

Commercial Rabbit Production

Rabbits have been produced for 3,000 years. Today they are raised for meat, research, pets, show, and pelts.

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Getting Started

Before investing your money in rabbit production, get all available literature, talk and visit with other producers, visit a rabbit processor, and talk with your county Extension agent. Refer to the information sheet "[Starting a Rabbit Enterprise](#)" for additional insight of advantages and disadvantages of producing rabbits.

After deciding to go into business, find a market and good source of breeder stock. Start on a small scale, No more that 20 does and 3 bucks are recommended for the beginner. With this number you can back out with minimal losses if rabbit production is not for you.

By starting on a small scale, you can learn rabbits and how they respond to certain management conditions. You have plenty of time later to expand the business to any size you want. You also have the opportunity to improve and develop your original stock.

You will have to invest at least \$35 to \$50 per unit or hutch to get started properly. This includes the cost of the doe, cage, feeder, and automatic waterer. It does not include cost of land, housing, or feed. If you have a vacant building that can make a satisfactory rabbitry, you can save added expenses. If you must construct a building, consider a cost from \$1.50 to \$3.00 per square foot of floor space.

Size of Rabbitry

A man and his wife can manage a 1,000-doe rabbitry with today's mechanization; however, this would be a full-time job. Some part-time help may also be required. Remember, a rabbitry makes demands on your time every day of the year.

Equipment

Cages

We recommend that you use all-wire cages. Hutches (or cages) with wooden parts are not sanitary or as convenient to manage.

A 30" x 30" x 18" wire cage is large enough for a doe and litter. Also use this size cage for each buck. It allows room for adequate exercise.

You may also use a 30" x 36" x 18" cage, especially if you leave fryers with the doe until 8 weeks of age. If you remove fryers from the doe at 4 weeks and raise them separately, the larger cage will support 7-8 fryers to market (4 pounds). You will need about 7 grow-out cages for every 10 working does.

Each rabbitry must have some extra cages set aside for isolation. Two to four are needed for each fifty working does. These cages are for isolation of sick animals and new breeding stock. Isolate these animals for three or four weeks. Keep show animals away from the breeding stock, since they are often exposed to diseases at shows.

Feeders

We recommend metal feeders because they are easily kept clean. They attach to the cage and remove easily for disposal of stale or moldy feed. Screen-bottom feeders eliminate the problem of feed fines.

Waterers

An automatic nipple-type water system is best. This system is sanitary and accommodates

heat tapes to prevent freezing. Use one nipple per cage. Locate nipples near the middle of the cage and 8 inches above the floor of the cage.

Do not use crocks, tin cans, or similar-type open waterers. They are unsanitary and encourage disease.

Nest Boxes

Many types of nest boxes are available. An open top 12" x 18" x 10" plywood box works well. Sides of ¾" plywood and ends and bottoms of ½" plywood work well. The bottoms should be removable for easy cleaning.

Wire bottoms are not practical since the doe burrows to the bottom to give birth to (kindle) her young. A wire bottom is not warm enough in winter and exposes the young to cold.

Requirements for a 20-Doe Rabbitry

<u>Item</u>	<u>Quantity</u>
Breeding Stock	20 Does 3 Bucks
* Cages	20 (Doe) 16 (Fryer & Replacement) 3 (Buck)
Nipple Waterers (Stainless Steel)	39
Plastic Pipe	150 feet
** Breaker Tank	1
** Water Filter	1
Heat Cables	150 feet
Thermostat	1
Feeders	39
** "J" Clip Pliers	1
** Tatio Kit	1
** Scales	1

** Feed Cart	1
Nest Boxes	15
** Propane Cylinder & Burner	1
** Pressure Sprayer (Fly Control)	1

* Additional cages are based on accelerated breeding program schedule.

** These items are one-time investment costs. Normal expansion would not necessarily require additional investment in these items.

