periods of three weeks each during which the following rations were fed:—

——	——	Ayrshires	Jerseys
		lb.	lb.
Period 1—February 14 to March 6	Corn silage	30	26·0
	Roots	50	40·0
	Clover hay	9	8·0
	Meal (average)	10	7·33
Period 2—March 7 to March 27	Roots	120	100·0
	Hay	9	8·0
	Meal (average)	10	7·33
Period 3—March 28 to April 17	Corn silage	30	26·0
	Roots	50	40·0
	Hay	9	8·0
	Meal (average)	10	7·33

The hay and meal rations remained constant throughout the experiment, the only change being in the succulent roughage fed. Samples of the silage and roots fed were taken and submitted to Dr. Shutt, Dominion Chemist, for analysis, his report on same being as follows:—

——	Laboratory No. 88455 — Corn Silage used in Period 1 14-3-27	Laboratory No. 88456 — Roots used throughout 14-3-27	Laboratory No. 88794 — Corn Silage used in Period 3 12-4-27
Water	78·95	89·83	82·20
Protein	2·0	1·18	1·88
Fat	0·69	0·13	0·72
Carbohydrates	9·82	6·78	8·19
Fibre	7·0	0·87	6·06
Ash	1·54	1·21	0·95
	100·0	100·0	100·0
Acidity	3·28		2·38

The milk was sampled over a four day period during the last week of each period to determine the total butter fat production. Data for the computation of tables was taken during the third week of each period only, the first two weeks being considered a transition period from one feed to another. The results from period 1 and period 3 were averaged and compared to the results in period 2, thus eliminating the effect of natural decline in milk flow. The following table gives the data obtained:—

Period		I	II	III	Average I and III
Experimental Ration		Corn Silage and Roots	Roots only	Corn Silage and Roots	Corn Silage and Roots
Number of cows in experiment	No.	10	10	10	10
Duration of test	days	7	7	7	7
Milk produced first 7 days	lb.	2,043·00	2,074·00	1,805·00	1,924·00
Milk produced second 7 days	"	2,053·50	2,039·00	1,769·00	1,911·00
Milk produced last 7 days	"	2,063·00	1,934·00	1,745·50	1,904·00
Average per cent fat in milk	%	4·61	3·41	4·19	4·42
Total fat produced	lb.	95·10	65·95	73·14	84·12
Total meal consumed at $32 per ton	"	588·00	588·00	588·00	588·00
Total hay consumed at $8.40 per ton	"	588·00	588·00	588·00	588·00
Total roots consumed at $4.15 per ton	"	3,080·00	7,560·00	3,080·00	3,080·00
Total silage consumed at $2.85 per ton	"	1,932·00	.....	1,932·00	1,932·00
Total roots consumed per 100 lb. milk	"	149·00	390·00	176·00	162·50
Total silage consumed per 100 lb. milk	"	93·00	.....	110·00	101·50
Cost of meal fed	$	9 41	9 41	9 41	9 41
Cost of hay fed	$	2 47	2 47	2 47	2 47
Cost of roots fed	$	6 39	15 69	6 39	6 39
Cost of silage fed	$	2 75	.....	2 75	2 75
Total cost of feed	$	21 02	27 57	21 02	21 02
Feed cost to produce 100 lb. milk	$	1 02	1 42	1 20	1 11
Feed cost to produce 100 lb. fat	$	22 10	41 80	28 74	25 42
Profit over feed, milk at $1.75 per cwt	$	15 08	5 27	9 94	12 51
Profit over feed, fat at 40 cents per lb	$	17 02	—1 19	8 23	12 62

DEDUCTIONS

From the foregoing data it will be seen that the straight root ration produced slightly more milk in the final period of the experiment than the ration

composed of roots and silage. It will be seen also that the feeding of a straight root ration as in period two apparently has a tendency to decrease the percentage of fat in the milk as compared to a ration composed of roots and silage. In this case, the difference in favour of the roots and silage ration amounted to 21.6 per cent. Further, it will be noted that while the root ration gave the greatest yield in milk, the cost of production of roots was so much higher than that of corn silage that the latter crop gave the lowest cost of production and the greatest profit over feed with both milk and fat.

The above results in amount of fat production bear out results obtained in 1923 and 1924, but do not coincide with results obtained in 1925, on which occasion roots produced slightly more fat than a silage ration.

In the above experiment for milk production purposes 4,431 pounds of roots proved equal to 2,062 pounds silage, 9 pounds hay and nine pounds meal, giving roots a valuation of only $1.40 per ton with other feeds at prices charged.

"SUGAR JACK PROCESS' FEEDING EXPERIMENTS

During the year, experiments were conducted to test the practicability and economy of the "Sugar Jack" system of feeding, a patented process which consisted of passing rough dried roughages, such as stook corn, corn fodder, clover threshings, poor quality hay and straw, previously chaffed, through a small silo open at the bottom end. As the material was put into the upper end of this small silo, it was moistened with a preparation called "Sugar Jack Converter", which is supposed to act on the feed as it passes down and make it more digestible and palatable. The silo had to be filled every day and two to three days was required for the feed to pass through the silo and become processed.

The results of these experiments conducted in conjunction with the Divisions of Bacteriology and Chemistry, are reported in a special bulletin, No. 96, New Series entitled "The Preparation of Farm Roughages—An Examination of the Sugar Jack Process," which may be had on application to the Publications Branch, Department of Agriculture, Ottawa.

DAIRY HERD RECORDS OF PRODUCTION

Following will be found a table giving the milk and fat production and feed consumption records for all cows and heifers which have finished a normal lactation period during the year ending March 31, 1927. Also a table giving the average production of the five best cows of each breed and of the whole herd of each breed for the same period.

In the case of heifers with their first calves, charges for feed include the consumption from a date approximately two months prior to parturition to the time of being dried off preparatory to their second calving. In the case of cows with their second calves, charges for feed include the period from the time of drying up at the end of the previous lactation period to the end of the lactation period herein reported.

In estimating the cost of feeds, the following values were used:—

Pasture per month	$ 2 00	
Meal and other concentrates	32 00	per ton
Hay	8 40	"
Roots	4 15	"
Silage (corn)	2 85	"
Green feed	7 25	"

These values represent the cost of production in the case of home-grown feeds and the actual cost price in the case of mill feeds, factory by-products, etc. that are purchased.

In calculating the value of the product, the actual cash values were used, which amounted to forty-two cents per pound for butter and thirty cents per hundredweight for skim milk.

The labour of caring for the cattle, the cost of manufacture of the butter, etc. have not been taken into consideration. On the other hand, the value of the manure and the value of the calves at birth will offset these items, though probably not sufficiently to cover other overhead charges, such as interest, depreciation, etc.

Name and Breed of Cow	Age at commencement of lactation period	Date of dropping calf	Number of days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average p.c. fat in milk	Pounds of butter produced in period	Value of butter at 42c. per pound	Value of skim milk at 30c. per cwt.
			days	lb.	lb.	%	lb.	$ cts.	$ cts.
Lady Hartog Burke.....H.	6	Sept. 2, 1925	442	18,563	42·00	3·46	755·59	317 35	53 76
Korndyke Bessie Ann.....H.	4	Dec. 13, 1925	373	14,024	37·60	4·51	743·42	312 24	40 18
Korndyke Posch Canary.....H.	6	Apr. 15, 1926	305	14,677[5]	48·12	3·4	587·95	246 94	42 53
Ottawa Lulu Posch.....H.	5	Apr. 26, 1926	331	11,837[5]	35·76	3·95	550·60	231 25	34 11
Morningside Bessie.....A.	5	Jan. 17, 1926	292	10,325[5]	35·36	3·95	480·15	201 66	29 95
Sarah Ann Pontiac.....H.	8	Feb. 8, 1926	296	12,708	42·93	3·32	496·41	208 49	36 86
Johanna Canary Maid.....H.	4	Apr. 29, 1926	282	11,139	39·50	3·87	507·28	213 06	32 12
Catlinn's Barbara.....A.	11	Apr. 4, 1926	358	12,374[5]	34·57	3·6	523·45	219 85	35 79
Brampton Ericas Pride.....J.	4	June 12, 1925	355	8,448	23·80	5·16	512·96	215 44	24 04
Ottawa Lulu Posch.....H.	4	May 15, 1925	320	10,722[5]	33·51	4·02	507·11	212 99	30 87
Old Hall Maggie 9th.....A.	14	Mar. 15, 1926	335	10,764[5]	32·13	3·73	475·46	199 69	31 09
Francy Oliva deKol.....H.	4	June 8, 1925	297	11,044	37·19	3·5	455·29	191 22	31 97
Ottawa March Francy.....H.	4	Mar. 19, 1926	309	11,308[5]	36·60	3·63	482·85	202 80	32 69
Ottawa Francy Bos DeKol.....H.	6	April 1, 1926	344	11,885[5]	34·55	3·7	517·51	217 35	34 34
Ottawa Barbara.....A.	2	Aug. 24, 1925	582	12,208	20·98	3·82	548·33	230 30	35 23
Hardcroft Dendrop 3rd.....A.	11	April 16, 1926	319	10,158	31·84	3·89	465·36	195 45	29 29
Zorra Hengerveld.....H.	5	Feb. 12, 1926	322	11,928[5]	37·05	3·51	492·16	206 71	34 53
Ottawa Auchinbay Mina.....A.	3	Feb. 2, 1925	463	10,601	22·90	4·03	502·99	211 26	30 52
Ottawa Triumph.....J.	3	Feb. 2, 1926	361	7,541[5]	20·89	5·23	464·42	195 06	21 44
Auchinbay Mina 5th.....A.	8	Dec. 8, 1925	337	10,636	31·56	3·88	485·95	204 10	30 67
Ottawa Lady 2nd.....A.	6	Jan. 2, 1926	392	10,182	25·97	3·88	464·19	194 96	29 36
Ottawa Grace DeKol.....H.	3	Jan. 19, 1926	437	11,443[5]	26·19	3·85	517·89	217 51	33 01
Midnight Jewel DeKol.....H.	9	Jan. 29, 1926	301	9,856[5]	32·75	3·6	417·32	175 27	28 51
Ottawa Dignity Dot.....A.	5	Feb. 15, 1926	319	9,758[5]	30·59	4·02	461·74	193 93	28 10
Lyons Segis Bessie Ann.....H.	7	Feb. 25, 1926	400	17,516	43·79	2·86	500·63	210 26	51 05
Brampton Bangle.....J.	7	Nov. 21, 1925	374	7,522[5]	20·11	4·67	413·16	173 53	21 51
Brampton Shortage.....J.	4	Aug. 29, 1925	381	6,642[5]	17·43	5·82	455·10	191 14	18 77
Johanna Keyes Helena.....H.	3	Sept. 21, 1925	312	9,562	30·65	3·51	394·44	165 66	27 68
Johanna Pietertje Ormby.....H.	4	Aug. 11, 1925	323	9,823[5]	30·41	3·43	396·14	166 38	28 46
Ottawa Tilly.....A.	5	Sept. 8, 1925	295	9,681[5]	32·82	3·6	410·40	172 37	28 00
Ottawa Woodcrest Johanna.....H.	3	Aug. 31, 1925	315	9,480[5]	30·10	3·56	397·03	166 75	27 43
Ottawa Elsie.....J.	6	Jan. 7, 1926	389	6,912[5]	17·77	5·37	436·34	183 26	19 62
Ottawa Culcaigrie Dot.....A.	4	Jan. 1, 1926	295	8,170[5]	27·70	4·30	412·86	173 40	23 46
Ottawa Burma Lady 2nd.....J.	7	Jan. 10, 1926	354	7,013	19·81	5·01	413·56	173 70	19 98
Ottawa March Johanna.....H.	2	July 15, 1925	364	8,648	23·76	3·74	380·38	159 76	24 97
Relief Lucy.....A.	3	Nov. 12, 1925	324	9,019[5]	27·84	3·94	417 86	175 50	25 99
Ottawa Starlight.....A.	4	Jan. 8, 1926	296	8,740[5]	29·53	3·92	403·20	169 34	25 19
Johanna Butter Maid.....H.	5	Jan. 1, 1926	259	10,901[5]	42·09	3·09	396·94	166 71	31 69
Allancroft Betsy 2nd.....A.	8	Oct. 9, 1925	266	7,471	28·09	4·04	354·90	149 06	21 51
Ottawa Lou.....J.	4	Nov. 24, 1925	374	7,118	19·03	4·83	404·11	169 73	20 32
Flavia 8th of Ottawa.....A.	6	Nov. 13, 1925	315	7,762[5]	24·64	3·98	363·07	152 49	22 36
Fanny of Oban.....A.	6	May, 11, 1926	293	7,237[5]	24·70	4·13	351·38	147 58	20 82
Ottawa Victorine.....A.	4	Oct. 4, 1925	300	5,793	19·31	4·39	299·41	125 75	16 62
Ottawa Belle.....A.	2	July 11, 1925	324	6,650	20·52	3·87	302·44	127 02	19 18
Dalfibble Orange Blossom.....A.	3	Nov. 5, 1925	295	8,018	27·18	3·69	347·97	146 15	23 17
St. Valentines Pet.....A.	12	Nov. 26, 1925	273	7,319[5]	26·81	3·7	318·39	133 72	21 15
Ottawa Bess Hengerveld.....H.	5	Nov. 10, 1925	360	9,320[5]	25·89	3·16	346·38	145 48	27 08
Leila Posch Mechthilde.....H.	10	May 24, 1925	312	7,974	25·56	3·53	330·98	139 01	23 08
Ottawa Tilly 2nd.....A.	2	Dec. 11, 1925	314	7,201	22·93	3·74	317 14	133 20	20 79
Lillian of Oban.....A.	7	Aug. 22, 1925	264	5,530	20·95	4·23	275·09	115 54	15 89
Auchlochan Emerald.....A.	13	Oct. 26, 1925	359	7,632[5]	21·26	3·74	335·73	141 01	22 04
Ottawa Beauty Maid 2nd.....J.	5	Feb. 1, 1926	262	4,651[5]	17·75	4·67	255·73	107 41	13 30
Ottawa Emerald 3rd.....A.	2	Nov. 21, 1925	334	5,805[5]	17·38	3·92	267·99	112 56	16 73
Marjorie of Ottawa 10th.....A.	5	Aug. 24, 1925	263	5,311[5]	20·20	4·22	263·59	110 71	15 26
Fairy's Fern.....J.	7	Jan. 2, 1926	272	4,202[5]	15·45	5·28	261·27	109 73	11 94
Ottawa Flo.....A.	5	Mar. 25, 1926	280	5,187[5]	18·53	4·30	262·13	110 09	14 89
Castlehill Strawberry.....A.	11	Nov. 23, 1925	276	5,475	19·84	3·59	231·42	97 20	15 83
Brampton Triumph 2nd.....J.	7	Aug. 2, 1925	303	4,604[5]	15·20	5·71	309·07	129 81	13 03
Ottawa Burma Lady 3rd.....J.	4	Oct. 26, 1925	265	3,477[5]	13·12	5·78	236·60	99 37	9 83
Ottawa March Korndyke.....H.	5	Jan. 12, 1926	282	6,625	23·49	3·64	283·56	119 10	19 15
Helena Keyes Plus.....H.	9	April 12, 1925	354	6,609[5]	18·67	3·91	304·25	127 79	19 05
Ottawa Belle.....A.	3	June 2, 1926	211	3,474	16·46	3·95	161·60	67 87	10 01
Grace Fayne Aaggie.....H.	10	Mar. 25, 1926	272	6,062[5]	22·29	3·39	241·71	101 52	17 57
Brampton Vinnie Beth.....J.	8	Dec. 16, 1925	185	2,642[5]	14·28	5·58	173·59	72 91	7 48
Belle of Oban.....A.	14	Jan. 25, 1926	340	6,732[6]	19·80	3·53	279·26	117 29	19 49
Ottawa Leoni.....J.	4	Nov. 17, 1925	288	2,923	10·14	4·98	171·40	71 99	8 33
Total for herd (66 cows).....	385	.....	21,389	572,581[5]	.....	.....	26,294·58	11,043 73	1,650 66
Average for herd (66 cows)....	5·83	.....	324·08	8,675·48	26·77	3·90	398·40	167 33	25 01

