THESIS.

STATUS OF SASKATCHEWAN LIVESTOCK INDUSTRY.

by

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Taken in Department of Animal Husbandry.

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Saskatchewan Agricultural College,

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Saskatchewan in recent years has come to be known and regarded with no small amount of pride by its citizens as the premier grain-growing Province of the Dominion of Canada. It has attained this position through the growing of wheat principally, the wheat crop being over twice as valuable as the total of all other crops grown in the Province. More than one-half the total wealth now being produced here, annually, comes from the soil in the form of wheat. In 1898 our wheat crop was grown from 276,000 acres. In 1915 it occupied 7,000,000; eighteen years ago the production of wheat in this area was about 5,000,000 bushels; last year it was 175,000,000 bushels. In 1918 the total value of the wheat crop to the farmer was less than $3,500,000; in 1915 it was $145,000,000.

The comparative standing of Saskatchewan with the three other leading wheat producing provinces of Canada is shown by the average production in bushels from 1911 to 1915. This includes both spring and winter wheat, the bulk of that grown in Ontario being the latter kind:

Saskatchewan ....... 113,030,121
Manitoba ............ 66,750,552
Alberta ............. 27,515,169
Ontario ............. 20,766,648.

This shows Saskatchewan very much in the lead as a wheat grower. It is likely that this lead will be maintained in future and the growing of grain will continue to be the first industry of our farmers for many years, owing to the conditions being suitable for wheat, the marketing facilities that have been built up and the difficulties that are to be experienced in changing from one system of farming to another. However, while this is true there is evidence that goes to show that the livestock industry is receiving more favourable consideration and attention from the farmers, especially in the districts which are
which are recognized as being suitable for its development. This is most fortunate from an economic standpoint as it will help to stabilize the farming business when prices of grains begin to recede from the high level reached in the years of the war just over so recently. The great decrease, in practically all the Countries at war, of their livestock will also serve as a strong inducement toward greater production of animals in Saskatchewan, so that we may look with confidence to an increase in the next few years. It is earnestly to be hoped that with the desire for greater numbers will also come a corresponding wish and purpose for a big improvement in quality and usefulness. Only by a combination of these two aims can the best efficiency and largest net profits be secured.

The history of the livestock industry in our Province and its development is concurrent with the growth of immigration and settlement. The first settlers would naturally bring some of their animals from the older provinces with them; a great many came from Ontario, as we received many of our best inhabitants from there. A short note from the early history of the territory reads "Assiniboia - now the South end of Saskatchewan - and Saskatchewan were devoted to agriculture. In 1885 Assiniboia boasted fourteen agricultural exhibitions." Many of us who are settled around the larger centres now can recall with pleasure the memories of those early fairs. Saskatoon owes a great deal to the late Thos. Copeland for his interest and energy in farming and getting under way the Central Saskatchewan Agricultural Society. This made an opportunity for bringing together the products of this district and arousing the friendly rivalry among the farmers to excel in stock and other things pertaining to a well-ordered farm. The history of this organization is but typical of many more in the Province and reflects in fair measure the growth and prominence of the livestock branch of agriculture. We have these Agricultural Societies with us now in large numbers and in all stages of development from the beginner in the newly settled districts, where they serve as a splendid opportunity of "setting up a standard in the land" in regard to all farm products to the wonderful "biggest and
best ever" aggregations held at Regina and Saskatoon annually which offer recreation and instruction from almost every point of view.

THE HORSE as a farm factor - Is he standing.
Tractor & Motor competition?

The horse has had more to do with the opening up of Saskatchewan than any other farm animal, making it possible to get the land into crops year after year, thereby swelling the income annually. It is only fair then to give him first place in our discussion at this time. Added to his usefulness also is the fact of his being the most popular of all the animals on the farm. This general liking for the good horse is going to help a long way in assuring him a place practically for all time. We are getting to the stage however where we need to lay special emphasis on the "good" and know quite clearly what we mean by the use of that adjective in relation to the horse.

Speaking generally we may divide horses into two distinct types - Heavy and light. It is the latter kind that has been in competition with the motor cars or automobiles, and as it is easier to decide the case between these two, than between heavy horses and tractors, we may do so at once.

In a Province which is as yet sparsely settled and where the saving of time is so important a matter in the short season that prevails, the automobile has proved a great boon to the agricultural population and has and is in great demand. This has been true of our townpeople also, as they have been able to get out into the country more, travel farther and faster - incidentally see less - and come back with pleasant ideas about the prosperity and general wellbeing of our country which is a very commendable attitude in which to live. This happy frame of mind often prevents any good reason from being discovered why a little more of the economic burden should not be placed on the backs of these prosperous country citizens and up to the present the farmer has been considered and proved himself to be a valuable type of pack-horse. In our re-adjustment of the horse industry this phase of the business may also
be remodelled to the general advantage of the Province as a whole. From observation as to means of conveyance in the summer months and the low prices that smaller horses bring at sales, backed up by the opinion of those men who have been studying the question, it is conceded that the light horse is not standing the competition of the motor car. The competition from the cars occurred at a time when the horses, while light, were not of the fast roadster type, thus placing them under a greater handicap. Many lovers of the racer and of the graceful carriage horse will continue to help a limited number of their favourites, and it is likely that our fairs and exhibitions will still offer attractive prizes for animals that conform to type requirements.