Profit (?) In Rabbits

Raising rabbits is not a "get rich quick" business. There is some profit for those willing to make the necessary sacrifices.

How Production Affects Income

For years five litters per doe per year was the goal of most rabbit breeders. An average of 8 fryers per litter has been tried. With increased costs of production, you must increase the number of fryers produced per doe per year. You can do this by increasing the number of fryers per litter and/or the number of litters per doe per year.

Using a figure of 15 pounds of feed to produce a 4 pound fryer, a 14 cent-per-pound feed cost, and market price of 60 cents per pound of fryer, this table shows how increases in production affect income:

Income Over Feed Costs (100 Does)	
(Average of 6 fryers per litter and 5 litters per year)	
30 X 4 lb average	= 120 lb live rabbits
100 does X 120 lb live rabbits	= 12,000 lb/yr
12,000 lb X \$0.60 per lb	= \$7,200

3,000 fryers X 15 lb feed X \$0.14 = \$6,300
 Income over feed = \$900

A. Effect of Increasing Average Fryers per Litter

7 fryers = \$1,050 income over feed costs
 8 fryers = \$1,200 income over feed costs
 9 fryers = \$1,350 income over feed costs

B. Effect of increasing Number of Litters per Doe per Year

8 fryers/6 litters = \$1,440 income over feed
 8 fryers/7 litters = \$1,680 income over feed

Based on an average of eight fryers per kindle, each additional kindling per year will produce an additional income above feed cost of \$2.40 per doe at a market price of \$0.60 per pound of live weight.

C. Effect of Feed conversion on Income

It is important to reduce feed waste and improve feed conversion as much as possible.

Feed Cost to Produce a 4-lb Rabbit

Feed	Price of Feed/lb		
<u>Lb</u>	<u>\$0.12</u>	<u>\$0.14</u>	<u>\$0.16</u>
16	1.92	2.24	2.56
15	1.80	2.10	2.40
14	1.68	1.96	2.24
13	1.56	1.82	2.08

Recommended Program For Production

The following goals for a commercial rabbit producer indicate the profits that can be expected if the goals are reached.

Goals

56 fryers per doe per year

13 pounds of feed to produce a 4-lb fryer

4 pounds live weight by 8 weeks

Income 100-Doe Rabbitry (if goals are met)

56 fryers X 4 lb = 224 lb live rabbits per doe

100 does X 224 lb = 22,400 lb rabbits per year

22,400 lb X \$0.60/lb = \$13,440 (yearly income)

5,600 fryers X 13 lb feed X \$0.14 = \$10,192 feed cost

Income above feed cost = \$3,248

This is a \$32.48 return over feed cost per doe.

All other costs (estimated) = \$0.07/lb live rabbit

22,400 lb live rabbit X \$0.07 = \$1,568

Net Income = \$1,680

Buying Breeder Stock

Once buildings are built or renovated and equipment purchased, you should purchase a good breeding stock. Remember -- Poor breeding stock will produce poor offspring. It is important that you begin with good stock.

The price a breeder asks for stock does not reflect the quality of the rabbits. Only time, records, and results can prove the worth of breeding stock and the reputation of the breeder.

Look at the records of the breeder's rabbitry to see the quality of the stock. Here are a few things you should look for:

1. Average litter size (8 or more)
2. Death rate (not over 5%)
3. Percent conception (90% or better)
4. Weight of litters at 4 weeks (total 10 lb)
5. Average weight of fryer
 - a. 4-lb at 8 weeks if left with doe

- b. 4-lb at 9 weeks if weaned at 4 weeks
- 6. Dressing percentage (55-60% including heart, liver and kidneys)
- 7. Feed to produce a 4-lb fryer (under 15 lb)

All of this information may not be available, but most of it should be. It pays to deal with a breeder who keeps good, accurate, reliable records. A look around the breeder's rabbitry can tell you much about the type of operation he has, but his records tell the real story.

