

system being adopted and so designed that for short periods the power may be more than doubled, an advantage not possessed by the gasoline engine, and one which any man that has head experience with traction engines will fully realise. Especially when his engine runs into a hole, has to climb a stiff bank and on soft ground or when plowing through scrub, a few more pounds of steam convert the compounding into a simple engine and away we go.

It is generally conceded that the thermal output of the gas engine is much superior to that of the steam engine, but victory will not be won on fuel economy alone. Reliability, wear and tear, easy manipulation and first cost will count for much.

The fuel question is nevertheless deserving of very serious consideration and it remains to be seen which class and application of it will give the best result upon the farm. We have for the internal combustion engine, gasoline, kerosene, petrol, alcohol and suction gas: for the generation of steam we have coal, wood, straw, gasoline, kerosene and alcohol.

Has the farmer realized that no less than four of the fuels are obtainable upon the farm; viz., wood, straw, alcohol and suction gas? How long is he to continue wasting a sufficient number of units of heat to do all his cultivation, seeding, harvesting, threshing, heating and lighting? It is merely a matter of economically transforming the various wasted products into a condition most suitable for combustion. He will then be no longer at the mercy of oil trusts, subject to annoyance from coal strikes or inefficient transportation.

Too much capital is made of the necessity for a team and teamster. If these small motors, as some would have us believe, are to entirely wipe out the horse from the farm, there might be something in the cry, but farmers are not wishing for the doom of the horse. On the contrary they are looking to him to bring more grist to the mill. He will always have or should have a few brood mares upon the farm. Then there is the threshing time when there are the separators to run, the sheaves to haul and the fall plowing to do. Is he to have motors to carry all this on at the same time? Then what about hauling grain to the elevator with two or three feet of snow on the ground? But if the necessity for a team and teamster is such a serious matter, even this can be cut out, for there are now light steam tractors capable of hauling 8 to 10 tons at a speed of from six to eight miles per hour, carrying fuel and water sufficient for a forty mile run.

But what are these small motors to cost? is the next and very important question. Judging from the conversation the writer has had with many farmers and others, there is likely to be some disappointment, for generally speaking it is expected that a light agricultural motor should be bought for anything between \$500 and \$1500 and for this amount a machine that will displace two, three or four of our horse teams. Why, a good team of four horses is worth to-day about \$1,000. Then there is harness, etc. Say that a 25 horse power motor displaces only two four horse teams, they would with harness be worth over \$2,000.

Now, can it be reasonable to expect that an engine which is to supply universal power upon the farm should be sold for less than half the price of an ordinary traction engine of the same power and only available for threshing and plowing? The motors thus far introduced into Canada, range in price from \$1,750 to \$3,000, for from 18 to 50 actual horse power. Even at these prices provided they will do the work with greater dispatch, reduce the number of working horses, which have to be fed when idle, and diminish the number of hands necessary upon the farm, no small benefit will accrue to the farmers.

But where are we to obtain these motors? From all accounts the demand is in excess of the supply. Here is in an industry for the Canadian manufacturers to take hold of and they should waste no time in doing so.

Statistics given for 1906 go to show that in Western Canada alone some 7,225,347 acres were cropped with either wheat, oats or barley and even this area is but five per cent. of the arable land available. From the acreage above mentioned some 198,243,000 bushels of grain were produced, to obtain which the land must have been plowed, disced, harrowed, seeded, the crop harvested and the grain threshed. Possibly some of the operations may have been repeated once or twice, but let us assume that the land was

traversed five times. This would mean that the acreage of work done would amount to no less than 36,126,735 acres. Add to this the haulage of the grain to the elevators and some idea may be formed as to the enormous amount of tractive force and belt power necessary to carry out the work, and this in but a very limited working season.

Year by year the areas will increase by leaps and bounds creating a greater and greater demand for motive power. Can this be supplied by horses as economically or can we raise a sufficient number to do the work and at the same time keep our own and the various markets of the world supplied.

The more motors the more horses; the more motors the more industries; the more motors, less cruelty to animals, for they can have the snaps; the more motors the larger will be the amount of marketable grain, for idle working horses will not be eating their heads off during rainy days and long winter months.

A. BURNES GREIG.

DAIRY

Wisconsin Dairy Report.

The twenty-third annual report of the Agricultural Experiment Station of the University of Wisconsin, U. S. A., is not so strong in dairy features as usual. Only three articles may be classed as strictly dairy, viz.: "The University Dairy Herd," "Development of Factory Dairying," and "Distribution of Lactose-fermenting Yeasts in Dairy Products."

COWS: FEEDS AND BREEDS.

The first subject, "Dairy Herd," is discussed chiefly under the heads: Methods of Feeding and Cost of Feed; Production; Breeds. The concentrates fed were: Wheat bran, distillers' grains and cottonseed meal, in the proportion of 2, 2, 1 by weight. "The amount of grain fed from day to day to mature cows in a normal condition of flesh was one pound for each pound of butter-fat produced per week." Stated another way, the cows were fed seven pounds of grain per day when producing one pound of milk-fat daily. "The roughage consisted of corn silage, soiling crops, mixed hay, and some alfalfa hay. All cows were fed as much roughage as they would eat up clean." The average cost of feeding a cow from July 1st, 1905, to June 20th, 1906, was \$38.41. The average net profit per cow was \$41.20. The average cost of feed per 100 pounds of milk was 52.4 cents. The average cost of one pound butter-fat was 12.7 cents.

The principle of feeding according to the production of the cows, is one of prime importance in economical dairying.

THE COWS.