COMPLETED DURING THE YEAR

Total value of product	Amount of meal eaten at $32 per ton	Amount of roots at $4.15 per ton and silage at $2.85 per ton	Amount of hay eaten at $8.40 per ton	Amount of green feed eaten at $7.25 per ton	Months on pasture at $2 per month	Total cost of feed between calvings	Cost to produce 100 lbs. of milk	Cost to produce one pound of butter skim-milk neglected	Profit on one pound of butter skim-milk neglected	Profit on cow between calvings, labour and calf neglected
$ cts.	lb.	lb.	lb.	lb.	mos.	$ cts.	$ cts.	cts.	cts.	cts.
371 11	5,030	14,570	2,912	.....	4	121 42	65	16·1	25·9	249 69
352 42	4,662	17,770	3,048	.....	2	119 55	85	16·1	25·9	232 87
289 47	3,900	10,335	2,432	.....	2	91 34	62	15·5	26·5	198 13
265 36	3,514	12,325	2,680	.....	2	89 04	75	16·2	25·8	176 32
231 61	2,922	7,410	1,976	.....	2	69 61	67	14·5	27·5	162 00
245 35	3,784	8,470	1,696	.....	2	83 74	66	16·9	25·1	161 61
245 18	3,742	11,345	2,576	.....	2	90 86	82	17·9	24·1	154 32
255 64	4,331	10,620	2,832	.....	3	102 32	83	19·5	22·5	153 32
239 48	2,812	16,180	2,428	600	2	87 37	1 03	17·0	25·0	152 11
243 86	3,532	14,490	2,540	600	2	94 01	88	18·5	23·5	149 85
230 78	3,520	8,130	2,168	.....	4	85 01	79	17·9	24·1	145 77
223 19	3,328	10,920	1,928	600	2	83 04	75	18·2	23·8	140 15
235 49	4,156	11,240	2,192	.....	2	95 73	85	19·8	22·2	139 75
251 69	4,770	13,790	2,912	.....	2	112 20	94	21·7	20·3	139 49
265 53	4,054	22,620	4,330	.....	4	126 83	1 04	23·1	18·9	138 70
224 74	3,612	11,340	2,980	.....	2	86 47	85	18·6	23·4	138 27
241 24	4,010	14,245	2,680	.....	2	104 96	88	21·3	20·7	136 28
241 78	3,694	18,450	3,400	600	2	107 39	1 01	21·4	20·6	134 39
216 50	2,722	14,790	3,176	.....	2	83 45	1 10	18·0	24·0	133 05
234 77	3,708	16,260	3,002	.....	2	102,07	96	21·0	21·0	132 70
224 32	3,650	10,050	2,612	.....	4	91 69	90	19·8	22·2	132 63
250 52	4,644	20,040	3,738	.....	2	124 43	1 09	24·0	18·0	126 09
203 78	3,120	10,640	2,192	.....	2	78 29	79	18·8	23·2	125 49
222 03	3,648	14,130	3,184	.....	2	97 05	99	21·0	21·0	124 98
261 31	5,236	22,180	3,152	.....	2	137 69	79	27·5	14·5	123 62
195 04	2,578	11,760	2,770	.....	2	74 07	98	17·9	24·1	120 97
209 91	3,038	16,080	2,738	.....	2	88 96	1 34	19·5	22·5	120 95
193 34	2,632	11,285	2,368	.....	3	74 14	78	18·8	23·2	119 20
194 84	2,868	11,740	2,408	.....	2	76 73	78	19·4	22·6	118 11
200 37	2,904	14,360	1,860	.....	2	82 48	85	20·1	21·9	117 89
194 18	2,790	11,505	2,092	.....	3	76 41	81	19·2	22·8	117 77
202 88	2,752	16,860	3,542	.....	2	88 57	1 28	20·3	21·7	114 31
196 86	2,850	14,100	2,696	.....	2	83 35	1 02	20·2	21·8	113 51
193 68	2,710	14,010	2,928	.....	2	81 20	1 16	19·6	22·4	112 48
184 73	2,696	11,630	2,266	.....	3	75 23	87	19·8	22·2	109 50
201 49	3,324	16,100	2,496	.....	2	94 09	1 04	22·5	19·5	107 40
194 53	3,102	13,860	2,796	.....	2	87 25	1 00	21·6	20·4	107 28
198 40	3,518	13,375	2,858	.....	2	91 43	84	23·0	19·0	106 97
170 57	2,214	9,430	2,070	.....	3	68 87	92	19·4	22·6	101 70
190 05	2,920	17,010	3,046	.....	2	90 69	1 27	22·4	19·6	99 36
174 85	2,848	11,010	2,634	.....	2	76 65	99	21·1	20·9	98 20
168 40	2 532	11,340	2,980	.....	2	73 19	1 01	20·8	21·2	95 21
142 37	1,424	10,740	2,204	.....	2	52 12	90	17·4	24·6	90 25
146 20	2,062	10,220	2,428	.....	1	59 75	90	19·8	22·2	86 45
169 32	2,752	15,880	2,496	.....	2	85 20	1 06	24·5	17·5	84 12
154 87	2,698	10,470	2,428	.....	2	72 29	99	22·7	19·3	82 58
172 56	3,222	15,070	3,034	.....	2	90 02	97	26·0	16·0	82 54
162 09	3,118	12,425	2,186	600	2	82 47	1 03	24·9	17·1	79 62
153 99	2,600	13,300	2,460	.....	3	76 84	1 07	24·2	17·8	77 15
131 43	2,222	9,420	2,294	.....	2	62 60	1 13	22·8	19·2	68 83
163 05	3,648	13,370	3,030	.....	2	94 78	1 24	28·2	13·8	68 27
120 71	1,638	9,660	1,944	.....	2	54 96	1 18	21·5	20·5	65 75
129 29	1,272	17,120	2,944	.....	2	64 52	1 11	24·0	18·0	64 77
125 97	2,344	8,490	2,056	.....	2	62 24	1 17	23·6	18·4	63 73
121 67	1,578	13,320	2,558	.....	2	60 68	1 44	23·2	18·8	60 99
124 98	2,378	10,500	2,756	.....	2	68 59	1 32	26·2	15·8	56 39
113 03	2,194	8,250	2,076	.....	2	58 58	1 07	25·3	16·7	54 45
142 84	2,694	18,355	3,136	.....	2	89 37	1 94	28·9	13·1	53 47
109 20	1,512	11,490	1,636	.....	2	55 93	1 61	23·6	18·4	53 27
138 25	2,904	16,570	2,744	.....	2	87 65	1 32	30·9	11·1	50 60
146 84	3,568	16,660	2,912	600	2	99 24	1 50	32·6	9·4	47 60
77 88	918	5,970	1,548	.....	2	33 20	96	20·5	21·5	44 68
119 09	2,912	11,240	2,432	.....	2	76 82	1 27	31·8	10·2	42 27
80 39	1,092	9,090	1,456	.....	1	40 90	1 55	23·6	18·4	39 49
136 78	3,720	18,815	3,308	.....	2	107 75	1 60	38·6	3·4	29 08
80 32	1,334	11,550	1,952	.....	2	51 35	1 76	29·9	12·1	28 97
12,694 39	200,181	865,770	171,332	3,600	144	5,536·72	.....	.....	.....	7,157·67
192 34	3,033·05	13,117·73	2,595·94	54·55	2·18	83·89	97	21·1	20·9	108·45

AVERAGE PRODUCTION OF FIVE BEST COWS

AYR

Name of Cow	Age at commencement of lactation period	Date of dropping calf	Number of days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average p.c. fat in milk	Pounds of butter produced in period	Value of butter at 42c. per pound	Value of skim-milk at 30c. per cwt.
			days	lb.	lb.	%	lb.	$ cts.	$ cts.
Morningside Bessie	5	Jan. 17, 1926	292	10,325[5]	35·36	3·95	480·15	201 66	29 95
Catlinn's Barbara	11	April 4, 1926	358	12,374[5]	34·57	3·6	523·45	219 85	35 79
Old Hall Maggie 9th	14	Mar. 15, 1926	335	10,764[5]	32·13	3·73	475·46	199 69	31 09
Ottawa Barbara	2	Aug. 24, 1925	582	12,268	20·98	3·82	548·33	230 30	35 23
Hardcroft Dewdrop 3rd	11	April 16, 1926	319	10,158	31·84	3·89	465·36	195 45	29 29
Average of best 5 cows	8·6	.....	377·2	11,166·1	29·60	3·8	498·55	209 39	32 27
Average of herd (29 cows)	6·3	.....	321·2	8,111·07	25·25	3·89	371·84	156 17	23 39

HOL

Lady Hartog Burke	6	Sept. 2, 1925	442	18,563	42·00	3·46	755·59	317 35	53 76
Korndyke Bessie Ann	4	Dec. 13, 1925	373	14,024	37·60	4·51	743·42	312 24	40 18
Korndyke Posch Canary	6	April 15, 1926	305	14,677[5]	48·12	3·4	587·95	246 94	42 53
Ottawa Lulu Posch	5	April 26, 1926	331	11,837[5]	35·76	3·95	550·60	231 25	34 11
Sarah Ann Pontiac	8	Feb. 8, 1926	296	12,708	42·93	3·32	496·41	208 49	36 86
Average of best 5 cows	5·8	.....	349·4	14,362	41·10	3·71	626·79	263 25	41 49
Average of herd (24 cows)	5·5	.....	329·7	10,985·9	33·32	3·55	458·49	192 57	31 78

JER

Brampton Ericas Pride	4	June 12, 1925	355	8,448	23·80	5·16	512·96	215 44	24 04
Ottawa Triumph	3	Feb. 2, 1926	361	7,541[5]	20·89	5·23	464·42	195 06	21 44
Brampton Bangle	7	Nov. 21, 1925	374	7,522[5]	20·11	4·67	413·16	173 53	21 51
Brampton Shortage	4	Aug. 29, 1925	381	6,642[5]	17·43	5·82	455·10	191 14	18 77
Ottawa Elsie	6	Jan. 7, 1926	389	6,912[5]	17·77	5·37	436·34	183 26	19 62
Average of best 5 cows	4·8	.....	372	7,413·4	19·93	5·23	456·40	191 68	21 08
Average of herd (13 cows)	5·4	.....	320·2	5,669·2	17·71	5·2	346·72	145 62	16 12

AND OF TOTAL HERD IN EACH BREED

SHIRES

Total value of product	Amount of meal eaten at $32 per ton	Amount of roots at $4.15 per ton and silage at $2.85 per ton	Amount of hay eaten at $8.40 per ton	Amount of green feed eaten at $7.25 per ton	Months on pasture at $2 per month	Total cost of feed between calvings	Cost to produce 100 lbs. of milk	Cost to produce one pound of butter skim-milk neglected	Profit on one pound of butter skim-milk neglected	Profit on cow between calvings, labour and calf neglected
$ cts.	lb.	lb.	lb.	lb.	mos.	$ cts.	$ cts.	cts.	cts.	cts.
231 61	2,922	7,410	1,976	.....	2	69 61	67	14·5	27·5	162 00
255 64	4,331	10,620	2,832	.....	3	102 32	83	19·5	22·5	153 32
230 78	3,520	8,130	2,168	.....	4	85 01	79	17·9	24·1	145 77
265 53	4,054	22,620	4,330	.....	4	126 83	1 04	23·1	18·9	138 70
224 74	3,612	11,340	2,980	.....	2	86 47	85	18·6	23·4	138 27
241 66	3,687·8	12,024	2,857·2	.....	3	94 05	84	18·9	23·1	147 61
179 56	2,867·1	12,474·3	2,622·2	20·69	2·28	80 44	99	21·8	20·4	99 12

STEINS

371 11	5,030	14,570	2,912	.....	4	121 42	65	16·1	25·9	249 69
352 42	4,662	17,770	3,048	.....	2	119 55	85	16·1	25·9	232 87
289 47	3,900	10,335	2,432	.....	2	91 34	62	15·5	26·5	198 13
265 36	3,514	12,325	2,680	.....	2	89·04	76	16·2	25·8	176 32
245 35	3,784	8,470	1,696	.....	2	83 74	66	16·9	25·1	161 61
304 74	4,178	12,694	2,553·6	.....	2·4	101 02	70	16·1	25·9	203 72
224 35	3,652·3	13,494·2	2,582·4	100	2·2	94 02	88	20·5	21·5	130 33

SEYS

239 48	2,812	16,180	2,428	600	2	87 37	1 03	17·0	25·0	152 11
216 50	2,722	14,790	3,176	.....	2	83 45	1 10	18·0	24·0	133 05
195 04	2,578	11,760	2,770	.....	2	74 07	98	17·9	24·1	120 07
209 91	3,038	16,080	2,738	.....	2	88 96	1 34	19·5	22·5	120 95
202 88	2,752	16,860	3,542	.....	2	88 57	1 28	20·3	21·7	114 31
212 76	2,780·4	15,134	2,930·8	120	2	84 48	1 14	18·5	23·5	128 28
161 74	2,260·0	13,858·1	2,562·3	46·2	1·92	72 88	1 29	21·0	21·0	88 86

OFFICIAL RECORDS

In order that the many surplus bull calves may have the necessary credentials in the way of official records, all normal cows and heifers that had not previously been tested or that looked like bettering previous records were entered in the Canadian Record of Performance for Pure Bred Dairy Cattle, conducted by the Live Stock Branch. Also many of the Holstein cows and heifers have been entered in the Record of Merit Test conducted by the Holstein-Friesian Association of Canada. The latter test, however, is gradually losing favour and being replaced by the former, as the yearly test is a considerably more accurate measure of the producing ability of an animal.

The following tables give the lists of cows qualifying under each of these tests during the year:—

CANADIAN RECORD OF PERFORMANCE TESTS ON CENTRAL EXPERIMENTAL FARM, APRIL 1, 1926, TO MARCH 31, 1927

Name and Number of Cow	Breed	Age at commencement of test	Number of days milking	Pounds milk	Pounds fat	Averags per cent fat
Auchinbay Mina 5th—70080	Ayrshire	8	305	10,499	414	3·94
Catlins Barbara—70085	"	11	365	12,495	467	3·74
Dalfibble Orange Blossom—83935	"	3	295	8,018	309	3·85
Morningside Bessie—69567	"	5	292	10,326	404	3·91
Oldhall Maggie 9th—70088	"	14	335	10,765	398	3·70
Ottawa Barbara—81532	"	2	365	9,838	379	3·85
Ottawa Culcaigie Dot—77700	"	4	295	8,171	352	4·31
Ottawa Tilly—66552	"	5	295	9,682	373	3·85
Relief Lucy—83933	"	3	305	8,879	342	3·85
Francy Oliva DeKol—90066	Holstein	4	297	11,045	351	3·18
Johanna Helena Keyes—76334	"	5	305	17,772	528	2·97
Johanna Keyes Helena—103067	"	2	305	9,520	328	3·45
Korndyke Bessie Ann—93035	"	4	365	13,987	520	3·72
Korndyke Posch Canary—77745	"	5	305	12,169	487	4·00
Lady Hartog Burke—63856	"	6	365	17,159	580	3·38
Lyons Segis Bessie Ann—64286	"	7	365	16,694	488	2·92
Ottawa Francy Bos DeKol—75342	"	6	305	11,474	421	3·67
Ottawa Grace DeKol—106492	"	3	365	11,070	427	3·86
Ottawa Lula Posch—80940	"	4	305	10,651	419	3·93
Ottawa March Francy—91580	"	4	305	11,228	404	3·60
Ottawa Woodcrest Johanna—101581	"	3	305	9,449	336	3·56
Zorra Hengerveld—77746	"	5	305	11,847	423	3·57
Brampton Erica's Pride—22428	Jersey	4	305	7,778	378	4·86
Ottawa Triumph—20181	"	3	361	7,542	425	5·64
Ottawa Triumph—20181	"	3	305	7,130	399	5·60

HOLSTEIN RECORD OF MERIT TESTS ON CENTRAL EXPERIMENTAL FARM, APRIL 1, 1926, TO MARCH 31, 1927

Name and Number of Cow	Age at Commencement of test			Number of days on test	Pounds milk	Pounds fat	Pounds 80 per cent butter
	years	months	days				
Johanna Canary Maid—94258	4	5	15	7	501·5	26·46	33·08
				30	2,159·5	97·64	122·07
Johanna Pietertje Ormsby—90067	5	7	30	7	569·5	21·08	26·35
				30	2,225·0	86·85	108·57
Johanna Helena Perfect—118446	2	10	1	7	297·0	11·72	14·65
				30	1,222·0	45·17	56·47
Johanna Pletertje Perfect—114910	2	10	28	7	347·5	12·82	16·03
				30	1,476·0	49·44	61·80
Ottawa Faforit Perfect—115103	2	10	16	7	362·5	13·93	17·42
				30	1,409·0	51·46	64·33
Ottawa Lula Posch—80940	5	7	18	7	522·0	20·39	25·50
				30	2,249·0	82·30	102·88
Ottawa March Johanna—105018	3	9	24	7	430·5	15·31	19·14
				30	1,940·5	62·98	78·73
Ottawa Woodcrest Johanna—101581	4	3	4	7	458·5	18·85	23·57
				30	1,881·5	75·23	94·05
Perfect Butter Maid—119903		7	3	7	337·0	12·35	15·44
				30	1,386·0	49·66	62·08

THE DAIRY

All milk produced by the herds on the Central Experimental Farm passes through the farm dairy. The quantity of milk delivered to the dairy during the past year was 504,795 pounds. The main product manufactured therefrom is butter of which 15,502 pounds were produced. This product, a high class, slightly salted, fresh butter is sold and delivered fresh to customers.

