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SOME IMPORTANT FACTORS IN THE PREVENTION OF SWINE DISEASES

L. VAN ES

In a state like Nebraska, where the growing of corn is such a large factor in agricultural production, the rearing of swine will always remain an important if not an absolutely imperative industry.

Our corn fed hogs, worked over into marketable, concentrated products at our meat packing centers constitute the most economic vehicle to carry a preponderating portion of our agricultural output to the ultimate consumer. Our farmers have recognized this from the beginning of our agricultural history. As a result the state has had for many years an enormous swine population, while on many farms there is a marked and continued concentration of many swine on a comparatively small area of land. In our system of agriculture, this cannot be otherwise and because of this fact it seems advisable to contemplate some of the accompanying disadvantages created by this condition. Those disadvantages are entirely associated with a group of swine diseases. The heavy swine population of the state and the more or less permanent concentration of great numbers of hogs on farms constitute the most favorable condition for the propagation of certain parasites and of all communicable diseases. The unfavorable conditions mentioned are more or less cumulative and tend to become more intensified as time goes on. On many farms where great numbers of swine were kept for a considerable series of years, certain disease producing factors have now been so solidly established that it is becoming increasingly difficult to raise a given year's pig crop to maturity and to that degree of thriftiness which makes for profitable production. It is becoming more and more evident that plans must be devised to safeguard our investments in swine by the elimination of some of the disease risks which are concomitant to the status of swine husbandry prevailing in the state. The great interest in swine diseases manifested by our farmers through numerous inquiries indicates that in many instances the problem is becoming quite urgent. This publication aims to render guidance and assistance to those who are confronted with the disease problem and to encourage in a general way the adoption of simple methods of sanitation, which tend to overcome some of the disadvantages associated with the need.

maintaining the number of swine required by our agricultural practice.

Swine are liable to diseases due to a great variety of causes. There are those produced by injury or by the commonplace factors which may bring unbalance or disturbance of the body functions. From an economic point of view they are the least important because they affect comparatively small numbers of animals. Of more importance are the abnormalities arising from faulty feeding and deficiencies of the rations as those factors have a more potent influence on the profit derived from the swine on a given farm. None of the above types of disease can compare in their potentiality for mischief with the one produced by parasites and infection. It is this type of disease which will be given consideration in this circular.

Included in this type is a group of three diseases, which are peculiar to young pigs and those are likewise the ones arising from the practice of continually concentrating large numbers of swine on small areas of land, such as the permanent hog lot or pasture, pig pens, etc. Those diseases may well be designated as filth diseases, because they largely occur as a result of the contamination of soil, feed and drinking water by the droppings of the animals inhabiting the kinds of enclosures mentioned. The three diseases referred to above are: roundworm invasion, pig-typhoid or caseous enteritis and "bull nose" or necrobacillosis.

The invasion of roundworm (*Ascaris*) is without doubt a source of considerable damage to swine raisers. Worms have always been unpopular with the latter and they have often mobilized against the parasites with the most fantastic weapons. The importance of the adult worm within the intestines was always emphasized and much money and time was wasted to meet the worm problem with worm medicines and preventatives of very dubious character. As a rule, nearly all worm medicines are very inefficient as repeated doses are necessary. Furthermore, the use of medicines will not solve the worm problem, as the pig on the farm will be in the same fix again the next year.

The acquisition of more exact information on the life history of the pig ascaris has, however, brought an effective means of solving the problem within our own reach. It was found that the egg of the common round worm will not be infective unless it has been contained in moist soil or water for a considerable period. When the larva has been formed in the egg it

remains there until swallowed by the pig and that is usually done by taking in with the feed or water the ripe eggs scattered in the pens and lots. The ripe eggs are extremely resistant and heat is about the only thing which will destroy the young worms within.

When ripe worm eggs are swallowed by the pigs the larvae are set free, but contrary to the opinion which prevailed until a few years ago, they do not then remain in the intestines, but promptly burrow out, gain the blood circulation and by this means reach the lungs, where their next stage of development takes place. After remaining there for a few days they find their way into the windpipe from where they reach the throat and are then swallowed for a second time and continue during the remainder of their life as inhabitants of the intestines.