Managing The Rabbitry

Cage Management

Clean loose or matted hair from the cages each day. A long-handled, stiff bristle brush makes the task easy. An accumulation of wastes and hair invites disease problems.

Burn the cages occasionally with a hand torch or propane burner. Just singe the hair off. Heating the cage wire damages the weld and causes rust.

Clean wires reduce the number of sore hocks. Do not place boards in wire cages because they promote unsanitary conditions.

Nest Box Management

Place the nest box in the cage on the 28th day of pregnancy. Fill each box $\frac{2}{3}$ full with clean hay or straw. Do not move the box after placing it where you want it. Add clean fur from other does' nests if the doe has not pulled fur soon after kindling (birth) -- especially in cold weather.

Nutrition

Feed costs are the major expense in producing a fryer, as much as 80 percent of the cost of production. It is extremely important to use a sound feeding program.

Type of Feed

Although many people use feeding systems that include green feeds, hay, or home-mixed grains, the best feed is a commercially pelleted rabbit ration that meets all of the rabbit's requirements. When you feed rabbit pellets, do not give any other feed. Hay is often fed to stop diarrhea and to aid the doe after kindling. It may be helpful in some cases, but do not feed it continuously.

Never feed a damp, moldy feed. If the feed is damp when you buy it, return it. Store feed in a cool, dry location. Place the feed on pallets that allow good air circulation among the bags. Avoid rough handling so that you will not have a high percentage of useless fines.

Protein Level

The protein level of the feed is very important. All commercial feeds are required by law to have a tag showing a minimum protein level. For efficient rabbit feeding, you need four diets. Since most rabbit producers cannot (or do not want to) handle more than one feed, a 16-17 percent protein feed may be substituted.

Protein Requirements of Rabbits

	<u>Percent Protein</u>
Normal growth (does or bucks) - 8 weeks to adult	15
Maintenance (does or bucks)	12
Pregnant Does	15
Nursing Does and Growing Young	17

Amount to Feed

One of the most common mistakes rabbit producers make is overfeeding. A fat animal does not reproduce efficiently. Be very careful of the amount of feed you give the breeding rabbits.

A good feeding program for an average doe would be 4-6 oz. each day until kindling time. Give her 12-16 oz. for 3 to 5 days after kindling, and then give her full feed until the bunnies are weaned. Do not give replacement stock, dry does, and herd bucks more than 4-6 oz. of feed each day. Check the bucks' and dry does' weights regularly to be sure they are of proper weight.

Feed Requirements of Various Classes of Rabbits

	<u>Weight (lb.)</u>	<u>Feed/Day (oz.)</u>
Normal growth (does or bucks)	4-9	5-6
Maintenance (does or bucks)	5 10 15	3 4-6 7
Pregnant Does	5 10 15	4 4-6 9

Salt

Commercial rabbit pellets contain enough salt. Under normal conditions, block or spool salt is not needed.

Feed Consumption Guide

The figures below represent approximate amounts of feed used under good feed management. Prevent wastage by feeding according to the rabbits' needs.

Lbs.
of
Feed

- 13 -- feed for doe, buck, and fryer to produce 4 lb of meat. A doe and a litter of eight eat approximately 104-108 lb of feed to produce market-size fryers.
- 40 -- produces a buck or doe from birth to breeding age (4-6 months).
- 2.7 -- produces 1 lb of meat between 4 and 8 weeks of age.
- 8 -- feeds each pregnant doe through 31 days gestation.

Mating

Provide one buck for 8 to 10 does. Always take the doe to the buck's cage. If they fail to mate within a few minutes, take her to a different buck. If this fails, try again the next day, but **DO NOT** leave the doe with the buck all day or even an hour in an attempt to solve a mating problem.

Try forced mating with a young buck or doe before you give up on them. If a doe or buck consistently gives a mating problem, eliminate it from the herd. A good conception rate is **90% or better**.