These light horses that are off type afford an interesting problem. Many farmers have them who realize their inefficiency for doing the farm work, yet the demand for this misfit animal is so little and the price so small that sales are hard to make. Anyway changing them from one farmer to another does not help the Province as a whole. The smoothest and best mares may be mated with larger stallions of the draft breeds and the size of the next generation materially raised. This is perhaps the only practical way of getting returns from this class of stock and at the same time bringing about an improvement. Could we have this plan adopted generally and carried on consistently for a few generations the beneficial results would be very far-reaching. Not the least benefit derived by this method will be the better chance offered for combatting the competition from the farm tractor. While on the surface of the question it may not seem to matter whether the work is done by horses or tractors so long as it is done with the maximum efficiency and the minimum cost, the matter has a far deeper significance than that. One of the greatest hindrances in our farming methods in this Province is that the cost of everything we need on the farm is under the direct control of some outside source. Anyone who has bought farm machinery in the last few years and noted the upward trend of prices will know the bearing this has on farm profits. The moving away from the old farming ways of 100 years ago, the self-sufficing system, has not been altogether to the best
advantage, although it has brought about a great deal of progress. If we allow the control of our farm power to pass out of our hands altogether the line of safety will have been passed and we shall find ourselves on the wrong side. Let the interest in breeding draft horses decline and the interest on high-priced tractors will rise at a corresponding rate and who will be to blame?

While considering the economic phase of the problem the opinion of Wayne Dinsmore, Secretary of the Percheron Society of America, is well worth noting: "When all is said and done, horsemen must realize the horse will survive as a power until so long as equine power can be furnished more cheaply, more efficiently and more satisfactorily than in some other form. Horses to-day furnish the greatest proportion of the power needed in producing crops and there is no reason to believe that the supremacy of good draft horses on farms ever will be threatened seriously; but inefficient horses and their owners will be slowly but surely eliminated.

The advantage to the farmer of producing his own power units is very great, for then he is independent. Tractor manufacture requires labour in the iron and coal mines, steel mills and tractor factories and much of this is high-priced labour. Strikes or wage increases may within a very brief time double the cost of power to the farmer who is dependent on the factory and he is subject to the arbitrary action of the manufacturers in the prices he must pay for repairs and the time when he shall receive them. The cost of fuel is also beyond his control. The man who uses draft mares and rears his own power units is free from such problems. He knows that the cost of his power units cannot be suddenly and arbitrarily increased by the action of a manufacturer or labour union. He knows that he has no need to fret about repairs, for if one horse gives out another can be substituted in thirty minutes or less, and he is raising his own fuel in roughage and grains and can tell the 'Standard Oil Company where to go when the price of internal combustion oil is increased.'

We must not forget also that while the horse in ordinary work exerts a pull equal to one-tenth his weight, he can in an emergency pull a load five or six times as great, while mechanical power at best can pull only 100% overload. This reserve
of power available in horse power units is invaluable on the farm or anywhere else when thoroughly dependable power that can work in soft footing is needed."

"Furthermore, the waste from his equine power units goes back to the farm as fertilizer, instead of being sold to the old junk man at half a cent a pound, and last, but not least, his power units in horse flesh endure much longer than any other field power he can buy."

"The good draft horse still reigns supreme on farms and will continue to do so, but the inefficient horse is doomed."

Thinking of agricultural conditions, principally, rather than the needs of the cities, what are the requirements of a good draft horse for Saskatchewan? In regard to size, I believe a weight ranging from fourteen to eighteen hundred pounds would meet the needs and satisfy the tastes of the majority of our farmers. The aim should be to produce the heavier ones for even then enough of those verging on the lighter side would be produced. With this range of weight we should very likely have two quite distinct types the heavier ones being considered as medium or light drafters and the light ones answering to the agricultural type of which we have many fine specimens in various parts of the Province now. With either type the conformation must be desirable. This includes an attractive general appearance, a clean-cut head, an indication of wearing quality medium length of neck, sloping shoulders with full breast, deep chest and strong heart, attained by wide spring and depth of rib in the fore-flank. A strong, thickly-muscled loin and a roomy abdomen, well carried down in the rear flank. This is generally associated with what is termed a "well-coupled horse." The rump should be carried out fairly full and level to the croup, with heavy muscles in the breeching and gaskins. Strong clean hocks are very essential, supported by cannon bones of tense, flinty quality. The set of hocks is important, they should not be wide apart, nor cow-hocked, but so placed as to give the greatest freedom and grace of movement when walking or on the trot. Sloping pasterns, open hoorheads, and rather large, somewhat round hoofs of strong texture and wearing quality, with toes pointing slightly outward.
make a desirable combination in the hind limbs. The muscles on the arm and forearm should be large and firm, strong broad knees, particularly from front to hook rear, ably supported by flat cannons and clean tendons, with sloping pasterns correlating to slope of shoulder, which eases the concussion when feet are striking the ground, open hoof-heads, large circular front feet pointing truly in a forward direction, so that a straightforward, vigorous, snappy action may be attained. These features should be in proportion to one another and in harmony with the size of the horse, so that the entire animal presents a well-balanced, symmetrical appearance.

The heavier horses will be compact and blocky in form, but the lighter ones may be a little longer in leg. Depth of body in any of these weights mentioned is a very important feature as it gives endurance and vigour, while quality throughout must be insisted upon as it means durability or a longer-wearing animal. A tribute to horses of this build is given here from a successful farmer who has tested them.

"I was led to use draft horses by observing that more was accomplished in less time. With horses averaging from 1600 to 1700 pounds in weight, particularly when, as in my case, the horses were selected because of excellence in draft conformation, work can continue steadily for ten hours a day. I have found, after years of practical experience that it is always wise to have a little more horse power on each implement than seems necessary."

