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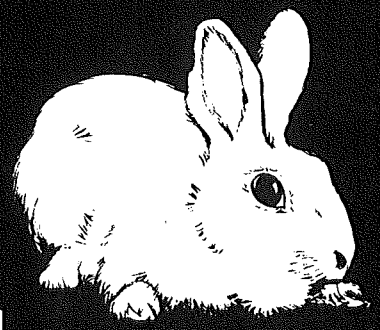


IOWA STATE UNIVERSITY
University Extension

Ames, Iowa

Adapted from Purdue University publication

4-H 662 | Reprinted | June 1992

A Message to 4-H Members

Welcome to the 4-H Rabbit Project. If you enjoy working with animals, you are going to like raising rabbits. They are fun to work with and to watch. Raising them can even be a way to make money! In this 4-H project, you will learn how to house, feed, manage, breed, market, and show rabbits.

But before investing your time and money, you should learn as much as you can about rabbit production. Begin by reading this manual. It provides basic information on caring for rabbits. The first section of this manual tells you about other places where you can find information about rabbits and help with raising them. There is also a glossary of rabbit terms to help you with words you may not know.

If you decide that raising rabbits is for you, keep this manual as a handy reference, and plan to use it from year to year.

A Message to Parents

Raising and marketing rabbits is an ideal project for young people, especially those in urban areas and on small farms where space may be limited. A 4-H Rabbit Project lets young people experience the satisfaction of owning fine, purebred animals without spending an excessive amount of money.

In this 4-H project your children will learn principles of nutrition, care, grooming, breeding, marketing, and showing rabbits. All that is needed is a place to house them, feed and water to keep them growing, a willingness to make the project a success, and, most important of all, your interest as parents.

It is important that you become familiar with the material in this manual and with other rabbit literature. Help your children to select goals they can achieve, and then help them understand what they need to do to carry out their goals.

Objectives of the 4-H Rabbit Project

To gain knowledge and skills in managing and caring for rabbits.

To learn how to select and exhibit quality rabbits.

To practice record keeping and develop an understanding of the importance of keeping good records.

To participate in group activities and develop leadership skills.

To learn responsibility and patience.

To gain satisfaction from completing a project to the best of your ability.

Table of Contents

4 Getting Started

5 Choosing a Breed of Rabbits

6 What to Look for When It's Time to Buy
- Fur
- Teeth
- Eyes
- Ears
- Feet
- Body Conformation
- Pedigrees
- Registration

11 Housing for Your Rabbits
- Weather and Ventilation
- Location and Security
- Hutches
- Cages
- Nest Boxes

16 Feeding and Watering Equipment for Your Rabbits
- Feeders
- Water Containers

17 How to Care for Your Rabbits
- Handling
- Clipping Toenails
- Feeding
- Coprophagy
- Watering

20 How to Keep Your Rabbits Healthy
- Proper Sanitation
- Common Rabbit Diseases and Conditions

23 How to Manage the Breeding of Rabbits
- Age to Start Breeding
- Time to Breed
- Breeding Schedules
- Mating Procedures
- Palpating
- Kindling
- Litter Size
- Tattooing
- Weaning
- Breeding Schedules
- Determining the Sex of Young Rabbits
- Caring for Young Rabbits

27 Learning About Breeding Programs and Genetics
- Breeding Programs
- Genetics

29 Keeping Good Records

30 Raising Rabbits for Profit
- Breeding Stock
- Meat
- Fur
- Wool
- Laboratory Use
- Pets

32 How to Process Rabbits
- Equipment and Tools
- Steps in Rabbit Processing

36 How to Prepare Rabbits for Show
- Selecting and Grooming
- Rabbit Show Standards
- Rabbit Show Classes
- Rabbit Show Procedures

41 Suggested Activities and Learning Opportunities

42 Opportunities in the 4-H Rabbit Project
- 4-H Rabbit Show
- 4-H Exhibit
- 4-H Educational Presentation
- 4-H Working Exhibit
- You Learn to be a Leader in 4-H

43 For Additional Information

44 Glossary of Terms

Rabbits, Rabbits, Rabbits!

**by Norman D. Long,
Extension Specialist-Youth,
Lynn Blanchard, Project Assistant,
and the Indiana State 4-H
Rabbit Advisory Committee.**

Getting Started

You don't need a lot of money and fancy equipment to raise rabbits. Two healthy does (females) and a buck (male), feeding and watering equipment, and a hutch and cages for housing are enough to get you started. But it's a very good idea to "look around a little" before you "leap" into your 4-H Rabbit Project. That way, you'll have a better understanding of what goes into a successful project—and of what you can get out of it.

Besides this manual, there are other good places to get information about rabbits. Contact your county Extension office. (Extension offices are usually found in county-seat towns. Their telephone numbers are listed in the white pages of the telephone book under "U.S. Government County Offices.") Your county Extension staff will be able to supply you with informational materials and the names of people who will be helpful as you begin to raise rabbits.

Visit breeders who live close to you. Let them know that you are interested in raising rabbits as a 4-H project. Experienced breeders can be one of your best sources of information. Ask for a listing of local rabbit breeders at your county Extension office.

You may want to join the American Rabbit Breeders Association, Inc. (A.R.B.A.). As the national rabbit organization, A.R.B.A. sets the standards for rabbit breeding and showing, and it provides helpful information to its members. To find out more about this organization, write or call:

The American Rabbit Breeders Association, Inc.
1925 S. Main St. Box 426
Bloomington, Illinois 61701
Telephone: (309) 827-6623

Libraries are another source of information, especially later on, as you get more involved in your rabbit project. The "For Additional Information" section of this manual gives you some tips on learning to use library resources and also contains a list of books and other information materials.

If you live in an urban area, you should also check with local zoning authorities at your court house and/or city hall before going ahead with your rabbit project. There may be ordinances that prohibit keeping rabbits or regulate the kind of rabbit housing you can use within subdivision or city limits.

Choosing a Breed of Rabbits

Zoologists classify rabbits as mammals. They are in the order of Lagomorpha, which includes both rabbits and hares. There are more than forty different breeds of rabbits, so choosing a breed can be a difficult decision for a beginner. That decision will be a little easier if you learn something about the different characteristics of rabbit breeds and the different purposes for which rabbits are raised.

Rabbit breeds are categorized according to body type. Some breeds are further classified by varieties based on color difference of the fur. The most general classification—and the one most useful to the beginner—is according to mature weight of the rabbit. Thus you can choose a small, medium, or large breed of rabbit.

Also, rabbits are raised for different purposes. They are raised for:

- Meat production
- Fur production
- Wool production
- Laboratory animals
- Pets
- Exhibition

Although there is usually more than one breed or variety suitable for the same purpose, asking yourself why you are going to raise rabbits will help you decide on a breed.

Table I lists the weight classifications for rabbits, some examples of breeds in the weight classes, and the primary uses of the different breeds. For a complete list of rabbit breeds and detailed information about evalulating rabbits on the basis of fur, teeth, eyes, ears, feet, body conformation, and weight, see the "Standard of Perfection" published by A.R.B.A. You may want to borrow a copy of this book from an established breeder or, better yet, buy one for yourself. It's a very useful reference.

Table 1. Rabbit Breeds and Weight Classifications.*

Very Small (2-4 lbs.)	**Small** (5-6 lbs.)	**Medium** (7-8+ lbs.)	**Large** (9-11 lbs.)	**Giant** (12+ lbs.)
Brittania Petite	English Angora	French Angora	American	American
Dwarf Hotot	Dutch	Belgian Hare	Beveren	Checkered Giant
Himalayan	English Spot	Standard Chinchilla	Californian	French Lop
Holland Lop	Florida White	Harlequin	Champagne D'Argent	Giant Chinchilla
Netherland Dwarf	Havana	Rex	American Chinchilla	Flemish Giant
Polish	Mini Lop	Rhinelander	Cinnamon	
	Tan	Sable	Creme D'Argent	
	Lilac	Silver Marten	Blanc de Hotot	
	Silver	Satin Angora	English Lop	
			New Zealand	
			Palomino	
			Satin Silver Fox	

*Classifications are according to mature weight.

Uses of 4-Class Rabbit Breeds**

Meat Production
Fur Production
Laboratory Research
Pets
Exhibition
Breeding Stock

Uses of 6-Class Rabbit Breeds**

Meat Production
Exhibition
Breeding Stock

**See section on "Rabbit Show Classes."

Besides looking at the different kinds of rabbits and the different purposes for raising them, you should look at your own situation, as well. It is generally best for beginners to choose a solid-colored, medium-sized breed. But if you only have limited space in which to house your rabbits, you may want to consider raising one of the smaller breeds. Also, depending upon your age, size, and strength, you should think twice before choosing a large breed of rabbit that would be difficult to handle at mature weight.

A useful tip is to start with a breed that is available from rabbit breeders in your area. When you have questions, they will be there to help you. When visiting breeders, let them know that you are a beginner and that you are interested in raising rabbits as a 4-H project. Look at their housing arrangement and the type of equipment used. Talk with them about your housing arrangements. They may be able to help figure out how much money you will need to get started. Ask about their feeding program. They should be able to tell you where you can find good feed at the best price. Above all, don't be afraid to ask questions!

It is best to buy rabbits directly from an established, reliable breeder. (It is usually difficult to find good quality, purebred rabbits in pet stores.) Remember, you don't have to buy rabbits from the first breeder that you visit. Always buy rabbits from breeders who keep good records and take good care of their rabbits.

It is up to you to decide how many rabbits to buy. If you plan to exhibit your rabbits in a 4-H Rabbit Show, you should begin with a trio (two does and a buck) of young purebred animals about 4 months old. As an option, you may want to start with a good, bred doe and begin to build from her offspring.

What to Look for When It's Time to Buy

Once you have an idea of what breed you want, it is time to think about what to look for when selecting your rabbits.

The rabbits you choose must be healthy, have the ability to reproduce, and have good conformation (body shape and balance). See Figure 1.

When choosing a rabbit, first observe it in its cage. Look for alertness, bright eyes, and a shiny coat. If you see a rabbit that displays these qualities, ask the owner to remove it from its cage so you can look at it more closely. (Let the owner hold the rabbit for you. Rabbits have sharp toenails, and they can scratch if you don't observe and practice the proper way to hold them.)

You may want to ask an experienced breeder to help you carefully look at and choose your first rabbits. Together, you should consider the following characteristics.

Fur

There are four different types of fur among the rabbit breeds: normal, satin, rex, and angora. Normal fur has a dense undercoat protected by longer guard hairs. Satin fur is finer than normal fur and has a glass-like, transparent hair shaft which reflects light and produces a bright luster or sheen. Rex fur is very dense. Its guard hairs are nearly the same length as the undercoat, and the fur stands at a 90 degree angle to the skin, giving a plush, velvet-like feeling. Angora fur has a long, wool-type fiber that is collected and spun into yarn.

Most breeds of rabbits have normal-type fur. The following information deals with qualities of normal fur. For information about other fur types, consult the A.R.B.A. "Standard of Perfection."

Run your hand lightly up the back from the tail. Normal fur should appear bright and alive. The fur should not be soft and downy. There are three points to check: texture, density, and balance and condition.

1. Texture. The feel of the fur when stroked from the head to the tail. The texture of the fur should not be harsh or wire like, nor do you want wooly fur. Look for fur that is coarse enough in guard hairs to offer some resistance when you stroke the fur. Guard hairs are heavier hairs that protrude above the undercoat and protect it. The undercoat should be fine and soft.

2. Density. The amount of fur in a given area (number of hairs per square inch). Look for a good, thick coat of fur.

3. Balance and Condition. The evenness and smoothness of the fur. Look for fur of a uniform length, not too long and not too short. A dense coat of short fur is better than a long, thin coat. Good texture and density and uniform length make up proper balance. The hair should be set tight in the skin. There should be no breaks in the fur, no mats of fur, and no stains. The guard hairs should be supple and glossy. The fur should look alive and brilliant.

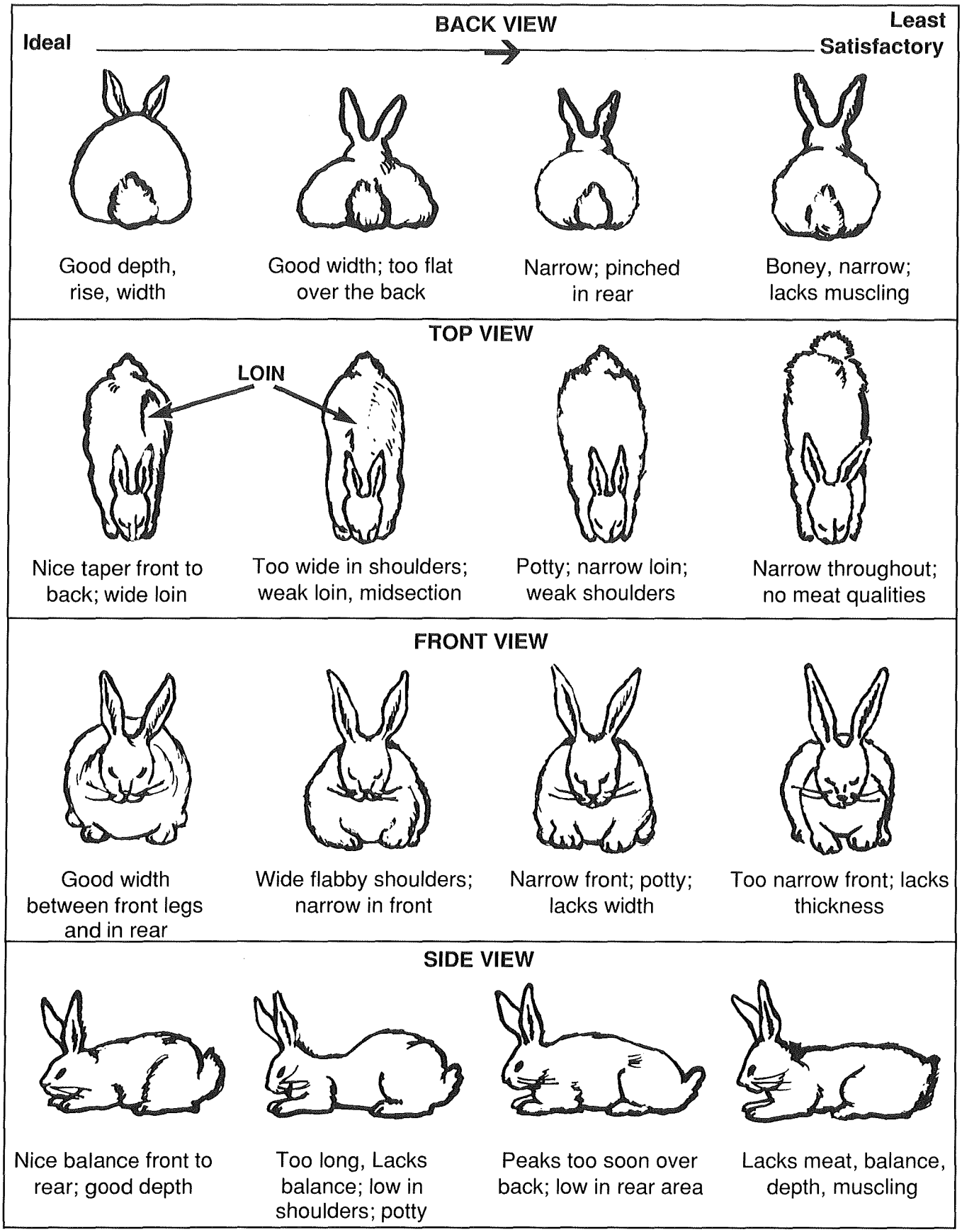


Figure 1. Look for rabbits with ideal characteristics. You can spot potential problems by carefully examining rabbits before you buy. Use these pictures as a guide.

Teeth

Have the breeder help you check the rabbit's teeth. The upper incisors should overlap the lower incisors. See Figure 2. In young rabbits, the correct incisor overlap may not always be clearly apparent; however, grossly maloccluded (crooked) teeth are usually noticeable.

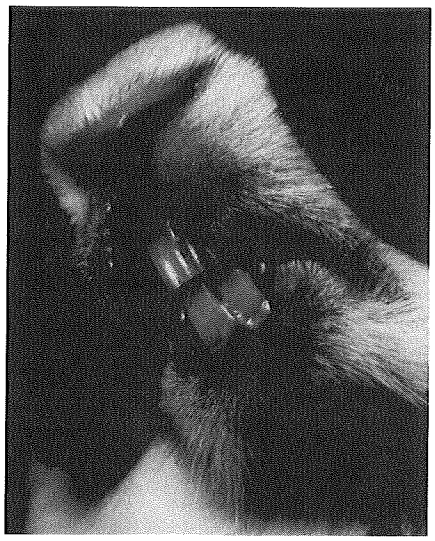


Figure 2. This rabbit's incisors overlap correctly.

Eyes

The rabbit's eyes should be clear and bright. If they are cloudy, dull, or opaque, the rabbit may be blind. If the fur just below the eye is wet and matted, the rabbit may have conjunctivitis. Rabbits with spots in their eyes, rabbits with eyes that are not the same color, or rabbits with improper color will be disqualified from exhibition. Check the "Standard of Perfection" for the proper eye color of the variety in which you're interested.

Ears

In general, the rabbit's ears should be held erect, except in breeds like English Angora and lop breeds. (Again, check the "Standard of Perfection" for your breed.) Look inside the ears. If there is evidence of a crusty material, the rabbit may have ear mites.

Feet

Ask the breeder to turn the rabbit over and help you check the bottoms of the feet. The feet should be well padded with fur. When pads on the back feet are soft and thin, the rabbit is likely to develop sores, a condition known as "sore hocks." Examine the toes. There should be five toes on the front feet and four toes on the back feet. Each toenail must be present and the proper color for its breed.