Normally you should use a buck once a day. Some producers, however, use a buck as often as two to three times a day for short periods of time. Smaller litters result from too frequent use of a buck. Some successful producers think fortified pellets (feed with additional vitamins) are helpful during a heavy breeding schedule.

A slow breeding schedule makes the does hard to breed, makes the bucks lose some of their viability, and causes conception percentages to drop. Following an accelerated breeding should eliminate problems.

A buck and doe remain profitable for two years if fed and managed properly. Their usefulness must be based on results rather than age.

At least 14 hours of light daily have been found beneficial. Provide artificial light in winter when daylight hours are less than 14 hours. A 40-watt bulb every 10 feet works satisfactorily. Use a time clock for ease and accuracy. This lighting program provides better conception in winter.

When a doe loses all her litter at kindling, rebreed three days later. If she loses all her litter after several days, rebreed immediately.

Keep replacements at the rate of one young doe each month for every twelve working does. The same applies for bucks. This practice is only a guide and may not be sufficient for the culling that is usually necessary during the first two to three years of operating a rabbitry. Culling must be heavy to improve the breeding stock. An accelerated breeding program also requires a few more buck and doe replacements than normal. Give young does about two litters to prove their mother instinct and litter size before deciding to cull or keep.

Cyclic Breeding System

This system is a simple and convenient way to keep track of buck and doe matings and prevent undue in-breeding. Group does into sections within your rabbitry. Each section is made up of nine hutches, with eight containing one doe each and one containing the buck. The sections are lettered A,B,C,D, etc. Tattoo the bucks or otherwise identify them with small letters a, b, c, d, etc.

The bucks and does should not be closely related. Have an additional 4 or 5 replacement bucks for each 50 does. Any replacement buck during the first year is automatically assigned the letter of the buck he replaces, and the breeding cycle is continued as diagrammed.

The first year the does in section A are bred to buck a; does in section B to buck b, etc. The second year the does in section A are bred to buck f; does in section B, to buck a, etc. Only the bucks are rotated annually; the does stay where they are. It takes six years to complete the cycle. This system should reduce problems with inbreeding.

Replace does in section A with replacement offspring selected from section A does. Section B replacement does should come from section B, etc.

	<u>Sections</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
1st Year Bucks		a	b	c	d	e	f

2nd Year Bucks	f	a	b	c	d	e
3rd Year Bucks	e	f	a	b	c	d
4th Year Bucks	d	e	f	a	b	c
5th Year Bucks	c	d	e	f	a	b
6th Year Bucks	b	c	d	e	f	a

If you replace a buck with your own stock, then the following procedure works satisfactorily. When replacing a buck (a) his replacement is selected from offspring of section A does. If replacing buck (b), select his replacement from offspring of section B does. The replacement buck is always assigned the letter of the buck he is replacing. Always select replacement stock based on desirable characteristics such as good livability, fast weight gain, and parents with good conception, large litters, etc.

Breeding Schedules

These schedules are based on the average 31-day gestation period.

<u>Breed</u>	<u>Kindle</u>	<u>Breed Again</u>	<u>Yields Litters/Yr</u>
Day 0	Day 31	42 days after kindle	5
		35 days after kindle	5½
		28 days after kindle	6
		* 21 days after kindle	7
		* 14 days after kindle	8

* To realize a profit for meat rabbits, you must select the 14- or 21-day rebreeding schedule. The key to profit or loss is pounds of meat per doe.

This schedule requires additional cages for growing fryers and requires weaning fryers from the doe at four weeks of age. This allows the doe an adequate rest period before the next litter. With this schedule eight fryers can be placed in each 30" x 36" x 18" cage. Use 30" x 30" x 18" cages for does.

Top management, careful attention to the condition of the does and bucks, and constant record keeping are required with this schedule. It will produce a profit if you receive the normal meat market price.

Palpating

Palpating is a method used for determining doe pregnancy at 14 days after mating. Non-pregnant does are re-bred immediately. This procedure saves waiting the additional 17 days to see if the doe is pregnant.