The manufacture of Cheddar cheese has been carried on as in the past, in quantities necessarily limited. The ten pound size is made exclusively and for this there would seem to be a popular demand. Although the output is small, the product is shipped to customers in a wide range of territory in Canada and the United States. Meilleur, Buttermilk and Cream cheese have all been made during the year. For the former, considered by connoisseurs as a unique product of Canadian origin, there would seem to be a limited demand, mainly by those who make some study of kinds and qualities and who have developed what may be more discriminating tastes. For Buttermilk and Cream cheese much the same may be said. A steady and appreciative market may be built up, always provided *that the quality is high class, attractively prepared for sale, and of unvarying quality*. One off-flavoured batch may go far toward destroying the consumers' confidence. This is more evident, apparently, with soft cheese and the more highly flavoured varieties than is the case with Cheddar. The average palate would seem to be best satisfied with the latter, concerning which a rather wide range of quality is accepted. Indeed modern tendencies in cheese consumption on the part of the average city family would seem to favour types of blended and processed cheese.

During the coming year it is hoped that even more co-operative effort may be possible with the Division of Agricultural Bacteriology, which division maintains a small but well-equipped laboratory in the Dairy building, facilitating the study of milk production problems—the factors influencing clean milk production and their relative importance, the effect of the milking machine on the quality of milk, the efficiency of sterilizing processes on milking machine, etc., etc.

OUTSIDE ASSISTANCE

As in the past, the Dairyman has rendered much assistance to farmers and dairymen from a wide area in the way of testing milk and milk products. He has rendered assistance in other capacities, as well, assisting at demonstrations, helping beginners in various lines of dairy manufacture, judging dairy products at fairs, etc.

HORSES

There are at present twenty-eight horses at the Central Experimental Farm made up of fourteen registered Clydesdales, twelve grade geldings and mares and two general purpose horses.

During the year the work performed for the various divisions on the Central Farm has amounted to 7,453½ days.

COST OF MAINTENANCE OF DRAFT HORSES

The following table shows the monthly feed consumption and cost thereof as concerning the maintenance of fifteen work horses,—

Total feed	$1,733 40
Labour	650 00
Interest $3,375 at 6%	202 50
Shelter estimated at $25 each	375 00
Harness and repairs (16·70 per head)	250 50
Shoeing (20·00 per head)	300 00
Total yearly cost	$3,511 40
Cost per horse	$ 234 09

TABLE I.—FEED CONSUMED BY FIFTEEN WORK HORSES FOR YEAR ENDING MARCH 31, 1927

Month	Hay consumed	Grain consumed	Bran consumed	Cost of feed
	lb.	lb.	lb.	$
April	6,600	7,052	300	148 03
May	6,820	7,216	375	152 56
June	6,600	7,052	300	148 03
July	6,820	7,216	375	152 56
August	6,820	7,298	300	153 01
September	6,600	7,052	300	148 03
October	6,820	7,298	375	153 98
November	6,600	6,724	600	146 24
December	6,820	6,388	675	142 12
January	6,820	5,914	675	133 90
February	6,160	5,352	600	120 99
March	6,820	5,914	675	133 90
Totals	80,300	80,476	5,550	1,733 40
Average per horse	5,353·3	5,365·1	370	115 56

Concerning this statement it may be said that the horses are of high class draft type, weighing on the average 1,700 pounds and valued for purposes of interest charge at $225 each. Maintenance charges aside from actual costs of feed, will vary under different conditions. The actual quantity of feed consumed per head represents the basically important information. The labour charge for this group is correctly proportioned to the total labour for all horses on the Farm. With these horses there has been no pasture or idle period. Feed charges, in the case of hay, is based on cost of production and with purchased feeds, the actual price paid applies. Harness is kept in continual and complete repair. Shoeing costs are not based on custom rates, but represent the time of the Farm blacksmith plus the cost of material.

Valuation of Feeds

Hay	$6 60 per ton.
Grain	34 70 "
Bran	26 00 "

TABLE II

Cost of Feeding Aged Clydesdale Stallion for One Year

4,380 lb. hay at $6.60 per ton	$ 14 45
3,866 lb. grain at $34.70 per ton	67 08
1,460 lb. bran at $26 per ton	18 98
Total feed cost	$100 51

Cost of Feeding Two Two-Year-old Colts for One Year

6,020 lb. hay at $6.60 per ton	$ 19 86
5,352 lb. grain at $34.70 per ton	92 86
1,764 lb. bran at $26 per ton	22 93
4 months pasture at $2 per month	8 00
Total feed cost	$143 65
Average cost	71 83

Cost of Feeding Two Yearling Colts for One Year

3,816 lb. hay at $6.60 per ton	$ 12 59
3,572 lb. grain at $34.70 per ton	61 97
848 lb. bran at $26 per ton	11 02
10 months pasture at $1.50 per month	15 00
Total feed cost	$100 58
Average cost	50 29

Cost of Feeding Four Foals from Weaning to March 31, 1927

4,445 lb. hay at $6.60 per ton	$ 14 66
3,749 lb. grain at $34.70 per ton	65 05
1,270 lb. bran at $26 per ton	16 51
Total feed cost	$ 96 22
Average cost	26 56

FEED COSTS OF REARING AND MAINTENANCE (TABLE II)

From the foregoing figures relating to feed cost of rearing, it will be apparent that the item of feed alone bulks high in the cost of horse rearing.

On the assumption that, as with other kinds of stock, it does not pay to stint feed with foals, yearlings and two-year-olds, these statements are warranted:—

1. It costs no more (frequently less) to feed the youngster of good draft type, the result of proper mating and selection, than the commoner kind.

2. From the standpoint of farm work, one kind may be no more useful than the other, although if draft qualities in the horse have their logical relation to the kind of work he is to perform, the horse of some quality with size, substance, good feet and a sufficiency of good clean flat bone should be the most efficient machine.

3. When it comes to sale, however, the present-day buyer of heavy horses is interested mainly in good draught type. He has much difficulty in finding his requirements and unfailingly and of necessity pays a good price. In many sections he can buy the commoner kind at prices that leave little, if any, profit to the breeder.

4. Even on the farm, where rearing costs are usually lower than as indicated by these figures, the rearing of a horse to working age represents a considerable item. Keeping in view the vital necessity of adequate and proper power on the farm, together with the fact that there is a profitable sale outlet for the good kind only,—rearing nondescript horses is the worst business on the farm to-day. It pays to procure or use the best sire available, to pay a reasonable price for his services,—or to leave the business alone. Realizing that the quality of farm mares has deteriorated of late years, in Eastern Canada at any rate, the necessity of using high-class sires is all the more indicated.

CRUSHED VERSUS WHOLE OATS VERSUS OAT SCALPINGS

The following table gives in detail the results of a test to determine the economy of crushing oats as compared to oats fed whole. This was carried on with two lots of four horses each from December, 1926, to April, 1927.

To this experiment was added a third group made up of two horses fed for a lesser period on oat scalpings, an elevator separation from oats, being offered for sale in parts of Eastern Canada. This product is of relatively stable content, variation in samples being represented usually by difference in weight. It weighs as high as 41 pounds per bushel and is made up of about 75 per cent wild oats, 15 per cent domestic oats, a small proportion of barley and the occasional kernel of wheat. In that the real danger in the use of this feed is in the dissemination of wild oats through the droppings, germination tests were made on two different occasions.

TABLE III.—CRUSHED VS. WHOLE OATS VS. OAT SCALPINGS FOR WORK HORSES

Table of quantities and weights

Week ending	Crushed oats	Bran	Hay	Total weights of 4 horses	Gain	Loss	Whole oats	Bran	Hay	Total weights of 4 horses	Gain	Loss	Oat scalpings	Bran	Hay	Total weights of 2 horses	Gain	Loss
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Dec. 18, 1926	.....	.....	.....	6,575	.....	.....	.....	.....	.....	6,605	.....	.....	.....	.....	.....	.....	.....	.....
Dec. 25, 1926	318	40	504	6,597	22	.....	318	40	483	6,625	20	.....	.....	.....	.....	.....	.....	.....
Jan. 1, 1927	318	40	504	6,605	8	.....	318	40	483	6,630	5	.....	.....	.....	.....	.....	.....	.....
Jan. 8, 1927	318	40	504	6,605	0	.....	318	40	483	6,555	.....	75	.....	.....	.....	.....	.....	.....
Jan. 15, 1927	318	40	504	6,580	.....	25	318	40	483	6,580	25	.....	.....	.....	.....	.....	.....	.....
Jan. 22, 1927	318	40	504	6,585	5	.....	318	40	483	6,470	.....	110	.....	.....	.....	.....	.....	.....
Jan. 29, 1927	318	40	504	6,535	.....	50	318	40	483	6,485	15	.....	.....	.....	.....	.....	.....	.....
Feb. 5, 1927	318	40	504	6,490	.....	45	318	40	483	6,495	10	.....	190	20	259	3,760	.....	.....
Feb. 12, 1927	318	40	504	6,520	30	.....	318	40	483	6,510	15	.....	190	20	259	3,740	.....	20
Feb. 19, 1927	318	40	504	6,535	15	.....	318	40	483	6,575	65	.....	190	20	259	3,725	.....	15
Feb. 26, 1927	318	40	504	6,500	.....	35	318	40	483	6,545	.....	30	190	20	259	3,635	.....	90
Mar. 5, 1927	318	40	504	6,530	30	.....	318	40	483	6,560	15	.....	190	20	259	3,690	55	.....
Mar. 12, 1927	318	40	504	6,490	.....	40	318	40	483	6,530	.....	30	190	20	259	3,700	10	.....
Mar. 19, 1927	318	40	504	6,515	25	.....	218	40	483	6,570	40	.....	190	20	259	3,720	20	.....
Mar. 26, 1927	318	40	504	6,530	15	.....	318	40	483	6,560	.....	10	190	20	259	3,700	.....	20
Apr. 2, 1927	318	40	504	6,540	10	.....	318	40	483	6,570	10	.....	190	20	259	3,700	.....	.....
Totals	4,770	600	7,560	.....	160	195	4,770	600	7,245	.....	220	255	1,710	180	2,331	.....	85	145
Averages	1,192·5	150	1,890	.....	40	48·75	1192·5	150	1,811·3	.....	55	63·75	855	90	1165·5	.....	425	725
Total net gain or loss in weight	.....	.....	.....	.....	.....	35	.....	.....	.....	.....	.....	35	.....	.....	.....	.....	.....	60
Average net loss in weight	.....	.....	.....	.....	.....	8·75	.....	.....	.....	.....	.....	8·75	.....	.....	.....	.....	.....	30

TABLE IV.—CRUSHED VS. WHOLE OATS VS. OAT SCALPINGS FOR WORK HORSES

Summary Table

——		Crushed oats	Whole oats	Oats scalpings
Number of horses	No.	4	4	2
Initial weight, gross	lb.	6,575	6,605	3,760
Initial weight, average	lb.	1,643·86	1,651·2	1,880
Final weight, gross	lb.	6,540	6,570	3,700
Final weight, average	lb.	1,635	1,642·5	1,850
Total loss in weight	lb.	35	35	60
Average loss per horse	lb.	8·75	8·75	30
Number of days on test	dys	105	105	56
Total oats consumed	lb.	4,770	4,770	1,710
Total bran consumed	lb.	600	600	180
Total hay consumed	lb.	7,560	7,245	2,331
Total cost of feed	$	115 50	114 47	30 65
Feed cost per head	$	28 88	28 62	15 33
Cost of feed per head per day	ct.	27·50	27·25	27·36

Valuation of Feed

Oats	$34.70 per ton.
Bran	26.00 "
Scalpings	0·41 per bushel.
Hay	6.60 per ton.

TABLE V.—GERMINATION OF OATS IN DROPPINGS

Horse	Feed	Germination tests		Total	
		Feb. 17	March 27	Per horse	Per group
Ben	Crushed oats	0	4	4	
Captain	"	0	0	0	
Harry	"	2	0	2	
Walter	"	0	0	0	6
Bess	Whole oats	0	4	4	
Darling	"	45	6	51	
King	"	9	0	9	
Pony	"	4	5	9	73
Nigger	Oat scalpings	0	0	0	
Nellie	"	4	2	6	6

NOTES RE OAT FEEDING EXPERIMENT

Contrary to expectations, crushed oats failed to demonstrate any superior results over whole oats at least in so far as gain or loss in weights were concerned. It is to be expected that the weight of the individuals would vary, depending on the work which they were doing, but at the end of 105 days it was found that each group lost exactly 35 pounds. It would appear from this that crushing does not improve the physical properties of the oats for feeding to work horses. However, this part of the test does not tell the whole story, since crushed oats undoubtedly hold a place in the ration which whole oats cannot fill. Individuals with defective teeth, or on the other hand, animals which are inclined to bolt their feed, will not masticate the whole grain sufficiently, with the result that much of it is voided in an undigested state. Crushed oats is put to economical use, as well, during the periods of dentition change in colts.

A fact of considerable importance is that when crushed oats are fed there would seem to be decidedly few cases of colic. This has been demonstrated during the past year, for not a single case of colic developed among the horses receiving the crushed oats.

Concerning oat scalpings and the results obtained from its limited use in this test, it would appear that this feed has certain value as viewed from the nutritive or feeding standpoint alone. Indeed it is well known in a practical way that wild oats has these qualities:

CHEMICAL ANALYSIS

	Moisture	Protein	Fat	Carbo-hydrates	Fibre	Ash
Oats	9·2	12·4	4·4	59·6	10·9	3·5
Wild oats	9·33	10·63	3·89	56·56	15·12	4·47

Even in this comparatively short test, however, the difference in the feeds was evident. Wild oats was less palatable and its use resulted in the greater loss of weight. Fed over extended periods at hard work the results would have been much more marked.

The Real Danger in Feeding Wild Oats to Horses.—In this test the wild oats were fed whole, in that this method represented common practice where oat scalpings are fed. Wild oats is a dangerous weed, becoming altogether too common in Eastern Canada, largely through its introduction in the various grades of western oats, where, in the majority of carloads, it forms a small but increasing percentage. If this small percentage of wild oats in the feeding grades of oats is dangerous, how much more so would be a feed containing 75 per cent of this undesirable commodity?

Curiously enough, germination tests revealed comparatively small quantities of germinable wild oats in the droppings, particularly as compared to the results with whole oats, where a considerable number of kernels were voided in a germinable condition. As it happened, both horses consuming wild oats had good teeth and did not habitually bolt their feed. The habits of the horse or the condition of his mouth have much to do with the quantity of unmasticated, undigested and therefore germinable seed which may be voided.

While it is intended to carry on further tests of this nature, certain deductions are indicated by these germination tests:—

1. That crushing oats results in more complete digestion as indicated by the lesser number of viable grains in the droppings when compared to the results where whole oats was fed. Where it is desirable to ensure non-germination of grain fed to horses, as in the case of horses working on preparation of land for the production of registered seed, it would be unwise, however, to depend on crushed oats. While ground oats is not a satisfactory feed for horses as a steady diet, it provides the only safe way of grain feeding under the special conditions mentioned, and the feeding of ground oats for a few weeks will do no great harm.

2. Feeding any grain mixture made up largely of the seed or grain of what is regarded as a noxious weed is dangerous, particularly where the grain is fed whole. Subjecting such feed to fine grinding is the only safe procedure. Ground feed being undesirable (and in this case decidedly unpalatable), for horses, it would seem that oat scalpings might better be used for other kinds of stock, where fine grinding of grain is a desirable factor. As a matter of fact, horses refused to consume this feed in the ground form.

