

FEEDING THE BROOD SOW AND LITTER IN SWINE BREEDING.

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Swine feeding must always precede swine breeding. The breeder can do nothing until he is first able to feed the breeding stock so that it will at least live from one year to the next. He cannot do very much until he is able to feed in such a manner that the parent stock will do fairly well and he cannot accomplish the best results until he has mastered the art of feeding so that his animals will do as well as their inherent characteristics will permit them to do. Furthermore, he will not be able to make the improvement by way of breeding that should be made until he is able to feed better than ordinary, because improvement apparently can be made as rapidly by good feeding as by proper selection.

The feeding of the brood sow may properly be divided into two general heads, feeding the young sow and feeding the mature sow.

THE MATURE SOW.

Feeding the mature sow is a simpler matter than feeding the young sow, consequently this will be considered first. Such a sow, since she has come to maturity, need be fed only enough for maintenance and to develop the fetus before farrowing, and to nourish the litter after it is farrowed. Recent experimental data indicated that the pig requires for maintenance 0.1 pound of digestible crude protein, 0.4 pound of digestible carbohydrate and 0.04 pound of digestible ether extract daily per 100 pounds live weight. Other data have also shown that fattening pigs will do better when they are fed a little more than a maintenance requirement of protein. The protein seems to have considerable influence upon the coefficients of digestibility of some of the other nutriment, as, for instance, fat, crude fiber, and mineral matter.

The above-mentioned quantities of feed would be enough for such a sow only for maintenance when she is doing no work. This is not the purpose, however, for which sows are ordinarily kept. A mature sow may produce two litters per year and in order to do this amount of work she will have to be fed considerably more. In case she is suckled down during the period of lactation she will have to be fed up again during the period of gestation which will require a great

deal more feed than is necessary only for maintenance. Such feeds should be made up of a variety of substances with special reference paid to the matter of supplying the proper quantities of the various digestible nutrients daily per 100 pounds live weight, as protein, carbohydrate, ether extract, mineral matter and water. The latter is not usually considered a nutrient and neither is it considered of sufficient importance to pay any attention to a definite quantity of it in the ration. Recent experimental data, however, of the writer seem to show that a definite quantity of water in the ration for swine carries with it just as much significance as a definite quantity of protein, carbohydrate, etc. The data further show that during the cold weather of winter the pig when given free access to water will not drink sufficient for either maximum development or normal health and production. This would seem to indicate that water serves a further purpose in the nutrition of animals than simply to act as a solvent and should be considered as a nutrient and fed to the animal in definite quantities daily per 100 pounds live weight.

While this has not as yet been definitely determined for brood sows the water curve has been approximately fixed for growing and fattening pigs from the age of two to nine months. In such a case the curve starts at approximately 12 pounds daily per 100 pounds live weight and decreases to 4 pounds. In the case of brood sows, while it has not been experimentally determined, it has by general practice been determined by the writer that between 8 and 9 pounds of water daily per 100 pounds live weight will produce good results.

In regard to mineral matter it is clearly evident that in order to be able to supply the metabolism so that the brood sow can not only develop and live normally herself, but also furnish the material for the development of the fetus and then the nourishment for the litter, it is necessary that she be supplied with a sufficient amount of this substance. Since there is no standard for the mineral requirement of pigs and since the mineral content of various soils and various feeds and of the same soils in different decades differs materially, it would seem to be wise to give brood sows, as well as other pigs, free access to mineral substances of various kinds, such as charcoal, air-slacked lime, bone meal, salt, and wood ashes, at all times. These should be supplied in separate troughs or at least in separate compartments of the same trough so that the pig can supply whatever deficiency there may be in the feeds, according to the dictates of its appetite.

The protein is one of the most important parts of the ration from the standpoint of nutrition and also is more expensive than the other constituents. It is also easy to feed an excess, which may prove fatal or at least very harmful to the pig, both as a producer of pork and of litters. It has been shown that the final weight of pigs going to market at eight months of age is inversely proportional to the amount of protein fed during the first few weeks of the third month of the pig's life when such amount was more than 0.7 pound daily per 100 pounds live weight and directly proportional when the amount fed is less than 0.7 pound. Furthermore, when a considerable excess above 0.7 is fed so that the animal machine is injured and the pig ceases to be a breeder it is obvious what the importance of the proper quantity of protein, especially, and also of the other nutrients, signifies.