Body Conformation

Conformation (body shape, weight, and balance) is important for all breeds. Look at Figure 3. The hindquarters are not just the hind legs, but the legs and loin up to the last rib of the forequarter. In most breeds, the rabbit must have a wide loin section with well-rounded and full hips. The forequarters should be full and have a good coverage of meat over the shoulders.

The rabbit is one animal in which the hindquarters carry more meat and weight than the forequarters. The hindquarters produce the best cuts of meat. In dressing (cutting up) a rabbit, you will find that about 60 percent of the entire weight of a dressed rabbit is in the hindquarters.

The front and hind legs of the rabbit should be straight and not spraddled. The tail should be straight and not crooked. See Figure 4. It is important to remember that there are maximum and minimum weights listed in the "Standard of Perfection" that must be followed for each breed and show classification.

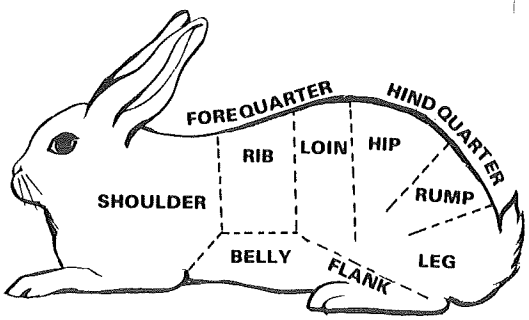


Figure 3. Parts of a rabbit.

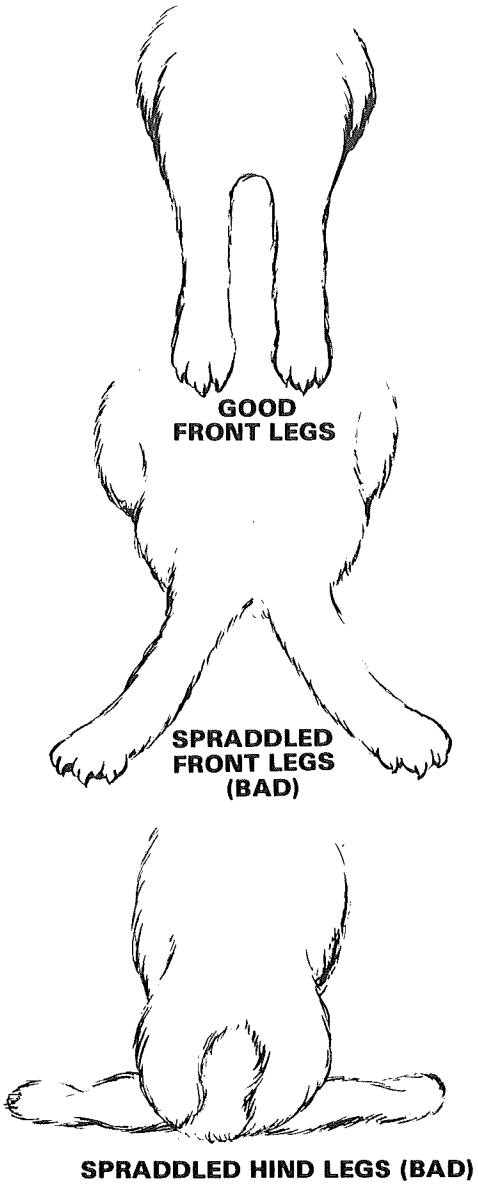
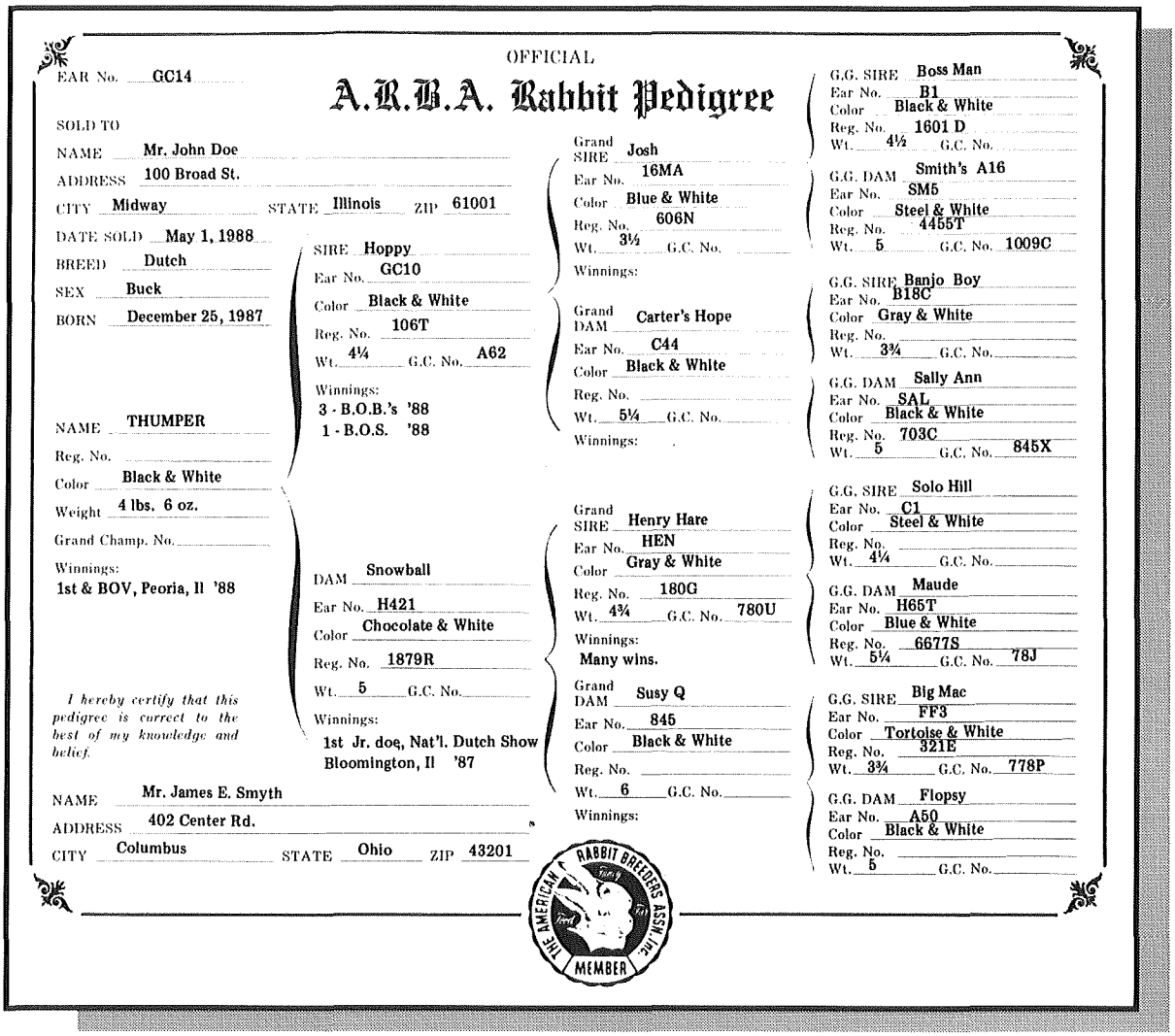


Figure 4. Check the rabbit's legs for strength and straightness.

Pedigrees

A pedigree is a written chart prepared by the breeder. It lists the breeder's name, the name of the rabbit, and the rabbit's parents, grandparents, and great grandparents. See Figure 5. If you plan to show or breed purebred rabbits, it is best to buy pedigreed rabbits. A pedigree does not guarantee the quality of a rabbit. However, it is useful in the breeding of good rabbits, which depends on the genes from the parents.



OFFICIAL

A.R.B.A. Rabbit Pedigree

EAR No. GC14

SOLD TO
NAME Mr. John Doe
ADDRESS 100 Broad St.
CITY Midway STATE Illinois ZIP 61001
DATE SOLD May 1, 1988
BREED Dutch
SEX Buck
BORN December 25, 1987

NAME THUMPER
Reg. No.
Color Black & White
Weight 4 lbs. 6 oz.
Grand Champ. No.
Winnings:
1st & BOV, Peoria, Il '88

I hereby certify that this pedigree is correct to the best of my knowledge and belief.

NAME Mr. James E. Smyth
ADDRESS 402 Center Rd.
CITY Columbus STATE Ohio ZIP 43201

SIRE Hoppy
Ear No. GC10
Color Black & White
Reg. No. 106T
Wt. 4¼ G.C. No. A62
Winnings:
3 - B.O.B.'s '88
1 - B.O.S. '88

DAM Snowball
Ear No. H421
Color Chocolate & White
Reg. No. 1879R
Wt. 5 G.C. No.
Winnings:
1st Jr. doe, Nat'l. Dutch Show
Bloomington, Il '87

Grand SIRE Josh
Ear No. 16MA
Color Blue & White
Reg. No. 606N
Wt. 3½ G.C. No.
Winnings:

Grand DAM Carter's Hope
Ear No. C44
Color Black & White
Reg. No.
Wt. 5¼ G.C. No.
Winnings:

Grand SIRE Henry Hare
Ear No. HEN
Color Gray & White
Reg. No. 180G
Wt. 4¾ G.C. No. 780U
Winnings:
Many wins.

Grand DAM Susy Q
Ear No. 845
Color Black & White
Reg. No.
Wt. 6 G.C. No.
Winnings:

G.G. SIRE Boss Man
Ear No. B1
Color Black & White
Reg. No. 1601 D
Wt. 4½ G.C. No.

G.G. DAM Smith's A16
Ear No. SM5
Color Steel & White
Reg. No. 4455T
Wt. 5 G.C. No. 1009C

G.G. SIRE Banjo Boy
Ear No. B18C
Color Gray & White
Reg. No.
Wt. 3¾ G.C. No.

G.G. DAM Sally Ann
Ear No. SAL
Color Black & White
Reg. No. 703C
Wt. 5 G.C. No. 845X

G.G. SIRE Solo Hill
Ear No. C1
Color Steel & White
Reg. No.
Wt. 4¼ G.C. No.

G.G. DAM Maude
Ear No. H65T
Color Blue & White
Reg. No. 6677S
Wt. 5¼ G.C. No. 78J

G.G. SIRE Big Mac
Ear No. FF3
Color Tortoise & White
Reg. No. 321E
Wt. 3¾ G.C. No. 778P

G.G. DAM Flopsy
Ear No. A50
Color Black & White
Reg. No.
Wt. 5 G.C. No.

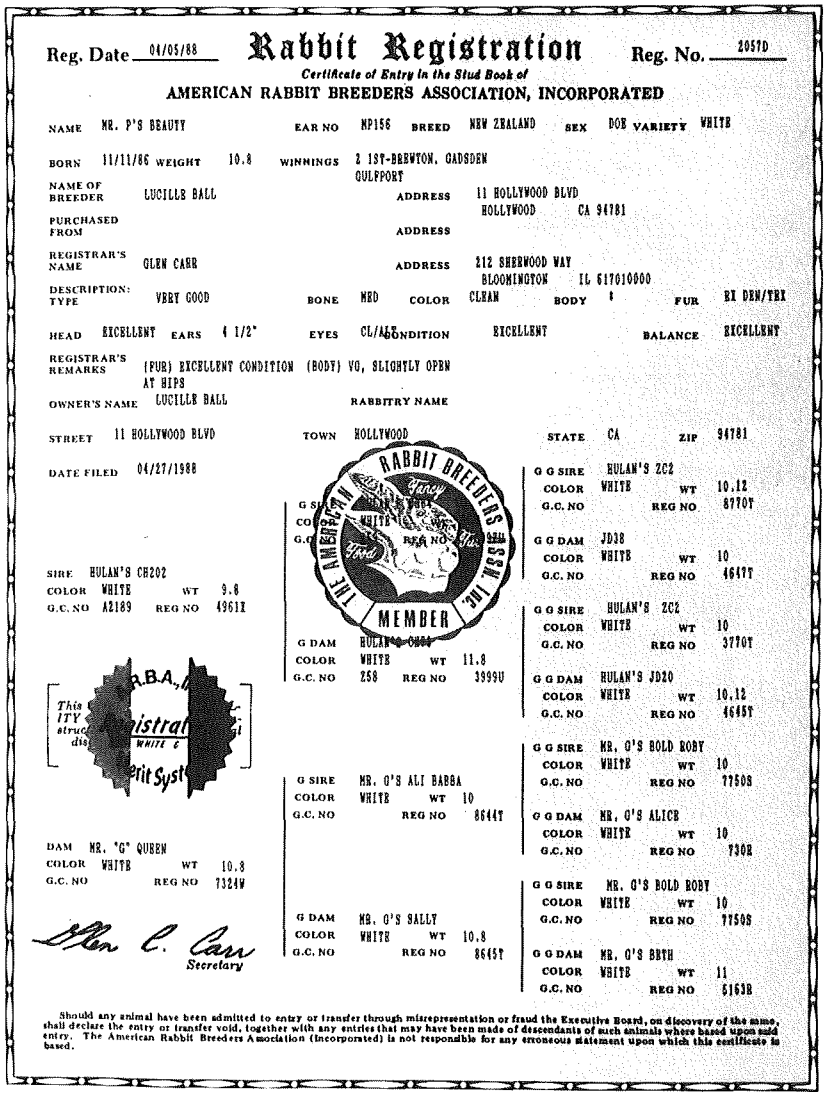
THE AMERICAN RABBIT BREEDERS ASSN. INC. MEMBER

Figure 5. The pedigree is a record showing the date of a rabbit's birth and a brief description of three generations of its ancestors.

Registration

Registration is a sign of quality in a rabbit. When all animals on a pedigree are registered, you can be sure that all ancestors were at least minimum weight and quality and that no inferior specimens contributed to the background of that particular rabbit. In order to be registered, a rabbit must have a pedigree and conform to rigid standards set by the A.R.B.A. Only A.R.B.A. members are eligible to have rabbits registered; however, non-members can own registered rabbits. Registration is accomplished by contacting an A.R.B.A. licensed registrar, who will examine your rabbit and complete the nesessary paper work.

The A.R.B.A. merit seal system shows how many generations of a rabbit's ancestors have been registered.The national office of the A.R.B.A. issues the certificate of registration, checks the registration numbers which appear on the pedigree, and attaches the merit seal to the registration certificate. If only sire and dam are registered, a red seal is attached. If the sire and dam and great sires and great dams are all registered, a red and white seal is attached. If all ancestors showing on a registration are registered, a red, white, and blue seal is attached. See Figure 6.



Reg. Date 04/05/88 — **Rabbit Registration** — Reg. No. 2057D

Certificate of Entry in the Stud Book of

AMERICAN RABBIT BREEDERS ASSOCIATION, INCORPORATED

NAME MR. P'S BEAUTY EAR NO NP156 BREED NEW ZEALAND SEX DOE VARIETY WHITE

BORN 11/11/86 WEIGHT 10.8 WINNINGS 2 1ST-BREWTON, OADSDEN GULFPORT

NAME OF BREEDER LUCILLE BALL ADDRESS 11 HOLLYWOOD BLVD HOLLYWOOD CA 94781

PURCHASED FROM ADDRESS

REGISTRAR'S NAME GLEN CARR ADDRESS 212 SHERWOOD WAY BLOOMINGTON IL 617010000

DESCRIPTION: TYPE VERY GOOD BONE MED COLOR CLEAN BODY 8 FUR EX DEN/TEX

HEAD EXCELLENT EARS 4 1/2" EYES CL/ALT CONDITION EXCELLENT BALANCE EXCELLENT

REGISTRAR'S REMARKS (FUR) EXCELLENT CONDITION (BODY) VG, SLIGHTLY OPEN AT HIPS

OWNER'S NAME LUCILLE BALL RABBITRY NAME

STREET 11 HOLLYWOOD BLVD TOWN HOLLYWOOD STATE CA ZIP 94781

DATE FILED 04/27/1988

SIRE HULAN'S CH202 — COLOR WHITE WT 9.8 — G.C. NO A2189 REG NO 4961X

G SIRE [illegible] — COLOR WHITE — G.C. NO [illegible] REG NO [illegible]

G DAM [illegible] — COLOR WHITE WT 11.8 — G.C. NO 258 REG NO 3999U

DAM MR. "G" QUEEN — COLOR WHITE WT 10.8 — G.C. NO REG NO 7324W

G SIRE MR. O'S ALI BABBA — COLOR WHITE WT 10 — G.C. NO REG NO 8644T

G DAM MR. O'S SALLY — COLOR WHITE WT 10.8 — G.C. NO REG NO 8645T

Secretary

G G SIRE HULAN'S ZC2 — COLOR WHITE WT 10.12 — G.C. NO REG NO 8770T

G G DAM JD38 — COLOR WHITE WT 10 — G.C. NO REG NO 4647T

G G SIRE HULAN'S ZC2 — COLOR WHITE WT 10 — G.C. NO REG NO 3770T

G G DAM HULAN'S JD20 — COLOR WHITE WT 10.12 — G.C. NO REG NO 4645T

G G SIRE MR. O'S BOLD ROBY — COLOR WHITE WT 10 — G.C. NO REG NO 7750S

G G DAM MR. O'S ALICE — COLOR WHITE WT 10 — G.C. NO REG NO 730S

G G SIRE MR. O'S BOLD ROBY — COLOR WHITE WT 10 — G.C. NO REG NO 7750S

G G DAM MR. O'S BETH — COLOR WHITE WT 11 — G.C. NO REG NO 5163R

Should any animal have been admitted to entry or transfer through misrepresentation or fraud the Executive Board, on discovery of the same, shall declare the entry or transfer void, together with any entries that may have been made of descendants of such animals where based upon said entry. The American Rabbit Breeders Association (Incorporated) is not responsible for any erroneous statement upon which this certificate is based.

Figure 6. Registration is a sign of quality in a rabbit. The A.R.B.A. merit seal attached to this registration certifies that all three generations of the rabbit's ancestors have been registered.