The herd, during the year, consisted of 7 Jerseys, 8 Guernseys, 8 Holsteins, 3 Shorthorns, 4 Red Polls, and 2 Brown Swisses. The report states, with reference to the breeds: "The average data show that, on the basis of the records made, the different breeds rank in the following order:

"In Production of Milk.—Holstein, Jersey, Guernsey, Red Polls, and Brown Swiss.

"In Butter-fat.—Holstein, Jersey, Guernsey, Red Polls, Brown Swiss, Shorthorn.

"In Cost of Feed.—Shorthorn (lowest). Brown Swiss, Guernsey, Red Polls, Jersey, Holstein (highest).

"In Average Net Profit.—Holstein, Jersey, Guernsey, Red Polls, Brown Swiss, Shorthorn.

"In Average Net Profit, 1898-1906.—Holstein, Jersey, Guernsey, Red Polls, Shorthorn, Brown Swiss.

"According to the average results obtained of our herd for the period of 1898-1906, the three dairy breeds proper rank first, and the so-called dual-purpose breeds come last, both as regards average production of butter-fat and profit returned. The figures give decided evidence on this point, and emphasize the fact that cows of breeds that have long been bred and developed with a sole view toward a large and economical dairy production are the most profitable for a dairy herd." The report goes on to say: "In view of the changed conditions that confront the American farmer, with regard to the breeding of special-purpose cattle, and the demands for meat-producing animals of great excellence, as well as for dairy animals capable of a large and economical dairy production, we cannot recommend the perpetuation of the dual-purpose breeds for two purposes. It is possible, by careful and judicious breeding, to change them to a special-purpose breed, either a dairy breed or a beef breed, but excellence in either direction cannot be reached except by uninterrupted breeding towards one specific end for many generations. For this reason, we believe it will be the part of wisdom for dairy farmers to adhere to some one of the specific dairy breeds, and for producers of beef cattle to choose one of the improved beef breeds."

The foregoing are wise words, worthy the careful consideration of Canadian farmers.

FACTORY DAIRYING.

"The number of creameries in the state has decreased from 1,073 in 1900, to 1,017 in 1905, while the skimming stations have increased from 61 to 260. The total butter product for the state is estimated at 12,000,000 pounds, of which about one-quarter is produced in farm dairies. The cheese business of the state has increased, in five years, from 60,000,000 to nearly 110,000,000 lbs. cheese." By way of comparison, the 1905 statistics for Ontario give the estimated cheese production of this province as 165,000,000 pounds, or about 55,000,000 pounds more than the great state of Wisconsin; but our increase in the last five years has been, in round numbers, only 37,000,000 pounds, whereas Wisconsin has nearly doubled her cheese production in the same time. We shall need to look to our laurels. The average Wisconsin cheesemaker is much more anxious to seek information and improve his product than is the average Canadian cheesemaker, who is disposed to rely upon what has been accomplished, and to think there is nothing more to learn about the cheese business.

In addition to cheddar-cheese factories, the state has 301 Swiss cheeseries, which made about 15,000,000 pounds of Swiss cheese in 1905.

YEAST FOES OF THE DAIRYMAN.

It is the hidden and unseen which mystifies and unnerves a man. So long as men believed in ghosts, hobgoblins and princes of the air, the world made little progress. As science cleared the mists and fog of the middle ages from men's minds, they began to ascend with leaps and bounds. It is the hidden, sneaking foe which causes most trouble. The man who resorts to mean, low-down, petty, spiteful tricks, is the worst kind of an enemy. An enemy that fights in the open can be met and successfully overcome, if we have courage.

The unseen foes of the cheese and butter maker

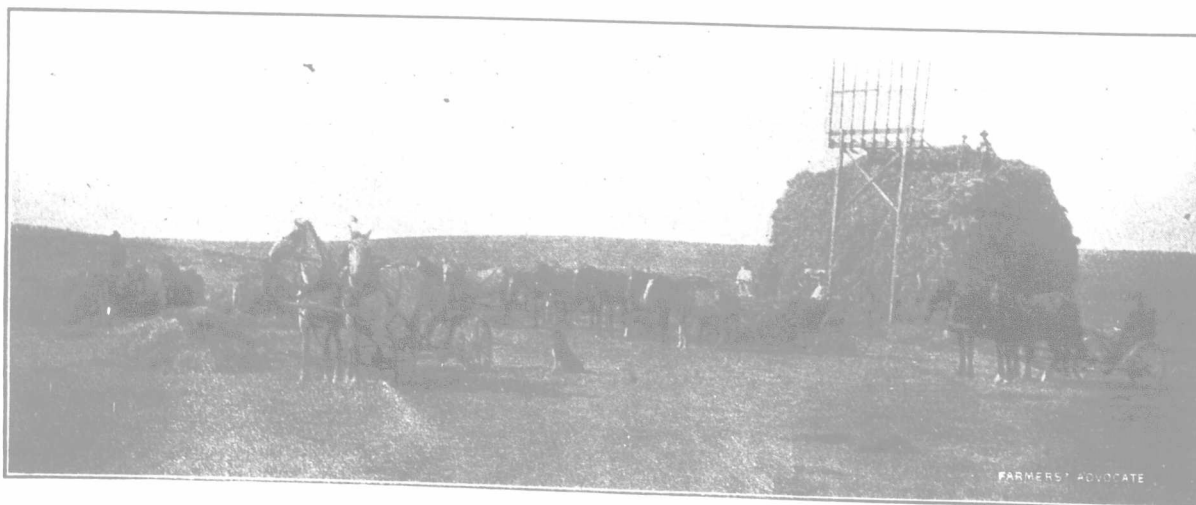


Photo by C. L. Thompson.

STACKING HAY ON THE BRAESIDE RANCH,
Knee Hill Valley, Alta.