"I am using heavy draft horses because I can do more work in less time, do it better and at less cost than with light horses. I am using mares because I find I can do my work and produce a fair number of colts each year. . . . Farm efficiency is best increased by the use of plenty of horse power and I am satisfied that I have found the most satisfactory way to secure it."

"With horses of this type, the competition from the light tractor will be much easier to combat, but even then will produce an interesting test case. The indictments against the horse as a power unit as presented by the tractor users are as follows: -

"With land doubling in value and the insistent call for food from the cities, horses at $250 and $300 apiece and with farm
labor securing from $40 to $60 a month, the farmer must be on the job all the time. His land must produce crops, his stock must produce profits, his work must be planned and handled on schedule."

As we shall see his most perplexing problem is that of power, for almost half his total production expense centres around his horses and their upkeep. He must substitute a highly-organized, highly-efficient form of motive and tractor power for that part of the horse form of energy which has grown too expensive to be profitable.

The magnitude of this power problem is astonishing. When we think of the wonderful industrial growth of this country with its vast manufacturing enterprises, we but vaguely realize the enormous amount of power required; and yet, according to Canadian census reports, the farms of Canada require practically as much power as that employed in all the manufacturing industries. The last Canadian census report for the period of 1901 to 1911 shows that there are a total of 2,600,000 horses and mules on the farms of Canada. The report shows that 77 per cent of these animals are over three years old, thus making available for farm purposes a total of 2,000,000 animals. Expressed in mechanical units this represents more than five-sixths as much power as was employed in all branches of manufacturing as shown in the census report of 1911.

A comparison of the number of horse power and the value of the products obtained from manufacturing enterprises and from farms is not only interesting but significant of the efficiency of these sources of power. In 1911, there was 1,789,000 mechanical horse power used in manufacturing plants, while at the same time there were 2,000,000 horses of work horses on farms. The total value of the manufactured products amounted to approximately $1,165,975,000 or about $650 per horse power; the total value of farm crops for 1910 amounted to approximately $584,514,000, or, in other words, less than $200 per animal of workable age.

The actual average price increase for all horses was from $76 in 1901 to $147 in 1911, a gain of 96%. Horses suitable for farm work now average from $280 to $350 apiece, according to reports from the Dominion Experimental Farm Directors.
Many items enter into the cost of horse labour; these include:

- Interest on investment: $15.00
- Depreciation of horse: $15.00
- Use and depreciation of harness: 2.30
- Shoeing: 1.26
- Feed: 82.33
- Labour, not including driving expense: 23.46
- Shelter: 34
- Miscellaneous: 34

Some of these are important enough to bear emphasizing more, and all have to be admitted.

In giving this table of the yearly cost of maintaining a horse, the value has been placed at $200 with interest at 6%; depreciation of $15 a year seems reasonable; cost of harness would amount to $2.30 a year, even under quite favourable conditions and good care. Shoeing is not given much attention in Saskatchewan and perhaps should not be included. There are some districts where it is advisable and the efficiency of many horses is raised by judicious care on this point.

Feed is the most expensive item in the cost of keeping this work animal. In feeding the horse it is well to remember that giving back returns by work is the only way of repayment that the horse has. Under our farm conditions here that repayment has all to be made in about seven months. On the average farm the yearly cost of maintaining a horse can be kept at a reasonable figure by careful attention to wintering as so many are idle during this period. For instance, at one of the experimental farms, five horses were fed at an average cost of 13½ cents per day during the winter months. The feed used consisted of oat chaff and oat straw and the horses were pastured on the prairie during the day. The figure $82.33 shows the average cost at the different experimental farms of Canada. This is, if anything, a little less than the cost per year has been in Saskatchewan the last few years. On the average farm in the central part of the province about one acre of oats is grown to two of wheat and taking one year with another there is not a great many bushels of oats sold from here. Of course, the horse does not use all of this feed but they consume the most of it.

The following is the amount of feed consumed by a horse...
in a year at the Brandon Experimental Farm:-

5,640 pounds of hay,
2,382 " oats,
265 " barley,
1,470 " bran,
6,000 " oatstraw,
2,000 " roots.

The Canadian census report for 1910 shows the average yield of hay and clover in Manitoba to be 3.1 of a ton per acre; 3.1 acres would supply one horse. The average yield of oats was 25 bushels per acre; at this rate one horse would consume the product of 2.3 acres. Just taking these two items would show that a horse eats the feed from over six acres. To make the figures more favourable for the horse, neglecting all the feed except hay and oats, let us say that he eats annually the products of five acres.

In 1914 there were 2,600,000 horses and mules on our farms and these require the growth from 12,000,000 acres to feed them. Now, there are only, 46,553,000 acres of improved land in the 714,500 farms in this country; therefore, to feed our horses and mules we use 25 per cent of all our productive land (Canada Census report 1911). Think of it, one acre out of every four is farmed for the benefit of horses that give only three hours work a day. In money value it will amount to almost $214,000,000 annually.

Seven million, eight hundred and eight thousand tons of hay are grown and harvested annually to feed them.

The labour cost of caring for the animal is put at $23.40 which seems reasonable. Miscellaneous includes veterinary services, medicines, liniments, and other little items required in looking after a horse.