The object is to feel the developing embryos in the horns of the doe's uterus. The two horns hold the embryos so they feel like chains of marbles on each side of the midline of the abdomen. If you wait longer than 14 days, the task is more difficult and almost impossible.

Position the doe lying relaxed, feet down, facing you. Grasp the ears and a fold of skin from the shoulders with one hand. Place your other hand under the body between the hind legs and just in front of the pelvis. Place your thumb on one side and forefinger on the other side of the uterine horns. Be careful not to apply a lot of pressure; just slide your fingers along, and the embryos should slide gently between the thumb and forefinger.

Does that have been handled often are much easier to palpate. Do not attempt palpation unless the doe is calm or you may damage the embryos. With a little practice, you will learn to determine pregnancy even earlier than 14 days.

False Pregnancy

False pregnancy occurs as a result of sterile mating or more commonly from stimulation of one doe riding another. It happens more frequently with does that have not kindled their first litter. Always separate does at least a month prior to breeding. Does must be separated at least 18 to 20 days before mating.

About 18-20 days after stimulation, the doe may pull fur and attempt to make a nest, but she will not keep it clean. This is a sign of false pregnancy and is a good time to breed her properly.

Handling Adult and Fryer Rabbits

Handle your rabbits as much as possible, but never pick them up by the ears or legs. Handling calms rabbits and gives them confidence in you. This becomes important when you need to palpate the doe, when you take the doe to the buck for breeding, and when you check the does's litter after kindling.

Cannibalism or Abortion

Cannibalism and abortion are common problems. The causes are many and mostly undependable. These are some of the causes:

1. First-litter does are usually extremely nervous. Give them one more chance and then cull if cannibalism recurs.
2. Unbalanced diet

3. Lack of water
4. Unusual noises can cause the doe to injure the young and can result in cannibalism.
5. Strange dogs, predators, or people can cause the doe to stamp her feet and mash the young.
6. Moving nest box after young are kindled.
7. Shallow nest box makes the does feel insecure and she is easily disturbed.

Records

The only way you can know how well you are doing in the rabbit business is to keep good records. If you keep good records then you can make sound management and business decisions. Good records let you know if you are making a profit, and they are necessary for income tax purposes.

Keep only necessary records. You can easily overburden yourself with record keeping. Decide what records you need and then keep them daily. Listed below are some basic records you need to keep:

1. Breeding records - date bred and buck used
2. Kindling dates and number born, dead and alive
3. Number and weight of weaned rabbits
4. Average weight at market time and age of fryers at that weight
5. Expenditures (including utilities)
6. Sales

You should design your own record cards to meet your needs. The standard size is 7 x 3⁵/₈ inches.

Fly Control

If rabbit manure is kept dry, there is little fly breeding. Good drainage under the cages and good ventilation keep manure dry. Leaking waterers usually create most of the problems. Proper pressure adjustment and replacement of defective valves help prevent the problem.

In spite of all you do, manure occasionally gets moist enough to attract fly breeding. Here are additional fly control methods:

1. Sprinkle agricultural lime generously over the manure twice weekly or as the situation demands. Lime absorbs much of the moisture.
2. Fly breeding in the manure is determined by a noticeable increase in adult flies. By stirring the manure, you will see maggots working. Spray manure only with larvicides approved for poultry cage houses. Follow label directions. Have house

well ventilated when you spray. For product names and directions, get the housefly control publication for egg and poultry producers, MCES Publication 306, from your county agent.

3. For adult fly control refer to Publication 306. Pyrethrins are effective but may irritate the young rabbits and the operator temporarily. Always watch for undesirable effects. Be sure to follow label precautions listed for poultry.
4. Use fly baits on walks. Spray grass areas outside the house.
5. Proper manure management is the safest, most economical, and effective way to control flies.

