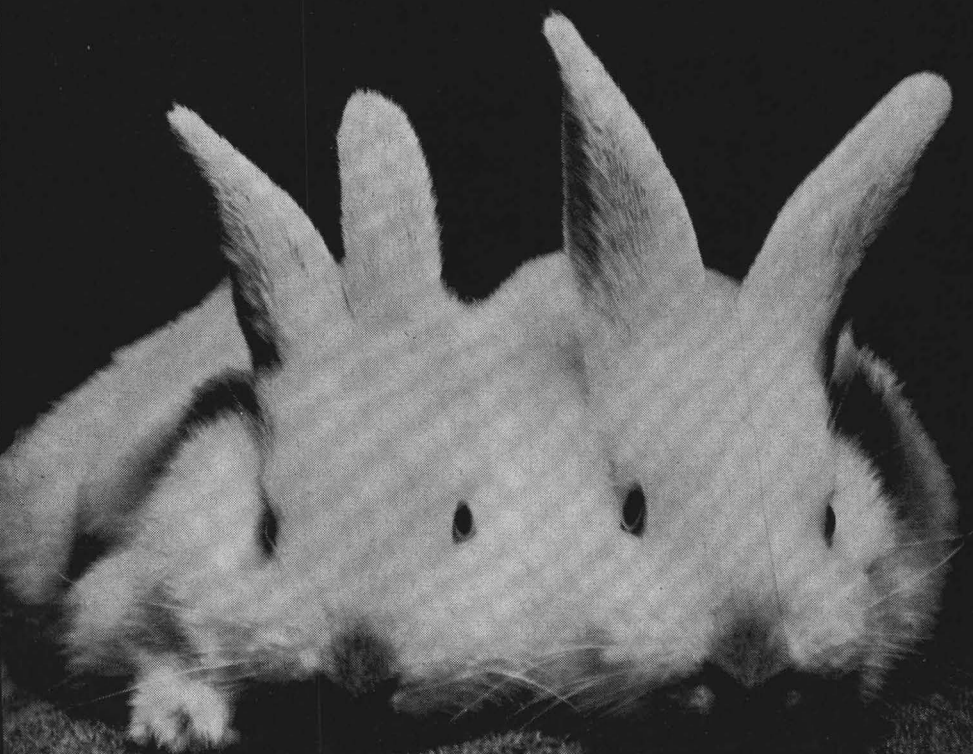


Rabbit Diseases and Parasites



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Rabbit Diseases and Parasites

Diseases

DISEASE is an unpredictable factor that can upset the carefully planned economy of a rabbit-producing project. When large numbers of animals are confined in a limited space, disease dilution factors that occur in nature are no longer in operation. Careful attention must be paid to husbandry practices to make up for the deficiencies of this artificial environment. In no phase of animal husbandry are sanitary standards more strenuously tested than in rabbit production. We are dealing with an animal whose susceptibility to many diseases is so great that it is the animal of choice in laboratory tests for the study of these diseases.

There are several practices which will help considerably in disease prevention.

1. New additions should be held away from the rest of the rabbits for at least 2 weeks. This includes rabbits returned from shows, where rabbits from outside sources have been contacted.

2. Strict attention should be given to hutch placement. Cold, drafty hutches predispose to respiratory infections. The design of the hutch is also important to provide the best possible sanitation.

3. Sick animals should be moved away from the rest as soon as they are noticed, and should be handled after the others have been fed and watered.

4. Hutches should be thoroughly cleaned and disinfected before reuse.

5. The loan of bucks for breeding purposes is an open invitation to disease.

The State Veterinary Diagnostic Laboratory is located at Oregon State College, Corvallis, and its services are available for detection and identification of disease. Recommendations for control and prevention of disease are made to rabbit raisers

by the staff in cooperation with any local veterinarians concerned.

The diseases described here have been observed at the Diagnostic Laboratory and do not represent the entire spectrum of rabbit disease. However, these maladies probably represent the most common ones which occur in Oregon.

Pneumonia

Pneumonia is a common ailment of rabbits. There are several types of bacterial and viral pneumonias. The disease may be either primary or secondary; e.g., following another disease which reduces the vitality of the animal. Wet or drafty hutches may predispose an animal to the primary form of pneumonia. The infectious contagious type of primary pneumonia spreads rapidly from rabbit to rabbit. This type calls for prompt action to remove the sick animals and stop the spread. Affected rabbits should be isolated and handled last.