In percentages the cost works out this way:-

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Miscellaneous</td>
<td>17%</td>
</tr>
<tr>
<td>Harness</td>
<td>12%</td>
</tr>
<tr>
<td>Interest</td>
<td>9%</td>
</tr>
<tr>
<td>Decreation</td>
<td>11%</td>
</tr>
<tr>
<td>Labour</td>
<td>17%</td>
</tr>
<tr>
<td>Feed</td>
<td>61%</td>
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</tbody>
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Practically two-thirds of the cost per year is here shown to be in the feeding problem. It is obvious that the number of horses kept should be given careful attention and feeding during idle periods regulated carefully. It is difficult to estimate exactly the comparative efficiency of the engine horse power and that of the
animal. The Tractor supporters have made the following comparison:

A comparison of the number of horse power and the value of the products obtained from manufacturing enterprises and from farms is not only interesting but significant of the efficiency of these sources of power. According to the Canadian Census report in 1911 there was 1,789,000 mechanical horse power used in manufacturing plants in Canada while at the same time there were 2,000,000 horses of working age on the farms. The total value of farm crops for 1910 amounted to approximately $584,514,000 less than $200 per animal of working age. The total value of the manufacturing products amounted to approximately $1,165,975,000 or about $650 per horse power.

This is an unfair comparison as the work done by the engine power would be under the most suitable conditions and under expert supervision. It will not do to infer that the same comparison would hold in comparing the two under field conditions; unfortunately data is lacking on any extensive scale on this part. A fairer comparison is found in the competition between the motor trucks and horses in the transfer work in large centres, and while these are taken from American Cities they may be taken for our cities also. The situation is placed before us very interestingly and concisely by Mr. Dinsmore in a paragraph on "Truck and Tractor Competition."

"The competition of trucks and tractors has had a distinct influence. It has frightened thousands of farmers into a partial, or complete discontinuance of horse breeding. Where it inhibited the breeding of mares of 1200 pounds or over to draft stallions this has been harmful. Where it stopped the use of small stallions or the breeding of very small or inferior mares it has been a benefit. More good than harm has probably resulted for we had a vast surplus of horses ranging from 1000 to 1400 pounds and horses as a whole were being produced more rapidly than demand warranted. Especially was this true of the smaller inferior kind. A surplus of inferior horses drags down the price on good ones, so that every man who is producing good horses has reason to thank any factor which materially retards the breeding of scrubs even though the same factor may temporarily depress interest in the production of real
drafters."

"How far truck and tractor use may limit the field for drafters in the future no one with certainty can foretell. We do know that in the large cities trucks and teams appear to be reaching a balance. Teams are cheaper and more effective in short hauls, trucks superior in the long hauls. For a time trucks replaced teams at a very rapid rate in our large cities; Chicago, especially favouring truck usage, has exact data on this. During the three years ending April 30th 1915 two-horse teams decreased 15%, three-horse teams 30% and auto trucks, one ton or over, increased 441%. During the next three years ending April 30th 1918, two-horse teams decreased 21%, three-horse teams only 6% and auto trucks over one ton increased only 174%, less than half as rapidly as during the preceding period. Furthermore, there was an increase of 2% in the three-horse teams in the last year and this tallies with the statement of very competent draymen, who stated that there had been a tendency on the part of some firms to swing back to heavy drafters for more of their short haul work for reasons of economy. In Greater New York there was during the two years and four months ending in March 1917, a reduction of only 2,100 horses despite a great increase in trucks; this was a decrease of less than 1 per cent."

"The limit of profitable replacement appears to have been reached, or nearly so, and not 30% of the heavy drafters have been displaced. The most experienced transfer men who have been in the business for twenty years or more disclose that teams can never be entirely eliminated in city work by trucks as the increased cost of handling short haul traffic would be prohibitive; and these are men who have both teams and trucks in constant service, do draying on the tonnage basis and are interested in the proposition solely from a financial standpoint."

Tractor competition to draft horses on farms is a newer development and has not yet reached its limit. The use of tractors will continue to increase up to the limit of a profitable replacement, wherever and the question of farm power will then go into a balance between tractors and horses, just as in our cities. The
proportion of horses displaced on farms will be much less, however, than in the cities, for there are many factors on the farm which do not exist in the city to retard the use of gas engine power units. Among these, the most important are, soft ground, lack of skilled mechanics, distance from repairs. Horses also cost less, whether reared or bought and are maintained at a much lower cost, especially as regards shoeing and feed."

An expression of their opinion on this highly important question of farm power has been secured from some of the leading men at the University, who have been watching the problem carefully, and the same is given herewith:

Dean Rutherford says "If one had a well-constructed tractor on these Western farms to supplement the horses on the hard work of summerfallow, it would be a fine thing. On the other hand, we cannot get the quality of plowing with the engine that we get with the horses, because the man is not on the seat to watch the levers and adjust them to the varying surfaces."

J. McGregor Smith says: "A tractor survey in Illinois where tractors were under observation showed that 15 of the 22 operators replaced one or more horses by the use of the tractor. This data indicates that a man farms 22 crop acres per horse without the use of a tractor, and 29.7 crop acres per horse when the tractor is used. Nine operators stated that the tractor enabled them to use either lighter horses, more brood mares or young horses."

"When we talk of farm conditions, we mean the average as found in the West. It is not a case of tractor versus horse - not competition, but co-operation - between the two that we must bring about. We cannot see that the tractor will replace the horse entirely. The horses is more mobile, it can go places where the tractor cannot, but the tractor can keep running 24 hours per day if necessary and do the heaviest work in the spring plowing and later in breaking and summerfallowing. Each has its place if the best results are to be obtained."
Some very interesting information has just come to hand in the report of the Livestock Commissioner of Saskatchewan, Mr. J. C. Robertson. He has this to say about the horses of the Province: "The market for heavy horses is in a fairly healthy condition, although in the different classes of livestock horses only have not shared with cattle, sheep and hogs the increased general demand and consequent rises in value. Saskatchewan now leads the Dominion in the number of horses, showing a remarkable gain in the past few years."

