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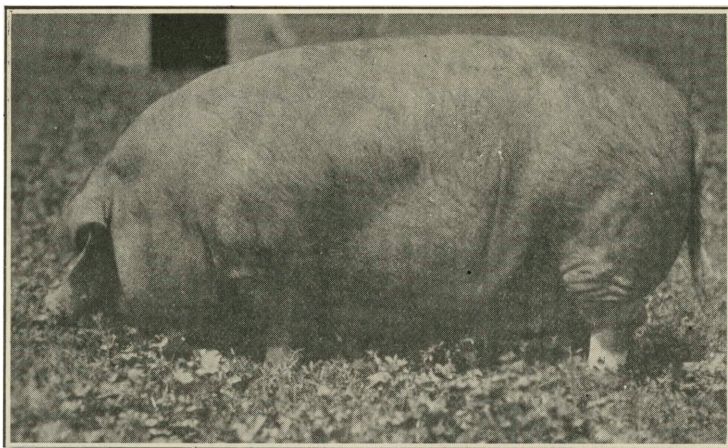
EXTENSION SERVICE

Fort Collins, Colorado

A. E. LOVETT, Acting Director

PREVENTION OF SOME HOG DISEASES

BY GEORGE H. GLOVER



CO-OPERATIVE EXTENSION SERVICE IN AGRICULTURE AND HOME
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PREVENTION OF SOME HOG DISEASES

BY GEORGE H. GLOVER

There is money in the hog business most of the time, at least for some people. These same people can usually be counted on to make good in other business ventures. Why some people succeed in business, and others do not, is foreign to the subject in hand, unless it be to merely suggest that a wide knowledge of the subject, attention to details, and eternal vigilance are the prime requisites in the successful raising of hogs as well as in other business enterprises.

It has been said that an ignorant man profits only by his own experience but that a wise man profits by the experience of others. Every phase of the swine industry has been studied by experts and the results, as well as the experiences of successful hog growers, have been made available in bulletins, newspapers, and diverse publications. The farmer who does not profit by this array of information is missing his one best opportunity to become conversant with what up-to-date hog raisers are doing.

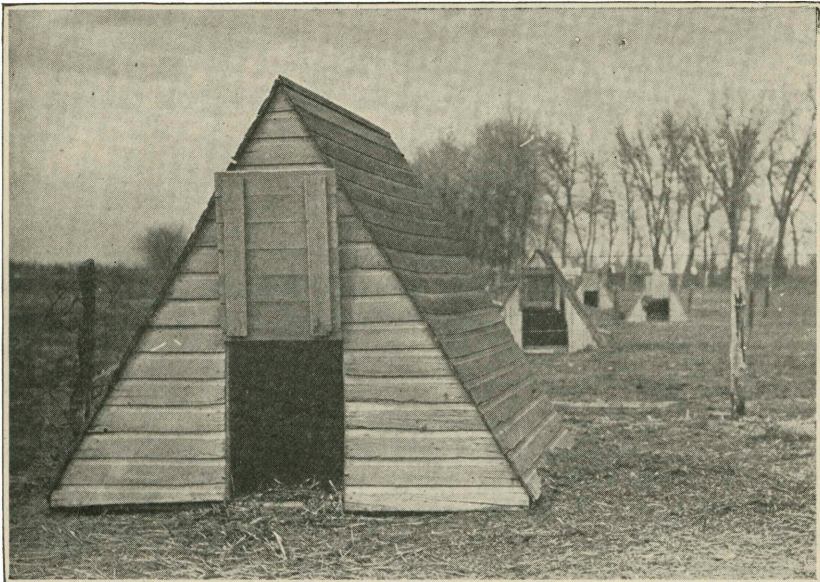
ONLY HEALTHY HOGS MAKE MONEY FOR THEIR OWNERS

The fact that hogs in spite of so much mistreatment frequently remain healthy, and make money for their owner, is no doubt the reason that they are so commonly neglected. Disease has become more and more of a problem in the successful raising of hogs. The health of hogs from farrowing to selling time is by far the greatest factor in determining whether the enterprise is to make a profit or a loss. From this standpoint the loss is usually figured on the basis of those that actually die from accident and disease. The fact of the matter is that, excepting those cases where a considerable proportion of the herd is wiped out by a pestilence, such as hog cholera, the greater loss cannot be so estimated. The larger loss in an average herd is the difference between what the herd actually made and what it should have made under the same circumstances, in a state of health. The relation of health to gains should be kept constantly in mind.