It is during the passage through the lungs that most of the damage is done by roundworms. There the invasion causes pneumonia, "thumps," etc. The worm invasions during the youth of the pig is also responsible for the loss of growth and unthriftiness so commonly observed in wormy animals.

When ripe worm eggs, that is, eggs in which larvae have developed, can be kept away from pigs up to the time they will be three or four months old, the damage will be practically prevented. How this can be done will be explained directly.

The second disease which has a predilection for young pigs is known as pig-typhoid, paratyphoid or, better still, caseous enteritis, which means a cheesy inflammation of the bowels. To this disease pigs are most liable when they are less than three or four months old. The disease is caused by a germ which especially develops in the intestines and which leaves the body with the droppings. It is especially manifested by a chronic, persistent diarrhea, certain respiratory troubles and severe emaciation. The infection clings to the heavily contaminated soil of yards and permanent hog lots and is often responsible for the fact that on certain farms a large portion of the pig crop is lost year after year. The sanitary management of hog yards, pens and lots is the only means by which this disease can be prevented at the present time.

"Bull nose" or necrobacillosis is also an infectious disease, the germ of which is very apt to infest permanent hog lots. The germ is commonly introduced by the damage caused to the gums during the eruption of the teeth of sucking pigs. It penetrates and grows into the tissues, causing inflammation and subsequent sloughing of the parts. Usually the mouth, lips and

nose are affected. It causes the peculiar deformity of the face which has given the disease its name. The disease is practically incurable, but the losses may be prevented in the same manner as the other filth diseases.

The three diseases mentioned are responsible for considerable losses among young pigs. In fact, there are not a few instances where they brought about the destruction of the entire pig crop during a given season. When left uncontrolled those diseases are apt to become more and more damaging. Fortunately they can all be effectively prevented by the same means. When we take the necessary steps for safeguarding young pigs against the invasion of round worms we practically do away also with the other two diseases in this group. Let us therefore inquire what must be done.

Worm (and disease) prevention must begin before the pigs are born. The place in which they are born is an important factor in the problem and must receive first attention. The farrowing pen must be thoroughly cleaned and freed from worm eggs and infective organisms. This is done by a thorough removal of all filth and litter and a subsequent flushing with scalding water. The addition of lye to the water increases its cleansing powers, but probably this does not influence the worm larvae very much. It is the heat of the water which destroys them. On farms where pig-typhoid or "bull-nose" is of more or less constant occurrence this cleaning and scalding process may be supplemented by a thorough spraying with a five per cent solution of liquor cresolis compound in soft water.

In pens with a dirt floor the problem is more difficult, because it is practically impossible to clean or disinfect soil. In reality a good, well drained floor constructed of impervious material is almost an imperative necessity if the pen is to be safe to a maximum degree. When dirt floors cannot be avoided, it will pay to remove three or four inches of the old soil and replace it with fresh earth taken from a part of the farm which was not used for swine for a considerable time.

Before the sow is permitted to enter the pen thus prepared, she also should receive a most thorough cleaning. Ripe worm eggs and disease germs are commonly present in the dried mud and filth attached to the skin. This is best removed by a thorough scrubbing with warm water and soap, during which the abdomen and the teats must come in for special attention, because it is from the filth attached to those parts that the pigs receive their initial dose of mischief with the first mouthful of

food of which they partake. Pigs farrowed in a clean pen and nursed by a clean dam enjoy an almost perfect protection against worm invasion and the two other diseases mentioned.

When the pigs are from ten to twelve days old they may be removed to pasture where sow and litter are placed in colony houses. A method of pasture rotation should be practiced, which renders it possible that the pigs can be kept on land where no swine have been during the present and previous season.

As pigs are often born at a time when no pasture is yet available, lots or runs may have to be resorted to. In this connection the permanent hog lot should be avoided. In fact, the permanent hog lot has no place on a sanitarily conducted hog farm. There is always use for hog lots on such farms, but they should never be populated by swine year in and year out. The hog farm of the future must at least have set aside three plots of ground which can be used as hog or pig yard. One of those can be used during a given season, while the other two should be used for some cultivated crop. This would permit the ground to lose most of its harmful constituents during two seasons without having a new supply added to it. These lots should not have water pools or open ditches and the watering of swine should be done by means of some self-filling watering device. This avoids contamination. The same principle can be applied to the feed by means of self feeders.