Rabbit Manure As A Fertilizer

As the cost of fertilizer products increases, so does the value of rabbit manure. Demand determines the price you may receive for manure. Home gardening has increased; more people are working with ornamentals in their yards than ever before; and organic farming is on the increase.

Fifteen does, two bucks, and their litters will produce approximately one ton of manure a year. Rabbit manure is drier than poultry manure. Rabbit manure analysis varies but is approximately 1.3% N, .9% P, 1.0% K. Use the same precautions as with other manure when using it around plants or in seed beds. It can burn plants.

Raising Earthworms

Raising earth worms is a business in itself and requires more time and attention than you may think. There is more to this than building frames to catch the manure and harvesting the worms. This extra business may rob some precious and needed attention from your rabbits; therefore, it is not recommended.

Rabbit Diseases

Here are some basic guidelines to help prevent diseases:

1. Disease is natural and can never be completely eliminated, but through intelligent practices, you can usually keep it at a low level.
2. Disease prevention is much better than treatment.
3. High resistance, long life, and high productivity can be inherited. Breeding stock selected on the basis of superior performance will pay well for the time spent.
4. Do not overcrowd your animals.

5. Practice good nutrition.
6. Provide plenty of draft-free ventilation. Solid sided cages with wire floors cause up-drafts. These drafts are discouraged.
7. Let your animals have plenty of sunlight, as long as it is not very hot.
8. Keep all equipment clean and dry to minimize the chance of disease outbreak. Keep it in good repair.
9. Avoid unnecessary handling of animals, their feed, containers for food and water, or any equipment they touch. The clothing and hands of the attendant can spread disease.
10. Isolate all stock being brought into your herd, whether it be a new introduction or one of your own animals that may have been in contact with other rabbits either directly or through equipment and handlers.
11. Isolate animals suspected of having infectious diseases. Care for such animals after the normal ones have had their attention.
12. Protect your animals from disturbing influences, particularly night prowlers. Allow your animals as much rest during the day as routine care will permit.
13. If you sell rabbits on a regular schedule to a dealer, have marketable stock segregated and confined outside of the rabbitry entrance. The pickup man visits many rabbitries in rapid succession and will appreciate your help in keeping him from spreading disease.

All animal drugs are now under federal regulations. These regulations are designed to protect the public health and welfare by setting drug safety and tissue tolerance levels. The tissue tolerance levels made it necessary to establish specific withdrawal times and other warnings and cautions. The manufacturer's instructions, by law, are placed on the label of each drug container. Follow these instructions, warnings, and withdrawal times precisely. Observe all local laws and regulations governing proper drug usage.

Conjunctivitis (Weepy Eye)

This condition is characterized by inflamed eyelids and a discharge from the eyes. Affected rabbits rub their eyes with the front feet until the fur around the eyes becomes wet and matted.

The cause of this condition is often a bacterial infection of the eyelids but may also be caused by an irritation from smoke, dust, sprays, or fumes. Mature bucks and young rabbits are most susceptible.

Treatment

Protect the animals from eye irritants. If irritants cause problems, you can usually clean the eye with a commercial eye washing product. The irritation will then clear up quickly.

If the eye does not improve, apply a 5% sulfathiazole or antibiotic eye ointment under the eyelids. A rabbit with pasteurellosis will often transmit disease organisms to the eye, so treat for this disease if symptoms are present. Eliminate animals with persistent eye problems so that they will not spread the disease.

Pasteurellosis (Snuffles, Cold)

This may be an acute or chronic inflammation of the mucous membranes in the air passages and lungs. A mucus is discharged from the nose and eyes. Affected rabbits rub their eyes and noses. The fur on the face and paws becomes matted and caked with dried mucus. The infected animals usually sneeze and cough.

The disease is caused by a bacterial infection. It usually occurs when the rabbit's resistance is low or when it is under some stressed condition. Rabbits that have recovered from this disease acquire little immunity and often remain carriers.