When you choose your rabbits, you won't go wrong if you:

- Select rabbits from a rabbitry that has a reputation for selling top-quality rabbits, practices good sanitation, and keeps accurate production records.
- Select your stock from a litter of rabbits that are uniform in size. Also consider the litter size, because that will affect the size of litters the rabbit and her offspring will produce in the future.
- Select rabbits that have good fur pads on their feet and well-filled loins, thighs, and shoulders.
- Select healthy, disease-free rabbits.

Housing for Your Rabbits

Before purchasing any rabbits, you need a place to house them. Appropriate housing should be ready when you bring your rabbits home. The structure that shelters or holds the removable wire cages for your rabbits is called the "hutch." Hutches may be large or small. They can be open-sided structures or enclosed structures with ventilation. Figures 7 and 8 show two forms of hutches to protect the cages and rabbits from the weather and predators.

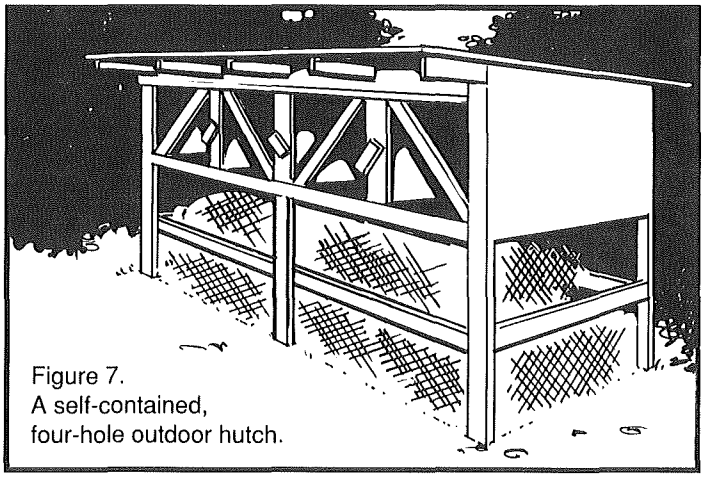


Figure 7.
A self-contained,
four-hole outdoor hutch.

As an alternative, some beginners save money and effort by starting their rabbitry with a single structure combining the functions of hutch and wire cages. The hutch is constructed with wire floors and doors that open from the front so that separate removable cages do not have to be built. See Figure 9. However, as you become more involved in raising rabbits and want to expand their projects, you will need to provide larger hutches with removable wire cages.

The kind of housing needed depends upon location, climate, and the money you have to spend. Whether you go into raising rabbits in a small or big way, plan for housing and equipment that allow easy feeding, watering, breeding, and cleaning. Keep construction as simple as possible. Neatness and convenience will make a good impression on visitors and prospective buyers.

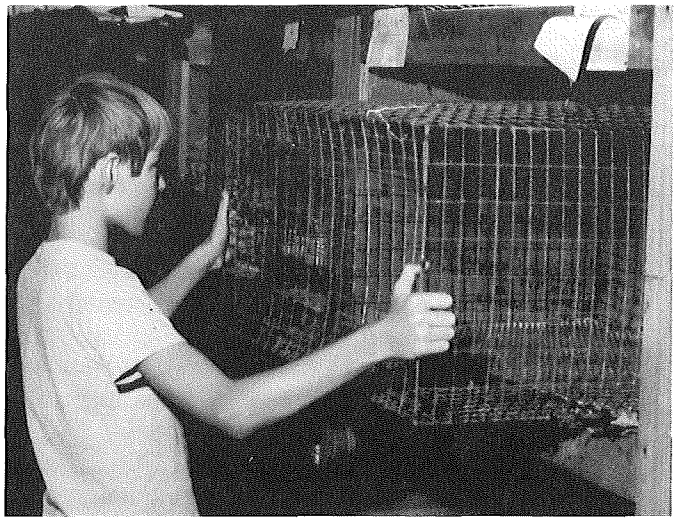


Figure 8. A wooden-framed hutch with removable wire cages for easier cleaning.

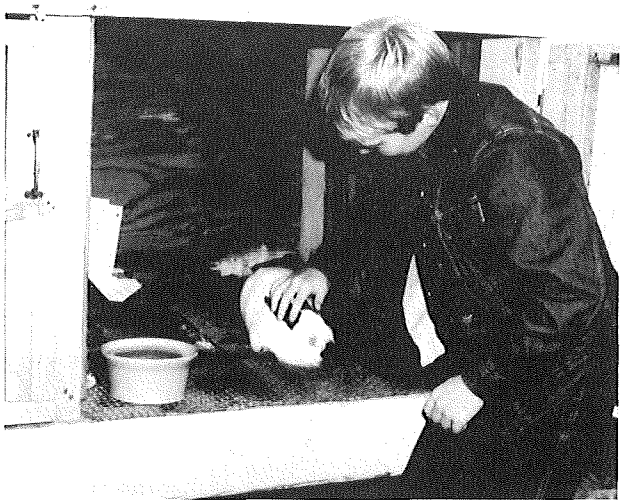


Figure 9. Hutches and cages can also be built as one unit.

It is hard to know what type of housing to use when you are beginning. The best thing to remember is that your rabbits deserve the best care that you can provide and afford. Ask your leader or someone who has experience in raising rabbits to help you plan the housing you will use. They may be able to help you decide how to best use the money you have to spend on housing. In addition, here are some housing ideas for you to consider.

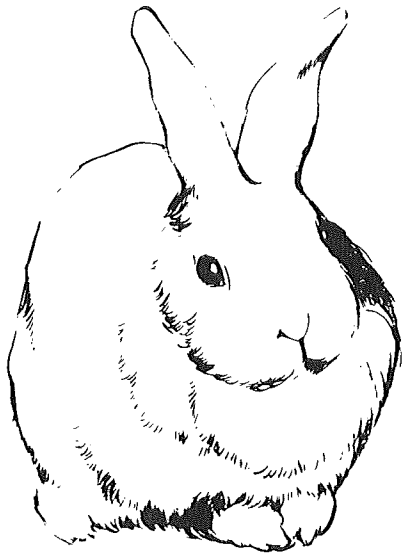
Weather and Ventilation

Rabbits can withstand cold weather better than hot weather. They may die if exposed to extreme heat. Ideally, the temperature in the hutch should not be higher than 85 degrees. In hot weather, your housing should provide the rabbits with shade and any gentle breezes that may be available. On extremely hot days, you can place plastic bottles of frozen water in the cage. The rabbits curl up around the bottle, and it helps to keep them cool. An electric fan can help to circulate the air. You will want to situate the fan so that it doesn't blow directly on your rabbits.

In cold weather, it is important to protect rabbits from drafts, rain, sleet, and snow. Rabbits can tolerate low temperatures and excessive cold, but wet and drafty conditions weaken their resistance to disease. Place hutches where rain will not enter the cages and wet the rabbits. In general, face cages toward the south for the best protection against drafts.

Proper ventilation is important in all types of weather and in all types of housing. Signs of poor ventilation are condensation and a smell of ammonia. The more rabbits there are in an enclosed area, the greater the manure build-up and the greater the number of air changes that are required to keep the ammonia level within tolerable, safe limits.

The air in an enclosed rabbit building should be changed a minimum of 10 times an hour through natural or mechanical means.Vents should be arranged so building air can flow into the building near the floor and exit at roof level. In enclosed buildings where temperature and humidity are controlled, the desirable combination is 60-78 degrees and 30-40% humidity.



Location and Security

Rabbits are easily frightened, so rabbit housing should be located where the rabbits won't be disturbed. It is important to protect rabbits from predators. Make rabbit hutches strong enough to keep rabbits in and dogs, cats, and other predators out. It may be necessary to build a fence completely around your outdoor hutches to provide protection from predators. Also, if a hutch door comes open and your rabbits get out, they will be confined inside the fence.

Hutches

If you are a beginner, start with a three- or four-compartment hutch frame and wire cages. The more experienced club member may want to buy or build all-wire cages to put in a draft-free building.

When building an outdoor hutch, do not use a metal roof without also using insulation. A metal roof will allow too much heat in the pen unless properly insulated and shaded. An outdoor hutch should be closed on three sides with panels or curtains to cover the openings during cold weather or storms. During extreme cold weather or bad storms, the front of the hutch should be partially covered, as well. You may want to place your rabbit hutches in a building that is open to the south if you live in an area that has extremely bad weather conditions.

Some breeders prefer the single hutch. Others build hutches with two or three tiers, one above the other. Each tier has compartments, and there are boards to catch droppings between each tier. The height of whoever takes care of the rabbits is a factor in determining how many tiers to use. Consider putting a wire skirt around the bottom of the hutch to keep young, playful children and pets out of the manure.

Hutches with two or three tiers save space and building material. However, tiered hutches are not as accessible for feeding, watering, and cleaning, and they need more ventilation.

Remember, you must protect the entire outdoor hutch with an all-weather roof that has an adequate overhanging eave (14 to 16 inches). If you build a semi-enclosed outdoor hutch, use construction-grade material: 2-by-4-inch, 2-by-2-inch, and 1-by-6-inch lumber, and 1/2-inch exterior grade plywood. See Figure 10.

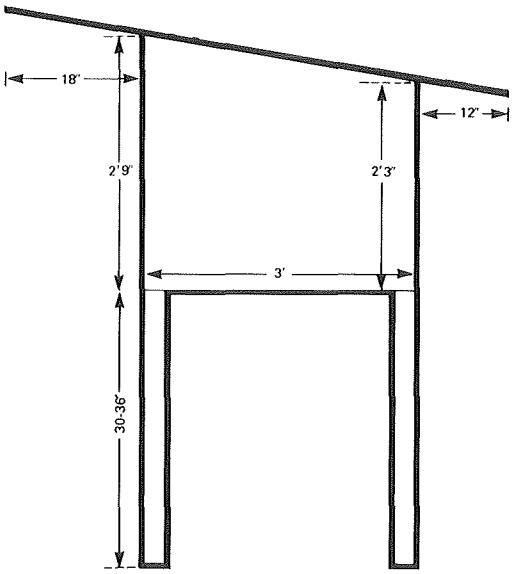


Figure 10. The length of the outdoor wooden hutch you build will depend on the number and size of the cages to be held. The main frame should be constructed with 2-by-4 and 2-by-2 pieces of lumber. The roof can be a sheet of plywood covered with shingles. The removable cages can rest on conduit pipe that runs from the front to the back of the hutch.

If you are going to construct wire cages for your rabbitry, it is helpful to use J-clips and J-clip pliers. They are available or can be ordered through most farm supply stores or where rabbit equipment is sold. See Figure 12.

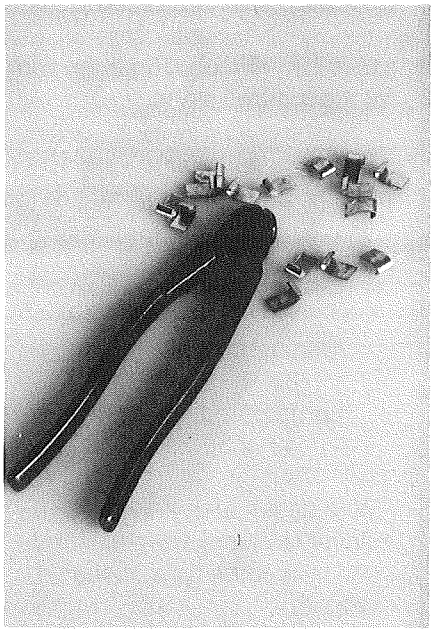


Figure 12. J-clips and J-clip pliers are helpful in constructing cages. Use the J-clips to join the sides and attach the top, the bottom, and the door.

Cages

All-wire cages without hutches work well if you have a shed, garage, or barn with proper ventilation. Wire cages are easier to maintain, easier and quicker to clean, and tend to outlast wooden hutches.

Although cages can be made of many materials, the ideal cage is all wire. Use 1/2-by-1-inch, 14-gauge welded wire for the floor. Fourteen-gauge wire is strong enough to support an 8 to 10 pound mature doe and her litter in a 30-by-30-inch cage. For the sides and top wire, you can use 1-by-2-inch, 16-gauge wire. (A solid floor is recommended for rabbits weighing over 10 pounds.)

When building a cage, the 1/2-inch side of the wire should be toward the rabbit. This gives the rabbit more support for the pads of its feet and helps to prevent sore hock problems.

It is important to remember that galvanized wire is rough on one side. Be sure there are no rough edges in contact with the rabbits. The smooth side should always be toward the rabbit. See Figure 11.

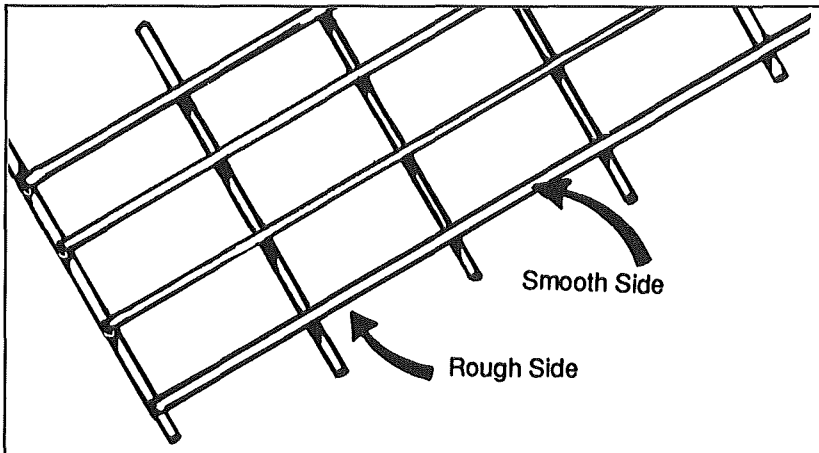


Figure 11. Examine your wire. The smooth side should always be toward the rabbit.

When building a wire cage, remember:

• Use 1/2-by-1-inch, 14-gauge galvanized wire for the floor (the 1/2-inch side should face up and be toward the rabbit's foot).

• Use 1-by-2-inch, 16-gauge wire for the top and sides.

• The size of the cage varies with the size of the breed:

Length x Width x Height

Small breeds
24" x 24" x 16" cage
Medium breeds
30" x 30" x18" cage
Large breeds
48" x 30" x 18" cage

• Wire cages are easier and quicker to clean. They must be used with some type of shelter or hutch.

Nest Boxes

It is necessary to provide nest boxes for your does before they give birth. A nest box keeps the kits dry, protects them from extremely hot and cold weather, and hides them from predators, as well.

The size of the nest box is important. Nest boxes that are too large are a common cause of kit death. When a nest box is oversized, the doe tends to stay longer than required to nurse her young and to soil the bedding with her droppings. This results in damp bedding and a strong ammonia odor that often causes serious respiratory ailments in rabbits.

The nest box should be 2 inches longer and 1 inch wider than the doe. The height of the box will depend on the size of the breed of rabbit you are raising. For example, the sides of the nest box should be12 inches high for giant breeds, 9 inches for medium breeds, and 6 inches for small breeds.

If you choose to use a nest box with a partially closed top, you should drill three to five 1-inch holes near the top of the back wall. The holes allow body heat to escape and reduce the amount of moisture in the box.

Nest boxes can be wooden or metal. Wooden nest boxes are often made from scrap wood. Metal nest boxes can be purchased with disposable liners, cardboard liners, and/or screened bottoms. Screened bottoms help to provide ventilation during hot weather. However, metal nest boxes aren't as warm as wooden nest boxes in cold weather. In cold weather, it may be necessary to place a good piece of insulation board under the metal nest box and/or some extra clean straw in the nest box. This protects the litter against chilling when the rabbits burrow down to the floor of the box. See Figure 13.

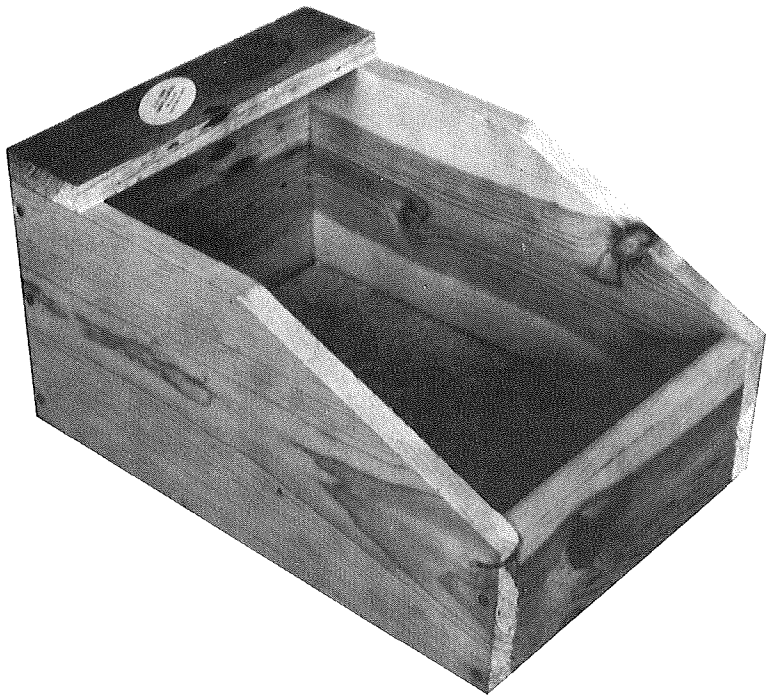
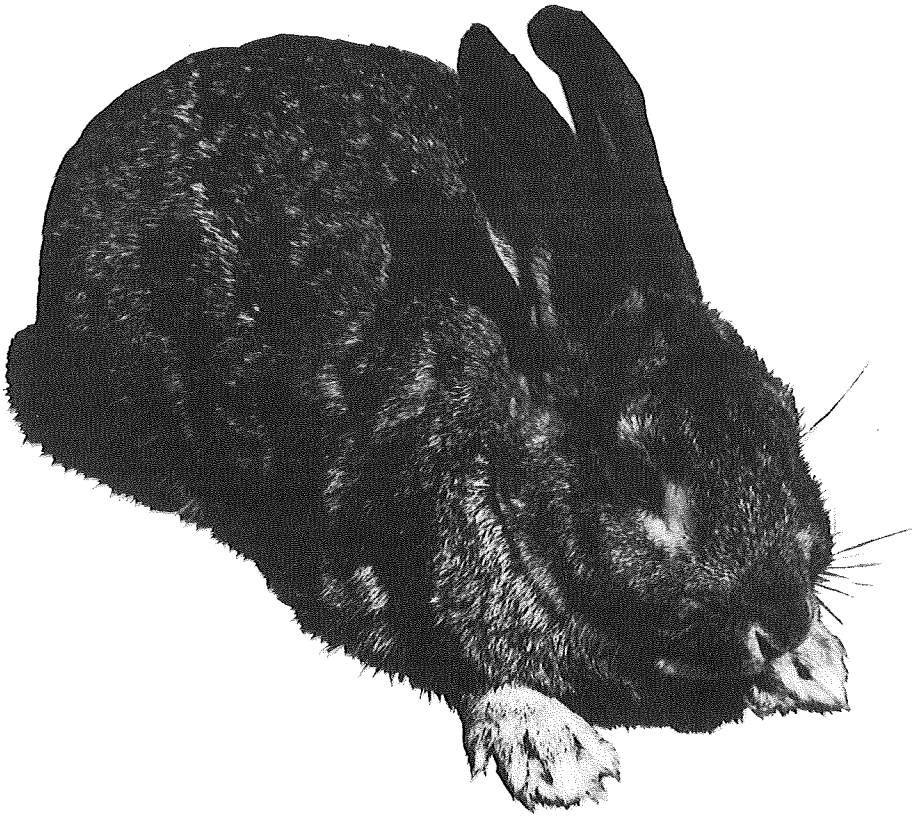


Figure 13. Wooden nest boxes can be purchased or made from scrap lumber.