PIG HYGIENE

"As dirty as a pig" is a common expression, yet the fact remains that a pig is as cleanly in its habits as other farm animals if given a chance. Too often the comfort of the swine herd is the last thing to be considered on the farm but it has been fully demonstrated that hogs will quickly and liberally repay for extra attention given them. Since the profit in feeding hogs depends upon the amount of gain per unit of feed, and since perfect health is necessary to secure the highest possible gains, it is of the utmost importance that suitable conditions for handling hogs should be the first thing to take into consideration. Vigorous stock, drainage, a pure water supply, feed, suitable runs, shade, buildings, farrowing pens, feeding places, wallows, etc., must all be planned for and the plans systematically executed. Resistance to disease is natural, or it may be acquired. Natural resistance depends very much upon physical vigor. Exposure, poor food, parasites and other things that lower the vitality not only prevent hogs from making satisfactory gains but lower their resistance to disease as well.

Shelter.—Segregated hog houses have many advantages from the standpoint of sanitation. Colony houses may be satisfactory if properly constructed. They should provide for plenty of light and



The colony pig house has other advantages besides being sanitary

ventilation without a draft. They should be easily cleaned and never crowded. Hogs should sleep on the ground and not on a plank or cement floor. Fresh bedding should be supplied regularly. The five essentials are: Air, sunlight, cleanliness, chemical disinfectants, and a balanced ration.

Straw stacks do not make a satisfactory shelter for hogs. They invariably "pile-up" in the winter time and become overheated. They come out hot and steaming; many of them chill and contract pneumonia. Parasitic and contagious diseases are easily transmitted in straw stacks.

Feeding.—Since most diseases of hogs, including parasites, are taken with the food it is important that feeding places be provided that can be easily cleaned. Plank, or better still, cement floors, should be provided. Feed troughs should be cleaned and disinfected frequently. Self feeders are to be considered. A hog feeder must have a working knowledge of balanced rations to get the best returns.

Hog Wallows.—Fat hogs suffer greatly from the heat and prostrations must be guarded against. Evaporation of sweat cools the body but this relief is denied the hog. During the hot summer months hogs simply must have shade with plenty of room. A wallow is indispensable to their comfort and may save their lives. A concrete wallow with running water is ideal. The filthy stagnant mud hole is abominable, but hogs will use it if nothing better is provided. If the mud wallow is the best there is, disinfectants should be used to destroy germs, lice, and other parasites.

Water Supply.—Because of hog cholera, it is always dangerous to keep hogs on a running stream and it is rather difficult in many places to provide fresh, cool water in any other way. Impure drinking water no doubt accounts for much sickness in hogs. When the water is bad, hogs will not drink as much as they otherwise would, nor as much as they should to keep them in good health and to make satisfactory gains. Each farm will necessarily have its own problem in figuring out a pure water supply. Where the business of raising hogs in a large way is contemplated, the first thing to consider is the chances for pure water in abundance.

Hog Runs.—Most of the time hogs should have free run of the fields. Low, damp, or swampy ground should be avoided. Hog diseases are harbored in this kind of soil. Hog lots and fields should be on high ground where there is natural drainage.

HOG DISEASES

Overheating.—Hogs, being unable to prespire freely, and being enveloped in much fat, are liable to be overcome with heat in the summer time. When hogs are driven they must be allowed to drift along slowly, taking their own time, and even then they are liable to go down with heat apoplexy. When overheated they should be placed in the shade. Cold water should be applied to the body, a fine spray will be better. The water must be applied slowly to the head at first, otherwise sudden death may occur. If a draft can be provided it will help to cool the body by increasing the evaporation.

