THE FARMER'S ADVOCATE
AND HOME MAGAZINE.

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full in the conduct of our exhibitions which would add much to their usefulness from an educational standpoint, and present to our people a higher ideal of what constitutes a model agricultural exhibition, and we trust as the years go by we shall be found approaching a little nearer to this standard.

A Great Clover Crop.

The farmers in all the older provinces of the Dominion are to be congratulated on the magnificent crop of clover now being harvested, the bulk of it, we believe, having been saved in good condition. If judiciously fed to the right class of stock it may easily prove to be worth more to the growers than a full crop of wheat, even at the boom prices which prevailed a few weeks ago and which have been followed by the usual reaction. There is literally millions for the farmers in this clover crop, not only in the immense amount of wholesome and nutritious stock food it provides, and its great possibilities in producing beef and mutton, cheese and butter, and even bacon and eggs, but also in its restorative influence on the fertility of the land, which is one of its greatest virtues, drawing, as it does, from earth below and air above and storing in available form elements which are necessary for the growth, development and production of the best paying crops of all kinds. Clover draws nitrogen from the air and stores it for use as a fertilizing agency, while the roots run deep down into the earth and bring up mineral elements which feed the crops, while the decaying roots and stems and leaves when plowed down furnish potash and phosphoric acid as well as vegetable matter or humus in the soil, which, improving its mechanical condition, contributes to its ability to retain moisture, rendering it more suitable for a seed-bed for cereal crops as well as for future catches of clover when re-sown, to repeat the round of restorative agencies. If clover were sown every year with all cereal crops on well-prepared land we should have no fear of the future fertility of the farms of fair Canada. With this and the barnyard manure made from the feeding of stock on the farm our land may be kept in good enough condition to grow the best of crops in perpetuity. Let it be laid down as one of the cardinal principles to sow clover and keep at it continuously.

"Another rule that may safely be followed is, that the more finished the product the greater the profit. In other words, that in general it will pay best to sell oats, barley, and peas, or other coarse grain, and hay, in the shape of beef, pork, and mutton, or butter and cheese, and thus keep on the land the bulk of all that is taken from it by these crops, together with the elements derived by them from the atmosphere."—Col. O'Brien, President of the East Simcoe Farmers' Institute.

STOCK.

Points in Experimental Pig Feeding for Profit.

Mainly in the light of investigations by modern experimenters we propose to consider the subject of swine feeding, with three points chiefly in view, viz.: (1) Animal health and vigor; (2) gains in weight from food consumed; and (3) quality of product. On the whole, it will be seen that the results represent a convergence with those deduceable from the best practice of the intelligent Canadian hog-raiser. Passing over what relates to the feeding and management of breeding stock, which alone would take a lengthy chapter, we note that after weaning pigs should (the season permitting) have the freedom of a grass lot, affording them pure air and exercise, with foods having a liberal supply of protein for muscle formation, such as skim milk, buttermilk, shorts, bran, peas, and green clover, and ash for the growth of strong bones, so that we may have a well-nutured animal, of vigorous health, to finish, of a character suited to market requirements, as to lean meat, etc., within the limits fixed by inheritance through the laws of breeding in type and capability as a feeder. The bulk of experimental work in America has related to this question of comparative gains from certain foods or combination of foods, and with various breeds and crosses, European investigators, notably those of Denmark, having done most in regard to the effect of foods on the product.

Exercise, Shelter, Grass, Weights, etc.—As a result of four years' trials (Utah Experimental Station) shotes confined in pens and others allowed exercise in yards and pasture, there was .2 of a pound greater daily gain and a saving of 92 lbs. of grain or 18 per cent. of the food consumed in making 100 lbs. of gain in favor of the latter, not counting the value of what grass was eaten. The general experience of Canadian swine feeders is, that under such conditions there are far less losses from pigs going off their feet or their feed with stomach derangement and rheumatism. It has not yet been shown that pigs can make satisfactory gains on pasture alone, if we except one case (Utah) where alfalfa was pastured. It was found (Illinois) that pigs on blue grass pasture given a half-full feed of corn for first eight weeks, and the next four weeks a full feed of corn, ate 441 lbs. corn to 100 lbs. gain, and with a full feed corn all the time ate 507 lbs. corn to 100 lbs. gain. In a check lot, without grass, 629 lbs. corn were taken for 100 lbs. gain, showing a 30 per cent. gain with the half feed on grass, and 20 per cent. gain with the full feed in lot without pasture. In regard to the value of shelter, another point affecting profit and loss, it was found by a winter experiment (Kansas) that pigs kept in an open yard, protected only with board fence on north, from Nov. 27th, for ten weeks, required 25 per cent. more corn to make 100 lbs. of gain than those enjoying the shelter of pens in a barn basement.