FOAL REARING AT THE CENTRAL EXPERIMENTAL FARM

Nine mares are due to foal during the spring and summer of 1927 to the service of Sandy Mac (imp.) 24318. During the season of 1926 this horse stood for service at the Central Experimental Farm and was bred to a fair number of mares. He is singularly sure and the type of horse that gives little trouble in so far as feet, legs and condition generally, would seem to be concerned.

During the 1926 season five foals were dropped, all sired by Sandy Mac

All were normal at birth, strong, healthy and singularly vigorous

There was no evidence, whatever, of joint ill or navel ill infection. (See reports Animal Husbandry Division five previous years.)

Aside from the standard system of management adopted for brood mares (see Report of Animal Husbandry Division for year 1926) the only prophylactic treatment used was the administration of small quantities of potassium iodide at regular intervals, during the period of pregnancy.

One very promising late summer foal was lost during the early fall from a condition, the symptoms of which in some respects resembled joint ill, but which was finally correctly diagnosed as pleurodynia and treated accordingly, unfortunately without the much desired result. Pleurodynia or muscular rheumatism of horses is apparently a comparatively rare malady, although in the opinion of the writer it may be more common than generally thought, due, as mentioned, to the fact that the symptoms of the latter may be confounded with those of joint ill. The disease mainly affects dogs and horses. Foals dropped late in the summer or in the early fall would seem to be peculiarly susceptible, due, likely, to warm days and cool nights. It is possible that many alleged cases of joint ill, occurring several weeks after foaling, are in reality the occurrence of acute muscular rheumatism.

Pain is emphatically expressed. Where the muscles of the loin, croup and thighs are affected, as is commonly the case, the hind legs are dragged and scrape the ground in characteristic fashion. Where the shoulder muscles are affected the front legs are also moved with difficulty and as described. There is a superficial quickened breathing and considerable sensitiveness to pressure on the intercostal spaces (between the ribs). There is no high fever and the appetite is not greatly affected. Unlike joint ill, however, there is no swelling and fever in the joints.

The disease is acute and where properly treated disappears in a week or so. Such acute attacks, in the case of foals, frequently result unfavourably, unless treatment is prompt and properly devised. Diligent massage with stimulating liniment, blanketing, the use of quinine, salol, etc., and attention in the way of laxatives are indicated.

The foregoing brief description is offered in that the case, though lost, was of interest, and because of the fact that the two diseases or conditions might well be confounded in the horseman's common diagnosis.

THE USE OF POTASSIUM IODIDE

The use of this drug with pregnant mares, as a possible preventive to joint ill in the foal, has been mentioned already in these pages and in the reports of this division for the past several years. Although it would seem that no specific or definite claim concerning the efficiency of this drug should be made as yet, these facts remain:—

1. That no case of joint ill has occurred on the Central Experimental Farm since this treatment was started in 1922, whereas considerable trouble was experienced annually up to that time.

2. That similar results have been experienced on other Dominion Experimental Farms where like conditions have existed.

3. That many breeders have reported results similar to those mentioned. (On the other hand a few adverse reports have been received.)

4. That proven merit is claimed for the treatment by certain of the veterinary profession.

At the Central Experimental Farm, spring and early summer foaling mares each receive, starting in October or November of the pregnant period, from one-half to a level teaspoonful of potassium iodide crystals in the drinking water, twice monthly, say on the first and fifteenth of the month, up to the time of foaling. The powder or crystals should first be diluted in a little warm water, then poured into the drinking water; or it may be given in mash or on feed. The method of administering is unimportant, provided the iodine is supplied regularly and in small quantities. Further, it is possible that lesser quantities might be equally as effective as those mentioned. The optimum quantity has not been indicated definitely as yet. While it is apparent that the quantity mentioned (between one-half and a level teaspoonful) is effective, and while less might prove equally so, it must be carefully noted that most unsatisfactory and dangerous results may accompany the administration of comparatively larger quantities.

Potassium iodide, as representing the most feasible medium of iodine administration, may be bought at any drug store. It is comparatively expensive. It is definitely known to act in a preventive manner toward such conditions as goitre in calves and lambs and hairlessness in pigs. The apparent results attending its use as a preventive to joint ill in foals is, comparatively, a more recent phase of usefulness. While the results to be expected from its use with cattle as a preventive to certain diseases and conditions (except goitre in calves) represent a field apparently less explored, as yet, it is thought that the administration of iodine may be proven, shortly, to be of distinct value with this class of stock. In a general way it would seem that the beneficial action is best illustrated during the period of pregnancy.

SWINE

On March 31, 1927, the herd of swine consisted of 302 head, including 268 Yorkshires and 34 Berkshires. A comparison of these figures with those published in the report for the last fiscal year indicates that the Yorkshire herd has increased considerably in numbers and the Berkshire herd has decreased. This condition is indicative of the popularity of these two breeds, the Berkshire breed not meeting with the same ready demand for breeding stock as heretofore. The demand for breeding stock, however, showed an increase over the previous year, there being a total of 134 head sold. This included 76 Yorkshire males and 42 females, 11 Berkshire males and 5 females. The steadily increasing demand for Yorkshire breeding stock from this herd demonstrates the popularity of this breed, but more particularly is indicative of the success with which the breeders are meeting in using stock from this herd, both for foundation stock and also for maintaining the quality of established herds.

The Yorkshire herd is in a particularly healthy and vigorous condition, as a result in part, at least, of the introduction in 1923 and during subsequent years, of new blood, through the use of the two imported boars, Culcairn Monarch 8 —88845— and Dalmeny A.R. —88840— and, also, to the three imported sows introduced at the same time. This breeding promises to nick well with the more extreme bacon type, such as is represented by the young boar, Orchard Grove Pat 76 —109848—. This latter boar was added to the

herd in November, 1925, and since that time has developed well and has proven to be a successful breeder, transmitting an abundance of length, smoothness, and refinement to his progeny.

Because of the unusually good results procured from the use of the Yorkshire boar, Agassiz Bonus —80699—, when used in this herd in 1922, he was procured this spring from the Kapuskasing Experimental Station, where he has been in service since 1923. This boar is of excellent bacon type and quality and has the faculty of transmitting these desirable characters to his daughters, as demonstrated by his previous breeding record in this herd.

The purchase was made in August of the Berkshire boar Compton Hall —69327—. At the time of his purchase he was an exceedingly promising individual and since that time has developed into one of the best herd sires of the Improved Berkshire type that has been used on this Farm in years. His excellent length, depth, strength, smoothness and breediness generally mark him as one of the outstanding boars of the breed. He should prove a valuable acquisition for maintaining the length and smoothness of the Berkshire swine in the herd.

EXPERIMENTAL WORK

As in past years, the persistent demand for young breeding stock has made considerable inroads into the number of young pigs available for experimental test work. Considerable investigational test work, however, has been completed during the year.

SOFT PORK INVESTIGATIONS

Objects of Experiment

1. To determine the causes contributing to softness in pork and bacon.
2. To determine the influence of feeds and feed combinations on the firmness of fleshing of finished hogs.
3. To determine the influence of self-feeding and trough-feeding on the firmness of fleshing.
4. To compare the feeding value of oats, barley, and middlings when used as individual feeds in a milk or water slop.
5. To compare single feeds with a mixed meal ration.

This work was undertaken as a supplement to previous work of a similar nature reported upon in previous reports, and also in Bulletin 38, published in 1901. Packing plants in various parts of the country and at certain times, have found that a considerable number of their bacon sides have not possessed the necessary firmness. The possible influence of feeds and feeding conditions generally, therefore, were again investigated, in order to procure data under conditions as they exist at the present time. The tests were undertaken with single feeds and also with a mixed meal ration fed in different ways.

A—Testing of Single Feeds as Affecting Softness

Plan of Experiment

Lot	Breed	Number of pigs	Meal ration fed	Other feeds used
1	Berkshire	3	Ground oats	Water.
2	Yorkshire	3	"	"
3	Berkshire	3	"	Milk.
4	Yorkshire	3	"	"
5	Yorkshire	3	Middlings	Water.
6	Berkshire	3	"	"
7	Yorkshire	3	"	Milk.
8	Berkshire	3	"	"
9	Berkshire	3	Ground barley	Water.
10	Yorkshire	3	"	"
11	Berkshire	3	"	Milk.
12	Yorkshire	3	"	"

Prices charged for feeds

Barley	$40 00 per ton.
Oats	35 00 "
Middlings	35 00 "
Milk (skim-milk or buttermilk)	0 25 per cwt.

The following tables show the results obtained from the feeding of single feeds supplemented with milk or water. In the first table the results procured from each lot are outlined, while the following table shows the results obtained after the Berkshire and Yorkshire lots on similar feeds were grouped together, and until finished.

	Lot No. 1 Oats and water	Lot No. 2 Oats and water	Lot No. 3 Oats and milk	Lot No. 4 Oats and milk	Lot No. 5 Middlings and water	Lot No. 6 Middlings and water	Lot No. 7 Middlings and milk	Lot No. 8 Middlings and milk	Lot No. 9 Barley and water	Lot No. 10 Barley and water	Lot No. 11 Barley and milk	Lot No. 12 Barley and milk
Breed	Berk.	York.	Berk.	York.	York.	Berk.	York.	Berk.	Berk.	York.	Berk.	York.
No. of pigs in experiment.....No.	3	3	3	3	3	3	3	3	3	3	3	3
Initial weight, gross..... lb.	174	124	158·3	93·1	112·2	167·2	153·1	130·3	109·3	126·3	115·4	107·2
Initial weight, average..... lb.	58	41·3	52·8	31·03	37·4	55·7	51·03	43·4	36·43	42·1	38·47	35·4
Finished weight, gross..... lb.	322	271·8	586	608	144	152 *	344 *	247 *	294	274·5	402 *	561
Finished weight, average..... lb.	107·3	90·6	195·3	202·7	48	76	172	123·5	98	91·5	201	187
No. of days on experiment.....dys	129	129	127	145	60	60	105	105	105	105	115	134
Total gains for period..... lb.	148	147·8	427·7	514·9	31·8	40·6	230	166·9	184·7	148·2	321·8	453·8
Average daily gain per animal. lb.	·382	·382	1·12	1·18	·177	·338	1·09	·79	·586	·47	1·399	1·13
Quantity of milk consumed.... lb.	.....	.....	2,555	2,775	.....	.....	1,350	1,148	.....	.....	1,570	3,080
Quantity of meal consumed.... lb.	1,115	1,185	1,075	1,510	275	242	515	422	870	875	637	1,325
Meal eaten per lb. gain..... lb.	7·5	8	2·2	2·9	8·65	5·96	2·24	2·53	4·71	5·90	1·98	2·92
Milk eaten per lb. gain..... lb.	.....	.....	5·97	5·38	.....	.....	5·87	6·87	.....	.....	4·88	6·79
Total cost of feed..... $	19 51	20 74	25 20	33 36	4 81	4 24	12 39	10 25	17 40	17 50	16 67	34 20
Cost of feed per head..... $	6 50	6 91	8 40	11 12	1 60	2 12	6 19	5 12	5 80	5 83	8 33	11 40
Cost of feed per head per day.. ct.	5·04	5·36	6·61	7·67	2·66	3·53	5·89	4·88	5·52	5·55	7·24	8·51
Cost of feed to produce 1 lb. gain ct.	13·18	14·03	5·89	6·48	15·13	10·44	5·38	6·14	9·41	11·81	5·18	7·54

* Total weights for two pigs, the third pig having died.

——	Lots Nos. 1 and 2 Oats and water	Lots Nos. 3 and 4 Oats and milk	Lots Nos. 5 and 6 Middlings and water	Lots Nos. 7 and 8 Middlings and milk	Lots Nos. 9 and 10 Barley and water	Lots Nos. 11 and 12 Barley and milk
Breed	3 Y. & 3 B.	3 B. & 3 Y.	3 Y. & 2 B.	2 Y. & 2 B.	3 B. & 3 Y.	2 B. & 3 Y.
No of pigs in experiment No.	6	6	5	4	6	5
Initial weight, gross.... lb.	298	251·4	229·4	194·1	235·6	187·4
Initial weight, average. lb.	49·66	41·9	45·88	48·52	39·26	37·48
Finished weight, gross.. lb.	1,200	1,294	296	591	1,293	963
Finished weight, average. lb.	200	215·6	59·2	147·77	215·5	192·6
No. of days on experiment..... dy.	220	136	60	105	190	124·5
Total gains for period... lb.	902	1,042·6	66·6	396·9	1,057·4	775·6
Average daily gain per animal..... lb.	·683	1·28	·222	·945	·928	1·26
Quantity of milk consumed..... lb.	.....	5,330	.....	3,078	.....	4,650
Quantity of meal consumed..... lb.	4,330	2,585	517	1,137	3,930	1,962
Meal eaten per lb. gain lb.	4·80	2·48	7·76	2·86	3·72	2·53
Milk eaten per lb. gain lb.						
Total cost of feed..... $	75 77	58 56	9 05	27 59	78 60	50 87
Cost of feed per head... $	12 63	9 76	1 81	6 89	13 10	10 17
Cost of feed per head per day..... ct.	5·74	7·13	3·02	6·56	6·89	8·30
Cost of feed to produce 1 lb. gain..... ct.	8·40	5·62	13·59	6·95	7·43	6·56

SUMMARY OF RESULTS

Without exception, the most rapid gains and also the most economical gains were made by the hogs which received milk as a supplement to the meal. Barley and water, however, gave surprisingly good gains, with oats and water a poor second and middlings last. In fact, the middlings and water was barely able to maintain growth, the two lots on this ration averaging only .22 of a pound of gain per hog per day and as a result became so unthrifty that it was necessary to discontinue these lots at the end of sixty days. The lots fed barley and water made an average daily gain of .928 of a pound in a 190-day feeding period, and oats and water an average daily gain per hog of .68 of a pound during a 220-day period. On the basis of feed consumed per pound of gain produced, the lots on barley and water consumed 3.72 pounds, those on oats and water 4.8 pounds, and those on middlings and water 7.76 pounds of meal.

The feeding of meal and milk resulted in greatly increased gains and, also, in a reduction of the meal requirement for a given gain in weight. The hogs on middlings and milk made an average daily gain per hog of .945 of a pound, those on oats and milk 1.28 pounds and those on barley and milk 1.26 pounds. The food consumption per pound of gain produced was 2.86 pounds of middlings, and 7.75 pounds of milk, 2.48 pounds of oats and 5.11 pounds of milk, and 2.53 pounds of barley and 5.99 pounds of milk, respectively. These results illustrate the high feeding value of milk as a supplement to the meal ration, and show that, while barley or oats when fed in a water slop give fair results, middlings is of little use unless in a meal mixture. A comparison of all lots fed single meals and water with those fed single meals and milk offers some interesting information as to the value of milk. In these tests 13,058 pounds of milk were equal in feeding value to 3,912 pounds of meal, and with the combined middlings, oats, and barley meals valued at $36 per ton, the milk, therefore, had a relative value of 53.9 cents per hundred.

A comparison of oats, middlings and barley meals, when supplemented with water, shows one pound of oats to be equal in feeding value to .77 of a pound of barley, or 1.61 pounds of middlings or, expressed in terms of barley, one pound of the barley was equal to 1.3 pounds of oats or 2.1 pounds of middlings.

When milk was used as the supplement to the meal, 2,585 pounds of oats were equal in feeding value to 2,987 pounds of middlings and 2,755 pounds of milk, while these were equal to 2,637 pounds of barley and 920 pounds of milk. With oats valued at 1.8 cents per pound, barley in these rations had a relative value of 1.69 cents and middlings 1.37 cents per pound.

One feature not shown by these figures is the decreasing feeding value of middlings as the test progressed. The pigs on middlings and water, as already stated, were incapable of going beyond the 60 day period on this feed, and while those on middlings and milk showed better results, the credit is entirely due to the milk which was fed.

The phase of the test just discussed makes no mention of the influence of these feeds on the firmness of fleshing, but this will now be dealt with.