Having supplied the proper amount of water, mineral matter, and protein, it will also be necessary to supply the right quantity of carbohydrate, ether extract, and exercise in order to have a sow do normal work as a breeder. For further discussion of these various considerations in the ration of a pig the reader is referred to Circulars 126 and 133 of the Illinois Experiment Station, which may be had upon application; also to "Swine Breeding, Feeding, and Management, by the writer, published by the *Breeders' Gazette*.

At breeding time the sow should be in a thrifty condition, carrying an abundance of flesh, and should be gaining rather than losing. A brood sow apparently will breed more readily and will produce a larger litter of better pigs if she is in good condition at breeding time than she would if not in such condition.

At farrowing time it is necessary in order to get best results and save the largest proportion of the pigs in the litter to feed the sow lightly before and after she farrows. Furthermore, to avoid the difficulties resulting from sudden changes in the ration the ration should be changed gradually from full feed to a light feed. During this time in order to avoid too sudden a reduction in the amount of protein in the ration which would result in the breaking down of fixed protein tissue of the body it is also necessary to gradually increase the relative protein content of the ration. The main reason for reducing the ration of the brood sow before farrowing is to avoid having too much milk in the udder which might result in milk fever or caked udder. After farrowing time it is again necessary to feed the sow very lightly for a time. She need be fed practically nothing but water

for the first few days and then in the case of a mature sow the feed should be increased gradually so as to get her onto full feed in about three weeks after farrowing. After this she may be put on full feed on a ration that contains the proper bulk and the proper amount of water and other nutrients.

The litter will begin to eat at about four weeks of age. If the ration for the dam is properly compounded the litter may at this time eat with the dam. This is considered equally as good and possibly a better practice than where the litter is fed at a separate trough. The latter method involves more labor and there is more danger in not having the trough properly cleaned at feeding time, which might result in various troubles, especially scours.

THE YOUNG SOW.

The young sow when less than two years old is still growing herself and needs sufficient nutrients in her ration for her own development in addition to what the mature sow receives. With this in view she may be fed the same as the mature sow except that the period during which she is brought onto full feed after farrowing may be shortened a little. That is, she may be brought onto full feed in two weeks' time.

FEEDING THE LITTER.

As above stated, before weaning time the litter may be allowed to eat with its dam. The two together should be fed certain definite quantities of the various food nutrients such as protein, carbohydrate, ether extract, mineral matter and water per 100 pounds live weight daily. After the time the pigs are weaned they should again be fed with the idea of bringing about the greatest development. For further information relative to this the reader is again referred to the above-mentioned publications.

GENERAL CONSIDERATIONS.

In regard to the feeding of the breeding herd recent experimental data seem to indicate that the pig is very much subject to environment and to the influence exercised upon it by its ancestors. That is, a brood sow that has been developed under conditions under which she has not herself developed into an individual of maximum efficiency as far as pork production is concerned will not be able to transmit to her

offspring the characteristics that are desirable either from the standpoint of pork production or from the breeding standpoint. That is, if a sow has not been properly fed her offspring will not be able to produce properly. Furthermore, an improperly fed sow will not produce as large a litter or as strong and healthy pigs, neither will she breed as regularly.

CHARACTERS IN MONGREL VS. PUREBRED INDIVIDUALS.

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It is a good general rule, in breeding, to focus attention upon one particular character at a time and work for its improvement. Thus if a smaller comb is the primary requirement, work for that, and do not try to combine it with sharper plumage-pattern or cleaner foot. A breed is more certainly built up character by character, one character at a time.

Now every character, *e. g.* the single comb, is developed in each chick, apparently, out of nothing. At least, before the ninth day we see nothing in the place where the comb will eventually arise. The area for the comb is present on the ninth day, and though the comb is not there we feel sure that something is present that will soon force up a row of points. And even at a much earlier stage of incubation, before the beak has been formed, we feel confident that *something* is present, representing the comb, that will develop into a comb when it has got into its proper place in the appropriate stage of development. That something, which really leads us back to the yolk of the egg before incubation, may be called a *determiner*. The determiner is thus a name for that something which controls and directs the development of a particular character like the single comb with all of its special details of form. This determiner in ordinary purebred or like-bred stock comes both from the egg of the hen and the sperm of the cock. That is, it has a double origin. The determiner that produces a single comb in such stock is a double determiner; it exerts a double or bivalent stimulus to the development of the single comb.

But if, on the contrary, only one of the parents has a single comb, while the other lacks it, then only one of the parents furnishes a determiner for single comb. Consequently the comb derived from such a union of unlike ancestry is produced by a single or univalent stim-