Thumps.—The one word that should at all times be associated with the prevention of disease is *exercise*. The disease is practically incurable and kills thousands of little pigs every year. It can be quite easily prevented and prevention consists in exercise—exercise for the mother before farrowing and exercise of the pigs from the day they are born.

Mr. E. Z. Russell, who is considered one of the best authorities on hogs, believes in enforced exercise for little pigs and has devised a unique method to this end which is best described in his own words: "Take a large barrel or hogshead, place it in a pen or alleyway adjoining the pen in which the mother is; take one or two pigs needing exercise and place them in the barrel. The pig will run around hunting for a corner and in that way will take sufficient exercise to prevent thumps."

A sow in breeding condition is rather thin in flesh, at least not too fat. A light, laxative, well-balanced ration should be provided for the sow throughout the period of pregnancy.

Paralysis.—Paralysis of the hind quarters of hogs, mostly seen in those that are well grown, is so uniformly characteristic as to suggest a common cause. Paralysis in little pigs is usually associated with infections. The paralysis in question is seen in hogs that are otherwise apparently in good health. It has been attributed to various things such as an unbalanced ration, inbreeding, constipation brought on by heavy feeding and lack of exercise, rickets, tuberculosis, neuritis, compression of the spinal cord from unknown causes, inflammation of the spinal cord following specific infections, kidney worms, intestinal parasites, etc. It is scarcely reasonable that the disease in question can be accounted for by the parasites mentioned. Paralysis of the hind quarters of hogs is of sufficient economic importance to be worthy of special investigation. However, as a prophylactic measure, all of

these things should be kept in mind. Except in case of very valuable hogs, medicinal treatment is not warranted and in the interest of food conservation early slaughter is recommended.

Lung Worms (*Strongylus paradoxus*) are a common parasite of young hogs. They are hair-like worms about an inch long that inhabit the bronchi and lungs. The symptoms are coughing after feeding and exercise, and an unthrifty condition. Treatment is preventive and consists in good care, with emphasis on liberal feeding and clean water. There is always the question as to just how much parasites are the cause of unthriftiness on the one hand, and how much they result from it on the other. Certain it is that thrifty animals have a high degree of resistance to parasites of all kinds.

Kidney Worms (*Sclerostoma pinguicola*) are found in the fat which surrounds the kidneys. It is doubtful if they do the harm that is sometimes attributed to them. There is no known treatment that will reach them. Prevention consists in good management of the herd.

Intestinal Worms.—Intestinal parasites are most common in young animals, but because of the habits of swine in eating and rooting for earth worms it is unusual to find even an old hog entirely free from them. The harm they do will depend upon their kind and number and the age of the host. Intestinal parasites injure swine by

1. Obstruction of intestine and liver duct.
2. Abstraction of nutrition, for they must be fed by the host.
3. Irritation of mucous membranes.
4. Liberation of chemical substances that are injurious to the host.

It is only after a herd has become severely affected that the symptoms become noticeable to the casual observer. They become unthrifty and finally emaciated. The symptoms will depend upon the manner in which the parasites are damaging their host. A general unthriftiness and occasional passage of worms with the feces constitute the only visible symptoms in most cases. Three principal types of parasites inhabit the intestinal tracts of hogs: Round worms (*Ascaris suis*), Thorn-head worms (*Echinorhyncus gigas*) and Pin-worms (*Oesophagastomum dentatum*).

The Round Worm is from 5 to 11 inches long. It has a fully developed digestive apparatus and lives on the food taken in by the host. The eggs of the female pass out with the feces and becoming mixed with the earth, food and water are ingested by other hogs. In the stomach the eggs soon hatch into young parasites which pass into the bowel and thus complete their life cycle. Prevention consists in

avoiding food that is contaminated with the eggs of infested hogs. If hogs are known to be affected the droppings should be gathered and limed to destroy the eggs. Common salt is a most effective agent for this purpose but must be used cautiously since hogs like chickens are very easily poisoned by it. Ferrous sulphate, copper sulphate and creosote are common ingredients of the cheaper vermifuges. The most effective agents are areca nut and santonin. The dose of areca nut is $\frac{1}{2}$ to 1 grain per pound weight of animal and santonin 1 to 4 grains according to size of animal. It can be given mixed with food. Treatment, say for six pigs, can thus be prepared and fed in a trough just long enough for them to eat without necessary crowding. Feed had better be withheld for at least twelve hours before giving treatment. Calomel (5 gr. to 100 pounds weight) may be used instead of areca nut. Both calomel and santonin are quite insoluble in milk, so had better be mixed with ground feed.