Treatment

Treat this disease in its early stages with sulfaquinoxaline or other sulfa drugs. Follow a control program of tetracyclines to prevent a recurrence of the disease. Adding .025% sulfaquinoxaline in the feed for three or four weeks or sulfaquinoxaline in the water for two or three weeks reduces disease transmission to the young. You may use other sulfa drugs if you follow label directions.

Treat individual animals with an injection in the muscle of 200,000 units of penicillin and .25 gram of streptomycin for fryer sized rabbits. Give mature rabbits a double dosage. Repeat the treatment on the third day after the initial injection. Then use a tetracycline control program.

Cull infected rabbits from the rabbitry and replace them with breeding stock that comes from clean stock. Although clinical signs are not present, carriers of the disease have the bacterial organism in their nasal cavities and can transmit it to healthy animals.

Eliminate drafty, damp, unsanitary conditions in the rabbitry. Follow a strict sanitation and management program.

Coccidiosis, Intestinal

Coccidiosis is the most common disease in rabbits. It may be classified as a parasitic disease since the causative organism is a microscopic animal (protozoa). It is very difficult to completely exterminate the protozoa once it has infected the animal. The protozoans causing this disease are classified as "coccidia," and those that infect the intestine are different from those that infect the liver.

Rabbits receiving the best care and management will often get coccidiosis. Symptoms in moderate or severe cases include a loss of appetite, "pot belly," diarrhea, and an inability to gain weight. In mild cases no symptoms may be observed.

Treatment

Follow a good management and sanitation program. Raise rabbits on wire floored cages that let droppings fall through the floor and away from the rabbits. Prevent fecal contamination of feed and water.

Control coccidiosis by feeding a .025% level of sulfaquinoxaline in the feed for three or four weeks, or in the water for two or three weeks. Other sulfa drugs (sulfadimethoxine, triple sulfa, etc.) may be effective yet provide greater safety from the toxic effects of sulfaquinoxaline. Amprolium in the feed or water may also be effective against coccidia.

Enteritis Complex (Bloat, Scours)

The literal translation of enteritis means "inflammation of the intestine." This group of diseases severely injures the intestines and digestive tract. Symptoms of the diseases include loss of appetite, weakness, a drop in body temperature, diarrhea, rough hair coat, and weight loss. The abdomen may be bloated because of excessive production of gas in the intestines by disease organisms. The droppings may be covered by a mucus. The cause of the condition is not known.

Treatment

Water soluble chlortetracycline or oxytetracycline at a concentration of one pound to 100-150 gallons (4 grams/gallon) of drinking water may be effective.

Caked Mammary Glands

This condition results when the milk is not removed sufficiently from the breast. It usually occurs after a high producing doe loses her litter, or when the breasts are sore and the doe refuses to nurse her young. The breasts become congested, and hard knots may form on the sides of the nipples. These knots may break open, revealing dried milk.

Treatment

If the caking is only moderate, oil of camphor rubbed on twice daily will break up the cake and the milk can be removed. Treatment for three to five days usually solves the problem, but high producing does may take longer.

Preventive measures are the best ways to correct the problem. Do not wean the young suddenly. If a litter is lost, breed the doe again immediately and carefully watch her for symptoms of this condition. Remove any sharp or protruding edges from nest boxes to prevent breast injury. Watch the doe carefully for mastitis infections that often follow caked mammary glands.

Mastitis (Blue Breast)

Mastitis, a bacterial disease, is not common but is occasionally seen in rabbitries. The condition usually follows injuries of the mammary glands or caked breasts and can spread through the

rabbitry very quickly. The mammary glands become inflamed, feverish, and swollen. The glands may turn bluish in color as the disease worsens. The doe will not eat but may drink plenty of water. She may have a fever as high as 105°F. or higher.

Treatment

You must start treatment early to be successful. Reduce milk production by cutting back on feed concentrates. Clean and disinfect the cage and equipment (especially the nest box).