Symptoms of pneumonia include rapid, labored breathing and mild to severe fever. There may be a clear, watery discharge from the eyes and nose, which later becomes thick and sticky. Food is usually refused as the temperature rises. The lungs are at first congested with excess blood and fluid. As the disease continues, the lungs lose their pink, springy appearance and the affected portion becomes dark and solid, resembling a piece of liver.

If the rabbit is to recover, it will require good nursing in a clean, dry hutch free of drafts. Sulfa drugs are quite effective in the treatment of many pneumonias when given at the rate of 1 grain per 2 pounds of body weight. Antibiotics are used successfully in many cases. Penicillin should be given intramuscularly at the rate of 200,000 units and repeated in two days. Streptomycin can be used at the $\frac{1}{4}$ gr. per pound level and repeated in two days. A combination of penicillin and streptomycin is often more effective than either drug used alone.

Myxomatosis—(Big Head)

This is a fatal virus disease of rabbits usually spread by mosquitoes. Although it has not been a major disease problem in Oregon, it has been reported from all Pacific Coast States.

Initial symptoms are watery discharges from the eyes and nose, and grotesque swelling of the head and ears. The ears become heavy and droopy. The swelling may also later extend

to the external genitalia. Spread of the disease is mainly by mosquitoes, although lice, fleas, and other blood-sucking insects can also act as vectors.

Control measures involve elimination of the insect vectors, and protection from wild rabbits. Two to four percent DDT spray emulsions have been used with success in rabbitries, and up to 10% DDT powder can be used for direct application to the fur of individual animals. Recommendations of the manufacturer should be followed carefully, since many insecticides are injurious if used incorrectly.

Vent Disease—Spirochetosis

This is a true venereal disease caused by an organism belonging to the spirochete group, very similar in appearance to that which causes syphilis in humans. The disease does not seem to affect the general health of the infected animal, but it does interfere with reproduction and is readily transmitted during breeding.

The external genital organs are red and swollen. The condition appears very similar to urine burn and must be differentiated by a person trained in this type of work.

A swab of the vent examined microscopically under dark field illumination usually shows the causative organisms.

Penicillin is the best drug for treatment of this disease and is given at the rate of 200,000 units intramuscularly every other day for a total of three injections. This disease can be prevented if new stock are carefully examined before breeding. Any animal showing vent irritation should not be bred. The loan of males for breeding is perhaps the greatest source of trouble in transmission from one rabbitry to another.

Tularemia

Although this is not a common disease of domestic rabbits, it is mentioned here because of its endemic occurrence in wild rabbits in some areas, and because it can produce serious disease in man.

The lesions common to this disease are usually the same as those that occur in pseudotuberculosis with the small white spots on the internal organs, especially the spleen and liver. The spleen is often enlarged.

Diagnosis of this disease is dependent upon isolation and identification of the causative organism, *Pasteurella tularensis*.

If tularemia is suspected, a veterinarian should be called at once. Mortality in rabbits, other animals, and man can be high.

Treatment of diseased animals is not indicated. Affected animals should be destroyed and the carcasses burned or deep buried. Cages should be disinfected with boiling lye solution. Prevention is based upon control of wild rodents.

Pseudotuberculosis

This is a specific fatal disease of rodents caused by *Pasteurella pseudotuberculosis*. It may produce an acute infection and sudden death or it may become chronic and produce small necrotic areas in the spleen, liver, kidney, lungs, and lymph glands. These areas appear as small white spots on the affected organs. Since the disease is common among rodents, it is probably introduced into the rabbitry by infected rats and mice.