The objection to this method of administration is that the weaker animals that need treatment most will not get their share. The capsule method has recently come in vogue and is recommended by prominent hog growers. Capsules containing the drugs are administered with a "balling gun" and the administration is not as difficult as it might seem. Capsules filled ready for use are sold by various biological firms.

The Thorn-head Worms are relatively few in number. They are from 8 to 12 inches long and have a head armed with a powerful biting proboscis, by means of which they attach themselves to the intestinal wall. They live by absorbing the food that has been digested for them by the host. Treatment, both preventive and curative, is the same as for round worms.

Pin Worms are very small and are found mostly in the large intestines. They may be present in considerable numbers without producing severe symptoms. If associated with other intestinal parasites there will be need of treatment, which will be the same as for those mentioned.

Lice.—There is no profit in feeding lice and it takes twice the food to fatten a lousy hog. To delouse a herd of hogs three things are to be considered: (1) The killing of lice on the animals. (2) The destruction of their eggs. (3) Cleaning the quarters to prevent re-infestation.

Hogs are treated by sprays, dips and hand dressings. Many hog dips are advertised and are effective. A vat should be provided which will permit of complete submerging of the animal and keep him in for

several seconds. Kerosene emulsion is more destructive to nits than many other dips but the treated animal is liable to blister badly in the hot sun.

Kerosene Emulsion

Kerosene	2 gallons
Soap	8 ounces
Water	1 gallon

First dissolve the soap in boiling water and then mix with the kerosene, stirring vigorously. This makes a stock solution. For either spraying or dipping, add 9 gallons of water to each gallon of stock solution. Crude oil is cheap and kills both lice and nits with one application. It can be used with water in dipping vats and can be used to advantage in hog wallows. In case of a few hogs it is convenient for hand dressing.

Tuberculosis.—Less than one-half of the meats consumed in this country are inspected, but nevertheless more than 25,000 carcasses are condemned by federal inspectors annually because of tuberculosis. Hogs contract the disease mostly from cattle and the human from both. It is impossible to make money for long out of a tuberculous herd. It does not pay to invest expensive feeds in animals that are handicapped with disease. On the contrary it will pay in the long run to “clean up” the herd and keep it clean.

Necrobacillosis.—This disease affects hogs in many different ways and is caused by the bacillus necrophorus. When it affects the nasal passages it is called “bull-nose” or snuffles. When in the mouth, it is spoken of as “sore-mouth” or necrotic stomatitis. In the intestines, it produces lesions that resemble those produced by cholera. In the venereal form the external genital organs of both males and females are involved. Occasionally one or more sections of the udder will become swollen and very hard; later a dry gangrenous ulcer will appear, which gradually becomes larger. Large firm tumors may appear anywhere on the head.

In male pigs the inside of the sheath is more commonly affected than elsewhere on the body, with the possible exception of the mouth. By moving the hand firmly down the outside of the sheath the accumulated exudative material can be squeezed out, thus demonstrating the presence of local infection. Occasionally no external lesions can be found but upon autopsy the fundus of the stomach and intestinal tract will be found badly involved.