Inject 75,000-100,000 units of penicillin into the muscle twice daily for three to five days. In severe cases it is best to destroy the doe and young.

Never transfer young from an infected doe to a healthy one. This complicates the problem and may spread the disease. You can hand feed valuable young by using a milk substitute. Correct any edges on the nest box that stick out or are sharp.

Ear Mites (Ear Mange, Canker)

This is the most common external parasite infection of the domestic rabbit. An infected rabbit shakes its head and flops or scratches its ears trying to rid itself of mites. Thick crusts of mites and serum will accumulate inside the ear. In severe cases symptoms include spasms of eye muscles, nerve damage resulting in partial paralysis, weight loss, and secondary infections of the ears.

Treatment

Massage mineral oil into the ear every third day for four applications. The mineral oil will smother the mites. Follow-up applications smother mites hatching from eggs.

Another treatment is swabbing the ear with a mixture of 1 part iodoform, 10 parts ether, and 25 parts vegetable oil. Remove all scales and crust before swabbing the ear. Repeat treatment 6 to 10 days after first treatment. An alternate swabbing solution is 25-30% emulsion of benzyl benzoate in vegetable oil.

Treat all animals near the infected animal. Treat all newly introduced animals to prevent the ear mite from entering the rabbitry.

Heat Prostration

Heat exhaustion can happen any time the temperature is above 92°F. Poor ventilation and high humidity contribute to the condition. Affected rabbits pant rapidly and lie on their sides. A blood tinged discharge may come from the mouth and nose. Death results unless the rabbit is treated. pregnant does are most susceptible.

Treatment

Any practice that lowers the body temperature of the rabbit helps reduce losses from heat prostration. Provide plenty of ventilation. Sprinkling water on the rabbitry roof may help reduce the temperature. You can put individually exhausted rabbits on wet burlap or immerse them in lukewarm water so the body temperature gradually drops.

Provide plenty of clean, cool drinking water. Rabbits often put their feet in the water to cool themselves. Provide additional salt spoons for the rabbits.

Ulcerative Pododermatitis (Sore Hocks)

You may see sores on the feet or foot pads. Few rabbits die from this problem, but their general condition is affected. Nursing does cannot feed the litter adequately, and breeding is hindered.

Sore hocks usually occur on wire floored cages. The tendency toward this condition may be inherited.

Treatment

Place animals with small sores on lath or solid flooring or on the ground until the condition clears. A rest board and soft, dry bedding material may help.

Cull and eliminate rabbits with severe or advanced cases. Medication works only temporarily. Zinc or iodine ointments may help prevent secondary infections.

Follow good sanitation and management practices. Eliminate wires that stick out of cages and floors. Do not let floors stay wet.

Sanitation

Formalin Disinfectants

Soil Disinfectant (on dirt floors or on yards) - Add 1 gallon of formalin (37%) to 12 gallons of water. This will provide a 2.8% solution. Apply 1 gallon of this solution as a coarse sprinkle at low pressure to each 15 to 20 square feet of ground area. It will soak through up to 6 inches deep, depending on soil density, and will destroy germs more effectively than any other disinfectant.

Formalin-quaternary ammonium mixture - Use on clean surfaces (ceilings and walls of rabbitry houses, cages, and equipment) and as foot baths. Stock solution: To make 1 gallon of stock solution, add 1 pint of water and 5 pints of formalin (37%) to 2 pints of quaternary ammonium (20%). Prepare this 1 gallon of stock solution by first adding 5 pints of formalin, then add 1 pint of water, and finally add the 2 pints of quaternary ammonium slowly to prevent foaming overflow. Use 1 ounce of this stock solution per gallon of water for spraying, scrubbing, or as a disinfectant foot bath. The gallon of stock solution makes

128 gallons of finished spray or disinfectant solution. The cost of this stock solution is much less than commercial disinfectants and works just as well.

By *Dr. Tom W. Smith*, Emeritus Professor of Poultry Science, Mississippi State University.

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