Lot	Breed and number of pigs	Days on test	How fed	Final live weight	Dressed weight	Grade on foot	Grade on rail	Firmness of fleshing	Remarks
No.	No.	Days		lb.	lb.			(48 hrs.)	
1	3 Berkshires....	210	Cats and water.....	190	.....	Thick-smooth.....	.....	Very firm.....	
		210	"	214	.....	"	.....	Slightly soft.....	Thicker and shorter than lot 2.
		210	"	200	.....	"	.....	Very firm.....	
2	3 Yorkshires....	230	Cats and water.....	204	.....	Select.....	Leanest...	Slightly soft.....	
		230	"	202	.....	"	"	Firm.....	Good length and type.
		230	"	190	.....	"	"	Slightly soft.....	
3	3 Berkshires....	127	Cats and milk.....	186	138	Thick-smooth.....	Leanest...	Firm.....	Rather heavy in shoulder and thin in belly fleshing.
		127	"	181	137	"	" ..	Slightly soft.....	Unfinished.
		127	"	219	173	Select.....	" ..	Barely firm.....	Cresty, lacked thickness of belly and flank.
4	3 Yorkshires....	145	Oats and milk.....	185	133	Unfinished.....	Leanest...	Very soft.....	Not finished, but good type.
		145	"	209	154	Thick-smooth.....	" ..	Very firm.....	Good length, but not right finish to grade select.
		145	"	214	161	"	" ..	"	" "
5	3 Yorkshires....	60	Middlings and water	.....	.....	.....	.....	.....	Taken off experiment, due to unthriftiness and immediate danger of pigs dying if left longer.
		60	"	.....	.....	.....	.....	.....	
		60	"	.....	.....	.....	.....	.....	
6	3 Berkshires....	60	Middlings and water	.....	.....	.....	.....	.....	Two pigs died during the first 60 days, and the third pig was removed in order to avoid immediate danger of death.
	.....	.....	"	.....	.....	.....	.....	.....	
	.....	.....	"	.....	.....	.....	.....	.....	
7	3 Yorkshires....	120	Middlings and milk.	172	130	Unfinished, light....	Leanest...	Soft.....	One pig died.
		120	"	172	125	" ..	" ..	"	Both of the other pigs were unfinished
	.....	.....	"	.....	.....	.....	.....	.....	
8	3 Berkshires....	120	Middlings and milk.	138	101	Unfinished. light...	Leanest...	Very soft.....	Only one pig survived and this one was unfinished and light.
	.....	.....	"	.....	.....	.....	.....	.....	
	.....	.....	"	.....	.....	.....	.....	.....	
9	3 Berkshires....	203	Barley and water...	223	.....	Thick-smooth.....	Lean.. ...	Barely firm.....	
		203	" ..	225	.....	"	"	Very firm.....	Well finished but rather shorter than the pigs in Lot 10.
		182	" ..	225	.....	"	"	Firm.....	

10	3 Yorkshires....	184	Barley and water...	212	.....	Select.....	Leanest...	Firm.....	
		184	" ..	221	.....	"	" ..	Soft, unfinished.....	Very good length and bacon type.
		184	" ..	196	.....	"	" ..	Firm.....	
11	3 Berkshires....	115	Barley and milk....	206	159	Thick-smooth.....	Leanest...	Very firm.....	Well finished but somewhat short.
		115	"	196	145	"	" ..	"	One pig was unthrifty and was removed from test.
		.....	"	.....	.....	.....	.....	.....	
12	3 Yorkshires....	134	Barley and milk....	200	157	Select.....	Leanest...	Very firm.....	
		134	"	195	150	"	" ..	Firm.....	Good type and quality, but one pig proved unthrifty.
		134	"	166	130	Unfinished.....	" ..	Soft.....	

RESULTS AT TIME OF SLAUGHTER

The chart outlining the results of grading the hogs both on foot and on the rail, illustrates fairly clearly that, on the whole, meal and water is more conducive to softness than is meal and milk. Of the lots fed barley and water or oats and water, 58.3 per cent of the hogs graded " firm " or " very firm " after forty-eight hours on the rail, while of the corresponding lots fed milk 72·7 per cent graded " firm " or " very firm." The lots fed middlings are not included in the above percentage, for the reason that the middlings and water lots failed to complete the test, so no comparison was possible. The three hogs which received middlings and milk and which did complete the test all graded " soft " or " very soft."

The following chart indicates the results in terms of percentages of the grading on the rail, after the carcasses had hung for forty-eight hours.

FIRMNESS OF FLESHING WHEN 48 HOURS ON THE RAIL

Meal	Barley				Oats				Middlings			
Supplement	Water		Milk		Water		Milk		Water		Milk	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Very firm	1	16·6	3	60	2	33·3	2	33·3	....	.....	....	.....
Firm	4	66·6	1	20	1	16·6	2	33·3	....	.....	....	.....
Slightly soft	....	.....	....	.....	3	50·0	1	16·6	....	.....	....	.....
Soft	1	16·6	1	20	....	.....	....	.....	....	.....	2	66·6
Very soft	....	.....	....	.....	....	.....	1	16·6	....	.....	1	33·3

Eighty-two per cent of the carcasses from the barley-fed hogs graded " firm " or " very firm," while approximately fifty-eight per cent of those from the oat-fed hogs came into these grades, while 100 per cent soft sides were shown by the lots fed middlings. These percentages are calculated on the basis of the number of hogs slaughtered at the end of the test. It is noteworthy that of the barley-fed hogs, both those that graded " soft " were unfinished hogs, while the hogs grading " very soft " from the oat-fed hogs were also unfinished.

B—METHODS OF FEEDING AS INFLUENCING FIRMNESS

A continuation of this investigation was made with five lots of hogs, receiving a mixed meal ration and milk. The objects of this part of the test were:—

1. To determine the influence of self-feeding, light trough-feeding, medium trough-feeding, and heavy trough-feeding, on the type and fleshing of the carcass.

2. To compare cull pigs with thrifty, vigorous pigs.

3. To compare a good mixed meal ration with the single feeds as used in the former test.

PLAN OF EXPERIMENT

Lot	Number of Pigs	Method of Feeding	Meal Ration Fed	Other Feeds
1	5	Trough at ordinary rate	*1st 60 days* Barley, shorts and middlings, 1 part; Oats, 2 parts; Bran, ½ part; Oil meal, 4%. *61 to 90 days* Barley, 1 part; Oats, 1 part; Shorts, 1 part; Bran, ½ part; Oil Meal, 4%. *91 days to finish* Barley, 3 parts; Oats, 2 parts; Shorts, 1 part, Bran, ½ part, Oil Meal, 4%.	Milk. Milk. Milk.
2	5	Self-fed	Same as Lot I	Milk.
3	5	Trough, forced-feeding	Same as Lot I	Milk.
4	5	Trough, light-feeding	Same as Lot I	Milk.
5	5	Cull pigs, trough-fed as Lot I	Same as Lot I	Milk.

Cost of Feeds

Middlings	per	ton	$35 00
Oats	"		33 00
Barley	"		40 00
Bran	"		26 00
Shorts	"		28 00
Oil Meal	"		50 00
Milk	per	cwt.	0 25

The meal ration for the first 60 days was valued at $1.70 per cwt.; from 61 to 90 days, $1.75; and for the remainder of the test, $1.80, based on the above costs.

The results procured in the feeding test are shown in the following table:—

—		Lot I Hand-fed	Lot II Self-fed	Lot III forced-feeding	Lot IV light-feeding	Lot V Cull pigs hand-fed
No. of hogs in experiment	No.	5	5	5	5	4
Initial weight, gross	lb.	176	176	228	279	111
Initial weight, average	"	35·2	35·2	45·6	55·8	27·7
Finished weight, gross	"	908	1,029	1,054	1,028	751
Finished weight, average	"	181·6	205·8	210·8	205·6	187·7
No. of days in experiment	days	128	128	128	128	128
Total gain for period	lb	732	853	826	749	640
Average daily gain per animal	"	1·143	1·33	1·29	1·17	1·25
Amount of meal eaten by group	"	1,865	2,585	2,135	1,895	1,510
Amount of milk eaten by group	"	4,435	4,495	4,815	4,640	3,550
Amount of meal eaten per lb. gain	"	2·548	3·03	2·59	2·53	2·36
Amount of milk eaten per lb. gain	"	6·06	5·27	5·83	6·19	5·55
Total cost of feed	$	43 73	56 48	49 14	44 76	35 30
Cost of feed per head	$	8·746	11 30	9 82	8 95	8 82
Cost of feed per head per day	cts.	6·83	8·8	7·68	7·0	6·89
Feed cost to produce 1 lb. gain	"	5·97	6·62	5·95	5·97	5·52

SUMMARY

As has almost always been found to be the case, in the past, the self-fed hogs made the most rapid gains, and made these gains with the highest feed consumption and the highest cost per pound of gain, as compared to the trough-

fed pigs. One surprising feature of the test is the remarkably good gains and economy of gains shown by the cull pigs, which were trough-fed. These pigs were fed at the same rate as the trough-fed pigs in Lot I, but gave better results. A comparison of the other trough-fed lots with the self-fed pigs shows that in rapidity of gains the heavily trough-fed lot ranked next to the self-fed pigs, followed in turn by the lightly trough-fed and the medium fed lots. In cost of gains there was practically no difference between the light, medium, and heavy hand-feeding methods.

The following chart shows the results obtained when the hogs were graded and after the carcasses had been on the rail for forty-eight hours.

SOFT PORK INVESTIGATIONS—METHODS OF FEEDING

Lot No.	Number of pigs	Breed	Ration	Grade alive	Live weight	Grade on rail	Firmness 48 hrs.	Number of days on experiment	Remarks
1	5	Yorkshires.	Hand-fed regular method	3 selects and 2 lights	160	Leanest...	Very soft.....	128	Unfinished.
					195	Leanest...	Slightly soft..	128	Slightly unfinished.
					175	Leanest...	Firm.....	128	Poor belly.
					181	Leanest...	Slightly soft..	128	Unfinished.
					197	Leanest...	Firm.....	128	
2	5	" ..	Self-fed.....	4 thick-smooth and 1 light-select	207	Lean.....	Firm.....	128	Short round rib.
					175	Leanest...	Barely firm...	128	Slightly unfinished, thin belly.
					199	Leanest...	Firm.....	128	
					243	Lean.....	Very firm....	128	
					205	Leanest...	Very firm....	128	
3	5	" ..	Forced feeding	4 selects and 1 thick-smooth	185	Leanest...	Firm.....	128	
					208	Leanest...	Firm.....	128	
					204	Leanest...	Very firm....	128	Very firm.
					229	Lean.....	Firm.....	128	Slightly overdone.
					228				
4	5	" ..	Light feeding	4 selects and 1 short-shop	236	Leanest...	Firm.....	128	
					215	Lean.....	Firm.....	128	Slightly overdone.
					181	Leanest...	Barely firm...	128	Looks like a poor doing hog.
					191	Leanest...	Very firm....	128	Short round rib, tight.
					205	Leanest...	Firm.....	128	
5	4	" ..	Cull pigs hand-fed regular method	2 selects and 1 thick-smooth and 1 light	181	Lean.....	Firm.....	128	
					160	Lean.....	Firm.....	128	
					195	Leanest...	Very firm....	128	
					215	Leanest...	Very firm....	128	

SUMMARY

The hogs fed the mixed meal gave a much higher percentage of firm sides than did those fed the single meals. Only three carcasses out of the twenty-three which were graded, classed as " slightly soft " or " very soft " or, expressed in terms of percentage, approximately 13 per cent as compared with 38·5 per cent for the hogs on single feeds, supplemented with either milk or water.

FIRMNESS OF FLESHING WHEN FORTY-EIGHT HOURS ON RAIL

	Self-feeding		Trough-feeding							
			Light		Medium		Heavy		Cull Pigs	
	No.	%	No.	%	No.	%	No.	%	No.	%
Very firm	2	40	1	20	2	40	1	25	2	50
Firm	2	40	3	60	.....	.....	3	75	2	50
Barely firm	1	20	1	20	.....	.....	.....	.....	.....	.....
Slightly soft	.....	.....	.....	.....	2	40	.....	.....	.....	.....
Soft	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Very soft	.....	.....	.....	.....	1	20	.....	.....	.....	.....

All lots were fairly uniform, except the medium trough-fed lot.

The most outstanding feature here is the remarkably good results shown by the pigs which were culls at the start of the test, all of the four grading "firm" or "very firm." The heavily trough-fed lot made the next best showing, four of these grading "firm" or "very firm." The fifth pig was not graded on the rail, but on the hoof classed as a "thick-smooth." The self-fed hogs ranked next and showed a slight advantage over the lightly trough-fed hogs. Medium trough-feeding showed the poorest grade of the test. These pigs were not as thrifty as the other lots, one in particular being a poor doer.

DEDUCTIONS

Summed up, these two experiments indicate that,—

1. The use of barley, oats or middlings, when fed alone with water, are more conducive to the production of soft sides than when supplemented with milk.

2. That barley, oats, or middlings, when fed as individual feeds, although giving satisfactory gains when supplemented with milk, were more conducive to softness than a mixed meal ration of good balance and variety.

3. Self-feeding does not appear to give any higher percentage of firm sides than trough feeding, as there was little to choose between the self-fed, the heavily trough-fed, the lightly trough-fed lots or the cull pigs, all of the hogs in these lots classing as "firm", "very firm", or "barely firm".

4. Ground barley is superior to ground oats, producing more rapid gains and also, somewhat firmer sides, while middlings is of little use when used as an individual feed.

5. There is an intimate relationship between the stage of maturity and the firmness of fleshing, the unfinished hogs almost invariably grading "soft".

6. Lack of thrift is conducive to softness.

7. Lack of finish or thrift at time of slaughter apparently has an effect upon the relative firmness of the carcass. Where a ration lacking in balance and variety is fed, the result may be shown in lack of bloom, thrift or finish when the pig has reached slaughter weight. Correspondingly other factors might be conceived as operative in the same way, in that these factors (such as, for example, parasitism) also are detrimental to proper bodily functioning, and therefore might be responsible for an unthrifty, unfinished pig. Certain feeds in themselves are definitely known as capable of producing soft pork. Aside from these, it is entirely probable that where certain other common feeds are used singly in the ration over long periods, unthriftiness is caused, due to just such lacking qualities as described, i.e., lack of balance and variety in the ration. These same feeds included in a well compounded ration give results entirely satisfactory. Rather, it would seem to be the indirect effect of the poor feeding practice described, that causes soft pork, not the direct effect of the single feed itself on the quality of fat deposition.

8. Soft pork, in the commercial sense, may be caused by the careless, injudicious, or possibly necessary use of poorly balanced rations, or, actually, single feeds representing as they do, in many cases, the only feeds available during long periods of the market pig's life. As a result of malnutrition (as causing lack of finish or thrift) a certain percentage of soft sides may result.

9. Viewed from another angle, it would appear that the available Canadian feeds commonly used for swine feeding—oats, barley, buckwheat, corn, shorts, bran, middlings—where appearing in properly balanced rations, are quite unlikely to cause soft pork. With the use of correctly compounded rations as relating to the successive stages of development—of considerable importance are the factors of, methods of feeding, housing, freedom from the effects of parasitism, and other environmental features, as viewed from their effect on normal, healthy functioning during the life of the market pig.

COST OF PORK PRODUCTION

OBJECT

To determine the cost of raising bacon hogs to 200 pounds in weight.

PLAN

One litter of seven pigs was selected and weaned at eight weeks of age. The ration was the same as that used in the soft pork experiment under section B. The pigs used were Tamworth X Berkshire.

The following table shows the cost of producing pork during the first sixty-day period, the next 30-day period, and the last forty-eight-day period, as well as the total period of 138 days.

COST OF PORK PRODUCTION

—		First 60 days	61 to 90 days	91 to 138 days	Total period
Number of pigs	No.	7	7	7	7
Initial weight, gross	lb.	242	678	873	242
Initial weight, average	"	34·6	96·8	124·7	34·6
Final weight, gross	"	678	873	1,316	1,316
Final weight, average	"	96·8	124·7	188	188
Number of days fed	days	60	30	48	138
Total gains for period	lb.	436	195	443	1,074
Average daily gain per hog	"	1·038	·93	1·32	1·11
Amount of meal eaten per group	"	725	630	1,305	2,660
Amount of milk eaten per group	"	2,205	1,140	2,325	5,670
Amount of meal eaten per lb. gain	"	1·66	3·23	2·94	2·48
Amount of milk eaten per lb. gain	"	5·06	5·84	5·24	5·28
Total cost of feed	$	17 84	13 88	29 30	61 0
Cost of feed per head	$	2 55	1 98	4 18	8 72
Cost of feed per head per day	cts.	4·25	6·60	8·72	6·32
Cost of feed per lb. gain		4·09	7·12	6·61	5·68

Statement of Returns

Cost of 7 pigs at weaning at $2.25 per head	$15 75
Total cost of feed for 138 days	61 02
Cost of pigs when finished, at 188 pounds	76 77
Value of 1,316 lb. pork at $11 per cwt	144 76
Profit over cost of feed for 7 pigs	67 99
Average profit per pig	9 71

In this test the cost of feeding a pig from weaning to finishing at 188 pounds in weight was $8.72, or a cost per hundred pounds of $5.68. With these pigs costing an average of $2.25 at weaning, this gives a total cost of $10.98 for feed. When selling at 11 cents per pound, each hog had a value of $20.68. Deducting the cost of feed, a profit over cost of feed of $9.71 per hog is realized, or estimated on the hundred pound basis, a profit of $5.16 per hundred pounds.

