cow, and the same thing applies to the canners and cutters themselves. When an animal is a little too good to be classed and graded as a good cutter, it would be classed as butcher stock and graded as medium or common. The grade of cattle, too, spoken of as good canners is a grade lower than cutter cows and heifers. The bulk of the cutter offering consists of farrow dairy cows that carry some flesh but not enough to warrant an attempt to use all as carcass beef. Common cutters and good canners may be considered in the same grade as they are between canners and cutters. The dividing line between the two is far from being definitely drawn; it is determined by the supply of and demand for such stock rather than the quality and condition of the offerings.

Stockers and Feeders.—Toronto market reports list stockers at 450 to 800 pounds, and feeders at 800 to 1,000 pounds. Growthy, thrifty-looking yearlings giving evidence of good breeding, and weighing somewhere within this range, would be classed as good stockers. Feeders are usually put into the stalls at around 900 to 1,000 pounds in weight, so they will come out in the spring after proper care and feeding and class as heavy steers. The difference between a good feeder and a common steer is that the former does not indicate any attempt being made to fatten him or prepare him for the block. The feeder may be just as heavy as the butcher steer, but the latter has evidently undergone a grazing or stall-feeding period preparatory for the market.

Maintaining that Extra Sow and Rearing the Litter.

With only a slight readjustment in the order of established and working plans it should be possible for ninety per cent. of Eastern-Canada farmers to winter an extra sow and rear the litter next summer, without inflicting any great hardship or disorganizing the present system of management. We are fully cognizant of the labor shortage and the high price of millfeeds. In making this statement we are aware that the barley acreage was not large in 1917, that oats alone are not conducive to rapid and economical gains, and that corn or wheat has not been available for swine feeding. In view of this condition it is at once apparent that some solution of the problem should be presented. When farmers single-handed have done their best to produce, we would be the last to suggest additional efforts if the need was not great and the sacrifice, if such it be, one that every true Canadian is willing to make in behalf of his country. If food can be produced with greatest dispatch, in time of crisis, by rearing swine, surely there is no one who will cavil at the appeal and fiddle while Rome burns.

How shall we go about it to get this increase? It is largely a matter of feed, for the housing problem involved by the keeping of an extra sow is not insurmountable to even the farmer with extremely modest equipment. A small amount of rough lumber, a few nails, a hammer, and a little ingenuity are sufficient to provide accommodation. The hog cabin might be resorted to but but this was fully discussed in "The Farmer's Advocate" of November 8, so it is unnecessary to set down any further comment here. In regard to feed it is different. Notwithstanding a bountiful harvest in 1917 we, at present, labor under the peculiar condition of being short of grains and concentrates suitable for swine. Barley yielded well but the acreage was not large; corn was a failure in Canada, and it has not been coming from the United States where it is reported to be plentiful; wheat for hogs is out of the question; millfeeds have been held at an almost prohibitive price, and oats alone do not give the desired results. This has been the situation to date. However, relief is in sight. The Food Controller has announced that the embargo will be lifted and corn will be coming forward by the middle of December, or the first of the year, at least. The millers are operating under orders that all by-products in the form of feeds for live stock be sold at cost, which is of vital importance to farmers in this connection for middlings are universally used to mix with oats or other grains for growing pigs or breeding stock. With this ray of daylight ahead it seems that the problem is partially solved and that we are justified in going ahead with plans that will ensure the increase which is so badly needed.

Keep an extra sow.

Breed the sow about the first of December.

Give free access to a mixture of salt, charcoal, bonemeal and wood ashes.

Feed plenty of roots and clover or alfalfa hay.

Provide the sow with dry, well-bedded sleeping quarters.

Exercise is important for the in-pig sow; keep her moving and working during the day.

Make provision for soiling or pasture crops next summer to cheapen production.

Get the litter out on grass in the spring, where they can exercise and come in contact with the soil.

Feed the young pigs well but wisely, and start to finish after the early threshing in August.

Selection and Mating.