Here are some important points to remember, whatever type of housing you use:

• Consider ease of cleaning as a part of your contruction plans. No matter what type of housing set-up you have, it is very important to keep it clean.

• Construct housing for the comfort of the rabbits. Even though sunlight is an excellent disinfectant, do not let it reach your rabbits. It bleaches out or discolors fur. (Bleached fur will result in poor markings at shows.)

• Make doors large enough so that rabbits, nest boxes, and feeder can easily be inserted and removed.

• Make the door so that it swings to the outside to create more space inside the cage for feeding, watering, and checking the nest box.

• Remember that any wood surface that is exposed to rabbits will be chewed.

• Do not leave any exposed sharp points or objects (nails, wire, etc.).

Feeding and Watering Equipment for Your Rabbits

Feeding and watering equipment can be built at home, but it's hardly worth the time because most equipment is relatively inexpensive to purchase. If it is cared for properly, the feeding and watering equipment that you purchase will last for several years.

Feeders

Wooden feeders do not work well because your rabbits will chew on them. Ceramic crocks or unbreakable, poly vinyl crocks that can't be easily tipped over are acceptable as feeders. But the best and most practical kind of feeder is a metal self-feeder with a screened bottom or a bottom that is perforated by many 1/8-inch holes to allow fines (very small food particles) to sift out. If the fines do not sift out, they will accumulate in the feeder and may cause illness in your rabbits. See Figure 14.

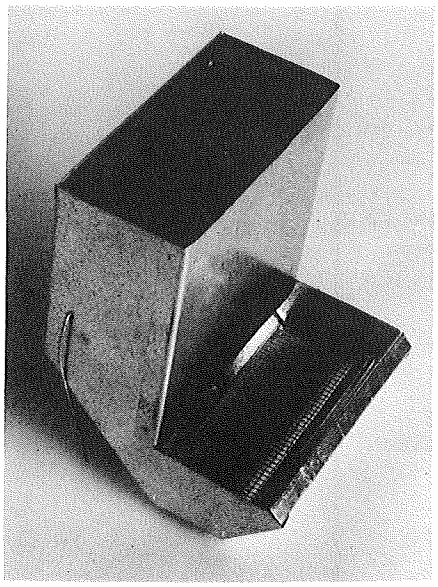


Figure 14. A metal self-feeder with a screened bottom. The screened bottom allows fines to sift out.

The metal self-feeder should be mounted on the side of the cage 4 inches from the cage bottom for giant breeds, 3 to 4 inches for medium breeds, and 2 inches for small breeds. There are several reasons for mounting the feeder. If the feeder is mounted on the side of the cage, you will have more floor space for your rabbits. It will be more sanitary, because your rabbits will not be able to hop into it and soil the feed with their droppings. (Dirty and moldy feed is a major drawback of feeders that are made from crocks and that sit on the floor of the cage.) Also, you can fill the metal self-feeder from outside the cage, and this is much easier than having to open the cage, take out the feeder, fill the feeder, and return it to the cage.

No matter what kind of feeder you choose, you should remember to check it frequently and remove any dirty or moldy feed.

Water Containers

Rabbits need clean, fresh water at all times. A lack of water causes decreased food intake, which results in slower growth. Although ceramic crocks with curved interior sides have been recommended for use as water containers, the recently developed unbreakable poly vinyl crocks are now preferred for year-round use. Crocks like these are preferred because:1) there is less chance that when the water inside freezes the resulting expansion will cause breakage; 2) they will not rust; 3) their smooth surface makes them easier to clean; and 4) they will not readily harbor bacteria. See Figure 15.

Figure 15. Crocks work well for watering; however, you should clean them regularly.

How To Care for Your Rabbits

Once you have housing, equipment, and rabbits, the next step is to learn how to properly care for your rabbits. This is one of the most important phases in successful rabbit breeding.

Let your rabbits get to know you. When you go near the rabbit hutch, make some noise or speak to them so they know you are approaching the cage. Some rabbits are extremely nervous and may become frightened if you suddenly appear in front of them. It may be helpful to place a radio in or near your rabbit housing so rabbits become familiar with human voices. Ask an experienced breeder about this practice.

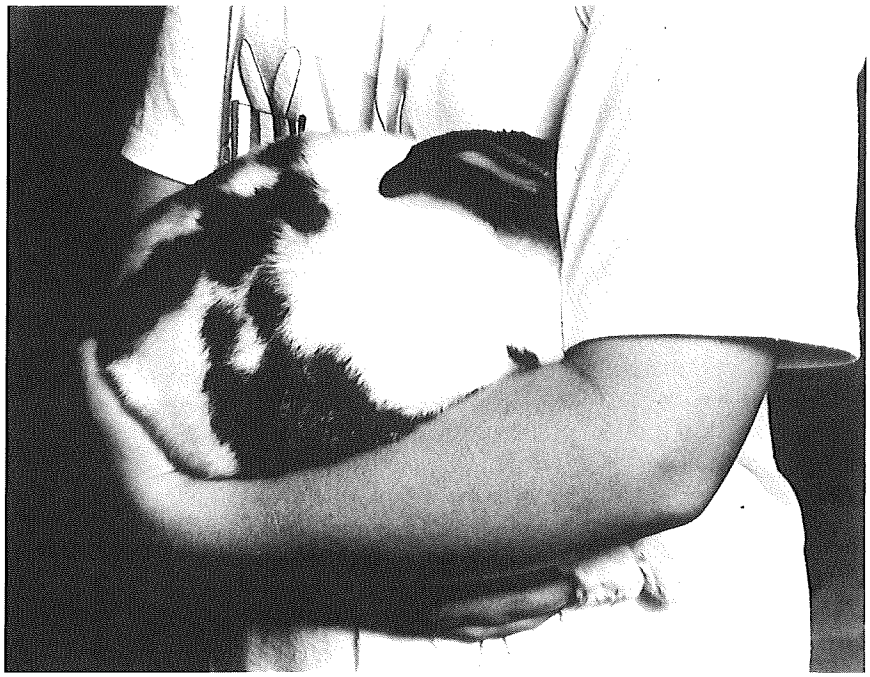


Figure 16. To carry a rabbit, tuck its head under your arm, place one of your hands under its belly, and support the rabbit's rump with your other hand.

Handling

You will need to handle your rabbits in order to examine them for injuries or disease and to prepare them for show.

Pick up rabbits by placing one hand under the belly and the other hand under the rump. When you carry a rabbit, hold the rabbit between your arm and your body with its eyes covered. See Figure 16. Do not lift or carry rabbits by the ears or legs. This can injure the animal.

Rabbits held loosely may scratch the handler because they are afraid of falling. Keep this in mind when you are carrying rabbits. Hold them firmly so they feel secure. If you need to carry rabbits for a distance, use a small box or rabbit carrier.

Clipping Toenails

Adult rabbit toenails need to be clipped on a regular basis. Do not clip toenails of rabbits under 6 months of age. Use Roscoe toenail clippers (available at most pet stores) for clipping the rabbit's toenails. Human nail clippers and side cutters are not as suitable, because the toenail often gets crushed, affecting growth and colorization of the toenail.

Feeding

Feed is the single largest expense in raising rabbits. Rabbits need a well-balanced ration that meets their nutritional needs and tastes good. A commercially prepared, pelleted rabbit ration from a reputable feed company generally supplies the proper amounts of protein, energy (from carbohydrates), fiber, minerals, and vitamins necessary to feed your rabbits. Commercially prepared pelleted rations are recommended for 4-H'ers getting started in the rabbit project.

Most commercially prepared pellets are round and about 1/4- inch long. The pellets with smaller diameters are generally easier for younger rabbits to ingest (swallow).

The way a pelleted feed is put together is important. The pellets should be firm and not broken into small particles (fines). Rabbits tend to only eat the solid pellets and will not consume the fines. Look at the end of the pellet. The firm pellets will have squarer ends. If the ends of the pellet are extremely ragged, this may indicate a softer pellet which will produce a greater amount of waste due to fines.

Different rabbits need different amounts of feed. It is difficult to determine the exact amount of feed a rabbit needs without experience. In general, 2 to 3 ounces of pellets daily are sufficient for small breeds, 3 1/2 to 4 ounces for medium breeds, and 4 to 8 ounces for the larger breeds. Feed intake should be adjusted to meet the needs of the individual animal.

A regular feeding schedule is important. Try to feed at about the same hour each day. Some breeders feed night and morning; others feed just the does with litters in the morning and then feed all rabbits, including the does with litters, at night.

Store feed in a container with a tight-fitting lid (a garbage can, for example). Such a container will prevent predators like rats and mice from contaminating the feed. It will also keep out water and help prevent the feed from getting moldy. Do not store feed for longer than 3 to 4 weeks. Feed stored for longer periods will deteriorate and lose its nutritional value and taste.

Coprophagy

Coprophagy is the ingesting (eating) of fecal material (solid waste), and it is a normal habit of rabbits. This practice occurs in all breeds of domestic rabbits. Actually, the practice of re-ingesting the soft waste is quite benefical. A second passage of the feed through the digestive system allows further digestion of fiber and other nutritional feed components.

Keep these points in mind when determining feed amounts:

- Breeding does and bucks should be kept in good condition. Many breeding failures are caused by does being overweight. In general, it is best to have a doe a little lean rather than a little fat.

- Pregnant does and lactating does require more feed. Consult an experienced breeder and/or a rabbit feed salesperson to help determine the amount of increase needed.

- Reduce the amount of feed given to a doe 24 to 48 hours before she kindles to help prevent caked mammary glands. After kindling, gradually increase to full feed in 7 days.

- Growing young rabbits should have as much feed as they can eat; however, DO NOT let stale or moldy feed accumulate in the feeder.

- Provide only as much feed as your rabbits will eat between feedings; any excess left in the feeder is usually wasted.

Tips to Remember When Feeding Rabbits

• Use a good quality, commercially prepared, pelleted rabbit feed.

• Use a suitably sized container to measure your feed. (A 6-ounce tuna fish can holds about 5 ounces of pellets if shaken off level.)

• To lower feed costs, feed a small amount of good, clean hay every day.

• DO NOT feed young rabbits cabbage, lettuce, or green grass.

Watering

Have fresh, clean water in front of rabbits at all times. Clean all water bowls daily. The amount of feed a rabbit will eat is partially determined by the amount of water that is consumed. Rabbits that eat dry rations will consume more water. (A doe and her litter will drink about a gallon of water each day.) During the winter, give rabbits warm water at least twice a day. Water rabbits several times a day in hot weather.

It is helpful to treat the drinking water with household bleach to reduce bacteria and algae that form in water bowls. (A standard formula: 1 teaspoon bleach to 1 gallon of water.) See Figure 17.

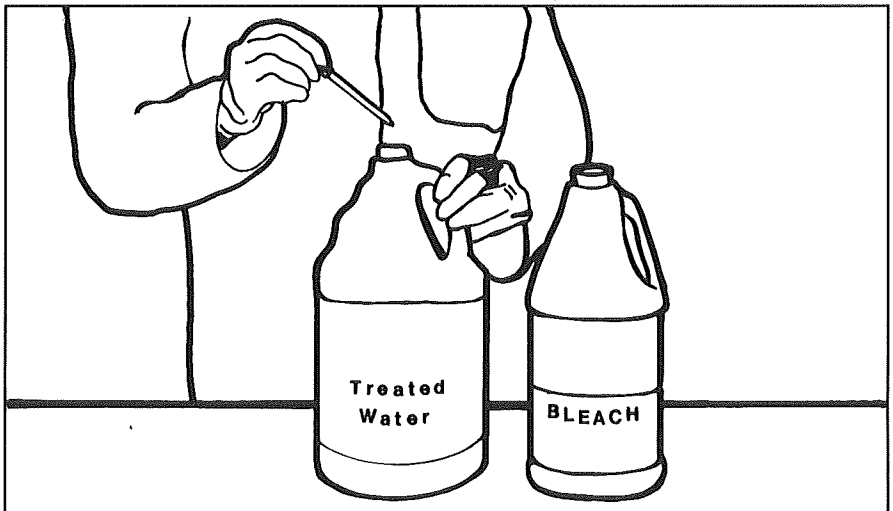


Figure 17. Well water should be treated with household bleach to remove bacteria and algae.

How to Keep Your Rabbits Healthy

The key to having healthy rabbits is prevention. Infectious rabbit diseases are caused by large invasions of disease organisms such as mites, bacteria, and viruses. These organisms usually appear and spread because of poor sanitation practices.

Proper Sanitation

Practicing proper sanitation is thus the best way to control disease in your rabbitry. Clean feeding and watering equipment daily. Clean hutches and cages at least once a week, and clean and disinfect nest boxes thoroughly after each litter. Use hot, soapy water, disinfectant, and a scrub brush. Let your equipment dry in the sun because direct sunlight is also a good disinfectant.

It is especially important that the nest box be as clean as possible. Sanitize nest boxes with water and household bleach. Use 1 part household bleach to 5 parts water. Don't rinse the solution off for 20 minutes, and then let the nest box dry thoroughly in the sun.

When loose fur on cages and other equipment becomes a problem, use a vacuum or a stiff bristle brush to remove it. The practice of burning off the loose fur or hair with an open flame is not recommended. Not only is it a serious fire hazard, but the heat that results is not hot enough to kill the disease-producing organisms hiding in the fur. Also, the method takes the protective galvanized coating off the wire, decreasing cage life, and it frightens the rabbits.

Guard against the introduction of disease in the herd, especially when a new rabbit is purchased. It is a good idea to have an extra (clean) hutch and cages where you can isolate new animals from the rest of the herd until you are certain that they are free from disease (about 14 days).

Disease can also come from using old cages or nest boxes discarded by breeders who are no longer raising rabbits. Do not use equipment from these sources until they are disinfected with bleach and direct sunlight.

If signs of disease do appear in your rabbits, remember that you should treat your rabbitry as a business enterprise that has to be managed in a reasonable and prudent manner. This means that sometimes you have to make hard decisions. You can take your sick rabbit to a veterinarian, but the rabbit may not recover and the expenses could be several times the original cost of the rabbit. It is often better to cull a sick rabbit to prevent infection of your entire herd. Be sure to dispose of all rabbits that die and to thoroughly disinfect all equipment. If you bury the rabbits, remember that they should be buried at least 18 inches deep to prevent the disease from spreading.

Common Rabbit Diseases and Conditions

If you are to become a successful rabbit breeder, you need a good working knowledge of some of the more common diseases and abnormalities that you may encounter in your rabbits. These conditions can endanger the health of your herd and/or lead to eliminations and disqualifications when you show your rabbits.

For your information, an alphabetical list of the more common diseases and conditions, along with their causes and treatments, follows. See "A Progressive Program for Raising Better Rabbits and Cavies," published by the A.R.B.A., for a more complete list of rabbit diseases and conditions.

Caked Breast

Cause: Milk production is greater than the amount of milk consumed by the young. A sign that can occur just after kindling if young are not nursing, after weaning, or after the loss of a litter.
Signs: Mammary glands are swollen, hard, and feel warm.
Treatment: Withhold pelleted feed for 72 hours. Give only hay and water. Relieve mammary glands by milking.
Prevention: Reduce the amount of feed given to the doe 24 to 48 hours before kindling. Gradually increase to full feed in 7 days.

Ear Mites (Ear Canker)

Cause: Small mites burrow deep into the ear and lay eggs.
Signs: Scabs or crusty material in the ear. Ear mites cause irritation. Infected rabbit may scratch its ear or shake its head due to irritation.
Treatment: Use a cotton swab to coat the inside of the ear with mineral oil or olive oil once a day for 3 days. Repeat this procedure in 2 weeks.
Prevention: Isolate rabbit with mites. It is helpful to place mineral oil or olive oil in the ears of every rabbit to eliminate mites that may be present without displaying signs.