As a result of several hundred feeding trials at many American stations, with lots of pigs of different weights at the beginning of the fattening period, it was found that the quantity of food eaten per day varied from 2.23 lbs. by pigs weighing 15 to 50 lbs., up to 7.50 lbs. by 300 to 350 lb. pigs. In the case of 450 lb. hogs, 10 lbs. of grain daily, or its equivalent, were eaten, or four times as much as the 50 lb. pig. It was also shown that pigs averaging 38 lbs. each made 100 lbs. gain from 293 lbs. feed, a proportion of which was skim milk and other easily digestible foods. Pigs weighing 78 lbs. took 400 lbs. feed to make 100 lbs. gain, and there was a steady increase in feed requirement for 100 lbs. gain as the pigs became heavier, the 174 lb. pigs taking 482 lbs.; the 226 lb., 498; and the 320 lb. animal consuming 535 lbs. food for 100 lbs. gain, or 33 per cent. more than the 78 lb. animal. A twelve weeks' fattening trial (Wisconsin) with mature hogs demonstrated that the gain after the first four or five weeks of confinement is secured only by constantly increasing quantities of feed for a given weight of increase, and the dangers from pigs going off their feed or from disease increase under confinement with heavy feeding.

Foods.—Next let us look at the results of trials with various feeding stuffs. The average of five trials at four stations (Kansas, Ohio, S. Dakota, and Wisconsin) showed that 6 lbs. more corn meal than whole wheat meal (469 of one and 463 of the other) were required to make 100 lbs. gain, the difference being so small as to put them on a par; but an equal mixture of corn and wheat meal effected a saving of 5 per cent., which indicates the economy of feeding grains mixed rather than singly. As a result of two experiments between shorts and corn, 15 lbs. more corn meal than shorts were required to make 100 lbs. gain; but in one trial a 439 lb. mixture of shorts and corn (equal parts) proved as valuable as 522 lbs. shorts fed alone or 537 lbs. corn meal alone. The combination was 20 per cent. more valuable than shorts alone, hence the mixture was not only a more economical ration, but should give a better quality of pork. In a seventy-two day trial with bran and skim milk vs. shorts and skim milk, the latter proved twice as valuable as the bran.

Corn meal was found (Wisconsin) 8 per cent. more valuable than whole shelled corn for fattening; shorts being mixed with each, but the cost of grinding reduced the difference considerably. In several trials (Mississippi an exception) corn and cob meal was found superior to corn meal alone, but it is difficult to get it ground sufficiently fine.

In a comparison (two trials) between barley meal and corn meal, skim milk being combined in the second experiment, 471 lbs. barley meal produced 100 lbs. gain, and 435 lbs. corn meal 100 lbs. gain, or 36 lbs. in favor of the corn. In the second trial there was a difference of 24 lbs. meal and 27 lbs. skim milk; or, averaging both, 8 per cent. more barley was required to make a given gain. In the second trial the barley-fed pigs drank twice as much water as those on corn. Danish experimenters confirm the foregoing, and also indicate barley to be probably the best single grain for producing bacon of the highest quality in regard to firmness and flavor. In one trial (Massachusetts) it required 20 per cent. more oats than corn to produce 100 lbs. of gain. Two trials—one with equal parts ground peas and bran (wet) vs. ground corn and bran—resulted in favor of the former, 363 lbs. making 100 lbs. gain, while 455 lbs. of the corn-bran mixture were required. Of soaked peas and soaked corn, respectively, 421 and 458 lbs. were required for 100 lbs. gain, showing the superiority of the peas.