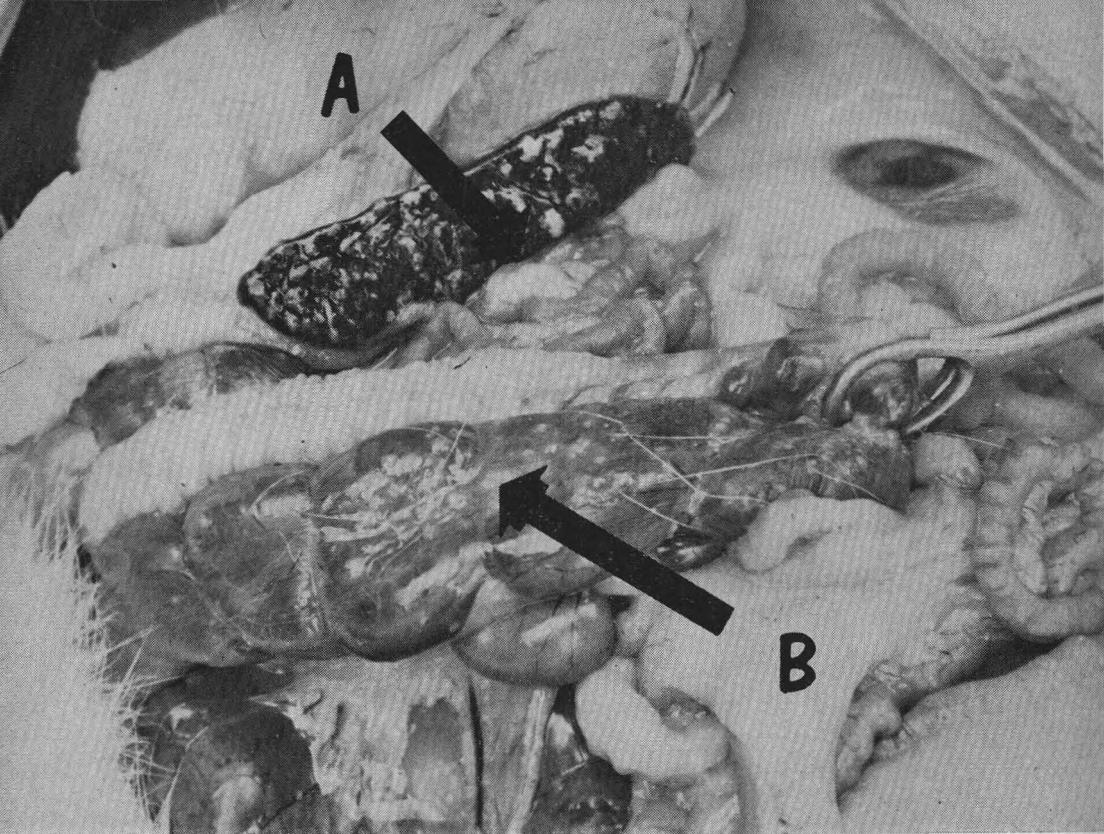
Treatment is useless. Affected animals should be destroyed and the carcasses burned or deep buried. A hot lye solution can be used to disinfect the contaminated hutch.

It is extremely difficult to differentiate this disease-producing organism from those that cause tularemia and plague, two *Pasteurella* infections that affect humans. Animals showing lesions such as have been described should be examined by a veterinarian.

Precautions against this disease include isolation of new additions to the herd and rigid rodent control.

Abscess

Abscesses can be extremely aggravating to a rabbit raiser. When the skin of the rabbit is broken or pierced by sharp objects, infection can take place. A number of bacterial species can be involved. Fight wounds from bucks that are penned together, sharp nails protruding into the hutch, or dirty hypodermic needles are common causes. An organism of the *Pasteurella* group has been reported as the cause of abscesses by a number of investigators. At Oregon State College, staphylococci and streptococci have been found in most abscesses examined in the Diagnostic Laboratory. The affected animals are usually destroyed. If they are to be treated, the abscess should be drained and treated locally with a disinfectant. Antibiotics given systemically have been of value.



Pseudotuberculosis. Note the white areas of necrosis on the spleen (A) and the intestines (B).

Mastitis—Caked Udder

Mastitis or caked udder can be either an infectious or a physiological condition. Often, the latter condition can lead to the former. Infectious mastitis is usually caused by staphylococcus or streptococcus invasion of the udder. The doe will become visibly sick and will show a high temperature and loss of appetite. She will crave water, and her ears will be warm to the touch. Early in the disease, the affected milk gland will be pink and hot, and the nipple will be dark and swollen. Later the gland turns a dark bluish-red (blue breast). The milk flow becomes smaller as the infection persists and may cease entirely. Infection may spread from gland to gland.

Penicillin is often effective in controlling this disease if it is recognized early. Two intramuscular injections of penicillin given at 48-hour intervals is the usual treatment. Additional injections may be given if necessary. Sick and suspicious animals

should be isolated and handled after the rest of the rabbits are cared for to protect the healthy ones. Cages and nest boxes that have held infected individuals should be thoroughly cleaned and disinfected before reuse.

Since infection often follows injury to the milk gland, especially the nipple, care should be taken to prevent damage. Proper construction of hutches and nest boxes is one of the best methods of avoiding injuries.