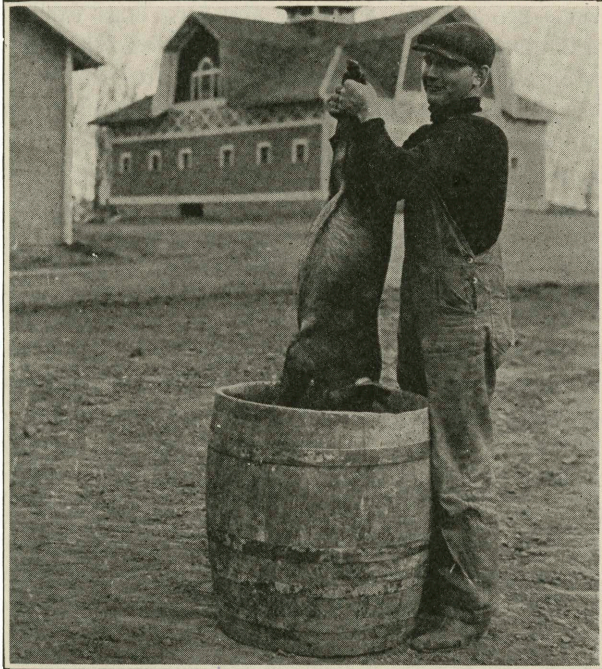
Showing necrobacillosis affecting the head

This disease has no doubt caused a greater loss in Colorado than has hog cholera and is far more difficult to combat. Being a chronic disease that continues on from year to year, its seriousness is not apt to be appreciated, unless one takes into account the aggregate loss throughout the State, in a given length of time. Pigs under eight months old are most affected, but the older ones may later become diseased, one at a time, until the whole herd is practically destroyed.

Prevention consists in a strict observance of the rules respecting the control of infectious diseases in general. Feed lots and pens must be kept clean and disinfectants used once or twice a month. Pigs that are badly diseased should be destroyed at once since there is no hope of recovery. After the disease appears in a herd each pig should be examined every day or two. When ulcers are found they should be scraped out clean, and strong antiseptics, or even caustics used. A mixture of creolin (5 parts), sublimed sulphur (10 parts), mutton tallow, vaseline or lard (100 parts), mixed to form an ointment has been found to be very serviceable. (White). In severe cases, after the scab has been removed, the raw surface may be touched with zinc chloride (10 per cent) or nitric acid (15 per cent). These caustics should be applied with care, otherwise they may do much harm.

After the sick pigs have been destroyed, and the mild cases treated, the others should be dipped and placed immediately in new clean pens. For dipping a half barrel or tub will suffice. Potassium permanganate solution (.5 to 1 oz. to one gallon of water), or a four per cent. solution of one of the coal-tar disinfectants will be satisfactory and reasonably cheap. The pigs should be completely submerged with the head down.

Hog Cholera.—A general discussion of hog cholera cannot be undertaken here, but a brief resume of what we believe to be the latest information may be helpful. The death rate from hog cholera is over 90 per cent and no breed of hogs is naturally immune. Cholera is caused by germs that are too small to be seen by any microscope and that pass through the finest filters. The virus (germs) is found in the blood and in all of the excretions. A hog must take some of this virus into his own body before he can have the disease. Cholera is not caused by parasites, a certain kind of feed or phases of the moon, neither does it just simply happen; there is a cause for everything. Knowing it to be caused by germs, we can see how easily it is to carry the disease from place to place. The two ways through which cholera



Dipping the pig. Submerge him completely, but do it quickly

is most commonly and most certainly transmitted are access to streams that are polluted by sick hogs, and shipping by rail. No community should allow hogs to be shipped in, or trailed in for short distances, that have not been immunized. Hog cholera thrives best in the summer time but freezing does not destroy the virus. The sunlight and air will quickly destroy the germs if they are not covered by straw, manure, dirt, or otherwise protected. After hog cholera has existed on a farm we may say in a general way that it will be safe to restock the farm with hogs in two years time, provided there has been a thorough cleaning and disinfection of the premises.

The carcasses of hogs dead of cholera, or animals that have died from any infectious or contagious disease, should be completely destroyed by fire. It may be conveniently accomplished by utilizing an iron wagon wheel or iron rods. In the absence of these things a narrow pit may be dug for the fire and the carcass placed across the pit above the fire. If it should happen that fuel is not available the carcass should be buried several feet deep and covered with one or more buckets of quick-lime.