WINTER HOUSING

A lack of available data have existed with regard to the prevailing temperatures at which the swine were housed during the winter, and with the object of procuring some reliable information on the matter, temperature readings were taken in the main piggery, the experimental piggery, and in a hog cabin, during the months of January and February.

The test in the main piggery was commenced on January 1, and continued until February 28. During this period the average minimum daily temperature recorded outside was 2.97° F, and the average maximum temperature 23.2° F.

The average temperature reading taken each day at 8 a.m. was 9.56° F. and at 4 p.m. it averaged 16.86° F. The average of the inside temperatures were as follows:—

TEMPERATURE INSIDE MAIN PIGGERY (AVERAGE OF FIFTY-NINE DAYS)

Location			Time			Average
Front	Centre	Rear	6.30 A.M.	11.30 A.M.	5 P.M.	
57·63°	66·27°	49·12°	53°	59·14°	60·87°	57·67°

The figures show that the average temperature in the piggery during the day was 57.67° F. The average outside temperature was in the proximity of 13.21° F. This shows a difference of 44.46° between the inside and outside temperatures. This piggery is equipped with a heater, which is located in the centre of the piggery, and helps to maintain a somewhat higher temperature than if the hogs generated the only heat in this building.

The test in the experimental piggery commenced on January 18, and continued until February 28. The average maximum outside temperature during the 42 days was 25.45° and the average minimum 5.38° The interior temperature readings obtained were as follows, these temperature readings having been taken in the piggery and also in the covered sleeping berth.

AVERAGE TEMPERATURE READINGS

Inside sleeping berth		Outside of berth		Outside	
7 A.M.	4 P.M.	7 A.M.	4 P.M.	8 A.M.	4 P.M.
36·29° (6·6 pigs)	42·5° (3·12 pigs)	22·88°	32·31°	11·21°	19·24°

It will be observed from the above that at the hours when the temperature readings were taken, all the pigs were not always in the berth. This condition will, of course, result in a lower reading than if all the pigs were inside. The figures as presented, show that with the average outside temperature in the morning at 11.2° F. the temperature of the pen averaged 22.88° F. and that of the sleeping berth 36.29° F., when there was an average of 6.6 of the eight pigs inside. The outside reading at 4 p.m. averaged 19.24°, the temperature of the piggery at that time, 32.31°, and that of the berth, 42.5°, with an average of 3.12 of the eight pigs inside. The difference in temperature between that prevailing outside and that of the sleeping berth, therefore, averaged 25.09° in the a.m., and 23.26° in the p.m., while the difference between the pen and the berth was 13.41° and 10.19° in the a.m. and p.m., respectively.

The test with brood sows in the portable hog cabin commenced on January 18, and continued for forty-two days, or during the same time as the previous test. Th outside temperatures were, therefore, the same for these two tests. The averages of the temperature readings for the cabin are as follows:—

AVERAGE TEMPERATURES FOR FORTY-TWO DAYS

Inside Cabin		Outside Cabin	
7 A.M.	4 P.M.	8 A.M.	4 P.M.
29·83° (4·7 sows)	34·83° (2·29 sows)	11·2°	19·24°

The average difference in the a.m. between the temperature in the cabin with an average of 4.7 sows inside, and the average outside temperature was 17.63°, while in the p.m., at 4 o'clock, with an average of 2.29 sows in the cabin, the difference was 15.59° between the inside and outside temperatures.

FARROWING AND WEANING RECORDS

In the Yorkshire herd a total of thirty-one litters were farrowed. The number of pigs farrowed per litter averaged 11.06, which is practically the same as for the last four years, while the average number raised per litter was 6.51 or 58.89 per cent. This is 5.13 per cent less than in the previous year, and 3.41 per cent less than in the season of 1924-25. This is explained in part, by the fact that a larger number of small and weak pigs and also dead pigs were farrowed than during the previous years.

A total of eight litters were farrowed in the Berkshire herd, averaging 8.63 pigs per litter at birth, and 6.87 at weaning, or a percentage of 79.7 of the pigs which were farrowed, raised to weaning. This is a somewhat better record than that shown by the herd in the previous year.

YORKSHIRE AND BERKSHIRE FARROWING AND WEANING RECORD—1923–1926

—	Total number of sows	Total number of pigs in litters	Average number of pigs per litter	Total number of good pigs at birth	Per cent of good pigs	Total number of small and weak pigs at birth	Per cent of small and weak pigs	Total number of dead pigs at birth	Per cent of dead pigs	Total number of living pigs at eight weeks	Total losses during the first eight weeks	Per cent of losses at eight weeks of age	Average number of pigs per litter at eight weeks	Per cent of pigs raised to eight weeks of age	Number fit for breeding	Per cent fit for breeding	Number fit only for feeding	Per cent fit only for feeding
	No.	No.	No.	No.	%	No.	%	No.	%	No.	No.	%	No.	%	No.	%	No.	%
1926-27—																		
Yorkshires	31	34[illegible]	11·06	265	77·26	56	16·3	22	6·4	202	121	35·28	6·51	58·89	148	73·26	54	26·74
Berkshires	8	6[illegible]	8·63	62	89·85	3	4·3	4	5·79	55	14	20·29	6·87	79·71	38	69·09	17	30·9
1925–26—																		
Yorkshires	28	310	11·07	269	86·77	32	10·3	9	2·9	199	111	35·48	7·10	64·02	.....	.....	.....	.....
Berkshires	18	159	8·83	144	90·5	14	8·8	1	0·6	119	40	25·16	6·61	74·84	.....	.....	.....	.....
1924–25—																		
Yorkshire	31	366	11·8	302	82·5	44	12·02	20	5·43	228	138	37·7	7·3	62·3	175	76·7	53	23·2
Berkshire	1[illegible]	156	8·21	136	87·2	15	9·61	5	3·20	90	66	42·3	4·74	57·7	65	72·2	25	27·7
1923–24—																		
Yorkshires	3[illegible]	36[illegible]	11·06	299	81·9	59	16·16	7	1·92	205	160	43·8	6·21	56·16	143	70·0	62	30·0
Berkshires	1[illegible]	138	7·66	216	84·05	1[illegible]	8·7	10	7·25	104	34	24·6	5·7	75·4	65	62·5	39	37·5

OTHER EXPERIMENTAL WORK

A number of other experiments are under way at the time of writing this report. One is the feeding of iron oxide to nursing sows to determine if iron will have a beneficial effect on young pigs.

A breeding project is also under way, that is to determine the best and most economical age to breed young gilts. Groups of gilts will farrow when 10 to 12 months, other when 12 to 14 months, 14 to 16, 16 to 18 and 20 months old.

A record of feed consumed by a group of eight sows for one year is being kept in order to have a complete record of the cost of pork production. These figures will cover the feed cost of pigs at weaning time, the cost at marketable age for spring and fall litters, as well as the feed cost of carrying a sow one year when raising two litters.

SHEEP

The flock of sheep numbers 217 head. Two breeds are kept. The Shropshire breed comprises 99 breeding ewes, 3 aged rams, two of which are imported, and 8 ram lambs, and the Leicester breed comprises 94 breeding ewes, 3 aged rams, two of which are imported, and 3 ram lambs. The health of the flock has been excellent throughout the year.

No trouble whatever was experienced with goitre or weak lambs at birth during the 1926 lambing season, as was the case in 1925. This improved condition is probably due to the feeding of potassium iodide to the pregnant ewes before lambing. This year, in order to obtain more definite results as to the value of potassium iodide, one group of ewes did not receive the iodide, therefore the lambing crop of 1927 may offer some further deductions as to its value.

With the cross-breeding work for the production of market lambs again featured this year, an experiment was started with the object of determining the weight of lambs and the time of the year that is most profitable to market. This experiment is of a high economic importance, since the market requirements to-day for the domestic trade as well as for export trade are for a well-finished but lighter lamb than has been marketed in the past. The demand to-day is for well-finished lambs averaging between 38 to 42 pounds when dressed. With this project also is featured the comparison of different breeds and crosses most suitable for the production of such lambs. This experiment will be continued for another year or two in order to obtain more definite results.

MARKETING LAMBS

Three shipments of lambs were made from the flock during the summer and fall; the first shipment to the Canadian Packing Company, Hull, P.Q.; the second to the Swifts Canadian Company, Toronto; and the last one to C.P.C., Hull, P.Q. The financial returns from these are as follows:—

Destination	Date sold	Number of lambs	Total weight	Average weight	Net price per lb.	Net price for lot
		No.	lb.	lb.	$	$
C.P.C.	July 7, 1926.	20	1,460	73·0	0·15	219·00
Swifts	Aug. 18, 1926.	55	4,250	77·3	0·1415	602·45
C.P.C.	Oct. 27, 1926.	17	1,550	91·17	0·10	155·00
Totals		92	7,260	78·9	0·1345	976·45

The price of fifteen cents per pound received on July 7, 1926, dropped to ten cents by October 27, 1926, a drop of 33⅓ per cent. The price received in Toronto on August 18, 1926, was fifteen cents per pound, but from this was deducted the cost of transportation, which proved to be 0·85 of a cent per pound from Ottawa.

These returns show the necessity of early marketing of the lambs, in order to take advantage of the stronger market.

The lambs in the first two shipments were slaughtered and graded. A cutting record was also procured from representative carcasses in both these shipments. As will be noted from a study of the first table, the live weights of the individual lambs were not procured, but the total weight is recorded.

RECORDS OF LAMB SLAUGHTERING EXPERIMENT—LAMBS SOLD JULY 7, 1926

Number of Lamb	Live weight	Weight of carcass	Breeding	Dressing percentage	Length from tail to neck	Balance of carcass	Grade
	lb.	lb.		%	inches		
1		39·0	C.B.		23·5	Good	Good
2		36·0	C.B.		21·5	Good	Choice
3		36·0	P.B.L.		21·5	Fair (heavy front)	Medium
4		39·0	P.B.L.		22·0	Good	Good
5		37·0	C.B.L.		22·75	Good	Choice
6	Average	37·0	C.B.S.		21·25	Good	Good
7	live	41·0	P.B.L.	Average	21·25	Good	Prime
8	weight	37·0	C.B.L.	dressing	21·75	Good	Good
9	of lambs	45·0	C.B.L.	percentage—	23·50	Good	Prime
10	—73 lb.	33·0	C.B.		20·5	Good	Medium
11	(Total	45·0	C.B.L.	54·11%	22·0	Good	Good
12	weight	49·0	C.B.L.		23·5	Good	Heavy
13	1,460 lb.)	37·0	C.B.		22·5	Good	Good
14		48·0	C.B.		22·5	Good	Heavy
15		38·0	C.B.		21·25	Good	Choice
16		34·0	P.B.L.		19·75	Good	Good
17		40·0	P.B.L.		21·5	Good	Choice
18		40·0	C.B.L.		22·25	Good	Choice
19		43·0	C.B.		22·0	Heavy in front	Good
20		36·0	C.B.		21·25	Good	Good
Averages	73	39·5			21·9		

CUTTING RECORD

Number	Breeding	Development of Fleshing			Colour of Flesh		Texture of Flesh	Development of Fat		
		Shoulder	Back	Leg	Lean	Fat		Shoulder	Back	Leg
12	C.B.L.	Good	Good	Excellent.	Excellent			Too fat	Too fat	Too fat.
16	C.B.	Fair	Fair	Fair	Lacks a little in colour			Medium	Medium	Medium.
17	P.B.L.	Good	Good	Excellent.	Slightly dark in colour			Excellent	Excellent	Excellent.
18	C.B.L.	Excellent.	Excellent.	Excellent.	Good			Excellent	Excellent	Good (a little fat.)

RECORDS OF LAMB SLAUGHTERING EXPERIMENT—SOLD AUGUST 18, 1926

Ear Tag Number	Live weight (At Range)	Weight of carcass	Breeding	Dressing percentage	Length from tail to neck	Balance of carcass	Grade
	lb.	lb.		%	inches		
608	89·0	42·5	C.L.	47·75	24·0	Excellent	Choice
609	94·0	46·0	C.L.	48·94	24·5	Excellent	Choice
610	75·0	39·5	C.L.	52·67	22·5	Excellent	Good
611	80·0	48·0	P.B.L.	60·00	24·5	Excellent	Choice
612	72·0	35·5	P.B.L.	50·71	22·5	Excellent	Choice
613	80·0	41·5	P.B.L.	51·88	25·5	Good but long	Good
614	68·0	33·5	C.S.	49·26	21·5	Excellent	Choice
615	78·0	34·5	C.L.	44·23	24·0	Good	Good
616	90·0	44·5	C.S.	49·44	25·0	Excellent	Choice
617	70·0	33·0	C.L.	47·14	22·5	Excellent	Good
618	86·0	41·0	C.L.	47·67	24·5	Excellent	Good
619	80·0	38·0	C.L.	47·50	24·0	Excellent	Choice
620	87·0	40·0	C.L.	45·98	24·5	Excellent	Choice
621	83·0	40·5	P.B.L.	48·80	24·5	Good but long	Good
622	74·0	34·0	C.L.	45·95	23·5	Excellent	Choice
623	104·5	52·0	C.L.	49·76	25·5	Good	Heavy (cho
624	91·0	45·0	C.S.	49·45	25·0	Fair	Good
625	91·0	46·0	C.S.	50·55	24·0	Excellent	Choice
626	81·0	42·0	C.S.	51·85	24·0	Excellent	Choice
627	108·0	56·5	C.L.	52·31	24·5	Excellent	Heavy (choice)
628	101·0	52·0	C.S.	50·00	26·5	Good	Good
629	81·0	39·0	C.S.	48·15	24·0	Good	Good
630	96·0	47·0	C.S.	48·96	24·5	Excellent	Choice
631	87·0	40·5	C.L.	46·55	24·0	Excellent	Choice
632	95·0	52·5	C.S.	55·26	24·5	Excellent (heavy)	Prime
633	85·0	39·0	C.L.	45·88	24·5	Fair	Medium
634	75·0	38·0	C.L.	50·67	22·0	Good	Good
635	102·0	56·5	P.B.L.	55·39	25·0	Excellent	Heavy (choice)
636	78·0	49·5	P.B.L.	63·46	23·5	Excellent	Choice
637	89·0	47·0	P.B.L.	52·81	25·5	Good	Good
638	83·0	40·5	C.L.	48·80	24·5	Excellent	Choice
639	95·0	49·0	C.L.	51·58	24·5	Good (heavy front)	Good
640	82·0	39·0	C.S.	49·56	24·5	Good	Good
641	76·0	39·0	C.S.	51·32	22·5	Excellent	Choice
642	95·0	46·5	C.S.	48·95	26·0	Good (trifle heavy)	Good
643	85·0	42·5	C.S.	50·00	24·0	Excellent	Choice
644	78·0	38·0	C.S.	48·71	22·0	Excellent	Choice
645	89·0	39·5	C.L.	44·38	24·0	Excellent	Choice
646	88·0	43·0	C.L.	48·86	24·0	Excellent	Choice
647	100·0	52·5	C.L.	52·50	25·0	Excellent	Heavy (choice)
648	110·0	57·0	C.L.	51·82	25·5	Good (heavy shoulder)	Heavy (choice)
649	87·0	41·0	C.S.	47·13	24·0	Excellent	Choice
650	90·0	45·5	P.B.L.	50·55	25·5	Good	Good
593	85·0	38·0	C.S.	44·71	24·0	Good	Good
594	95·0	45·5	C.L.	50·48	24·5	Good (slightly heavy at shoulder).	Choice
595	105·0	53·0	C.L.	50·49	26·0	Good	Good
596	85·0	41·0	C.L.	48·24	22·5	Excellent	Choice
597	85·0	43·0	P.B.L.	50·59	24·0	Good	Good
598	84·0	43·0	C.L.	51·19	25·0	Excellent	Prime
599	87·0	45·5	C.L.	52·29	24·0	Excellent	Choice
490	93·0	45·5	C.L.	48·92	25½	Good (slightly heavy in front).	Good
491	80·0	41·0	P.B.L.	51·25	24·5	Excellent	Choice
492	98·0	52·0	C.L.	53·06	25·5	Excellent	Heavy (choice)
493	90·0	47·0	P.B.L.	52·22	24·5	Excellent	Prime
494	103·0	50·5	C.L.	49·03	25·0	Excellent	Heavy (choice)
Averages...	87·65	43·86	.....	50·04	24·28		

CUTTING RECORD

Ear Tag Number	Breeding	Development of Fleshing			Colour of Flesh		Texture of Flesh	Development of Fat		
		Shoulder	Back	Leg	Lean	Fat		Shoulder	Back	Leg
612	P.B.L.	Medium	Medium	Medium	Good to excellent	Excellent	Excellent	Good	Good	Good
491	P.B.L.	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
635	P.B.L.	Excellent	Excellent	Excellent	Excellent	Excellent	Good	A little ov	erdone all	through
645	C.L.	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
629	C.S.	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Explanation of Terms Used

P.B.L.—Pure-bred Leicester.