Physiological caked udder usually occurs in a heavily producing gland when milk is formed more rapidly than it is withdrawn. This condition will ordinarily subside by itself. The application of hot packs for a few minutes twice a day may help.

Snuffles

Snuffles is a contagious disease of the upper respiratory tract, somewhat similar to the common cold in humans. Exposure to cold and draft seems to predispose to this disease. The rabbit coughs and sneezes excessively and may have a mucous discharge from the nostrils. Very often the rabbit will paw at his nose, and the forelimbs become matted with the discharge.

Pasteurella sp. and *Brucella sp.* of bacteria have been suspected of causing snuffles. A virus may also be involved. The rapid spread and poor response to medication follows the pattern of a virus disease.

There is no known effective treatment for this condition. The disease is highly contagious, and recovered animals may be carriers. Affected animals should be destroyed, and the carcasses should be burned or buried deep enough to prevent predators from uncovering the carcasses.

Mucoid Enteritis or Bloat

Mucoid enteritis is reported to be the No. 1 disease of rabbits. It occurs frequently in Oregon rabbits and not only kills a high percentage of infected animals but also lessens the value of many of the survivors. Young animals just under weaning age are most often affected. The exact cause of this condition is unknown. It seems to occur most often after a change in feed. However, it has been known to occur when the ration remained the same. There is no immunity produced after an attack.

Sick animals are thirsty but lose their appetites. An infected rabbit usually will sit huddled in a corner with ears drooping and eyes dull. The fur will lose its sheen. Weight loss



Muroid enteritis or bloat. Arrows indicate areas containing clear, thick mucous. Note the distended intestines.

is rapid. There may be either constipation or profuse diarrhea. If there is diarrhea, the stool will contain a great deal of thick, clear mucous. There is no sure way to prevent or cure this disease. Antibiotics in the feed have given variable results.

Sore Hocks

Animals that tread constantly with the hind feet or ones which assume a hunched-up pose with their feet tucked under their bodies should be checked for sore hocks. The affected area may lose its fur and develop a scaly crust or may bleed or discharge pus. The condition starts from irritation of the pad over the hock and is usually caused by urine-soaked bedding. In this respect, it is similar to urine burn. Sore hocks can also be caused by irritation by sharp objects such as wire nails. Heredity appears to be a factor in this condition, and any animal show-

ing sore hocks should not be kept for breeding stock. The irritated area is subject to secondary infection by a variety of bacterial organisms.

Hutch construction that provides adequate self-cleaning and prevents the accumulation of litter is the most effective means of preventing sore hocks.

Treatment consists of cleaning the affected area, removing the crust, and applying an antiseptic. Anything which might have caused the condition should be removed from the hutch. It may be necessary to move the animal to a cage with solid flooring until the infection heals. Rabbits should be protected from disturbing influences that might cause stamping, and persistent stampers should be eliminated.

Hutch Burn

The accumulation of filth in the pen is a major factor in causing hutch or urine burn. This condition occurs at the hocks, dewlap, abdomen, or wherever the fur is wet for some time. Usually it affects the exposed mucous membranes of the genitalia. The vent becomes reddened and swollen, and ulcers may be present.

Affected areas should be clipped, cleansed, and treated with an antiseptic lotion or powder. Treatment is useless unless the original cause of the trouble is eliminated and better sanitary measures are applied.

Wry Neck

Wry neck is not a specific disease in itself but is a symptom of something else. The most common cause of wry neck is ear mites; however, any condition affecting the sense of equilibrium can produce it. Any rabbit twisting his head to one side should be examined for ear mites or ear canker at once.

Parasites

THE PRINCIPAL parasite infestations occurring in domestic rabbits are coccidiosis, both of the liver and the intestine; and ear mange, sometimes referred to as ear canker. Rabbits are also susceptible to infestations by tapeworm larvae (bladderworms); roundworms of the stomach, caecum, and lungs; liver flukes; skin mange; lice; and fleas. However, only the first two parasites mentioned constitute any major economic problem to rabbit raisers in this country. An exception to this may

occur when rabbits are raised under conditions where they are on the ground or in contact with wild rabbits, rodents, dogs, and coyotes.

Coccidiosis

Coccidia are microscopic single-celled animals that reproduce rapidly, occur in large numbers, and are easily transmitted. The disease caused by their presence, coccidiosis, has been estimated by many authorities as being responsible for about 90% of the mortality in young rabbits up to three months of age. Five different types of coccidia have been reported from the domestic rabbit. One of these types affects the liver, while the other four occur in the intestine.

