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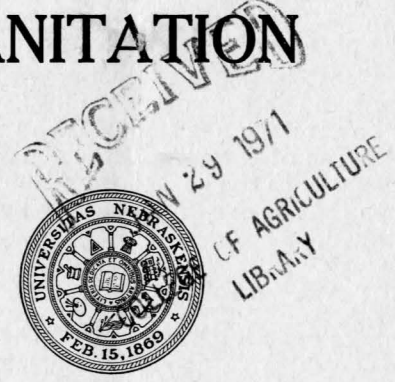
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THE UNIVERSITY OF NEBRASKA
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Extension Circular 226

MORE ABOUT HOG-LOT SANITATION



UNITED STATES
DEPARTMENT OF AGRICULTURE
CO-OPERATING

More About Hog-Lot Sanitation

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In connection with almost any discussion having to do with the transmissible diseases of swine, something may be heard about the practice of sanitation and its great value. Not uncommonly it is stressed the most when there is the greatest doubt as to one's ability to cope with the given situation, or when there is the least confidence in its efficiency. The word "sanitation" often is a mere commonplace uttered when the problem in hand is especially baffling, while often something alleged to be sanitation is undertaken merely because it yields a certain degree of comfort of the conscience when something is done or said with the best of intentions. There may even be a faint hope that desired results may be achieved by whatever is undertaken.

NOT ALL PRACTICES ARE REAL SANITATION

The things done in the hope that they constitute sanitation are frequently bizarre enough. Sometimes disinfectants are promiscuously scattered about the premises and this is called sanitation, when in reality nothing more is accomplished than the creation of a smell. In other cases, stable yards and pens are divested of their rubbish and this completes the process of sanitation, as if disease would disappear at a mere gesture.

With the prevalence of such ideas, it is not surprising that the results are often far from those hoped for, that sanitation so frequently inspires but little confidence, and that farmers are so commonly induced to pin their faith in the useless nostrums, biologic or otherwise, which are constantly dangled before them by the clever salesman of our day.

Sanitation thus is often given a rather vague and indefinite position among the measures of disease control. This is further enhanced by the fact that the most costly of all swine diseases, hog-cholera, is probably one which is least amenable to purely sanitary methods.

Yet there is no fallacy more potential of costly mischief and of far-reaching bad results than the belief that sanitation is only of a subsidiary importance among the various factors of

our disease fighting machinery. In fact, in the case of a certain group of highly important swine diseases real sanitation is as yet our only hope in coping with rather disastrous situations.

MANY LOSSES OF SMALL PIGS ARE NOT CHOLERA

It is commonly assumed that 90 percent of all disease losses of swine as recorded by our statisticians can be charged to the account of hog-cholera. While perhaps our statistical methods may be somewhat crude, there can be no doubt that this estimate is fairly correct. On the other hand, observation compels us to believe that statistical efforts leave a large proportion of our swine population and its losses by disease unaccounted for. We fear that they pertain too exclusively to swine of maturity or of shoat age and take but little account of the younger stock. We suspect that the small pig, the potential hog, is already neglected and that the more or less severe losses occurring among them do not appear in our census reports.

Statistically recorded or not, there is no doubt that on many farms in our swine breeding states it is becoming increasingly difficult to raise a profitable proportion of the pig crop to maturity. From birth on to the age of three or four months, the morbidity rates are conspicuously high on such farms. This may constitute a marked feature during a series of years.

While it is safe to say in many instances of this kind, hog-cholera is the all-important factor in the problem, there is a considerable number among them in which this disease can be excluded. We frequently observed cholera-susceptible herds in which the spring crop of pigs dwindled to a small number of stunted, gaunt, unthrifty and unfit animals, while the shoats and more mature swine remained exempt from sickness. In some of such cases it was found that the pigs surviving had retained their susceptibility to hog-cholera either in field outbreaks or when they were artificially infected with this disease.

It may indeed be difficult to correctly eliminate hog-cholera in all cases, but many observations compel us to give consideration to certain diseases peculiar to pig age. Many such have been described, surmised or commercially exploited, but as we draw from our own observations, we are forced to give special recognition to the paratyphoid infections, ascaris invasions and that form of *B. necrophorus* infection, which is commonly called "bullnose." In our experience this trio stands out pre-eminently among the factors responsible for losses among young pigs.