C.L. or C.B.L.—Cross-bred Leicester.

C.S. or C.B.S.—Cross-bred Shropshire.

Live Grades.—Prime, 40-45 lbs.; choice, 35-40 lb.; good, 35-45 lb.; medium, 30-45 lb.; heavy, 45-50 lb.; extra heavy, 50 lb. and up.

Grades Used for Cutting Records.—Excellent, good, medium, poor.

Development of Fat.—Overdone, excellent, good, medium, poor.

A choice cross-bred carcass. (No. 626 in Records of Lamb Slaughtering). Note the uniformity of finish and development generally. Weight of carcass 42 pounds.

The lambs in the shipment to Toronto yielded a greater percentage of the higher grades of carcasses than did those sold earlier in the year. In the Toronto shipment 5·5 per cent graded prime, 45·5 per cent choice, 34·5 per cent good, 12·7 per cent choice-heavy, and 1·8 per cent medium; as compared to 10 per cent prime, 25 per cent choice, 45 per cent good, 10 per cent medium, and 10 per cent heavy, for the lot shipped to the C.P.C., Hull, in July.

The average weight of the lambs in the first shipment at their destination was 73 pounds, and the average dressed weight 39·5 pounds. The dressing percentage was, therefore, 54·1 per cent for this lot.

The average weights of the lot shipped to Toronto were 87·65 pounds at the range and 77·3 pounds at their destination. The average dressed weight was 43·9 pounds, this giving a dressing percentage of 56·5 per cent, which is 2·4 per cent higher than in the case of the first shipment.

In length from tail to neck, the average length of the July shipment was 21·9 inches, and that of the carcasses in the August shipment 24·28 inches.

While some of these results are significant and indicative of the results that are to be expected under this particular method of marketing, nevertheless it is impractical to draw any definite conclusions from a single year's investigations.

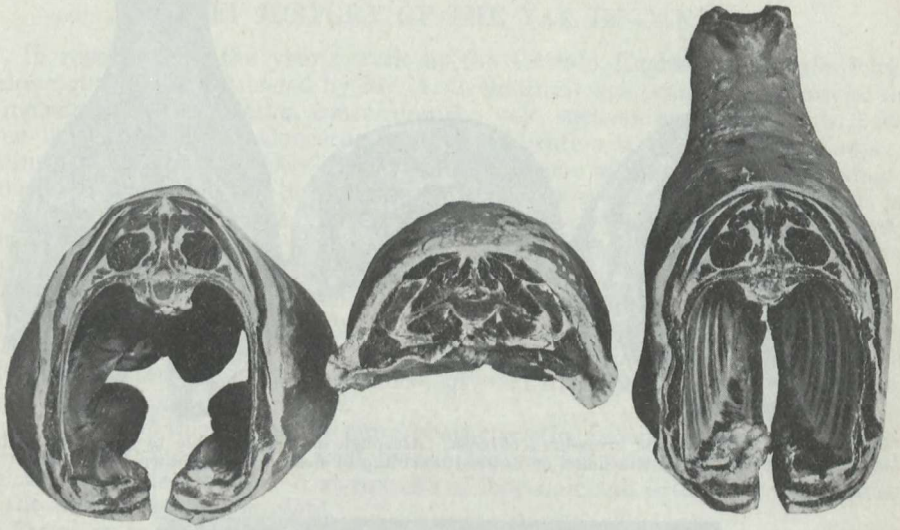
WOOL

The total yield of wool from the 1926 clip was 1,400 pounds. As has been the practice in former years, this was marketed through the Canadian Co-operative Wool Growers, Limited.

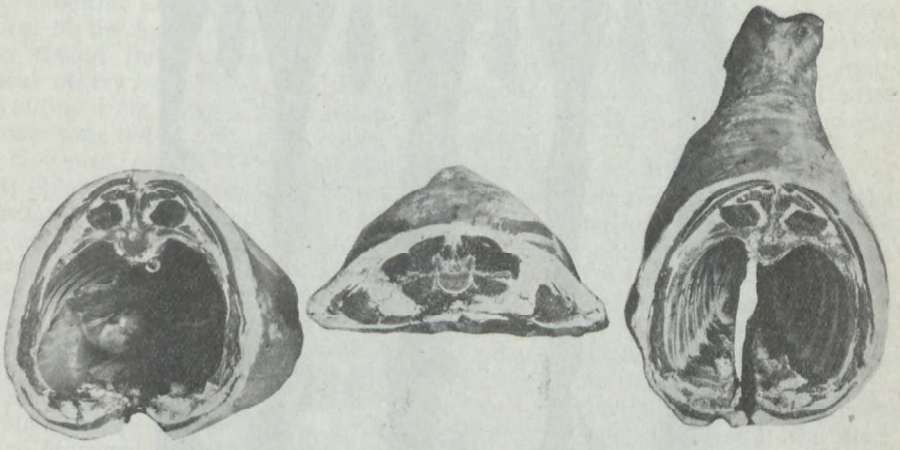
The grading of the wool gave the following results:—

Grade	Weight	Price per lb.
	lb.	cts.
Medium Sta. (3/8 blood sta.)	279	28
Low Medium Sta. (1/4 blood sta.)	402	25
Low Sta. (Low 1/4 blood sta.)	224	27
Common and braid	323	26
Hard Cotts	150	17
Medium dead	12	20
Coarse dead	7	18
Medium tags	3	5

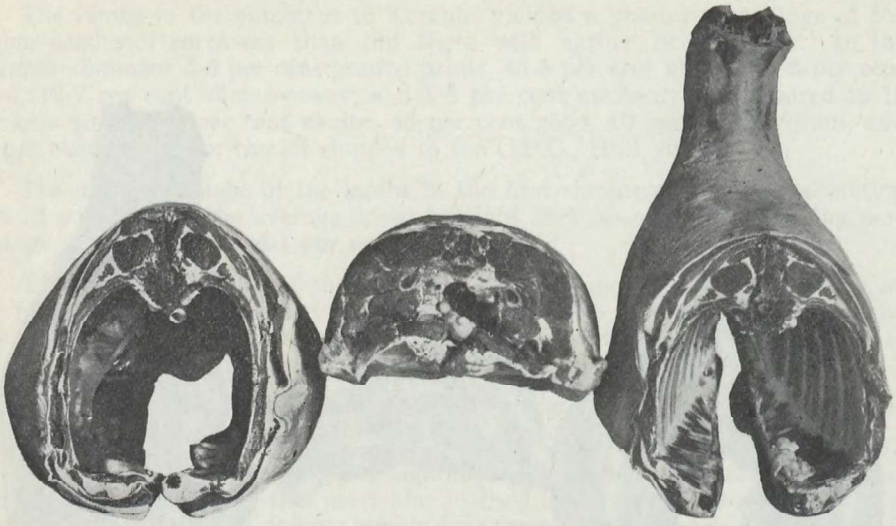
The average weight of the fleece from Shropshires was 8·39 pounds, and from the Leicesters the average weight was 8·70 pounds.



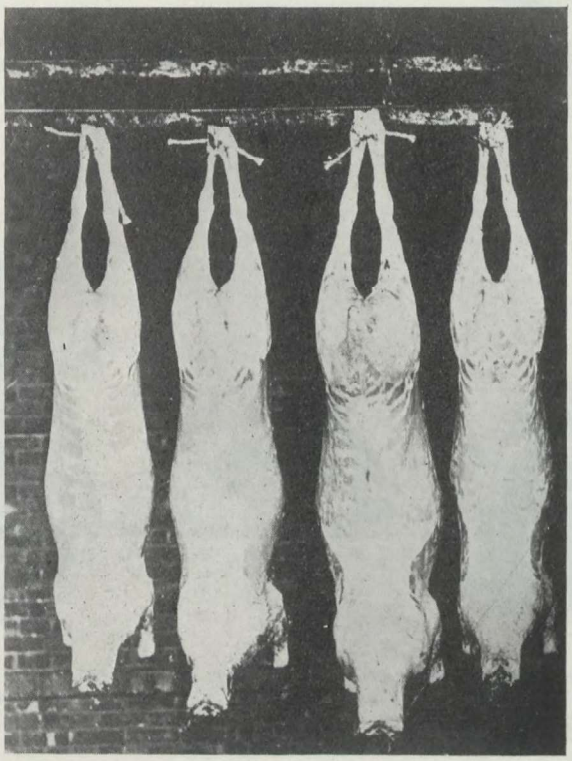
Cross sections of a choice cross-bred carcass. (See No. 626). This carcass closely approached the ideal requirements in weight, balance and finish.



Cross sections from a choice heavy cross-bred carcass. (See No. 647). This carcass, although choice, was on the heavy side and would show rather too much waste in the opinion of the average householder. Weight, 52.5 lb.



Cross section from a good cross-bred carcass. Although most acceptable to the trade, this carcass has not quite the finish or desired marbling of flesh and fat shown in No. 626.



Market lamb carcasses in the cooling plant of one of the abattoirs. Although these represent a good run, they lack in uniformity of size, finish and balance as compared with No. 626.

ANIMAL HYBRIDIZATION AT BUFFALO PARK, WAINWRIGHT, ALTA.

A BRIEF HISTORY OF THE YAK IN CANADA

In reporting on the year's work at the Cattalo Enclosure, Buffalo Park, Wainwright, as superintended by Mr. A. G. Smith, it has been thought advisable to include some information concerning the yak, such as has not hitherto been given in these reports. Concerning the hybridization work in progress, representing as it does a distinctly novel venture and one of universal interest, much erroneous information has been printed in the news columns of this continent in which the experiment is displayed in sensational style, and in which statements would lead the reader to believe that a "new breed" of cattle had been definitely produced. Such of course is not the case. Such, indeed, may never be the case. Many misstatements have been made concerning the yak.

The Yak (*Bos Grunniens*) is the wild (and domesticated) ox of the plateaus of Tibet, a country of high altitude, sparse vegetation, and during winter, intense cold. This animal is one of the finest of wild oxen and is the most reliable means of transportation in Tibet.

The coat of this animal is quite characteristic, having a very fine undercoat, the product of which is used by the natives for spinning into shawls and soft carpets, while the outer-coat consists of long hair and is used by the natives for the making of strong cloth.

Previous to the year 1909 the naturalist, Ernest Thompson-Seton, was particularly interested in the northern climates of Canada and due to his influence, His Grace the Duke of Bedford also became interested in Canada's northern areas. In the year 1909 the Duke of Bedford presented to the Dominion Government a small herd of yak which he had shipped from England early in the spring of that year. This herd consisted of one aged bull, one yearling bull, two aged cows, and two yearling heifers. The adult animals were somewhat smaller than our larger domestic cattle and possibly were not as typical of the larger strains of yak as commonly reported by naturalists who have visited the Tibetan plateau. However, these animals appeared quite typical otherwise. The journey from England to St. John, N.B., and after quarantine from thence to Brandon, Man., took nearly four months and the animals were not in very good shape upon arrival.

However, on the Dominion Experimental Farm at Brandon a range of thirty-five acres of land was provided with adequate sheds, and during the midsummer and fall months these animals quickly picked up in condition. They appeared to be excellent foragers, very closely resembling the bison in that regard. However, once the winter months set in and rough feed was provided in the sheds, these animals ceased attempting to forage for a living.

Unfortunately during the months of January and March, 1910, the aged bull and one of the aged cows were lost due to digestive disturbances. The balance of the herd remained in good health as it did also during the year 1911.

However, whether or not due to the relatively low altitude, the females did not produce offspring, and in consequence it was decided that if the herd was to be saved for future use in Canada it would be advisable to move it to higher altitude. In May, 1912, arrangements were made whereby the herd was moved from Brandon and placed under the jurisdiction of the Parks Branch, Department of the Interior, and located at the Rocky Mountain Park, Banff, Alta. That this was a good move is evidenced by the fact that the cows started breeding fairly regularly in the succeeding year and in seven years the herd had increased to considerable numbers of very excellent animals.

In the meantime the Dominion Department of Agriculture, Experimental Farms Branch, had become much interested in the matter of hardiness in cattle for the as yet unsettled northern areas and had become keenly interested in the work being done by Mr. Mossom Boyd of Bobcaygeon toward the introduction of bison blood into our beef breeds of domestic cattle. In the year 1916 twenty animals were purchased from the estate of Mossom Boyd and these animals were temporarily placed at the Dominion Experimental Station, Scott, Sask. Later on an arrangement was made whereby the Parks Branch gave the use of a suitable area of land at the Buffalo Park, Wainwright, Alta., to which this herd of hybrid buffalo cattle was moved. In this work it was immediately realized that the problems which previous investigators had faced, namely, sterility in hybrid males, was one of the most difficult factors to overcome. In considering different methods of overcoming this obstacle it was thought possible that the introduction of the yak into this hybridization scheme might materially assist. Zoologically the yak appears somewhere intermediate between bison and domestic cattle, and it was thought that if the yak would consort freely with both bison and domestic cattle and the resultant offspring prove fertile, the desired end might be more quickly achieved.

In consequence of the above, the Department of Agriculture again approached the Parks Branch, Department of the Interior, with the object of obtaining a few representative yak for this work at Wainwright, and in June, 1919, obtained two bulls and two females from the Banff herd. Later on the Parks Branch found it advisable to move still further numbers of these animals to Wainwright, hence in October, 1921, the majority of the yak from Banff were moved to Wainwright. Later still all individuals were moved.

That this experiment in so far as it has gone has been remarkably successful is already shown through the numerous excellent individuals combining the blood of yak and buffalo, the yak and domestic cattle, and their offspring now coming combining the blood of bison, yak and domestic cattle.

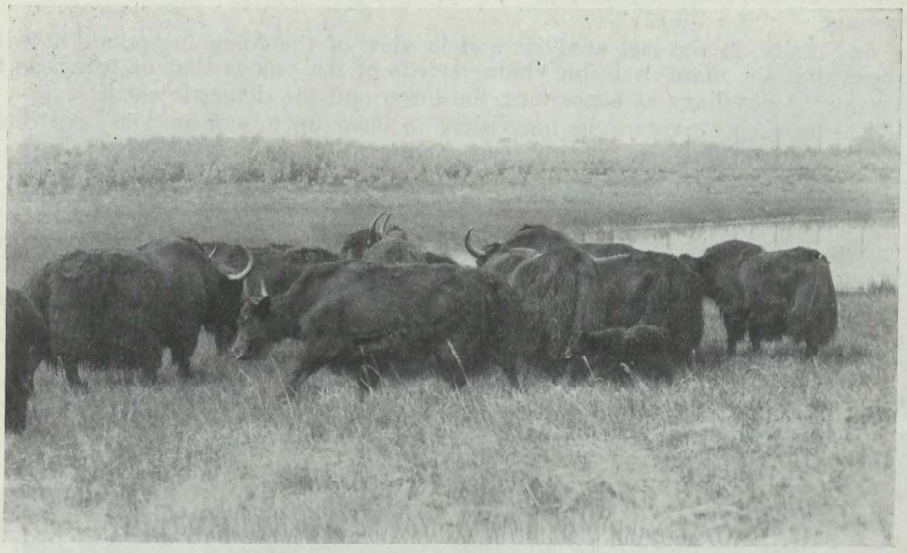
What may be the future development in this breeding work toward the retention or elimination of yak blood will be largely determined by progress in breeding work. However, the work to date has afforded a most interesting study of considerable value in animal breeding, and it is quite possible that in future years there may be developed a herd containing largely the domestic blood of the improved beef breeds, but with an infusion of bison and yak blood sufficient to give that hardiness, ability to withstand storms, ability to forage in winter, and the general thrift and vigour, which may be of some commercial value to the colder and northern sections of Western Canada where the beef industry will for all time be one of the important phases of agriculture.