When no pasturage is available for the young pigs, efforts must be made to place them on land which was not used by swine for one or more seasons, according to the size of the enclosure. It may here also be suggested that every hog lot can be improved in a sanitary sense by sub-soil drainage.

After pigs have been kept on worm-free ground as described until they are four months old, they can be permitted access to other land. At that age the danger of heavy worm infestation has practically passed and the worm larvae they pick up after that age has been reached will cause but little harm. The same can be said with regard to "bull-nose" and pig-typhoid.

There is no swine disease of which the incidence is not favorably affected by such sanitary measures as were described above. Hog-cholera, the disease occurring during all ages of swine, is also more or less subject to the influence of sanitation. As the latter cannot be exclusively depended on and in the face of the wide distribution of the disease and the dense hog population of many regions of Nebraska, it will be necessary to re-

strict the losses due to this disease by the use of the now universally practiced immunization method.

Our knowledge regarding the disease which under the name of "flu" has attracted wide attention is as yet too incomplete to enable one to give explicit directions in regard to its prevention. The disease is a highly communicable bronchitis often progressing to pneumonia. It is conspicuously apt to attack swine of less than one year old. There is no evidence to show that the course of the disease is in the least affected by the use of medicines or vaccines. As long as the cause of the disease is as yet entirely unknown the idea of vaccinating against it seems preposterous to say the least. Hogs sick with this disease are usually badly influenced by handling and other causes of exertion and excitement and it is quite probable that they fare best when left alone. The avoiding of contact with possible sources of infection seems to be the most promising of preventative measures.

The prevention of tuberculosis in hogs is included in the prevention of the disease in cattle, as hog tuberculosis is practically always transmitted by cattle tuberculosis. The eradication of the latter disease will eventually mean the disappearance of infection in swine, a reason the more why our present efforts against bovine tuberculosis should receive all the support and encouragement possible.

Abortion in swine is becoming more and more prevalent and is a real problem on many farms. Our knowledge on the subject is as yet quite imperfect. It seems probable that more than one type of infection may be responsible for the disease. While this may be true, it must be remembered that strong evidence is coming to hand which indicates that the cause of bovine abortion also plays a part in that of swine and we do not hesitate to recommend that pregnant sows be kept away from cattle yards; that they have no access to the fetuses and afterbirths of aborting cattle; that they be not fed on slaughterhouse offal or milk unless those food stuffs be properly sterilized by heat.

The practice of keeping pregnant brood sows in a common yard is no doubt responsible for the disastrous results occasionally observed. It often means access to a common source of infection and it also means that when one sow aborts it will promptly enable the remainder of the pregnant animals to devour the cast off fetuses and afterbirth. A more effective means of bringing about infection cannot be devised. If it is not feasible to keep each pregnant sow on a farm by itself, an attempt

should be made to separate them in small groups as a means of checking the progress of infection in case it should be introduced.

The sanitary measures described above consist essentially of a maximum degree of cleanliness and avoidance of filth of animal origin and the bringing about of such a segregation of animals as the circumstances may warrant. There is no disease which will not be influenced in a favorable manner by such measures. This also includes the parasitic diseases of the skin, mange and lousiness, which are not an infrequent source of loss and annoyance to hog raisers. In addition to the sanitary measures recommended, the use of dips and dipping vats will go a long way to prevent the condition. Mangy swine should always be segregated and treated with an occasional brushing with crude petroleum, preferably that obtained from the Texas oil fields. Lousiness can be effectually combatted by the use of kerosene emulsion, which is prepared as follows:

Dissolve about one-quarter of a pound of common laundry soap in one gallon of soft water by boiling. When the soap has all dissolved and the solution is still hot, pour into it two gallons of kerosene and stir the mixture vigorously.

Of the resulting creamy emulsion, one part is added to eight or ten parts of warm, soft water. This can be used as a spray or applied by means of a stiff fibered brush.

In the prevention of the diseases mentioned, nothing is of greater value than sanitary measures and management. Swine diseases cannot be prevented or cured by stock foods, tonics and similar substances. In addition to this it should be remembered that no medicinal agent will render a healthy hog healthier, while at the same time we must recognize the fact that as yet hog cholera is the only one of the common diseases of swine in Nebraska which can be prevented by means of vaccination or serum treatment.