All of the Province, but particularly the south-western portion, has more light horses than there is a demand for, or than there is likely to be a demand for in the near future. The motor-car to a great extent has displaced the light driving horse on the roads and the people of this country, as well as all the others, are now realizing that the light horse, no matter how hardy he is, is of comparatively little value for draft purposes compared with the heavy powerful horse of good quality, such as is sired by good Clydes, Percheron and Belgian stallions. It therefore appears to be advisable for the farmers and horse-breeders of this Province to discontinue breeding light horses and to concentrate their efforts on the production of animals that at maturity will average 1400 pounds and upwards.

Judging from the number of stallions brought into the Province a good demand is expected by the various firms of breeders and importers. Prices obtained for fillies and brood mares are satisfactory and the supply of the right kind of stock is not adequate to meet the demand. Due to the difficulty of shipping horses from Scotland very few importations of Clydesdales have been made in the last few years but a considerable number of Percherons and Belgians have been brought in from the United States.

The number of horses in the Province has increased by
111,405, now reaching a total of over 1,000,000 head, which speaks well for the development of the industry. Saskatchewan now has more horses within its boundaries than any other province in Canada. A few of these are range horses, but the great majority of them are work horses to be found on each and every farm throughout the province.
The Production of Beef Cattle.

Saskatchewan has much territory suitable for the production of beef cattle. Generally speaking, the Northern part of the province is considered to be best, having more shelter, water and grass than either central or southern Saskatchewan. There was a time when ranching held full sway in the Swift Current and Maple Creek Districts, but the homesteader invaded this part also, and while there are still many head produced, most of the large herds have disappeared. Central Saskatchewan being the home of the best hard wheat, it is not producing beef on an extensive scale. Those who are familiar with the situation are satisfied that for the near future the exportable surplus of this commodity will be produced in the park lands and wooded areas of the North. The Prince Albert, Melfort and Battleford districts are particularly mentioned as being very suitable for stock-growing. Many of the prospective settlers under the scheme of the Soldiers Settlement Board are planning to take up land in these places. This will give an added impetus to the business which should be of great value to this form of safe farming.

Along with suitable districts there is available several suitable breeds of beef cattle that do well in our climate. The Hereford, Angus and shorthorn have all been giving good accounts of themselves and are available in fairly large numbers. This is important in deciding on the choice of breed to get started with, one that can be maintained without having to go too far for good sires of the same kind. The Hereford is a large-framed animal, massive in the front quarters and therefore exceptionally hardy and a good rustler under range conditions. The Angus, while not so large, is uniformly smooth and compact, early maturing and kills out well, being very popular with the butchers. The Shorthorn has demonstrated its superior qualities under so many varying conditions that it also meets with great favour here; as well as being meat producers, many of this breed are real good milkers and are deservedly popular among the farmers of average-sized farms.
The change from the ranch to the smaller holdings is going to necessitate a rather different method of handling our cattle if best results are to be obtained. The foundation for success is the use of the pure-bred sire of desirable conformation quality and masculinity. On the ranch the breeder can well afford to buy an animal of this type because he has enough females to warrant the purchase. He knows that the added value of each calf - as compared with those from an inferior bull - will soon repay him for the extra price on the initial cost of such a sire. The problem of the smaller farmer is to get the use of such a bull without too much expense. The number of cattle kept is often determined by the amount of feed that can be produced in a year of rather low yield. Otherwise, we may often have to sell stock at too much sacrifice. What is grown should be of the best quality for many reasons; one of the chiefest being that stock of this kind can be sold to better advantage and is in greater demand.

The Dominion Department of Agriculture has a plan of assistance for farmers in districts where they will form themselves into rings of ten members with the object in view of increasing the number and quality of their cattle. A bull of good breeding is supplied free of charge and about all the cost to the ring is the annual upkeep of the sire. The bulls are changed constantly, those of the same breed being used in the one community preferably.

Where the interest in good stock is sufficiently strong so that several farmers have a few pure-bred females a bull could be owned jointly by several farmers, or by one of them. The service fees would help pay for the cost of his feed, which is considerable in a year, and a first-class animal could be kept to the benefit of all concerned. One good animal used to his capacity is much better business for a community than several inferior ones being used just to make it a little less trouble in getting the cows bred.

The principles of and benefit to be gained from community breeding is so well set forth in a paper on the subject by Mr. J.R. Booth that the following paragraphs have been used here with his permission:
Community or co-operative breeding of live stock is by no means a new idea. Great Britain, France, Belgium, Holland and the Channel Islands are examples well known to any student of the subject. Out of community breeding in these old lands were developed most of the distinct breeds of live stock of the present day. It is extremely doubtful if ever a breed of Shorthorn Cattle, Hereford Cattle, Clydesdale, Belgian or Percheron horses which are so well marked, so ably suited to the particular work for which they were created, would even have been created had not some far-sighted prophet seen the advantage of working with his neighbours to this end. In describing the history of breeds we too often describe one man in the community as the founder of the breed, whereas a study of the local conditions nearly always indicated that several farmers are working with him, or in the spirit of competition, shall we say, against him. Some one of a group always comes to the front and posterity very often forgets the group which put him up when eulogizing the efforts of the one who partly through his own constructive breeding and partly through this community competition produced one or more outstanding animals which left a more or less definite impression upon the stock of the future. For example, we think of the early history of the Herefords as centering around two or three men, and yet if we look closer we find a whole community in Herefordshire breeding these particular cattle, exchanging sires and selling females. This soon resulted in the production of an outstanding animal and the breeding of this and succeeding great animals has made one or two men famous as the founders of the breed.