Symptoms.—The symptoms are not at all uniform and the post mortem lesions are not the same in any two hogs examined. The reason for this diversity of condition is that hog cholera may be acute, sub-acute or chronic, and again may be complicated with swine plague, necrobacillosis, infectious pneumonia, or other diseases. A positive diagnosis cannot always be made in the first instance even by the most skilled and experienced veterinarian. The following is a good rule to follow: **If hogs refuse to come up for their food, take no chances.** If it proves to be cholera there will be extreme weakness, especially in the hind quarters, back humped, ears and tail will hang limp, body hot, eyes congested and either diarrhoea or constipation.

Cholera Cures.—There is positively no cure for hog cholera and from the very nature of the disease it is not likely that there ever will be. It may seem presumptuous to even mention to the intelligent farmers of Colorado the folly of spending money for "sure cure" remedies for cholera. The prosperity of these concerns, however, speak for the persuasive ability of their agents and the credulity of farmers. Those who "fall for it" are not the farmers who are doing much thinking along the line of improved agriculture. Tonics have their place but to give them in the form of stock food, or otherwise, in the expectation that they will keep hogs healthy and keep cholera away, is absolutely foolish. Tonics never cured a sick pig and could not possibly benefit a well one.

Uncontrollable Conditions.—A certain farmer, though surrounded by cholera, kept his hogs healthy for three years. He did it by maintaining the strictest kind of a quarantine and a liberal use of disinfectants. He was not praised for his neighborly qualities, yet if all his neighbors had exercised the same vigilance, cholera would have been controlled in that neighborhood. Since farmers generally are not seriously impressed with the idea of being "their brother's keeper" it behooves every farmer to look out for himself. If we had an ideal people who would take care of their hogs and protect them in an ideal way, for the common good, each farmer would be protecting the other fellow as well as himself and cholera would soon be a thing of the past. There are three things to consider in this connection: (1) Sanitation and all that the word implies; (2) anti-hog cholera serum; (3) or raise no hogs. Since no considerable number in a community will co-operate in sanitary measures it becomes necessary to use cholera serum in cholera districts, or raise no hogs. The following succinct statements are worthy of serious consideration by hog growers:

1. Virus is the blood of a hog suffering from cholera.
2. Immune serum is the blood (with clot removed) from a hog that has recovered from cholera.
3. Hyperimmune serum is blood (with clot removed) taken from a hog whose ability to resist cholera has been built up by injecting an immune hog with virulent blood. This is the commercial anti-hog cholera serum.
4. Serum protects a hog from a few days to a few weeks.
5. When the serum and virus are both injected (simultaneous method) the virulent blood produces the disease to the extent of developing anti-bodies which make for a lasting resistance. At the same time the serum protects the animal from a severe attack of cholera. Serum alone is to be considered in connection with the transportation of hogs into new territory.

6. The simultaneous treatment is always appropriate in communities where hog cholera is rampant.

The results depend upon (a) technic in making injections; (b) strict observance of the principles of sanitation; (c) a proper balance of potent virus and serum; (d) the special care that must be given hogs both before and after treatment; (e) correct dosage, which depends upon judgment as to the weight of hogs; (f) the taking of temperatures of all hogs where the herd is known to be diseased and knowing those that should be treated and those that should be slaughtered.

7. The results depend upon the accuracy of details, from the making of serum to the care of the hogs after they have been treated.

8. Considering the complexity of the many details involved, common judgment would dictate, and experience has fully demonstrated, that only those who have had special training and experience (including veterinarians) in the manufacture and administration of the serum and virus, have any moral right to undertake it. To invade the realm of bacteriology and medicine by a short cut is too often a dangerous and disastrous experience.

9. In case of a suspected outbreak of hog cholera, immediately notify the State Veterinarian, State Capitol, Denver. The State Veterinarian is assisted by government veterinarians who will immediately take charge and help you to save your hogs and to prevent the spread of the disease in the State. The law requires that you do this.

The Veterinary Division of the Colorado Agricultural College stands ready at all times to make laboratory diagnoses, to make special investigations, and to promote educational propaganda.