Not uncommonly we find all three occurring side by side in the same herd if not in the same animals.

We do not know if there is any relation among them, but it does not seem impossible that during the migration of the *Ascaris* larvae, the latter play a part as inoculators or vehicles of such organisms as the paratyphoid bacillus.

However, it is not the purpose of this discussion to deal with details peculiar to the conditions mentioned, but rather with the circumstances under which they arise and the more important factors which may enter into their prevention.

CONFINEMENT CAUSES FILTH

In that part of the country where the growing of corn and the breeding of swine constitutes a well established agricultural practice, it is common that the animals, young and old, are kept confined in enclosures set aside for this purpose. In those enclosures the animals are fed and watered and whatever provisions for comfort or shelter are provided, they are as a rule connected with such yards. In some cases, when the swine are kept at pasture, the latter communicates with the yard in order to give the animals free access to the water supply. Not uncommonly, that part of the homestead which is low or deficiently drained and which for this or other reasons cannot well be utilized for other purposes is given over to the hogs.

In this type of enclosure the hogs arrive shortly after being farrowed and there they are provided with food and water for a considerable period, if not during their entire existence on the farm. On a comparatively small area of soil thus a considerable number of swine are kept for a series of years, practically without interruption. On this patch of soil the solid and liquid body wastes are being continually deposited, while, in addition, hog wallows and other pools are permitted to exist because of lack of drainage.

In such yards altogether too common, even the more or less feeble attempts at tidiness for decency's sake do not prevent the animals from being in constant contact with their own sewage and from being compelled to seek their food and water in this very questionable, if not highly dangerous, medium.

Experience in public health promotion during the last fifteen years has amply shown the dangers of sewage contamination and of even the mere proximity of open privies and cesspools to human habitations. A community people, yes, more less isolated families may truly be said to live under a more than ordinary disease hazard, when no provision is made

for proper sewage disposal, or the harmless storing of the same. This in a measure is also true in connection with our domestic animals and especially so in the case of swine.

We have no hesitancy to recognize as a sanitary axiom, that no species or higher vertebrate can exist in a more or less enduring contact with its own body wastes without the imminent risk of sooner or later being involved in outbreaks of disease.

This, however, is precisely the condition which prevails in the average hog yard. Year after year the excreta of many animals are voided on a comparatively small area of land and when infection once becomes a factor, a truly vicious circle is at once established. The soil, as it were, becomes glutted with organic materials and pathogenic organisms in quantities far in excess to its digestive powers, while the diseased animals or virus carriers of one generation uninterruptedly are contributing their quota of pathogenic factors to do mischief to the next one.

NATURE ACTS AS PURIFIER

Under ordinary conditions the soil rids itself in time of most of the pathogenic elements, with which it became contaminated, by the process of biologic purification, but in the case just now cited, its digestive powers are overtaxed; more disease providing factors are added than can be destroyed, while it is by no means impossible that the mineral products of decomposition accumulate to the extent of becoming a hindrance to the growth of the very microorganisms which create them and upon which soil purification is dependent.

It need not be emphasized that the conditions described furnish the principal factor to the pollution of food and drinking water and that combined they must be regarded as being widely responsible for the appalling death rate among the pigs on certain farms. Nor is it necessary to point out the great need of effective measures to cope with this rather widespread problem.

Prior to devising ways and means to that end, two facts should be given recognition. In the first place, that no relief can as yet be procured from therapeutic or immunizing methods. The use of "necro" cures, worm expellers, and so called and alleged mixed infection bacterins is mere piffle, by which nothing of material assistance can be accomplished. In the second place, that soil cannot be effectively and economically disinfected.

SOLUTION LIES IN SOIL SANITATION

The solution of the problem is entirely a sanitary one. It is a question of sanitation throughout. By the term sanitation is meant the creation and maintenance of an environment which is safe to animal life.

The measures proposed must center themselves upon the soil as the principal factor in our problem.