It was in such manner that all our present breeds have been developed in these old lands and it may be added that even at present co-operative breeding is more popular there than in our own continent.

It may be argued that the breeds have been established and the results of community breeding so fixed that co-operation is no longer necessary. The fixing of breed characteristics, however, is only one half of the game of stock-breeding. The maintenance of fixed characteristics is of equal importance; anyone who has studied
the farm flocks, herds and studs of our own country must have been impressed with the conglomeration of the characteristics incorporated in the animals on the average farm. You will find in any community men trying to make beef animals produce milk or butter fat in paying quantities. The reverse is quite true. The same with horses: how often have we seen driving horses hitched to the plow or heavy horses - drafters - doing light road work. There are occasions we must admit when such practices are justifiable, but they are not commendable either from the animal standpoint or from the profit result obtained by the farmer.

Co-Operative Marketing.

The marketing of livestock and livestock products is a very interesting problem and important enough for a special article all to itself. It has recently been the subject of a very extensive investigation by a commission appointed by the Government of the Province of Saskatchewan. There has been a strong suspicion both among the farmers and consumers that the meat and meat products of the North American continent are under control of a few large packing corporations. The Commission has not succeeded in clearing away the suspicion, and so long as this continues the best interests of the business cannot be served.

A suggestion that is offered as a help toward improvement of the present situation is for farmers to market co-operatively. This is right in line with the spirit and practice of community breeding and in fact is the logical sequence of such a system. By co-operation the farmers who do not have enough stock of their own can go in with their neighbors and ship a carload to the primary markets thus eliminating the drover, or local buyer. The United Grain Growers Ltd., a farmers' company, is now located at Calgary and Winnipeg to receive such shipments, or any other, and handle them to the best advantage of their customers.

It is a debatable question just how much competition there is among the buyers who represent the packers who get the meat and meat products ready for the retail trade. One instance is cited where a shipper was offered a price on his animals at
Winnipeg by a representative of a certain firm. He decided to re-
ship to St. Paul and on getting there was offered the same price
by the same firm. This was the only offer that he got and he was
forced to sell at a loss of freight and expenses from Winnipeg.
Another shipper went on from Winnipeg to Montreal and was not
offered a bid at all. His loss was so great that it put him out of
the cattle business altogether.

The advantages of packing houses are the result of funda-
mental economic principles which accompany large scale production;
these are, minute division of labour and specialization in the manu-
facturing department of the business, utilization of by-products,
efficient marketing organisation and methods; as a result of these
three advantages a surprisingly low cost of production and distribu-
tion and finally the production of the highest possible quality of meats and
the standardization of grades.

In course of time, with more experience in the co-operative
business, stockyards and packing plants may be owned and operated by
farmers and citizens combined to their mutual advantage. In the mean-
time farmers should make a point of supplying all their own require-
ments in the meat line the year round by curing meat and operating
beef rings in the summer. The more of his own wants that the farmer
can supply the better it will be for Western Agriculture.

It is gratifying to know that the Legislature of the
Province is alive to the importance of the plan of co-operative
markets as the following extract, taken from the report of Mr.
Robertson, will show:-

The Southern Saskatchewan co-operative stock-yard is
located at Moose Jaw and will cater to the entire Southern part of
the Province. It is well located being at the junction point of the
Canadian Pacific main line to Winnipeg and the Soo Line, which is the
direct line to St. Paul, also being within reasonable short distance
of the American boundary. It is likely that more American buyers will
come here than to further Northern or further Western points.

The Northern Saskatchewan co-operative stock-yard is
located at Prince Albert where one large packing house already has an
abattoir located, while it is probable that the Northern yard will
have a smaller area to draw from for the first few years, there is no part of Western Canada better suited to the livestock industry than is Northern Saskatchewan and as the years go by the amount of stock in this country is bound to increase very rapidly. The fact that these two home markets have been established will mean much to the livestock resources of the province."

The total number of cattle now in the province, according to the provincial statistician is 1,279,331. It is very probable however that this figure has not been maintained as the drought and poor crops over a very large area have necessitated the killing of thousands of cattle during the fall of 1919.

The dairy industry being more of a specialized one, than the general work of raising meat animals, for food, I think it better not to attempt to treat its standing in this article. Suffice it to say that it is on the increase in importance and financial benefit to those concerned. The price of dairy products seems high, no doubt, to those who have to buy them, but due to the high price of feed and labour, it is not hard to believe that the profits of the dairy-men are not more than to insure a reasonable return on their time and enterprise.

Varying kinds of cattle for the growing pigs have been used to advantage in supplementing their grain rations. This has been found to lessen the cost of production quite materially; self-feeding devices are also used to great advantage. It is of no use to tell Professor Tindale who has short pigs, when will they be able to eat hay in barrels, for pigs are not nearly as intelligent as they are. It would be difficult to tell the correct time to feed the pigs as their feeding habits vary with the season of the year. This would make it difficult for the farmers to know just when their hogs are hungry. Some are always hungry; others only at intervals.