In order to effectively control this type of parasitism, it is essential that the parasite's life cycle be clearly understood. Coccidia multiply in the rabbit (host) and eventually produce a "cyst form" which is passed in the host's droppings. This stage multiplies within the "cyst" into eight cells, each capable of forming many new parasitic cells. This development is dependent on the availability of suitable environmental conditions such as temperature, moisture, and oxygen. The free "cyst" is then ingested by a rabbit and thereby reaches the site where it may continue to develop.

Rabbits become infected by eating contaminated feed, drinking contaminated water, or inhaling dust laden with "cysts." Once inside the host, the "young" coccidia penetrate cells of the intestine or bile ducts and begin their development. The cumulative damage done to these cells accounts for the symptoms commonly observed in coccidia infections. Once an infection is started, literally thousands of "cysts" may be eliminated daily by a single rabbit.

General symptoms of this disease are loss of appetite, weakness, unthriftiness, diarrhea, unsteady gait, a frequent hind-quarter paralysis, and convulsions, followed by death in severe infections.

Liver Coccidiosis or Spotted Liver Disease

Coccidia of the liver are usually found in the bile passages rather than in the actual liver tissue. In examination of infected rabbits, white spots are frequently observed on the liver, and this organ may be enlarged. In the latter case, infected animals may present a bloated appearance. The disease appears most commonly in young rabbits, three to four weeks of age. Ani-



Liver Coccidiosis or Spotted Liver Disease. Note the numerous spots on this liver.

imals surviving an infection do not gain weight rapidly and have a listless appearance. They are often carriers of the disease and thereby constitute a source of infection to other animals.

For treatment, a ration containing 0.025% sulfaquinolone fed continuously for 30 days has been recommended by the United States Department of Agriculture.

Sanitation is the key to prevention. This involves the use of clean feeding equipment, routine and frequent cleaning of hutches, and an understanding of the mechanism of disease transmission.

Intestinal Coccidiosis

Intestinal coccidia live in the cells lining the intestine. Although not generally as harmful as the liver form, these parasites can account for costly losses. The symptoms include soft

droppings or diarrhea, failure to feed, "pot-belly," and a listless appearance. No treatment is recommended, as most infections are self-limiting and recovery may frequently be followed by a resistance to reinfection.

Prevention of this type of infection is the same as that recommended for the species found in the liver.

Mange Mites

Mange mites are minute organisms (Arthropods) closely related to insects. They are parasitic and live either on or under the skin of many different species of animals. In the rabbit, they may be found on the body, in the ears, or in the nasal passages. The skin damage and irritation caused by their presence is commonly referred to as "mange." Mange mites are easily spread from one animal to another by direct contact. The species occurring in the ear present the greatest problem to rabbit raisers since they are the most common and are highly pathogenic.