The breeding sow should be retained, or if conditions are such that the herd must be reduced by one or two, the surplus should be disposed of to neighbors who can handle them. This does not mean an increase in breeding stock, but it provides for a conservation of stock that might otherwise go to the block. Proven sows should be bred rather than slaughtered in a time like this.

The swine industry in Canada must be bolstered up and greater production made a certainty by saving the sows farrowed last spring. We should have a "Choose Your Sow" day immediately in order to rescue from the shambles thousands of young females now being fed and shipped for slaughter. Select from a good-sized litter, the progeny of a good mother. The young sow should conform to the type of the breed represented, and possess at least 12 well-developed teats, evenly placed, with the front ones well forward on the body.

There are two factors which influence the date when these young sows should be bred, namely: their age at farrowing time, and the season of the year. The period of gestation for swine is 112 days or 16 weeks, and this time is seldom exceeded with the first litter. It is not wise to have the young sow farrow much under one year old, so the approximate time for mating can be decided upon, having these factors in mind. Furthermore, April weather is usually more clement than that in March, so with the first litter arriving during the early part of April or later they are greeted with more favorable temperatures, and the dam will have had an opportunity to exercise and come in contact with the soil. In the majority of cases, too, the litter will be within about six weeks of finishing when barley and early oats are threshed in August.

Wintering the Sow.

Just as with all classes of breeding stock, extreme conditions should be avoided in the case of the brood sow. The thin, emaciated female cannot farrow a litter of well-developed, robust pigs, and feed them properly during the first few weeks of their life. The over-fat sow is frequently lazy and does not exercise sufficiently, is troubled with constipation, the bane of the swine industry, and often loses the entire litter while her own life is endangered. Even when the young are born successfully, she is liable to be clumsy and lie or tramp on them. Strive for the happy medium—a thrifty, active, well conditioned sow, but not fat. Provide dry, well-bedded sleeping quarters, free from drafts, but allow for ample exercise in the barnyard or elsewhere. If necessary force the in-pig sow to move about and be on her feet a good part of the day. A few oats strewn in the horse manure is an attractive object to place before the breeding stock, and one which will encourage them to work willingly.

It is not possible to recommend any great variety of feeding stuffs. Probably the best for all conditions is a mixture, equal parts, of ground oats and middlings, and if any skim-milk is available the ration can be made almost ideal. When running outdoors in cold weather and taking considerable exercise, a pregnant sow may be fed some corn, but it should not exceed one-third of the grain allowance. Under other circumstances it is too heating and too fattening to be fed with safety, and it does not contain the muscle-forming material required by the unborn pigs. In rare cases where it might be plentiful this winter, the constituents lacking in corn can be provided by adding a little bran and mixing with the oats and middlings previously recommended. Roots are an important item also and so are clover and alfalfa hay; they provide succulency, and the proportion of bulkiness which is necessary and conducive to an efficient digestive system. Constipation should be prevented, for it is responsible for the loss of many sows and hundreds of litters annually. Roots are a good regulator, but oil-cake meal or a little ground flaxseed added to the ration will ward off constipation and make for a thrifty animal. Sometimes the dry meal is fed on the pulped roots which is a suitable method, but the feeder has a wide latitude in regard to feeding practices. When the troughs are placed outdoors it is not wise to mix too much water or slop with the meal. The amount of water required will depend on the quantity of roots fed and the severity of the weather, but they should have it when they want it and in ample quantities. We have seen sows brought through the winter in splendid condition on mangels and dry chop, the feed of which entailed little labor and could not be considered expensive.

Rearing the Litter.

The maintenance of the extra sow this winter does not concern farmers so much as the rearing and finishing of an additional litter next summer. A slight readjustment of established plans will make provisions for the extra sow, but we must also provide for seven to ten or a dozen pigs through the summer months that will require to be reared, developed and finished. Ordinarily this number of hogs will make a very noticeable impression on the feed bin, so it behooves one to anticipate the shortage and provide suitable substitutes. Our success and the extent of our profits will depend upon forage or green feed for it can be utilized in the construction of frame and body organs, in the meantime conserving the high-priced grains with which to lay on flesh and finish.