Various kinds of pens for the growing pigs have been used to advantage in supplementing their grain rations. This has been found to lessen the cost of production quite materially; self-feeding devices are also used to great advantage. It is of no use to tell Professor Tindale who has short pigs, when will they be able to eat hay in barrels, for pigs are not nearly as intelligent as they are. It would be difficult to tell the correct time to feed the pigs as their feeding habits vary with the season of the year. This would make it difficult for the farmers to know just when their hogs are hungry. Some are always hungry; others only at intervals.
The number of hogs in the province shows a considerable decrease during the year 1918, although prices were extremely high according to the Livestock Commissioner. The scarcity of feed compelled many farmers to cut down the number of sows to be retained as breeders. It is very likely that the decline in the number of hogs has followed right through the year 1919. While it is regrettable that breeding stock should be killed off in view of prevailing high prices and sure markets, the unprecedented high price of grains and mill feeds has made it inevitable. It is to be hoped that the majority of our farmers will be able to keep at least one good brood sow and rear one litter during the year, as this has proven to be a safe practice in the past. It is easy to understand howver that too many of our farmers will not be able to do this.

The University of Saskatchewan is giving several breeds of pigs, mostly of the bacon type with a view to getting reliable information on the cost of producing pork; the most suitable breeds for our conditions and the most efficient means of handling the boars, sows and litters throughout the entire year. While it will take a few years yet to get comprehensive data on the matter, enough has been done to show that the simpler and more natural the methods of handling are, the better the prospect of success. Inexpensive shelters are used both in summer and in winter and much importance is given to regular exercise of the brood sows in winter. They are fed at some distance from their sheltering pens and thereby compelled to walk to their troughs and back again.

Various kinds of pasture for the growing pigs have been used to advantage in supplementing their grain rations. This has been found to lessen the cost of production quite noticeably; self-feeding devices are also used to good purpose; it is to be hoped that Professor Tisdale who has charge of this work, will soon be able to put out in bulletin form the result of his work up to the present. This would prove of interest and benefit to farmers because the work is being done under conditions which are applicable to the farms and by one who understands the prevailing conditions in Saskatchewan and something of the difficulties that the problem of pork-production presents.
Some very good work has been done in experiments with hogs of different breeds by Mr. C.G. Hutton until recently Superintendent of Experimental Station at Lacombe in Alberta. His work applies to western conditions and an article by him which appeared in a farm publication recently is given below:

Editor's Note: G.H. Hutton, Superintendent of the Dominion Experimental Station, Lacombe, Alta., has probably conducted more comprehensive hog experiments than any other man in Canada and he has presented a great deal of useful information on hog raising to Western farmers.

For three years extensive tests have been conducted at this station to determine if possible the relative economy of production of pork with three different breeds of swine, Berkshires, Duroc-Jerseys and Yorkshires have been used; while a relatively small number of hogs were used in the initial test in 1916, when only sixty animals were included, the numbers were increased in following tests, not less than one hundred and fifty head being used thereafter.

In the second year of operation of this test brood sows were purchased from a large number of different breeders and their progeny were included in the experiments. Since the foundation animals included the blood of practically all the strains of the different breeds which are common throughout Western Canada, the objection cannot be raised that this was a test of different strains of hogs, and the strain would doubtless determine the result. The test was as cosmopolitan in regard to strain as it could be made and representatives of all of the litters of pure-bred pigs farrowed about the same time were included.

In 1916 the test was conducted during the winter, while in 1917 and 1918 it was begun as soon as the spring litters were weaned and was carried on until the hogs were ready for market. In every case the hogs were fed at the self-feeder the same kind of grain with a five-per cent. addition of digester tankage. They were given the same kind of pasture during the seasons of 1917 and 1918 and an effort was made in 1917 to have the watering system comparable, though, if anything in that year, the Duroc had the advantage, since only they enjoyed free access to water at all times. In 1918 every
breed had access to water at will and were under identically similar conditions as to shelter, system of feeding and apparently all other respects.

For two years the Yorkshires won in economy of production while the Berkshires stood first in 1916; in 1917 the Berkshires and Duroc-Jerseys were practically equal as to grain required for a pound of pork. A variety of feeds were used; in 1916 ground oats, barley and tankage. In 1917 the feed was principally shorts and tankage, while in 1918 grade A screenings well ground together with tankage constituted the ration fed.

In 1916, as has already been stated the work was done during the winter, when no pasture or succulent feed was fed. In 1917, the pasture was timothy with very little alsike clover and in 1918 rape pasture was provided.

In size of litters, the breeds stand as follows:

<table>
<thead>
<tr>
<th>Breed</th>
<th>Average No. per litter</th>
<th>Average alive at weaning</th>
<th>Average per cent raised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkshires</td>
<td>10.8</td>
<td>7</td>
<td>64.4</td>
</tr>
<tr>
<td>Berkshires</td>
<td>9.1</td>
<td>6.4</td>
<td>70</td>
</tr>
<tr>
<td>Duroc-Jerseys</td>
<td>8.4</td>
<td>7.4</td>
<td>68.1</td>
</tr>
</tbody>
</table>

Taking the three year average the pounds of grain required for the different breeds is as follows:

<table>
<thead>
<tr>
<th>Breed</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkshires</td>
<td>4.09</td>
</tr>
<tr>
<td>Duroc-Jerseys</td>
<td>4.69</td>
</tr>
<tr>
<td>Berkshires</td>
<td>4.71</td>
</tr>
</tbody>
</table>

The dressing percentages of the breeds for the experiments of 1917 and 1918 stand as follows:

<table>
<thead>
<tr>
<th>Breed</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkshires</td>
<td>74.62</td>
</tr>
<tr>
<td>Duroc-Jerseys</td>
<td>74.47</td>
</tr>
<tr>
<td>Berkshires</td>
<td>72.05</td>
</tr>
</tbody>
</table>

This experiment, while on a very extensive scale, cannot be considered as conclusive, even yet, though the results are now published for the first time and cover a considerable period and should prove of interest to the breeders of the country. The experiment is serving to emphasize the importance of the good sire because the uniformity of the litters of the different breeds from year to year is quite an indication at the very beginning as to the result of the test at the finish. It is impossible to pay too much attention to this factor of the enterprise. The
pounds of grain required for a pound of pork are also a valuable indication to swine breeders as to the cost of production of pork from year to year.