Malocclusion (Buck Teeth or Wolf Teeth)

Cause: A condition that is inherited or caused by broken or missing teeth. The teeth opposite the broken or missing teeth grow excessively and/or are crooked.
Signs: Crooked teeth, elongated teeth, lower teeth overlapping the upper teeth.
Treatment: Cull rabbits from the herd.Teeth on young rabbits can be trimmed until the rabbits reach slaughter weight. Do not use for breeding.
Prevention: Do not use rabbits with malocclusions for breeding stock; cull these rabbits as soon as possible.

Mastitis (Blue Breast)

Cause: A bacterial infection in the mammary gland caused by an injury from the nest box, cage, or bite from nursing young. Condition can occur just after kindling or prior to weaning. Often preceded by caked breast.
Signs: Mammary glands are swollen, tender, warm to the touch, and discolored.
Treatment: Injection of penicillin is effective against the bacterial infection; mammary glands should be emptied by milking.
Prevention: Reduce chance of injury to mammary glands when the doe enters the nest box. Reduce feed intake to decrease the amount of milk a doe produces; this will result in less stress on the udder. Withhold feed before kindling, at weaning time, and when a doe loses her litter.

Red Urine

Cause: A normal condition due to incomplete breakdown of food nutrients in some animals.
Signs: Red-colored urine. Mostly seen in snow-covered areas, because white snow makes the condition more visible.
Treatment: None.
Prevention: None.

Snuffles (Pneumonia)

Cause: A bacterial infection in the upper respiratory system.
Signs: Sneezing, watery eyes, white nasal discharge, breathing difficulty, and decreased growth rate. See Figure 18.
Treatment: Rabbits showing signs should be isolated from the herd and treated with an antibiotic. Cull rabbits that show signs of snuffles. There is no cure for this disease.
Prevention: Practice good management by keeping facilities clean and well-ventilated.

Figure 18. Snuffles is an infection caused by bacteria in the respiratory system. A runny nose and sneezing are symptoms of snuffles.

Sore Hocks

Cause: Sores caused by thin fur pads on bottom of feet coming into contact with rough places on the cage floor. More prevalent in rabbits with increased body size due to selective breeding for larger rabbits because increased body size puts increased weight on the foot pad.
Signs: Infected sores on the bottom of the feet. Rabbits moving uneasily or sitting on crocks or other objects in the cage to reduce weight on sores. Nervous and heavy rabbits are more likely to develop sore hocks. See Figure 19.

Figure 19. Sore hocks are often caused by rough edges on the cage floor.

Treatment: Difficult to treat. A dry solid surface (hock board) can be provided for the rabbit to sit on; however, the boards can become dirty due to urination and defecation, which increases bacterial growth. Sores can be treated with astringent ointment daily until healed. Since treatment is difficult, consider culling animal from herd.
Prevention: Eliminate sharp or rough places on cage floor. Carefully select animals with well-furred, large foot pads.

Vent Disease

Cause: Infection by a spirochete organism; transmitted through mating.
Signs: Blisters, scabs, and pus in the genital area.
Treatment: Injection of penicillin or daily application of pencillin ointment.
Prevention: Check breeding animals before mating. Never use infected animals.

Weepy Eye

Cause: Inflamation of the eyelid resulting from a blocked duct between the nasal area and the lower eyelid. Can be related to respiratory problems.
Signs: Excessive discharge from the eye and matted fur under the eye. Condition is aggravated by rabbit rubbing its eyes with its front feet. See Figure 20.
Treatment: Can be treated with eye drops. Consult a veterinarian for medication and assistance in opening blocked duct.
Prevention: Practice proper sanitation and ventilation to prevent respiratory problems.

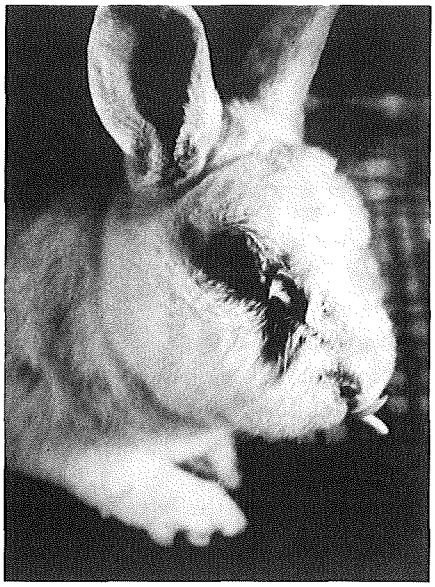


Figure 20. Matted fur at the inside corner of the eye and lower eyelid is a symptom of weepy eye.

Wry Neck

Cause: Bacterial infection of the inner ear. Possibly associated with respiratory infections.
Signs: Rabbit turns its head to one side and has loss of balance. As condition progresses, rabbits will roll completely over. See Figure 21.
Treatment: Very difficult to treat; culling is the best solution.
Prevention: Proper ventilation.

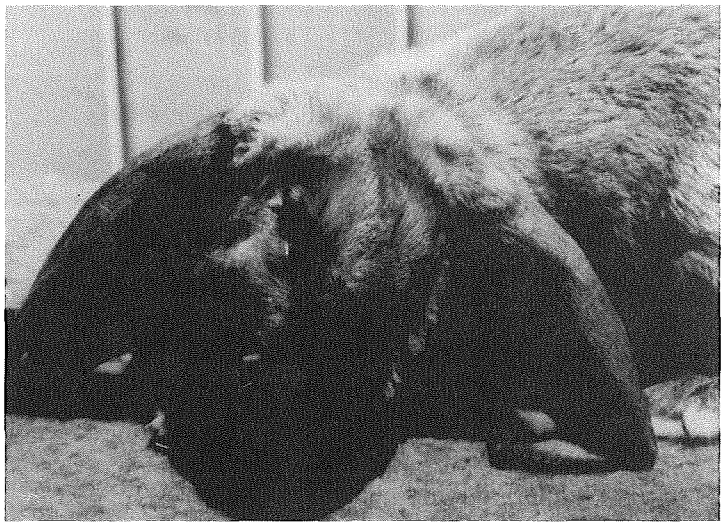


Figure 21. Wry neck is caused by an inner ear infection and not by a skeletal deformity. A rabbit with wry neck should be destroyed before others are infected.

How to Manage the Breeding of Rabbits

Age to Start Breeding

The age at which rabbits are sexually mature and are ready to breed for the first time varies among the breeds. General statements about the age at which animals might be bred do not always apply to all rabbits in any given breed. Thus, ages are mentioned here as a guide only. In general, small breeds such as the Dutch or Polish can be mated at 4 1/2 to 5 months of age. Medium-sized breeds like the Californian and New Zealand can be bred at 6 to 7 months of age. Giant breeds such as the Flemish and Checkered Giant can be bred when 9 to 12 months of age.

Does do not display an obvious heat cycle. Their eggs are not shed (ovulation) at regular intervals, as with other domestic animals. Instead, ovulation is stimulated by mating.

There are physical signs that signify when a doe will be receptive to mating. These include restlessness, rubbing her chin on the cage or equipment, and a moist, slightly swollen, vulva (sex organ).

Bucks mature more slowly than does. As bucks mature, they can be used 3 to 4 times a day, but generally they should be rested for 5 to 7 days after a vigorous day of mating.

Time to Breed

Table 2 is a breeding chart that will help you plan when to breed your rabbits so that they will be ready for show. It will also tell you when your kits will be born. To use the chart, you must first know the dates of the show at which you would like to exhibit. With that information, you can work back in the chart to determine when to breed your rabbits.

For example: You would like to exhibit Juniors at a show that is held during the last week in July. Look down in the "Juniors" column on the chart until you find the last part of July. (It will be listed as "July-Aug.," meaning the last half of July and the first half of August.) Follow this line over to the column entitled "Breed In." It tells you that you are to breed in February. The gestation of a rabbit is normally 28 to 32 days.

Table 2. Breeding Chart.

Breed In	Pre-Jr. Meat Pen	Juniors	Intermediates	Seniors
Jan.	April	June-July	Aug.-Sept.	Oct.
Feb.	May	July-Aug.	Sept.-Oct.	Nov.
Mar.	June	Aug.-Sept.	Oct.-Nov.	Dec.
April	July	Sept.-Oct.	Nov.-Dec.	Jan.
May	Aug.	Oct.-Nov..	Dec.-Jan.	Feb.
June	Sept.	Nov.-Dec.	Jan.-Feb.	March
July	Oct.	Dec.-Jan.	Feb.-Mar.	April
Aug.	Nov.	Jan.-Feb.	Mar.-Apr.	May
Sept.	Dec.	Feb.-Mar.	April-May	June
Oct.	Jan.	Mar.-Apr.	May-June	July
Nov.	Feb.	Apr.-May	June-July	Aug.
Dec.	Mar.	May-June	July-Aug.	Sept.

Breeding Schedules

The condition of the doe is important in any breeding program. If she is in good flesh, she can be mated. If she is thin, it is best to wait until she is in good condition before rebreeding her.

Female rabbits will be receptive to mating 72 hours after kindling. This procedure is recommended for does that lose their litters during or shortly after kindling.

On the average, a healthy doe will have a productive life of about 3 years. With the breeding schedules below, a healthy doe can be expected to raise 12 to 15 litters during her productive life.

Four Litters Per Doe Per Year

Four litters can be produced annually by breeding the doe on the day her litter is weaned (at 8 weeks/ 56 days). Following this schedule, she will produce a new litter about every 88 days. (Birth to weaning: 56 days + mating to kindling: 32 days = 88 days)

Five Litters Per Doe Per Year

A doe can produce five litters each year if she is bred when each successive litter is 6 weeks/42 days old. This means that, with a weaning age of 8 weeks, the doe will have a rest period between litters of about 17 days. Under this schedule, the doe will produce a new litter about every 74 days. (42 + 32 = 74)

Breeding schedules to produce in excess of five litters per year can be used to maximize meat productivity and doe efficiency, but these require that litters be weaned earlier than 8 weeks of age. Housing and feeding programs for the early-weaned young would need to be modified. If you decide to put your rabbits on such an accelerated breeding schedule, ask an experienced breeder for advice.

Mating Procedures

You should always take the doe to the buck's cage for mating because many does are possesive of their cages. (They can become aggressive in defending their territory and injure bucks that are placed in their cages.) If the doe is receptive when she is put in the buck's cage, mating will occur within 5 minutes, after which the buck falls over on his side. After mating, return the doe to her cage immediately. Five to eight hours later, breed the doe a second time to the same buck to insure maximum litter size.

Palpating

Palpating is a method of determining by touch whether or not your doe is pregnant. With this method you do not have to wait through the whole gestation period (pregnancy) to find out if your doe is pregnant. You should palpate your doe 14 days after mating. If you wait longer than 14 days, the task becomes more difficult and you risk injuring the feti (unborn young).

The goal of palpating is to feel with your fingers and thumb the developing embryos in the horns of the doe's uterus. The two horns of the uterus carry the embryos. They feel like chains of marbles on each side of the centerof the doe's abdomen. If you do not feel the embryos, that means that the doe is not pregnant. You should rebreed non-pregnant does immediately.

Here's the way to palpate your doe. Place the relaxed doe in front of you with her feet down and facing you. Grasp her ears and a fold of skin from the shoulders with one hand. Place your other hand under the body between her hind legs and just in front of her pelvis. Place your thumb on one side and your forefinger on the other side of her uterine horns. Be careful not to apply excessive pressure; just slide your fingers along and the embryos should slide gently between your thumb and forefinger. See Figure 22.

Ask your leader or an experienced rabbit breeder for a demonstration and help as you learn to palpate your does.

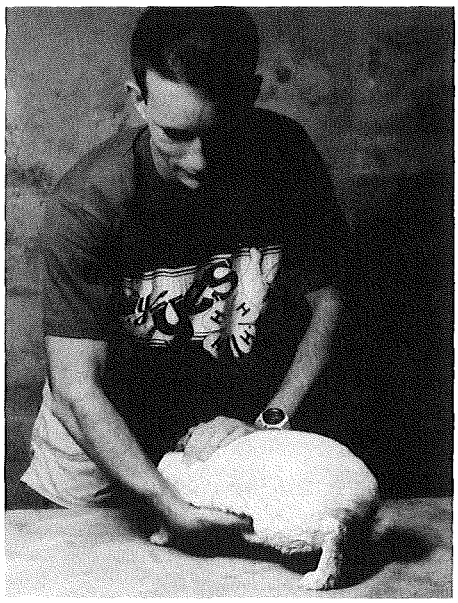


Figure 22. Palpation is used to determine pregnancy. Restrain the doe by using one hand to hold the fold of skin over her shoulders. With your other hand, gently feel her abdomen, moving your fingers back and forth along her uterine horns. The embryos (developing kits) will feel like a chain of marbles.

Kindling

The birth process in rabbits is called "kindling." The care of the doe at this time is very important. The kits are usually kindled 28 to 32 days after the buck and the doe are mated.

Plan to put a nest box in the hutch on the 27th day after mating. If the doe does not give birth by the 34th day, remove the nest box and rebreed her. If the doe does not become bred after the second mating, think about culling her. Culling is the process of eliminating the least desirable rabbits through selling or slaughter.)

Place a small amount of absorbent material such as pine wood shavings in the bottom of the nest box before placing the nest box in the cage. Place the nest box in a clean corner of the back of the cage. Then, place several large handfuls of good, clean straw in the cage and nest box. The doe will move this material as she prepares her nest. It is best to let her handle the birth as much as possible.

Kits are born without fur, and their eyes are closed. See Figure 23. (Do not be disappointed by their appearance; it will be a while before they look like the "fluffy little bunnies" you expect.) To make up for the kits' lack of fur, the doe will pull out some of her own fur to insulate the kits (keep them warm). This is normal behavior and is not a cause for alarm. In the winter, leave the fur in the nest box, but in warmer weather, remove the excess fur so that the kits do not become too warm. Save this extra fur in a clean paper bag to use when does do not provide enough fur for their litters.

During kindling, the doe is often thirstier than usual. Provide her with a good supply of clean water. If a doe does not have enough water at this time, she may kill her kits or desert them soon after birth.

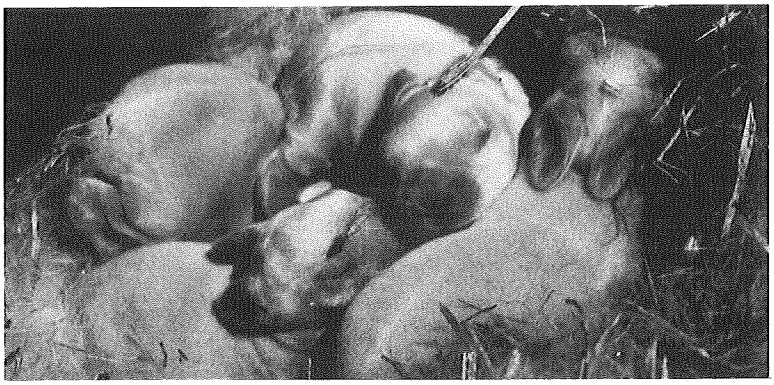


Figure 23. Kits are born without any fur, and their eyes are closed.

Do not disturb the doe while she is giving birth. Make sure that dogs, cats, and other predators do not disturb her. Predators can frighten the doe into jumping around in the nest box and crushing her kits or even into eating them.

Sometimes you will see kits that have gotten outside of the nest box. Gently return them.

Within 24 hours of kindling you should examine the nest box to find the kits that should be culled. Discuss this procedure with an experienced breeder. Here is a recommended procedure to follow:

1. Remove the nest box from the cage.
2. Set the box on a solid surface and part the bedding gently.
3. Look for dead young, runts, or young with missing limbs or deformities. Remove them from the nest and dispose of them in a humane way.
4. Put the bedding back in place and return the nest box to the cage.

The day the doe kindles, reduce her amount of feed. Gradually return to full feed by the 7th day. During the winter months of freezing weather, it is a good idea to give the doe lukewarm (not hot) water. The more water she drinks, the more milk she will be able to produce for nursing her litter.

Litter Size

Most does have eight nipples, which limits the number of kits she can nurse. Some breeders breed two does on the same day so that when the litters arrive, they can be evened out. If one doe has four kits and the other has ten, three can be taken from the litter of ten and put with the litter of four. That way, there is a better chance that all the kits will be nursed and none will be so small and weak that they have to be culled.

Remember to mark the rabbits that are transfered to another doe for pedigree information. This can be accomplished by using a small ink dot in the ear for kits and a permanent tattoo when the rabbits are between 3 and 6 weeks old.

Tattooing

An ear tattoo is the accepted method of identification for rabbits in the United States. It is permanent, easily and quickly accomplished, and results in no disfiguration. Rabbits should be tattooed at the time they are separated from the doe. This is after they have left the nest box and before they are weaned.

Ask your rabbit project leader or experienced breeder to help you with tattooing your first litters. They may let you use their tattooing equipment to get started.

Tattoo marks should be placed in the rabbit's left ear. (Note: the rabbit's left, not yours). Plan a marking system that will help you identify your rabbit by simply looking at its tattoo. For example: use even numbers in does and odd numbers in bucks. You may want to use a combination of letters and numbers to help you tell when the rabbit was born and which litter the rabbit was from. See Figure 24. When tattooing your rabbits, make out pedigrees for all of them.

The rabbit's right ear normally is reserved for use by an A.R.B.A. registrar, who places a permanent A.R.B.A. tattoo number in the right ear of the rabbit.