Buckwheat is a valuable pig feed, but not equal to wheat (Ottawa). In regard to potatoes, one trial (Wisconsin) showed that 440 lbs. corn meal produced 100 lbs. gain, but 262 lbs. corn meal mixed with 786 lbs. boiled potatoes gave 100 lbs. gain; in other words, 441 lbs. potatoes save 100 lbs. of corn meal. Trials at three stations showed that 400 lbs. of field roots saved 65 lbs. grain, on which basis 615 lbs. roots would save 100 of grain. In Denmark 1 lb. barley was found equal to 6 to 8 lbs. mangels or 4 to 8 lbs. fodder beets. In Canadian practice, pulped roots mixed with ground grain prove of great value in winter fattening hogs, preserving the animals in health, which is difficult to do in heavy feeding when closely confined in cold weather. The great advantage of some succulent feed is in keeping the animals on their feet and in good vigorous health, to which end exercise, cleanliness, and good ventilation greatly aid.

One experiment at Ottawa (Canada) Station shows the following results:

FEEDS.	LBS. FEED FOR 1 LB. INCREASE.	*SHRINKAGE PER CENT.
Shorts	4.41 lbs.	22.27
Barley (ground)	4.35 "	25 44
Corn (ground)	4.16 "	23.11
Shorts, Barley, Corn (mixed).	2.90 "	18.26
Skim milk	2 31 "	
Peas (unground)	3.33 "	21.57
Skim milk	2.35 "	
Barley (unground)	3.64 "	25 81
Skim milk	2.52 "	
Corn (unground)	2.90 "	18.26
Skim milk	2.31 "	
Oats (unground), Barley, Peas	3.20 "	20.92
Skim milk	2.60 "	

*Fasted 14 hours before killing, and dressed weight taken 24 hours after killing.

Unfortunately no record is given as to quality, such as might have been secured by submitting the carcasses, tagged with numbers, to competent experts on bacon and hams for the British market.

Several tests showed that foods largely protein gave more blood, larger livers, etc., than those on carbonaceous (largely fat and heat producing) foods like corn; with corn worth 40 cents per bushel, skim milk is worth about 20 cents per 100.

Corn alone has not been found well suited for bone and muscle production in young and growing animals, and requires to be fortified by foods supplying what it lacks if used at all for such. Pea meal is rich in protein, but too heavy to be fed alone, being improved by mixing it with bran, shorts, ground oats or corn meal. Soaked whole peas appear to do better than pea meal alone.

Quality of Pork.—Many feeding trials have been made in Denmark, with a slaughter test at the conclusion, and expert examinations of carcasses as to fat and lean and other differences attributable to feeding or other causes, carcasses being grouped in four classes according to quality (No. 1 being the best), the grading being done with special reference to the British market. One trial indicated that 1 lb. separator skim milk was equal to 2 lbs. whey, but the latter was after cheese had been made from the skim milk, so that it contained less fat and less casein than whey in Canada, where the cheese is all made from whole milk. Skim milk pork was found superior to that from whey, the same grain being fed in each case. In a test with 110 animals, there was shown to be a practical equality between rye and barley, both as to gains and quality, nor was oil cake of any more value, pound for pound, than barley or rye. The result of seven series of experiments with 144 hogs on thirteen farms, feeding equal weights of corn as against barley or rye, showed a slightly higher gain on corn, and it was about equal to a mixture of the other two feeds. Exclusive corn made the softest pork and put most carcasses in the lowest grade. The shrinkage was about the same. Some pigs fed on rye or barley went into the fourth or lowest class, as the following table shows, weights at slaughtering varying from 181 to 185 lbs.:

FOODS.	PER CENT. IN CLASS— No. 1.	No. 2.	No. 3.	No. 4.
Barley all time	57	35	4	4
Corn till 120 lbs	28	50	22	0
Corn till 140 "	25	58	17	0
Corn till 160 "	45	30	25	0
Corn all time	29	33	24	14

In another trial, where half barley or rye and half corn were fed, five carcasses went into No. 1 class, and seven into No. 4. Barley alone put eight into No. 1 and one into No. 4, and corn alone,