**Common parasites of swine:**

Swine are subject to several parasites external and internal. Of the first class the most troublesome is the ordinary bug louse. These insects are responsible for much unthriftiness and poor gains, are an advertisement of the unobservant eye or carelessness of the feeder and are intolerable, in that, unless the infestation is of long standing they are fairly easy of eradication.

**Methods of eradication:**

1. Pigs may be dipped or sprayed with any good creosote or coal tar disinfectant made up as per directions, accompanying the preparation.

2. Coal oil or kerosene is used by some. Though effective it has blistering action and should be avoided.

3. Fuel oil is highly recommended. Experiments with it at Ottawa proved it efficient, but slightly irritant and leaving the hair of the pigs in a dirty, discoloured condition.

4. Crude castor oil is non-irritant, soothing and quite destructive to lice. Where procurable, it forms, possibly, the best application for this purpose.

5. Paraffin oil (low grade) as now used in the herd of swine at the Central Experimental Farm, has proven non-irritant to the skin and effective as an insecticide.

**Canadian Bacon trade with Britain.**

Canadian bacon and pork products are received with much favour on the British market and Canadian bacon has commanded for a number of years a higher price than American bacon. If Canada is to maintain the preferred position, farmers must be encouraged in the production of hogs from which Wiltshire sides can be cured. There has been too little discrimination shown on the Winnipeg market in regard to this point as the man with the earload of first-class bacon hogs is often compelled to accept the same price as the man with a load of hogs of the hard type. This condition of affairs may be expected to change for the better and the market for Canadian bacon promises to be an extremely important factor in the agricultural development of Saskatchewan.
Sheep in Saskatchewan.

The prospects for development for sheep breeding industry in Saskatchewan are most promising. There has been an exceedingly good demand for breeding ewes from all parts of the province. Saskatchewan is as yet practically free from the majority of contagious and infectious diseases so destructive to sheep in other countries. Our natural conditions of climate, feed and water are well suited for the production of first class mutton and wool. The world's shortage of wool ensures high prices for the next few years. Market prices for sheep reached a higher level than ever before during the past year.

The price of breeding stock during the present year has increased in proportion to the advance in price of wool and mutton. As a result the price of breeding ewes supplied by the Department of Agriculture in the fall of 1919 was $20, as compared with about $15.25, $10.50 and $8 in 1917, 1916 and 1915 respectively. Although this price appears rather high, yet, considering the quick turnover from the two crops received, viz., wool and mutton, the profits to be expected with reasonable success are such that farmers are justified in paying a high price for suitable foundation breeding stock.

Wool Marketing: Along with the high price of mutton the farmer has realized a substantial increase in the price of wool. As a result of the war, the shortage of no other agricultural product has been so noticeable and keenly felt. This year 394,000 pounds of wool were handled and marketed co-operatively by the Co-Operative Branch of the Department of Agriculture. The price received was 61.50 cents per pound, netting the farmer 58.50 cents per pound after cost of sacks, twine, handling and shipping charges were deducted. In 1917 223,000 pounds of wool were handled by the department at 60.75 cents per pound; in 1916 and in 1914 about 70,000 pounds at 16 cents. As a result of co-operation, by means of which a proper system for the handling, grading and marketing of wool was obtained has contributed largely towards placing the industry on a safe and substantial basis. At time of writing a marked increase in wool shipments for 1919 is assured. It is
expected that approximately 500,000 pounds will be marketed co-
operatively by this department and indications are for a keen
demand and good prices.

The above remarks summarize the situation fairly
accurately in regard to the increased interest in the growing of
sheep in our province up to the time of the issue of the report.
Unfortunately, the business received a hard knock in the fall of
1919 owing to an extreme scarcity of feed in so many large areas.
Prices of range ewes have fallen from 1/3 to 1/2 of what they
brought in the fall of 1918 and even at the lower prices it was
difficult for the breeders to dispose of their surplus. Along
with this there is also a re-action noticeable against the
booming of the sheep industry which has been in progress for
the last few years. Farmers are beginning to consider the diffi-
culties of growing sheep just as much as they are thinking of
the advantages of keeping them. Just recently a farmer near Saskatoon
sold his entire flock on account of his losses by coyotes. While
this re-action may check the growth of this important branch of
agriculture for a while it may not be altogether a disadvantage
as those who do take up the work will be better prepared for the
obstacles to be overcome and will be in a position to handle their
sheep in a way that will fit in with our conditions of farming here.
In this branch of livestock as well as in the others, care should
be taken not to get too many on hand for the size of the farm and
amount of feed available. With attention given at lambing time,
reasonable shelter and convenient ways of pasturing in summer, use
being made of the summerfallow if at all possible, and feeding
economically in winter and to the selection of strong pure-bred
rams, there will be found a place of value for sheep on the
average farm of Saskatchewan.

In reviewing the live-stock situation, notwithstanding
its difficulties there is reason for continued hope and confidence
in its future for Saskatchewan. The animal husbandry man is put-
ting his work into a permanent system of agriculture over a longer
period than the exclusive grain-grower. His aim is to maintain the
fertility of the soil of which he is a steward for the time in which he holds possession and there is interest and variety in the management of such a big problem. Just how to maintain the right balance between grain and livestock on the typical prairie farm is a question worth considering carefully at the present time and it is to be hoped that it will receive the consideration by our farmers that such an important economic problem deserves.