Summarizing results to date:—

1. The yak would seem to have no special characteristic which would render it desirable for introduction into Canada.

2. The yak was used in this experiment on the assumption that they would cross readily with either bison or domestic cattle. This has proved to be correct, as will be noted from this and previous reports. The yak consorts readily with either and no abnormalities are present at parturition, as is the case for example with the bison-domestic cross. The hybrids, three-quarter breds, and extractions representing the blood of all three are exceptionally rugged and hardy.

3. Hybrid, yak-bison or yak-domestic females are fertile, mate, conceive, carry and deliver their offspring normally. The fertility of the male hybrids, however, has not as yet been so definitely proven. And on this point rests the future of the experiment as concerning the utilization of the yak.



A part of the Yak herd at Wainwright, Alta.

A close-up of a trio of Yak at Wainwright.

4. In point of hardiness, the yak does not compare generally with the bison. It has been noted that, as they increase in age, considerable suffering results in some cases, from the rigours of the Wainwright winters. Some shelter is necessary.

5. Finally, in the last analysis and in view of the foregoing points, it will be seen that the main desirable characteristic of the yak is that of being, as it were, an intermediary as concerning the bison and the domestic cattle.

The foregoing paragraphs may serve to clear up misconceptions regarding the use of this animal in hybridization studies at Wainwright.

INVENTORY OF LIVE STOCK AT CATTALO ENCLOSURE, BUFFALO PARK

The following is an inventory of stock on hand at the Cattalo Enclosure, Buffalo Park, Wainwright, as on March 31, 1927.

——	Males	Females
Bison	2	6
Domestic	2	11
Yak	1	3
Cattalo		3
Hybrids—		
Bison-Domestic		2 3-yr.-old/27 1 1-yr.-old/27
Yak-Domestic	1 4-yr.-old/27 1 3-yr.-old/27 1 2-yr.-old/27 1 1-yr.-old/27 4	5 4-yr.-old/27 2 2-yr.-old/27 1 1-yr.-old/27 8
Domestic-Yak	1 3-yr.-old/27	1 2-yr.-old/27
Yak-Bison		1 4-yr.-old/27
Hybrids, 2nd cross—		
50% Yak, 25% Bison, 25% Domestic	2 2-yr.-old/27	
75% Yak, 25% Domestic	1 2-yr.-old/27	
75% Domestic, 25% Yak	4 1-yr.-old/27	
75% Domestic, 25% Bison		2 1-yr.-old/27
50% Domestic, 25% Bison, 25% Yak		1 1-yr.-old/27
The original Mossom Boyd herd—		
Three-quarter Bison		2
Hybrid (Buffalo-Domestic)		3
Cattalo		2

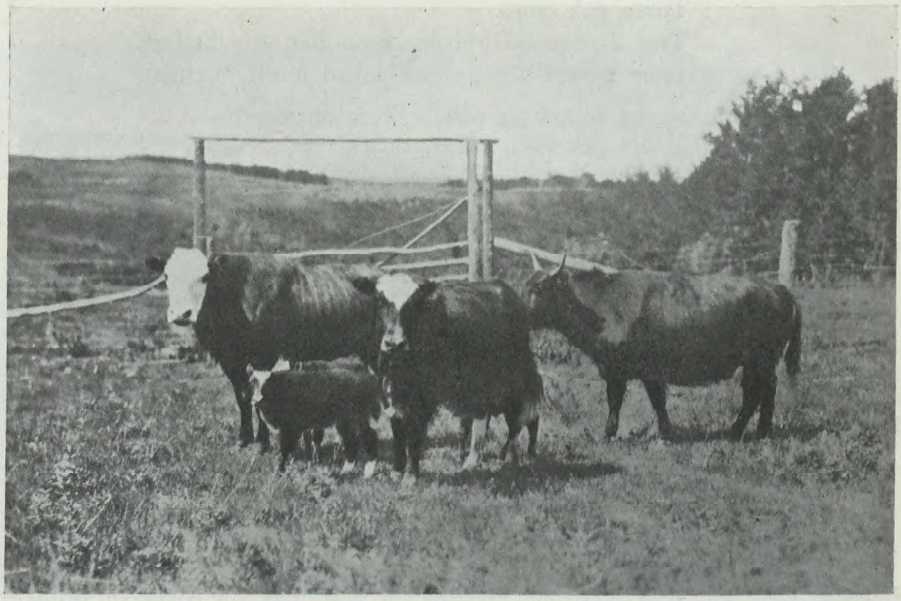
NOTES ON RESULTS OF 1925 MATINGS

The group mating as arranged in 1925 were as stated in the 1925 report and as repeated herewith:—

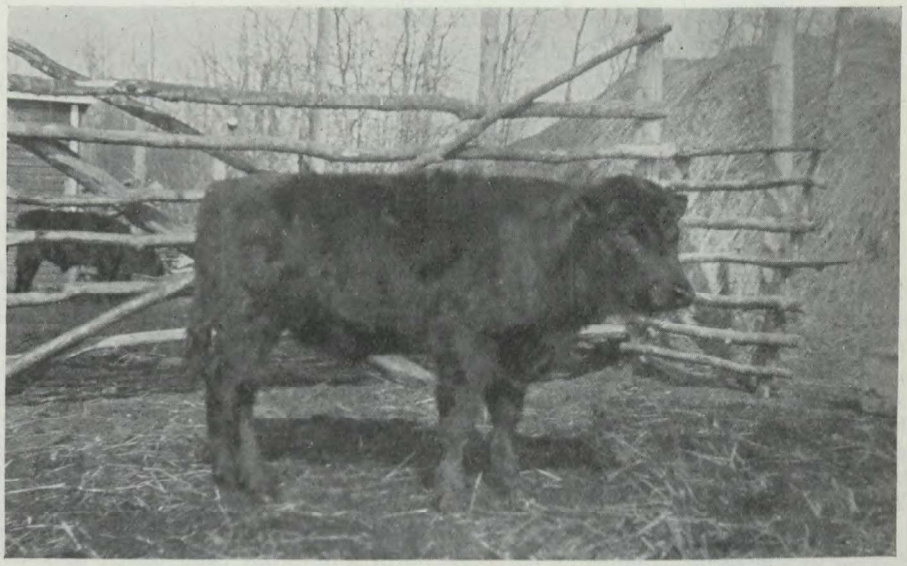
Group A.—One 2-year-old yak-domestic bull.
One 1-year-old bison-domestic heifer.
One 2-year-old yak-bison heifer.
One 2-year-old yak-domestic heifer.
Two domestic cows.

In this case the hybrid sire apparently was infertile, as none of the females bred by him during the season proved with calf. It should be noted that the yak-bison heifer mentioned was removed from this group during the fall as she was clearly non-pregnant, and bred to the domestic bull to which service she conceived and dropped a female calf in August.

The fact that the yak-domestic sire proved infertile is discouraging, but not considered in this case as conclusive evidence that a male hybrid of this extraction need necessarily be so. Other younger male yak-domestic bulls are being developed and will be tried out similarly.



A group of hybrid (first cross) females with their second cross calves.



Second cross male hybrid; sire a domestic bull, dam a Yak x Domestic Hybrid. Born 1926. Photograph taken spring 1927.

Group B.—Two domestic bulls.
Three yak cows.
Two 2-year-old hybrid bison-domestic heifers.
Four 2-year-old hybrid yak-domestic heifers.

From this mating the following results were obtained:—
The yak cows did not get with calf.
The hybrid bison-domestic heifers both dropped normal healthy female calves.
The four hybrid yak-domestic hybrids were bred and dropped healthy calves, all males.

Group C.—Two buffalo bulls.
Five domestic cows.

No success attended this mating. It is evident from last years results that the breeding powers of the cows have in some cases become impaired. The results of this year indicate the necessity of fresh domestic females.

Group D.—Two yak bulls.
Six domestic cows.
One bison cow.

Two hybrid yak-domestic calves, a male and a female, were secured from this grouping. The remainder of the domestic cows did not conceive, probably for the reason already mentioned. The bison cow did not conceive.

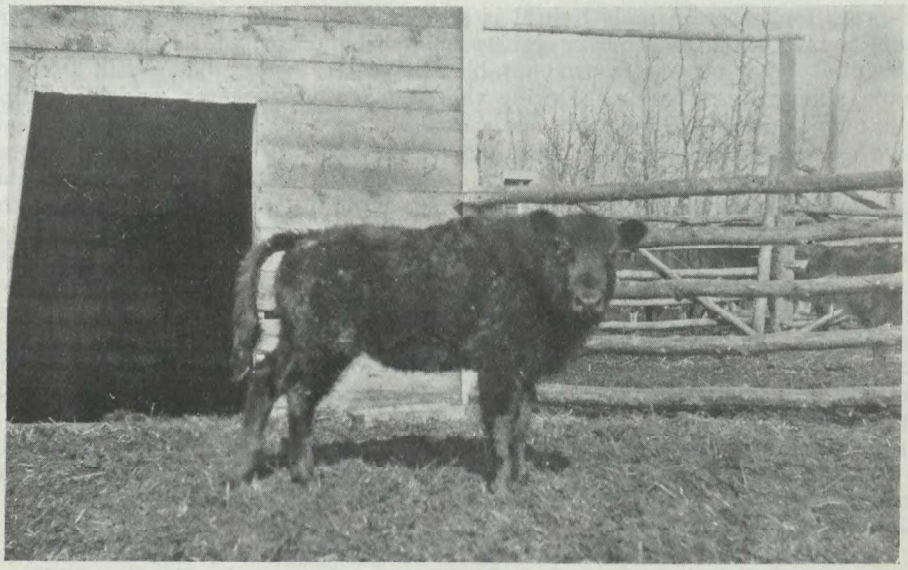
Summary of natural increase during 1926:—
4 males—Domestic sire x hybrid yak-domestic dam.
2 females—Domestic sire x hybrid bison-domestic dam.
1 female—Domestic sire x hybrid yak-bison dam.
1 female—Yak sire x domestic dam.
1 male—Yak sire x domestic dam.

On a percentage basis the combinations of blood are respectively as follows:

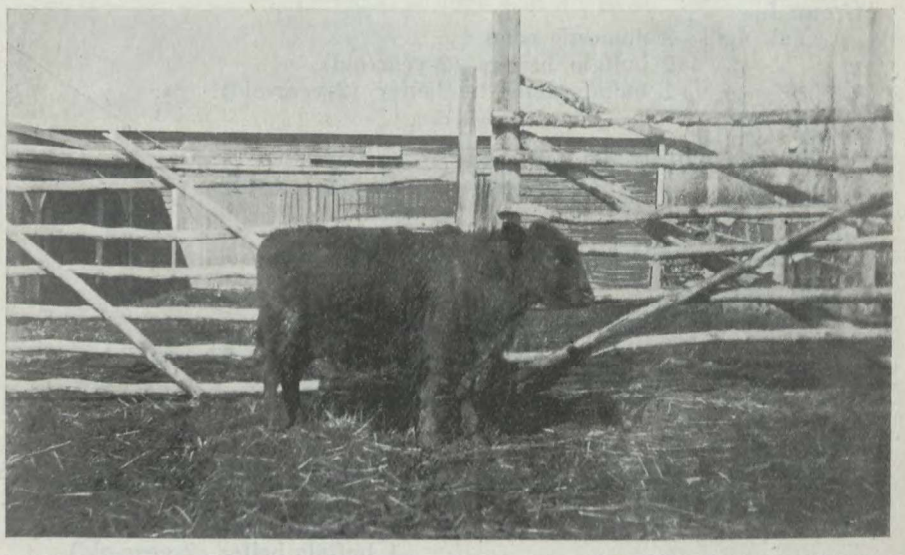
75	per cent	domestic, 25	per cent	yak.
75	"	25	"	bison.
50	"	25	"	bison, 25 per cent yak.
50	"	50	"	yak.

Of particular interest is the female calf, progeny of a domestic sire crossed with a hybrid (yak x bison) dam,—theoretically 50 per cent domestic, 25 per cent bison, 25 per cent yak. The results of previous experiments would seem to be in accord and to the effect that while the bison male may be crossed with the domestic female with qualified success (see reports of the Animal Husbandry Division), the reverse cross is almost an impossibility. In this case the dam was a hybrid (yak x buffalo) and the presence of the yak blood may have been responsible for the fact that the calf in question was delivered under perfectly normal conditions as concerning both the hybrid mother and her offspring. The period of gestation in this case was 273 days.

Those familiar with the difficulties connected with the production of hybrids of the bison x domestic extraction will know that pronounced difficulty and abnormality is encountered at parturition, the hybrid calf and frequently the mother being lost. While this is the case with hybrid calves of either sex,



A second cross female hybrid of most unique origin; sire, a Domestic bull; dam, a Yak x Bison hybrid. Born 1926. Photograph taken spring 1927.



A "three-quarter bred"; second cross female hybrid; sire, a Domestic bull; dam, a Bison x Domestic hybrid. Born 1926. Photograph taken spring 1927.

as originating from the bison x domestic cross, the conditions are so pronounced in the case of the male that comparatively few have been produced alive or kept alive for more than a few hours. It would seem that in the great majority of cases. too, where a male hybrid is presented, the dam dies as well. Where male hybrid bison x domestic calves have been presented in the past these difficulties have proved insurmountable, the calves either being still born or dying almost immediately. During the past season, however, one interesting case may be noted. Two years ago a domestic cow gave birth to a female calf sired by a bison bull and evidenced less of the difficulties common to this cross than any similar case at parturition. During the 1925 breeding season this cow was again mated with a bison. As the period of pregnancy advanced the cow went off feed badly on two or three different occasions. A discharge of fluid was noticed (hydramnios is apparently common in nearly all cases with the bison x domestic cross), and she lost flesh. At time of parturition the cow was very weak, but with some assistance and great difficulty the calf was delivered in the natural way. The calf proved to be a male, was alive at birth, gave every evidence of continuance in this world, showed strong pulse and activity, but finally succumbed. The cow, in her weakened state, died shortly afterward.

The above case is cited in that it was the first instance at Wainwright where a male calf was delivered naturally and the calf was the first male showing strength and functioning normally. While the calf was lost the case is nevertheless of interest.

Another item worthy of note in connection with this case was that on examination of the carcass of the calf, fourteen ribs were found on one side and thirteen on the other.

GROUP MATINGS FOR 1926 BREEDING SEASON

The group matings as arranged for the 1926 breeding season were as follows:—

Group I—
Yak bull—3 domestic cows.
2 buffalo heifers (2-year-old).
1 buffalo-domestic heifer (2-year-old).

Group II—
Buffalo bull—7 domestic cows.
3 yak-domestic heifers (3-year-old).

Group III—
Domestic bull—3 yak cows.

Group IV—
Domestic bull—2 yak-domestic heifers (age 3).
2 buffalo-domestic heifers (age 3).
1 buffalo cow.
1 buffalo heifer (2-year-old).

Group V—
Yak-Domestic bull (3-year-old)—2 yak-domestic heifers (yearlings).
1 yak-buffalo heifer (3-year-old).
1 domestic cow.
1 buffalo heifer (2-year-old).
1 domestic-yak heifer (yearling).

The results of these matings will be given in the next annual report.

LOSSES DURING THE YEAR

Two of the females from the original Mossom Boyd selection (this herd is now retained purely for exhibition purposes), died during the year. One of these, Mistress Halogen, a true Cattalo cow, 13 years old, was affected with paralysis of the kind quarters—a condition not uncommon in the main bison herd. She finally became bogged in a slough and died. Examination of the carcass failed to disclose the presence of the extra or fourteenth rib.

The second loss from the old hybrid herd was the three-quarter bison Trialia.

A domestic cow, in calf to a bison, was lost at parturition, and as reported elsewhere.

A domestic cow was slaughtered, owing to her crippled condition.

A yak bull died, cause unknown other than as might be caused by old age and severity of winter.

Aside from the losses enumerated, these due in all cases to age, accident or the abnormalities incidental to hybridization,—the health of all individuals in the different groups has been excellent. As mentioned in previous reports, the hybrids are singularly rugged and hardy.