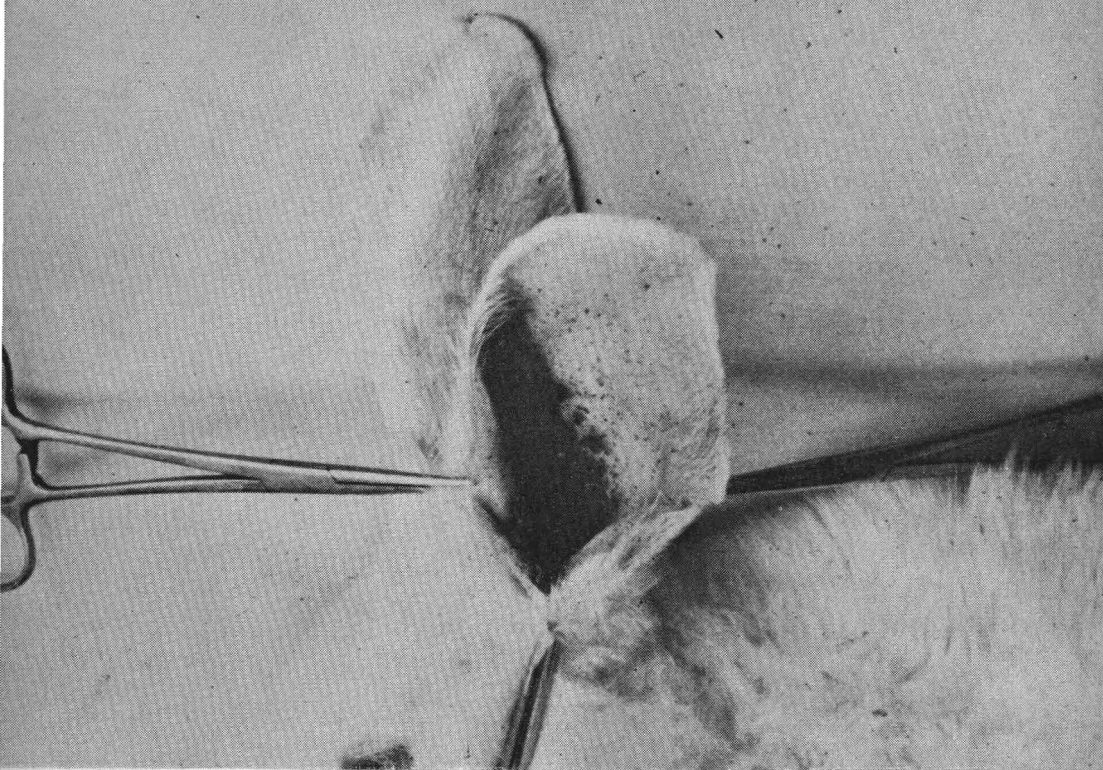
Ear Mange or Ear Canker

Two species of mite may be found in the ear. The presence of either of these is referred to as "ear mange" and the reaction by the rabbit to an infection is called "ear canker." In ear infections, mites become established under the skin inside the base of the ear. They can multiply rapidly and are easily transmitted to other rabbits. The irritation resulting from an infection will be accompanied by the formation of a serous exudate and inflammation of the skin. Frequently this inflammation will spread to the inner ear and, in some instances, to the covering of the brain. As the serous exudate dries, it will form a flaky crust which can easily be seen when infected animals are examined. In advanced cases, this crust (the canker) can be detected on most of the inner surface of the animal's ear.

Infected animals appear nervous, scratch at their ears, shake their heads and, in many cases, fail to gain weight. The ears will be encrusted and some animals may hold their heads in a twisted position. The latter symptom is termed "wry neck."

Diagnosis is made by finding mites in the ear. This can be accomplished by removing the yellowish crust on the ear, scraping the skin, and examining these scrapings microscopically for mites.

If detected in the early stages of an infection, the mites can be controlled without too much difficulty. The U.S.D.A.'s



Ear Mange. The dark, crusted area in the ear is a result of a mange mite infestation.

recommendation for treatment is to swab the ear thoroughly with a mixture consisting of 1 part iodoform, 10 parts ether, and 25 parts olive oil or other vegetable oil. Application of this preparation should be repeated at 6- to 8-day intervals, until the ear appears normal. However, a simpler form of treatment can be achieved by using a commercial fly spray. This should be applied with a standard spray gun. Usually only one application is necessary.

To prevent spread of infection, the hutch of an infected animal should be carefully disinfected. Likewise, waste materials from the hutch, cleaning equipment, and any other items that the infected animal may have contacted, should be burned or disinfected. Animals adjacent to the infected animal should also be treated, as they may be infected. It is important to note that handlers of infected animals can transmit the mites to

other rabbits, so extra care with regard to sanitation is absolutely essential.

Rabbit raisers should use caution when introducing new animals to a herd, as this procedure affords an excellent opportunity for initiation of infection. New stock should be carefully inspected for the presence of mites.

Skin Mange Mites

These mites are not as common as the ear mites; however, they seem to be more difficult to eliminate. Lesions caused by these usually appear first around the nose and sides of the face. Later, lesions may be observed on the legs and body. Because the rabbit scratches and bites these areas, signs of skin irritation will be intensified, and the hair may come off.

U.S.D.A. recommendations for treatment include clipping the hair back to the area where healthy skin appears. This practice should be followed by the application of a mixture containing 1 part flowers of sulfur and 3 parts of lard. Treatment should be repeated at 4- to 6-day intervals, until the skin appears normal. As an alternative treatment, a mixture of 1 part pyrethrum powder and 9 parts vaseline may be used. This should be gently rubbed into the affected areas at 4-day intervals.

Since skin infections are seldom encountered and are difficult to eliminate, a number of authorities recommend disposal of the animal in preference to treatment. Expensive animals such as those used for breeding purposes would be the exception to this practice. In every case, contaminated material, i.e., hutches, clothing, equipment, should be carefully disinfected. Carcasses of animals to be disposed of should be incinerated.

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