When the young pigs are about three weeks old they can be taught to eat, and when four weeks of age they should be given access to a small pen wherein a trough is placed for their exclusive use. At six weeks they are usually weaned, but if no skim-milk is available perhaps it would be just as well to postpone the separation for another fortnight. It is necessary, of course, to consider the next litter, and the pigs must be weaned in good time so the dam may be bred to farrow at a convenient date in the fall. The male pigs should be castrated while still on the sow, preferably when around four weeks old.

Middlings or ground oats with the hulls sifted out are among the best feeds for newly-weaned pigs. The middlings are more palatable if scalded and allowed to stand for several hours or between two feeding periods; then mixed with skim-milk they are very acceptable. In the absence of skim-milk a little tankage may be used to advantage. As previously mentioned, ground oats, minus the hulls, are very good and many litters are started on them, never knowing the taste of middlings. When three months of age the pigs may be introduced to other grains including corn, barley and such, but corn should be fed cautiously at first for it is not a bone-and-muscle-forming feed which is required at this stage in the development of the pigs. Two parts of middlings and one part of cornmeal or ground barley constitute about the proper relation of one to the other. When skim-milk is fed corn can be utilized sooner and to better advantage than when it is not. Middlings with ground oats and barley is a common ration and a very suitable one, especially if supplemented with a little skim-milk or tankage. The feeder has a considerable range of feeds to select from, particularly in summer when the pigs can be gotten out on grass, which is a good conditioner and trouble preventive. The aim at first should be to develop a frame and perfect those body organs which later will be called upon to digest heavier feeds and convert them into flesh. Young pigs need not be fat so long as they are growing well and are thrifty.

The Cost of Production.

There is no class of live stock regarding which the cost of production has been more satisfactorily determined than with swine. Investigators in the United States, Canada and Britain are pretty well agreed in the quantity of grain required to produce 100 pounds of gain during certain specified periods of growth. The following table is an abbreviation of one given in Henry's "Feeds and Feeding." The results from other experiments seem to coincide closely with these figures.

Wgt. of hog	Wgt. feed eaten per day	Feed eaten daily per 100 lbs. live wgt.	Feed for 100 lbs. gain
Lbs.	Lbs.	Lbs.	Lbs.
15 to 50	2.23	5.95	293
50 to 100	3.35	4.32	400
100 to 150	4.79	3.75	437
150 to 200	5.91	3.43	482

With this amount of information condensed into such small space, one should be able to estimate fairly accurately the grain requirements for one or more litters and, incidentally, the cost. Further investigation along the same line was conducted at the Ontario Agricultural College, Guelph, by Prof. G. E. Day, who reports in the following table:

Live weight of hogs	Meal required for 100 lbs. increase in weight
54 to 82 pounds	310 pounds
82 to 115 "	375 "
115 to 148 "	438 "
148 to 170 "	455 "

The evidence we now have and which is verified on every hand leads one to expect that 4 to 4¼ pounds of grain will produce one pound of gain in live weight, throughout the growing and finishing period of the hog's lifetime. Another outstanding feature of these tables is the proof that as the hog increases in age and weight more grain is required to produce one pound of gain. It is this peculiarity of all live stock that we should take advantage of next summer in order to bring about an increase in swine products with the least possible expenditure of grain of millfeeds, and in this direction lies the chief solution of the problem with which we are confronted.

Grain Substitutes.

Up to 100 pounds live weight the pig makes very economical gains and requires less than 4 pounds of grain to produce a pound of gain. During this period hogs will consume middlings, middlings and ground oats, ground oats and barley, and tankage (not exceeding 10 per cent. of the meal ration) in the absence of milk. In the meantime we should make provision for laying on that second 100 pounds with as little cost as possible. Substitutes for grain must be resorted to. Reliable experiments have shown that gains can be made on forage