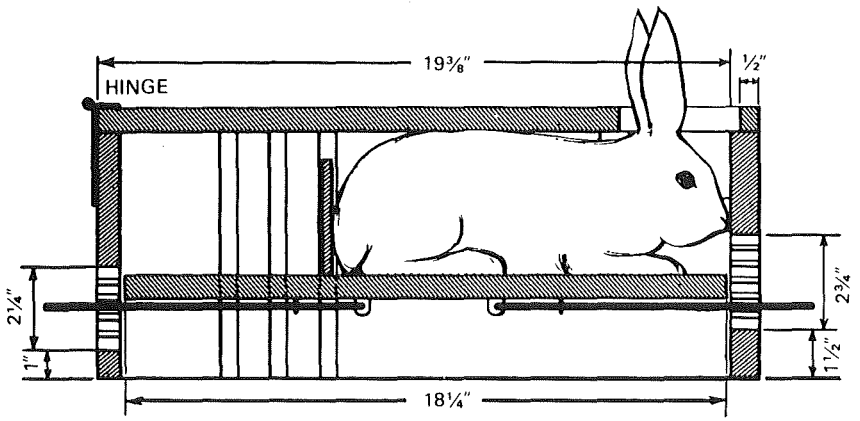
When tattooing a rabbit, you will have better results if you clean the wax from the rabbit's ear with a cotton swab soaked in alcohol. Hold the rabbit on a level surface, or you may keep the rabbit still by using a tattooing box that is designed to hold rabbits of various sizes. See Figure 25. If a tattooing box is not available, have another person hold the rabbit securely. It may be helpful to wrap a towel completely around the rabbit, leaving just the ears exposed for tattooing. Tattoo with caution in hot weather because the rabbit may overheat.

Figure 24. An ear tatoo is a permanent way of identifying rabbits. This tatoo is properly positioned in the rabbit's left ear.

Weaning

Young rabbits begin to come out of the nest box when they are 15 to 20 days old. Weaning can take place when the young are 4 to 8 weeks old. Weaning time depends on the breeding schedule used and the breed of rabbit. Consult an experienced breeder for advice on weaning.

Figure 25. Here's a side view of a tatooing box, one of the pieces of equipment you might want to use. The spring-type holders tacked to the lower side of the movable floor hold the rabbit firmly toward the top of the box. A movable cross partition holds the rabbit toward the front. Blocks of wood on each side hold the rabbit's head in the center of the hole at the top of the box.



Determining the Sex of Young Rabbits

If you separate the doe from the litter without putting the kits in individual cages, be sure it is the doe you move. Kits go longer without fighting if they stay in their original cage than if you move them to new quarters. Do not leave bucks together when they are over 2 months of age.

Separate the bucks from the does at, or shortly after, weaning. Young bucks will soon begin to fight, and young does might be bred by a litter-mate at an earlier than desirable age.

To tell the difference between a buck and a doe, press the sexual aperture (opening) open. To do this, turn the animal on its back and gently restrain it. With the index finger, push the tail down and toward the rabbit's back. It is important to keep the tail steady. With the thumb of the same hand in a position slightly above the sexual aperture, apply just enough pressure to expose the reddish mucous membrane. In a male, the sexual aperture will form a round protrusion. In a female, it will form a slit. See Figures 26a and 26b.

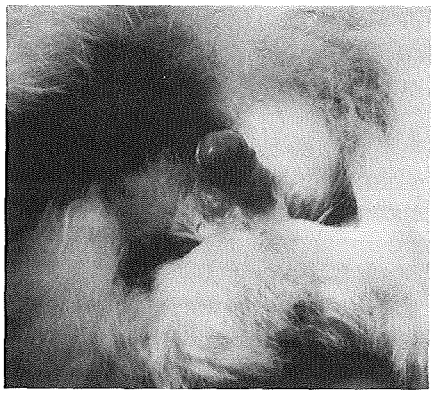


Figure 26a. In a male, the sexual aperture forms a round protrusion.

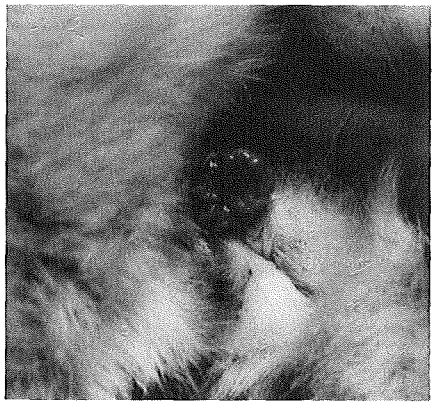


Figure 26b. In a female, the sexual aperture forms a slit.

Caring for Young Rabbits

Young rabbits should have access to feed and water at all times so they will grow properly. If you plan to sell any young, be sure to check each animal carefully and represent them truthfully to prospective buyers. Do not sell rabbits until they are at least 3 months old (unless you are selling to a laboratory that needs younger rabbits). Always indicate the kind of feed and feeding program you use. This allows the new buyer to either use the same feed or to change the rabbits' feed gradually.

Learning About Breeding Programs and Genetics

After you have some experience with breeding and raising rabbits, it is time to think about improving your rabbit herd. One way to improve is to learn about different breeding programs; another way is to learn about genetics, the study of heredity.

Breeding Programs

Four different breeding programs are commonly used by rabbit breeders to improve their herds.

Outbreeding: The mating of unrelated animals of the same breed.

Linebreeding: The mating of animals that are both descended from the same animal but are related several generations back. For example: first cousins, uncle to niece, or aunt to nephew.

Inbreeding: The mating of animals that are closely related. For example: parent to offspring or brother to sister.

Crossbreeding: The mating of animals of different breeds.

Each breeding system has advantages and disadvantages. Many rabbit breeders practice some form of line breeding. For more information about breeding programs and the advantages and disadvantages of each system, see "A Progressive Program for Raising Better Rabbits and Cavies" published by the A.R.B.A., or talk to an established breeder.

Genetics

For your purposes as a 4-H rabbit breeder, genetics means the study of your rabbits' heredity. A basic understanding of genetics will help you develop a good breeding program.

The bodies of your rabbits, like those of all animals, are made of millions of microscopic building blocks called "cells." Each cell contains a center portion called the "nucleus." The nucleus contains chromosomes, which occur in pairs. In the rabbit, each cell nucleus contains 22 pairs of chromosomes.

Chromosomes are composed of tiny, particle-like structures called "genes." It is often helpful to think of chromosomes as a string of beads, with each bead being a gene. There are many genes on each chromosome. Because chromosomes occur in pairs, so do genes.

Each gene bears a special chemical code that represents a particular characteristic of the animal or offspring. In other words, genes contain the specific information that determines how your rabbit looks and behaves and how its body functions.

Body cells are of two types, somatic cells and germ cells. Somatic cells make up the tissue and organs of the body, while germ (sex) cells are responsible for reproduction. When a germ cell containing 22 pairs of chromosomes divides, the result is a cell with only one set of 22 chromosomes. In the male, the resulting cell is called a "sperm cell." In the female, the cell is called an "egg." Each cell contains its own set of genetic information in its own set of genes.

During mating, the sperm and egg cells unite to form a new cell complete with 22 pairs of chromosomes and a new combination of genetic information. Each parent has contributed one-half of the genetic information to its offspring. By following the "instructions" in the genes, the new cell divides and grows, first into an embryo, and eventually into a kit.

Because of this, the offspring contains either a mixture or blending of the characteristics of the parents. Whether certain characteristics are expressed in the offspring depends on several factors.

Certain genes may hide the effect of other genes. These genes are called "dominant." The gene being hidden is referred to as "recessive." Recessive genes are important in rabbit breeding. Defects such as buckteeth are due to recessive genes. See Figure 27. It is important to know how to identify those of your rabbits carrying recessive genes. An excellent discussion of the recessive gene problem appears in the A.R.B.A.'s "Official Guide to Raising Better Rabbits." This publication also has a guide to a linebreeding program.

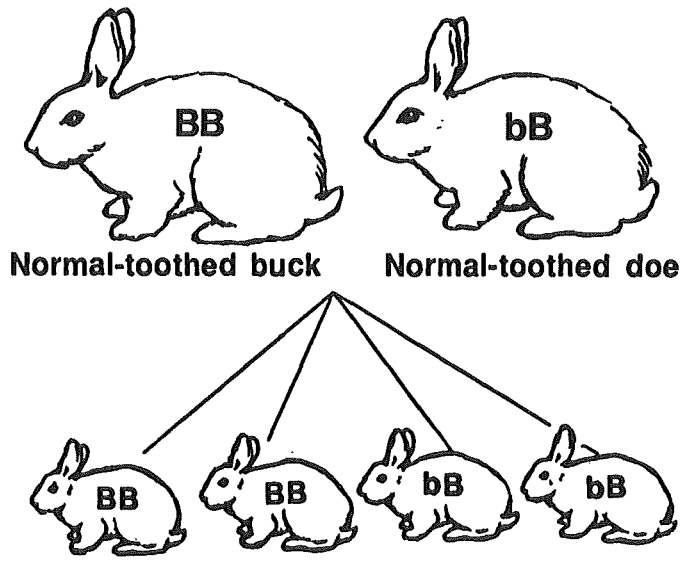


Figure 27. This diagram shows the offspring from the mating of a normal-toothed buck that does not carry the recessive gene (b) with a normal-toothed doe that does carry it. Although buck-toothed offspring do not appear, the buck-toothed gene (b) has not been eliminated.

Keeping Good Records

Records are an important part of raising rabbits. Records represent the "backbone" of your rabbitry. Accurate records of income and expenses are important so that you know your financial situation. It is also important to keep a record on each doe and buck. Records like this show quickly which does and bucks are producing large, healthy, fast-growing young rabbits showing the desirable qualities of their breeds. Accurate records also help you to make unemotional decisions about which rabbits to keep and which rabbits to cull.

"Indiana 4-H Rabbit Records," 4-H 517, describes the records necessary to a successful rabbit-breeding operation and explains how to keep them. Good records include the following items.

Beginning inventory.
Includes all rabbits, buildings, equipment, feed, and supplies on hand at the start of the year.

Total operating expenses.
Includes the cost of buildings and equipment, feed and supplies, veterinary services and supplies, rabbits purchased, registration fees, show supplies, transportation, advertising, etc.

Total marketing receipts.
Includes the value of all rabbits or equipment sold and all show premiums received.

Closing inventory.
Includes all rabbits, buildings, equipment, feed, and supplies on hand at the close of the year.

Doe performance records
(for each doe).
Includes the doe's age, when she was bred, any breeding problems, when she was palpated, when she was kindled, the number kindled, the number raised, litter weights, and when kits were weaned.

Buck performance records
(for each buck).
Includes the buck's age, the dates when the buck was used for service, the number of does bred, the number of does rebred, litter size, and growth records of offspring.

Growth records of offspring are important. The following list explains the ages at which the growth of young rabbits should be measured and why this information is helpful.

- 3 weeks of age - Weigh each rabbit and record weight. The average is a good indication of the lactating ability of the doe. Good does are the foundation to superior offspring.
- 6 weeks of age - Weigh each rabbit and record weight.This helps identify outstanding rabbits.
- 8 weeks of age - Weigh each rabbit and record weight. Make first selections for herd replacements at this time. For commercial meat-type rabbits, all animals should be ready for fryer marketing.

As you become a more experienced rabbit breeder, your records should include a herd book and a show record. A herd book includes a complete pedigree of each rabbit and a performance record of service bucks. A show record includes dates and places of shows entered and information on classes and awards received. Contact the A.R.B.A. for more information on keeping herd books and show records.

Raising Rabbits for Profit

As your rabbitry grows in size, you will want to find a market for your rabbits. There are several different ways to market your rabbits. You can raise and market them for breeding stock, for meat and fur or wool, for laboratory use, and for sale as pets.

Whether or not you make a profit raising rabbits often depends on how well you manage your business, what you learn about the market in your particular area, how well you reach that market, and how dependably you serve it. Following are some ideas to consider when you are trying to decide on a market for your rabbits.

Breeding Stock

You may have the opportunity to sell breeding stock. Success in this area depends on your ability to breed and raise top-quality animals and to keep accurate, complete records. Selling top-quality animals will give you a good reputation with customers. Attending rabbit shows and showing your rabbits is a good way to get your name known and to make contacts.

Meat

If you would like to raise rabbits for meat production and you are sure you can provide a steady supply, check locally owned groceries, neighbors, and friends to see if they have a need for rabbit meat. You might also consider placing a small ad in your local newspaper.

Domestic rabbit meat is all white meat with a delicate flavor. The meat has very little bone and fat content. It is an excellent source of protein in our diets and contains minimum cholesterol.

To help you market your rabbit meat, Table 3 compares rabbit meat to other meats in relation to protein, fat, moisture, calories, and cholesterol.

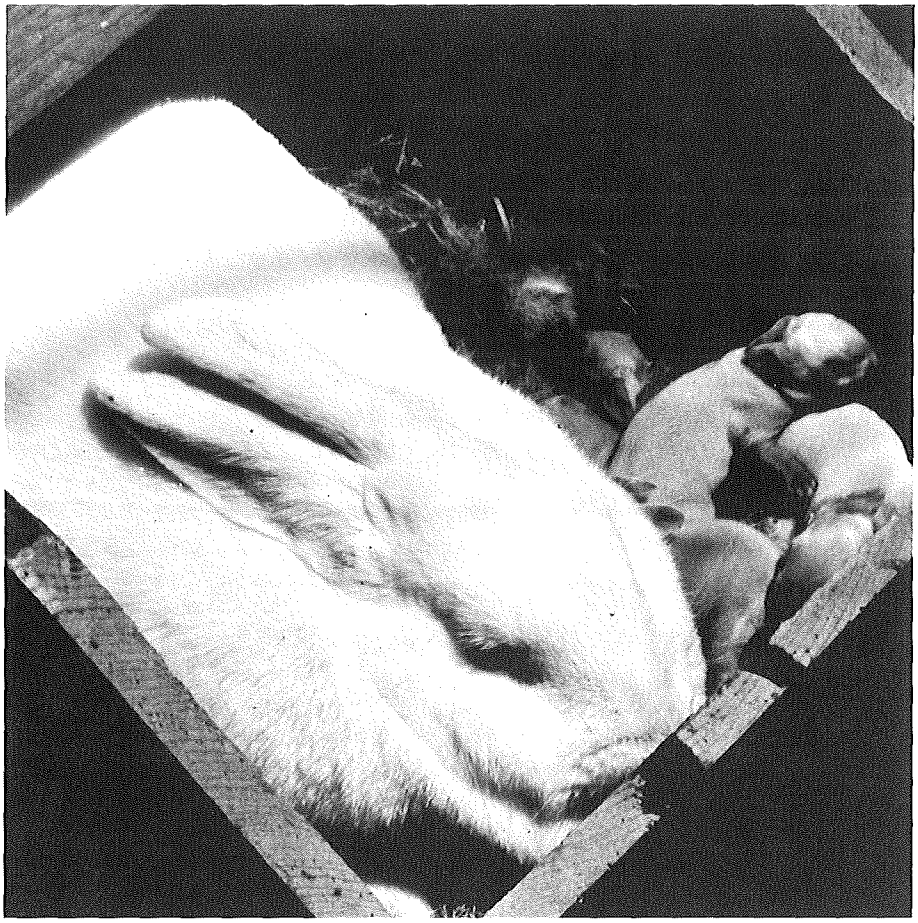
Fur

The cash market for tanned fur is limited; however, hides can be tanned for use in making novelty and craft items at home. Contact the A.R.B.A. for more information on this topic.

Table 3. Nutritional Values of Common Meats.*

	% Protein	%Fat	% Moisture	Calories per lb.	Cholesterol mg/100g**
Rabbit	20.8	10.2	67.9	795	164
Chicken	20.0	11.0	67.6	810	220
Veal (med. fat)	18.8	14.0	66.0	910	--
Turkey (med. fat)	20.1	20.2	58.3	1190	--
Lamb (med. fat)	15.7	27.7	55.8	1420	250
Beef (good)	16.3	28.0	55.0	1440	230
Pork (med. fat)	11.9	45.0	42.0	2050	230

*From U.S.D.A. Circular #549, 1963
**Research Study (1988) Lukefahr, Nivosu, Rao, and Chawan - Alabama A. & M. University, Normal 35762.



Wool

The Angora rabbit is raised for its wool. If you want to raise Angoras, you should first learn where the wool can be marketed for a profit. There may not be a local market; therefore, you will have to ship the wool. You should become familiar with the process and understand what is involved before you start to raise Angoras for wool production. It is especially important to visit with Angora breeders before starting out on your own.

Laboratory Use

Some laboratories buy rabbits for research purposes. You will need to check in your area for research facilities that buy rabbits. In most states, license for this is required from the Animal and Plant Health Inspection Services of the United States Department of Agriculture.

Pets

Pet stores may be a good place for you to sell rabbits that you have in surplus or that do not have proper color or markings. Again, you will need to check the opportunities available to you in your area. The yellow pages of your phone book would be a good place to start.

How to Process Rabbits

If you plan to raise rabbits for meat production, you will need to learn how to process rabbits. Ask your club project leader and/or an experienced breeder to give you and your parents a demonstration. People with experience in processing rabbits can give you pointers, answer questions, and help prevent accidents. See the illustrations in the "Steps in Rabbit Processing" section.

Equipment and Tools

Getting the tools and equipment together is simple. Nail a board to a wall or fence at about head level. Screw in two hooks with sharpened points about 8 inches apart. Put a table about 30 inches high, 2 feet wide, and 3 feet long near the hooks. Under the hooks place a pan or bucket to catch the blood, intestines, head, and feet.

Put two buckets of cool, clean water on the table. One bucket is for washing blood from hands and knives; the other is for washing and cooling the processed rabbits.

If you have found a market for pelts, have several wire stretchers ready. (Wire stretchers are available from most hardware or hunting and trapping supply stores.) On the table have clothespins handy for fastening the hides to the stretchers.

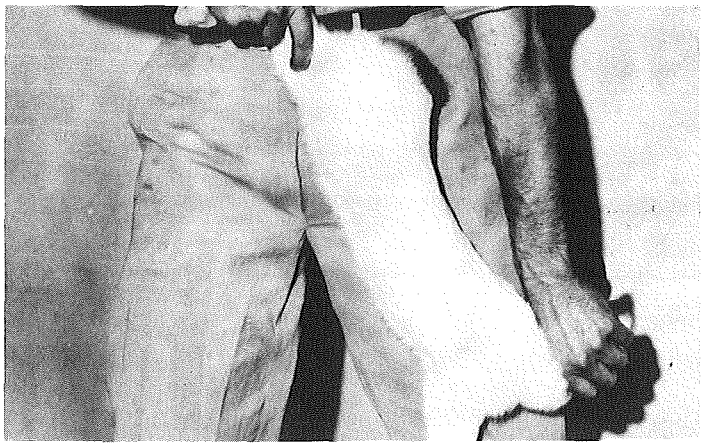
You can use a simple carrying box to hold the rabbits you are going to process.