One of those measures consists in the avoiding of the infective ground or yards by pigs from birth on to an age of not less than four months. This method has been proposed in a very effective manner by Ransom and his associates as a means for the control of ascaris in swine and to them belongs the credit for the first pointing out a way for relief. In brief it is proposed to establish clean and parasite free farrowing quarters, to remove by thorough cleaning all filth from the body of the sow and by transferring the pigs to non-contaminated pastures, without permitting the least contact with the ordinary hog yards and pig pens. Not only is this method of great promise in dealing with ascaris, but for the prevention of pig typhoid and bullnose as well.

The other measures for the control of the fifth diseases of pigs pertain to the contaminated lots themselves, because of the potential elements of mischief associated with them. Three factors may be made to co-operate for the purpose. First, the cessation of further contamination by the withholding of swine. Second, by adequate drainage. Third, by cultivating and croppings of the areas involved.

While in a practical way soil cannot well be disinfected, it will effectively rid itself of most of its pathogenic bacteria, which are not spore formers, by the process of biologic purification. The speed of this purification is subject to seasonal fluctuations of moisture and temperature. When the soil is frozen, it is practically suspended, while during the warm and moist months of summer its capacity is the greatest. In the case of the spore formers, it is probable that they are never entirely eliminated by the digestive powers of the soil. They are quantitatively reduced by their gradual subsidence into the deeper layers, especially so in soil of loose texture.

The eggs and embryos of the gross parasites are likewise apt to persist for long periods in spite of the purifying functions of the soil. They are also subject to subsidence into the ground structures although little is known on this subject as well as that pertaining to the adverse influence of a biologic nature to which they may be subjected in the soil.

PIG-LOT SANITATION PLAN

In order to afford the soil of hog yards a measure of time to dispose of its pathogenic elements, it is tentatively proposed to establish what may be called a three year pig-lot rotation. Provision is made for space sufficient for three distinct yards, one to be in use for a year and the other two to remain uninhabited by livestock and to be devoted to cropping or garden purposes. Each year a fresh lot is put in use, so that two years elapse between successive occupations.

A similar arrangement is proposed in the case of the land to be used for pasture purposes, even if in that case there is a less degree of infection concentration.

In all hog lots and pastures, there should be provision for adequate drainage. Storm water should have the means for a prompt run off, while no pools should be permitted to form or to exist. Hog wallows are not only superfluous, but positively detrimental for their capacity as infection centers.

As a general rule the improvement of hog lots should not be permitted to involve a considerable outlay of money; yet there are many areas requiring tile drainage as a principal means of sanitation, while it is probable that all hog lots could be improved by this means.

Sub-soil drainage facilitates a perpendicular flow of precipitation water and hence also the subsidence of undesirable organisms and substances; it promotes the aeration of the soil; and it helps to eliminate the end products of decomposition, the accumulation of which is apt to inhibit the microbic life upon which soil purification depends.

The resting hog-lots should be used for cropping of some sort, preferably with crops requiring a maximum amount of cultivation. As soon as possible after the swine have been removed from the lot, the latter should be deeply plowed in order to bury the noxious substances as far as possible below the surface and to loosen the upper soil layer, after which the seeding or planting can be undertaken whenever the season becomes favorable for the purpose. The repeated stirring of the soil enhances its biologic activities and at the same time it facilitates the subsidence of those undesirable factors which are the least subject to microbic action. The growing crop is an important means of removing the mineral end products of decomposition because the latter can be generally utilized as plant foods.

SANITARY FEEDING PRACTICES

In connection with hog lot sanitation, attention must be given to the manner in which food and water are offered to the animals. The drinking water should always be provided in special containers, which can be readily cleaned and from which the water can be periodically flushed out and changed. The drinking from water accumulations on the ground should be rendered impossible as such sources of supply are never free from the dangers of contamination.

Feeding from the ground should be avoided for the same obvious reasons. From a sanitary view point it is probable that the self feeder is the most suitable means of offering concentrated feed to swine.

Concrete feeding floors may also obviate some of the dangers which are associated with feeding from the ground, provided that they be kept clean and free of filth accumulations.

The concreting of entire hog lots would help to solve many of the problems of livestock hygiene but unfortunately this can only be done in exceptional cases, owing to the high cost of construction. On rented farms it would be very difficult to consider this type of improvement and in proposing sanitary measures against the diseases under consideration all suggestions of costly improvement better be omitted. Enough can probably be accomplished in the manner indicated.

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