You need two knives. One should have a narrow sharp, 3-inch blade, and the other should be a boning knife with a medium-width, sharp blade 5 to 6 inches long. Keep both knives very sharp.

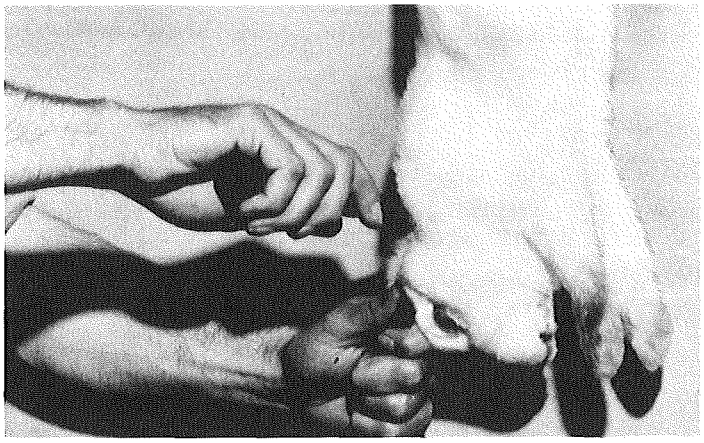
Processing Rabbits for Market

The illustrations in the "Steps in Rabbit Processing" section on the next three pages will help you when you first try to process rabbits by yourself. With practice you will soon do the job efficiently. Eventually you will be able to process a rabbit in just a few minutes.

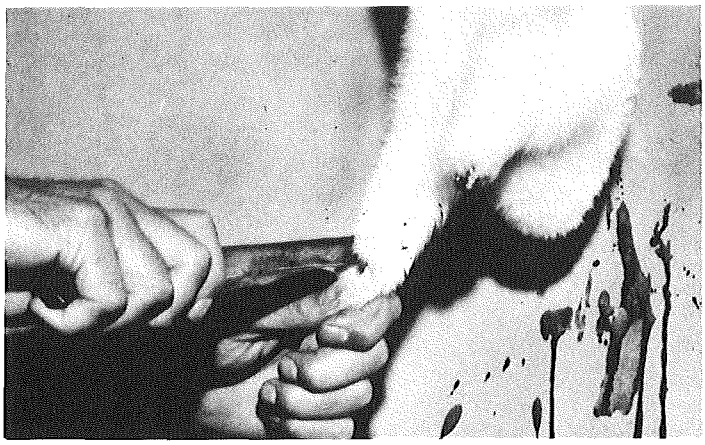
Steps in Rabbit Processing



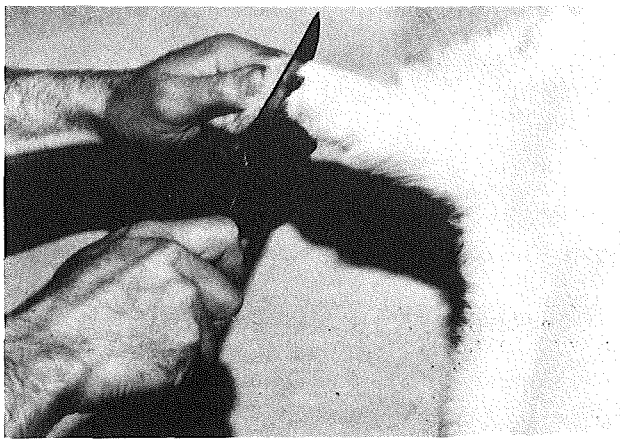
1. Stun the rabbit by dislocating its neck. Press the base of your thumb against the back of the rabbit's head. Bend its head back as far as possible. Pull until you feel the head break away from the neck.



2. Hang the rabbit by its left leg and immediately cut off its head. Cut close to the head and through the place where the head was broken away from the neck.

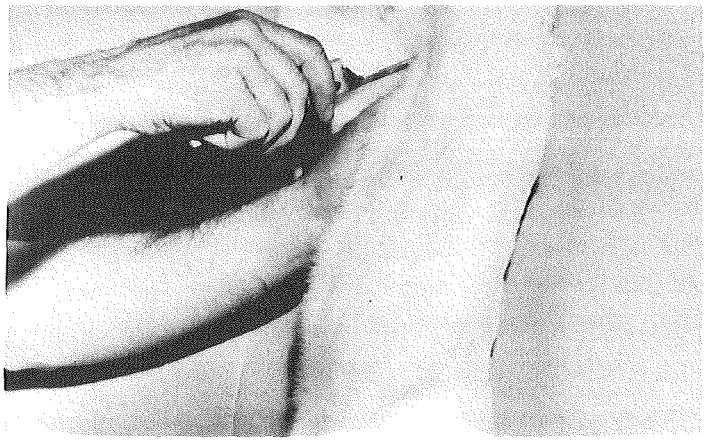


3. Cut off both front feet with a boning knife.

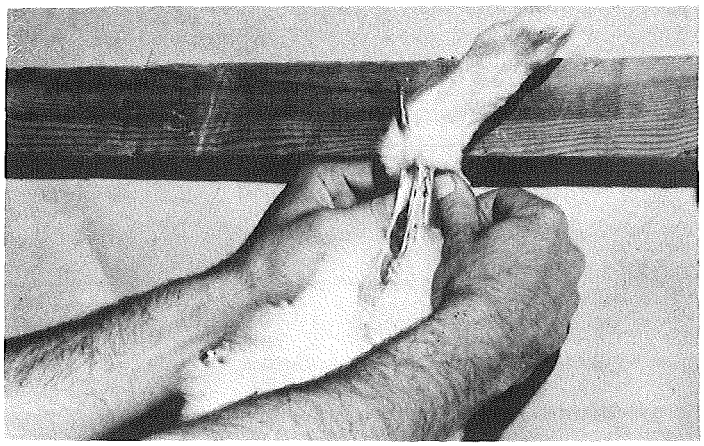


4. Cut off the free hind foot.

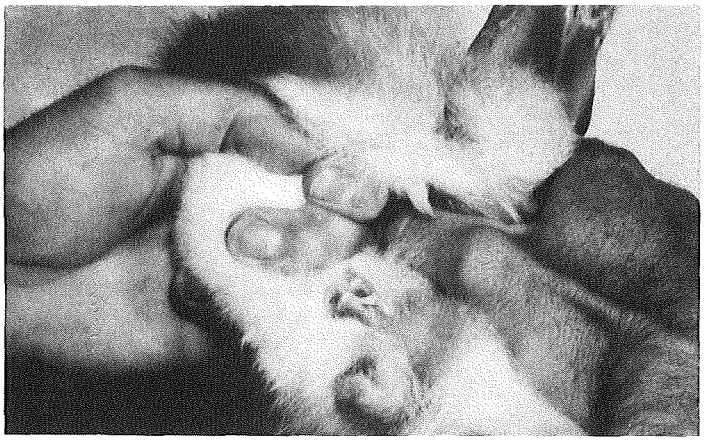
Steps in Rabbit Processing



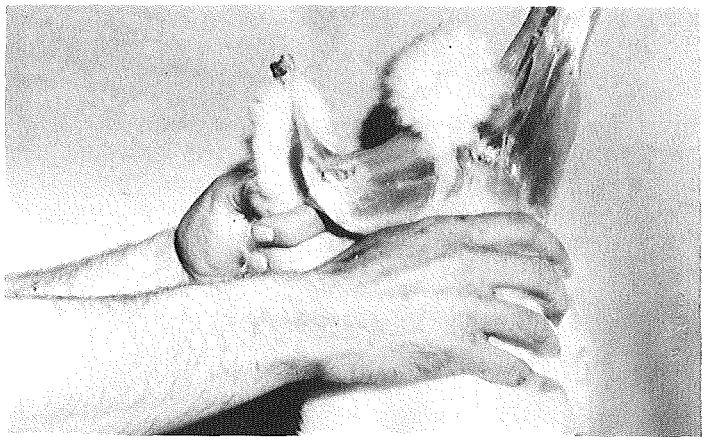
5. With the other knife, slit the skin up the inside of both hind legs.



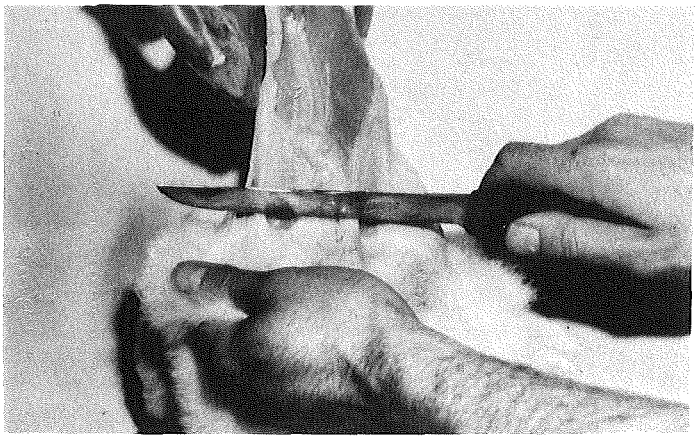
6. Tear the hide away from the hind leg on the hook.



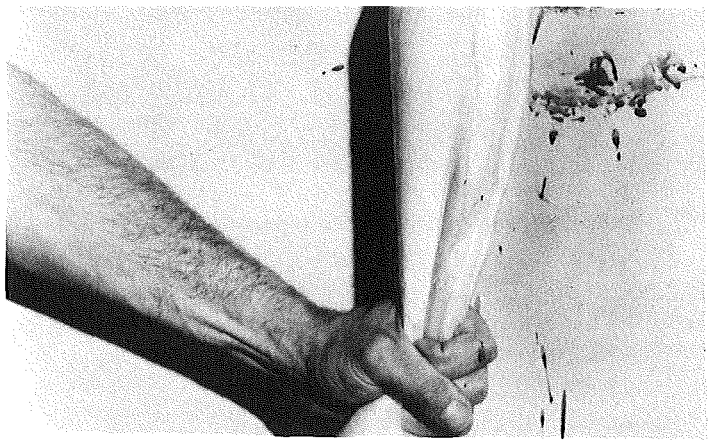
7. Tear the hide from the tail and vent by working your fingers between the hide and the body ahead of the tail and over the rump.



8. Force your fingers between the hide and the body, and pull the hide from the free hind leg.

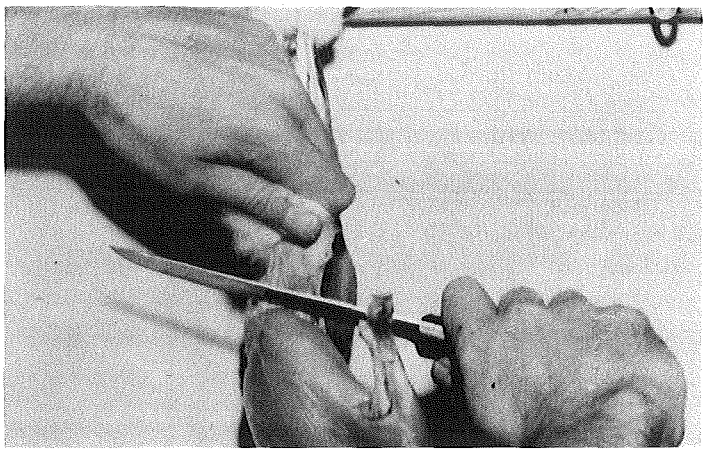


9. Cut as shown, leaving the fat on the flanks, not on the pelt.

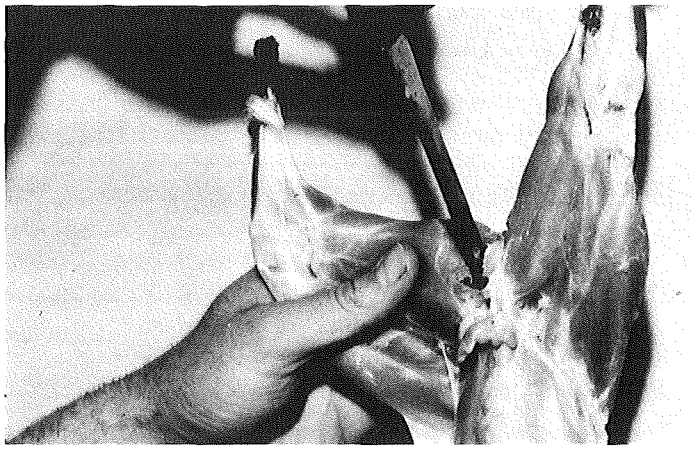


10. As soon as you can hold the whole pelt with one hand, remove the pelt with one strong pull. Dry the skin indoors.

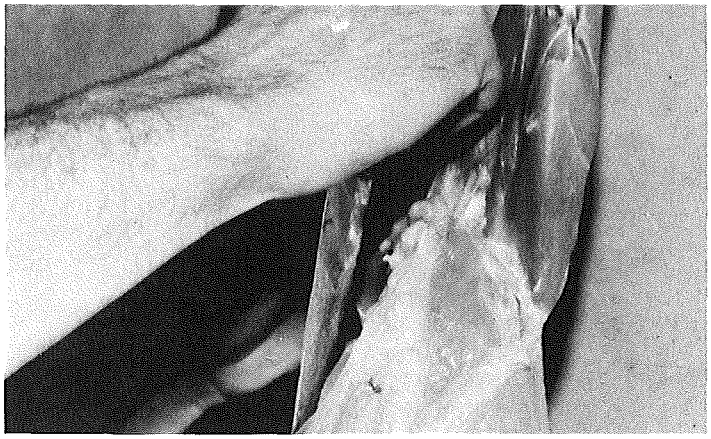
Steps in Rabbit Processing



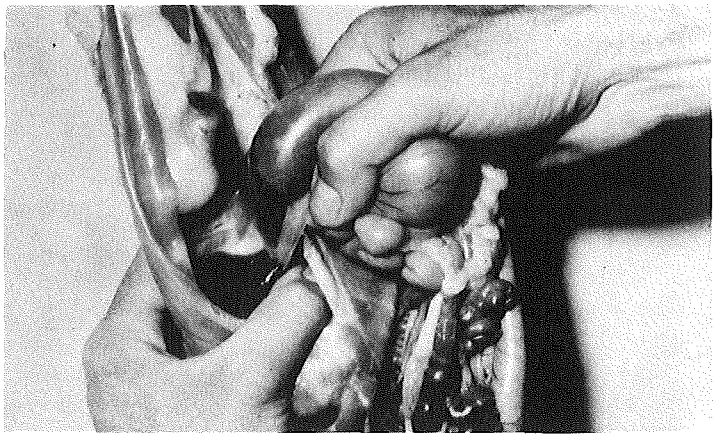
11. Cut off the tail.



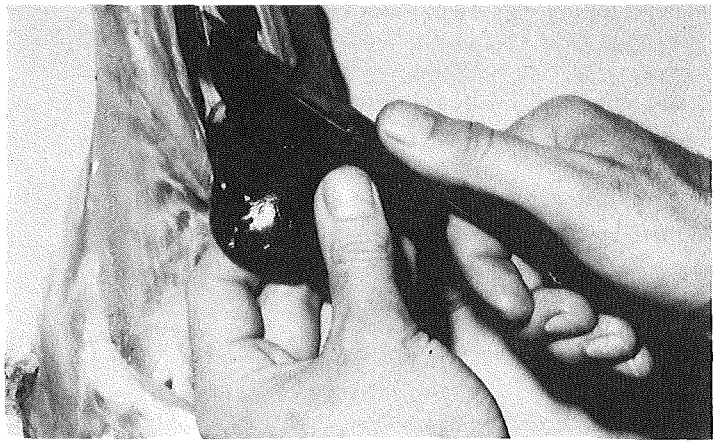
12. Cut the pelvic bone between the hind legs by inserting the knife from above and prying it out.



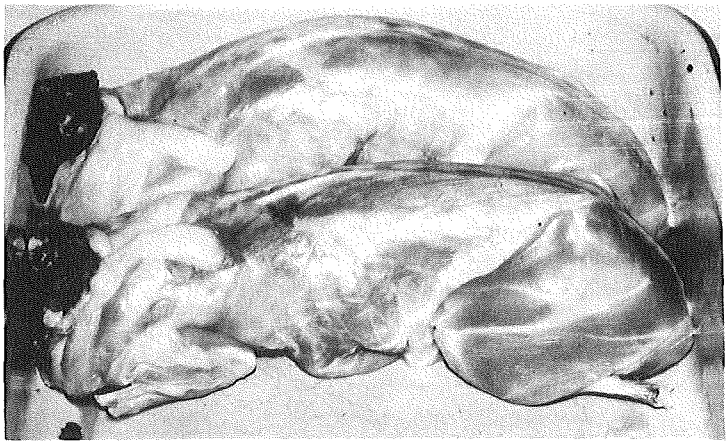
13. Slit down the belly, being careful not to cut the bladder, intestines, or stomach.



14. Pull out the insides by grasping the stomach and holding the liver in place with the thumb of your other hand. Leave the kidneys, liver, heart, and lungs in place.



15. Carefully remove the gall bladder without cutting or breaking it. Do not let the bitter green bile of the gall bladder spill on the meat.



16. Wash the carcass in cold water. It may be left in cold water for 15 minutes for cooling. Remove and place in a pan or wire basket in a natural position.

How to Prepare Rabbits for Show

Clean rabbits in top condition win rabbit shows. This means that preparing for show is something that starts as soon as you acquire your rabbits. If you have kept your hutches and cages clean, given your rabbits good daily care, and protected them from direct sunlight to prevent their fur from becoming bleached out, you have already taken a big step towards success.

Selecting and Grooming

The next step is to carefully inspect your rabbits to select those you are going to show. (The next section of this manual, "Rabbit Show Standards," lists the most common faults you are likely to find in your rabbits and also lists the characteristics or conditions that will lead to elimination and disqualification.)

You must also be sure of the sex of any rabbits you are going to show, because sex is one of the things that determines the class in which you will enter your rabbits. See the section of this manual titled "Determining the Sex of Young Rabbits." The other factors that determine class are the age, weight, variety, and breed of your rabbits. Be sure to review A.R.B.A.'s "Standard of Perfection" for your particular breed so that you will be familiar with the points on which your rabbits will be judged.

Begin grooming the rabbits you have selected at least 6 weeks before show time. Grooming should be done in the cool part of the day to prevent your rabbits from getting too hot. A small table covered with a carpet remnant can serve as a grooming place. For the first few days of grooming, moisten your hands and rub them through the fur until it is damp. Once the fur is good and damp, gently and repeatedly stroke your rabbit from head to tail to remove loose fur. This may bring about molt, but it's better for the rabbit to molt then instead of at show time. There will be plenty of time for the fur to grow back.

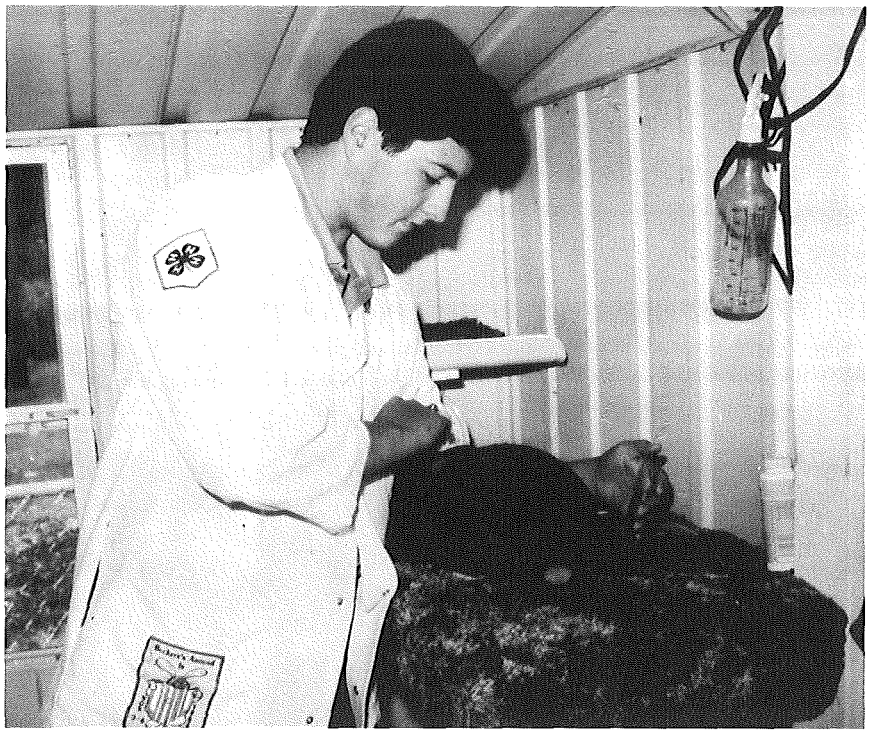


Figure 28. Prepare for show by grooming your rabbit. Stroke its fur from head to tail.

After the first few days of actual grooming, always stroke your rabbits from head to tail. Stroking your rabbits daily this way will make their fur glossy and tight. Do not stroke your rabbits' fur backwards (from tail to head), because this can cause their guard hairs to break. See Figure 28.

Daily grooming not only improves the appearance of your rabbits, it also tames them and makes them easier to handle at the show. As you are grooming them, place your rabbits in the preferred position for their breed and encourage them to stay in that position. Because different breeds have different show positions, talk to someone familiar with your breed to find out how best to position your rabbits for show. It's also a good idea to play a radio near your rabbits' hutch. This will help them to get used to voices and to the extra noise they will hear at shows.

Talk to older 4-H'ers, junior leaders, and your 4-H leader to learn more about how to prepare your rabbits for showing at county and state fairs. They are there to help you, and you can benefit from their experience.

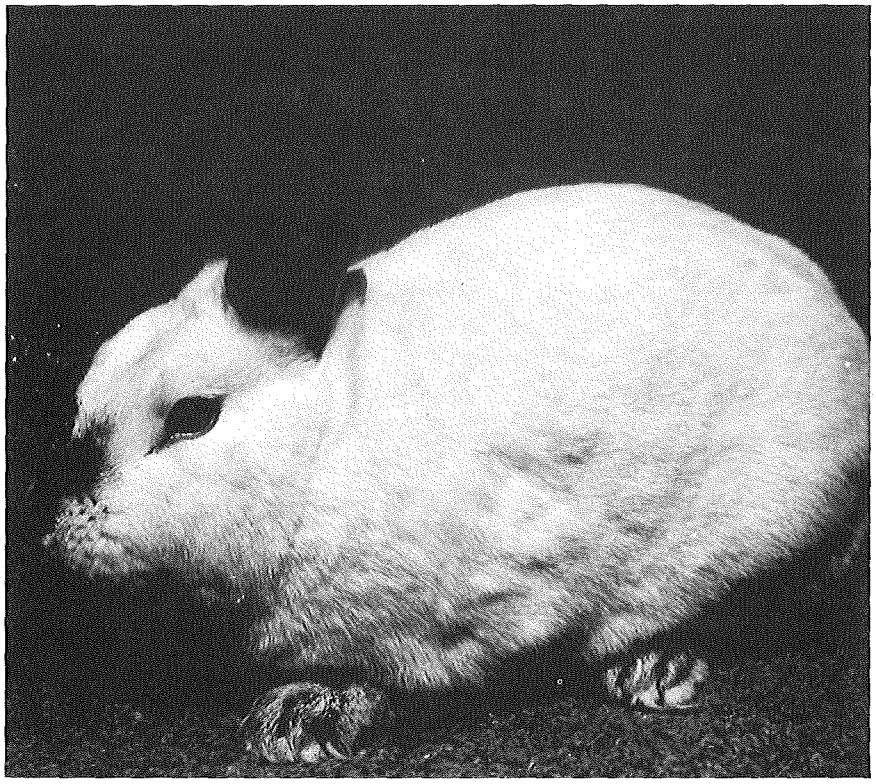
Rabbit Show Standards

The following information on standards is taken from the A.R.B.A.'s "Standard of Perfection."

General Faults - All Breeds

Faults are conditions or characteristics that are not acceptable. They will generally result in lowered show placings. A list of the most common faults follows.

- Specimen in molt or otherwise out of condition (but not diseased).
- Hutch stains.
- Broken toe nails.
- Stray white hairs in colored fur.
- Double dewlaps.
- Poor tail carriage, one that is not set on either side.
- Poor ear carriage.
- Poor eye color.
- Flabby and overfat, or thin and extremely poor in flesh.



General Eliminations - All Breeds

Eliminations are conditions that are assumed to be temporary in nature and curable; nevertheless, they are cause for elimination from competition in a show and from registration until the ailment is cured or corrected. Ear cankers, sore hocks, and overweight or underweight are examples of conditions leading to elimination. Table 4 lists common eliminations.

General Disqualifications - All Breeds

Disqualifications result from one or more permanent defects, deformities, or blemishes which renders an animal unfit to win an award in competition or from taking part in exhibition. Examples are snuffles, crooked feet or legs, and the wrong color mixed in fur. See Table 4 for more disqualifications.

Table 4. Rabbit Show Eliminations and Disqualifications.

Affected Area	Eliminations	Disqualifications
General	Slobbers Pot belly Does heavy with young Vent Disease Abscesses Overweight Underweight	Cold Snuffles Tumor Rupture Dewlaps in the following breeds: Dwarf Hotots, Himalayan, Netherland, Dwarf, Polish, Tans, and Silvers Bucks not showing both testicles
Ear	Ear canker	Lop ears, except in lop-eared varieties Ears torn or ears with portions missing
Eye	Sore eyes Discharge from eyes, if severe	Blindness in one or both eyes Unmatched eyes Spots in the iris or on the cornea
Feet/Legs	Sore hocks (showing infection, not merely bare)	Crooked feet or legs Bowed legs Severe cow hocks Deformed bones
Skin/Fur	Mange or scruvy condition or scales at the root of the fur Fungus growth or mites causing a scabby condition	Wrong color mixed in the fur
Tail		Wry tail (permanently set to either side) Screw tail Bob tail (shortened so as to be conspicuously out of proportion) Broken tail (permanently out of line)
Teeth		Wolf teeth or buck teeth Malocclusion Broken or missing teeth
Toenails		**White** toenail(s) in all solid-colored breeds except Himalyan and Californian.* **Colored** toenail(s) in any rabbit whose foot color is white. (A colored toenail is permitted on a white foot in breeds which have broken varieties.) For example: New Zealand White, Dutch, Checkered Giant, White Polish, White Rex or English Spot. **Absence** of toenail(s), including dew claw, on all breeds.
Weight	Overweight or under weight for breed and class.	

* See A.R.B.A.'s "Standard of Perfection" for additional information.

Rabbit Show Classes

The system of classes at rabbit shows will seem complicated if you are a beginner. But, as with other aspects of rabbit breeding, talking with someone who has show experience will help, and it will get easier once you start competing. The main thing to remember is that the sex, breed, variety, age, and weight of your rabbits will determine the classes in which you will enter them. (Your rabbits have to be the required age and weight by the date of the show.)

There are always two classes in each of the categories in a rabbit show: one for bucks and one for does. Two general classes are provided for all breeds under 9 pounds senior ideal weight. (See the A.R.B.A. "Standards of Perfection" for the ideal weights for each breed.) This group is considered "Four Class Rabbits," because there are really four classes: senior bucks, senior does, junior bucks, and junior does. Following are the requirements for senior and junior rabbits of either sex.

Senior - Rabbits 6 months of age or older or over maximum Junior weight on day of show.

Junior - Rabbits under 6 months of age and under maximum Junior weight on day of show.

Three classes are provided for all breeds having 9 pounds or over ideal senior weight. This group is considered "Six Class Rabbits," because there are 6 classes: senior bucks, senior does, intermediate bucks, intermediate does, junior bucks, and junior does.

Senior - Rabbits 8 months of age and older or exceeding maximum Intermediate weight on day of show.

Intermediate - Rabbits from 6 to 8 months of age or exceeding maximum Junior weight on day of show. (No animal over 8 months is eligible to show in an Intermediate class.)

Junior - Rabbits under 6 months of age and not over maximum Junior weight limit of breed on day of show. (No animal over 6 months of age is eligible to show as a Junior.)

Besides the classes explained above, there are other classes that you will find at some shows.

Pre-Junior - A rabbit under 3 months of age and generally weighing less than 5-6 pounds on day of show. Weight will depend on the breed.

Meat Pen - Three rabbits of the same breed and same variety weighing up to 5 pounds and not over 10 weeks of age on day of show.

Single Fryer - A rabbit weighing up to 5 pounds and not over 10 weeks of age on day of show.

Baker - A rabbit weighing less than 8 pounds but more than 5-1/2 pounds and less than 6 months of age on day of show.

Roaster - A rabbit weighing more than 8 pounds and more than 6 months of age on day of show.

Rabbit Show Procedures

Contact the superintendent of your county fair 4-H rabbit show or your county Extension office for rules and guidelines for show procedures, because they can vary from show to show. Contact the A.R.B.A. for guidelines concerning their shows. See Figure 29.

The order in which rabbits are judged at rabbit shows depends on the class they are in. Senior bucks are usually judged first and senior does second. If the intermediate class applies to the breed, intermediate bucks and does are judged third and fourth. Then come junior bucks, junior does, and, where applicable, pre-junior bucks and pre-junior does.

All the rabbits of the same class–those of the same breed, variety, sex, and age and weight range (New Zealand, white, senior bucks, for example)–are exhibited on the show table for the judges' inspection. Most judges place by starting with the lowest rated animals. The lowest rated rabbits are sent to their pens; they are followed by the average animals and then the good ones. Thus, the last rabbits on the table are the top rabbits in the class.

The terms for rabbit show awards can be difficult for new exhibitors to understand. Terms like "Best of Breed" and "Best of Opposite Sex" may seem confusing to beginners who are more familiar with the common awards of grand and reserve grand chamnpion. The terminology of rabbit show awards is explained below.

Best of Breed (BOB) is awarded to the rabbit that is the best animal in a breed. The Best of Breed can be either a doe or a buck and can be from any age group that is exhibited (senior, intermediate, or junior).

Figure 29. Exhibiting at a rabbit show allows you to have your rabbits evaluated and helps you learn how to improve your herd.

Best of Opposite Sex (BOS) is the best rabbit from any age group not the same sex as the animal that was named BOB. For instance, if a buck was named BOB, a doe is named BOS.

In breeds with more than one variety (color), each variety is judged separately. For example, the New Zealand breed has three varieties: Black, Red, and White. Each variety is judged separately, and **Best of Variety (BOV)** is selected from either sex. A **Best of Opposite Sex of Variety (BOSV)** is then selected; the BOSV is the opposite sex of the rabbit that was named BOV.

To select BOB in breeds that have varieties, all BOV are compared to each other. When BOS is selected, all animals of the opposite sex, whether they were awarded BOV or BOSV, are compared to select BOS of that breed.

Best in Show (BIS) is selected from all the BOB animals. BIS is selected by comparing each of the BOB to the "Standard of Perfection," and the rabbit that adheres closest to its breed standard is awarded BIS.

In shows where Best Four and Best Six class rabbits are selected, the Best Four and Best Six class rabbits are compared to the "Standard of Perfection" to determine BIS.

Suggested Activities and Learning Opportunities

Here is a list of activities that will help you develop valuable information-seeking, communication, and leadership skills as you learn more about rabbits. These are not required activities. You are free to choose the ones that interest you and that you think will help you the most. But this list is really a recipe for success, and successful 4-H rabbit breeders will have taken part in most if not all of these activities by the end of their 4-H rabbit careers.

You will notice that the list starts with pretty simple activities for beginners and that the activities towards the end of the list take more knowledge and ability. But as you progress through the list—and through the 4-H rabbit project—you will gain the necessary knowledge and be ready for bigger challenges.

Another thing you will notice is that the last activities in the list are different: they ask you to teach what you have learned. All along, people have taught you and helped you with your rabbits. By the end of your 4-H rabbit project, YOU will be able to help and to teach and to lead. That's what 4-H is all about!

- Visit with an experienced rabbit breeder to learn about rabbit care and proper management.

- Develop a library of rabbit literature that will be helpful in your rabbit project from year to year (clippings, pamphlets, pictures, books, notes from observing other successful breeders, etc.).

- Study the A.R.B.A. "Standard of Perfection" for the breed(s) of rabbits you are raising.

- Learn how to select good rabbits.

- Learn how to keep housing and equipment clean and sanitary.

- Learn how to keep good records.

- Attend an A.R.B.A. Youth Rabbit Show to learn more about show procedures and rabbit breeds.

- Learn how to identify several breeds of rabbits.

- Learn how to prevent diseases and parasites in rabbits.

- Plan a breeding program so you can raise your own rabbits and/or purchase additional rabbits to add to or improve your breed.

- Learn how to palpate a doe.

- Consider adding a second breed of rabbits to expand your 4-H rabbit project.

- Learn how to use the resources of your public and school libraries to find out what you want to know about rabbits.

- Learn about breeding programs and genetics, and understand how good rabbit selection can improve your herd.

- Find a market in your area for offspring that you do not plan to keep.

- Write a report on raising rabbits for a school assignment or newspaper article.

- Visit a laboratory or company that uses rabbits for research to learn about how rabbits are used in laboratory conditions.

- Learn how to cull and process rabbits.

- Collect and mount sets of rabbit teeth as an educational display.

- Assemble the skeleton of a rabbit, and identify the separate bones.

- Assemble your 4-H Rabbit Achievement Book.

- Help a beginning 4-H rabbit member get started in the rabbit project.

- Help beginning rabbit raisers understand why some equipment is better to use than other types.

- Serve as a 4-H Junior leader for the 4-H rabbit program.

- Set up a rabbit judging contest to learn and practice how to select quality rabbits.

- Develop a rabbit trivia game to play with other 4-H'ers to increase knowlege of rabbit breeds and management.

- Design a computer software program that helps 4-H rabbit breeders keep and use the information necessary for high-quality records on breeding, feeding, and marketing.

- Add to this list: use your experience and the skills you have developed to design another activity that will help 4-H'ers learn more about rabbits.

Opportunities in the 4-H Rabbit Project

Here are some opportunities to demonstrate the progress you have made in the 4-H rabbit project. Besides giving you the chance to share what you know about rabbits, these 4-H activities can help you develop skills you will use throughout your life.

4-H Rabbit Show

Exhibiting in a 4-H Rabbit Show can provide you with the chance to have your rabbits evaluated and to learn how to improve the rabbits you are raising. You also will have the opportunity to meet a large number of fellow rabbit breeders with whom you can share ideas. Participating at the county and/or state fair 4-H Rabbit Show can be an enjoyable learning experience for you. Check with your county Extension office for show details.

4-H Exhibit

Preparing an exhibit about something you have learned in your 4-H rabbit project is a good way to share the information with others. County and state fairs include an animal science class if you would like to have your exhibit evaluated. You also may consider preparing an exhibit or display for your school or a store window.

4-H Educational Presentation

Share your knowledge about rabbits by giving an Educational Presentation. Gather information on your topic from several resources, organize the information, and create an interesting presentation to tell others what you have learned about your topic. This experience will help you learn more about rabbits, gain communication skills, and give you experience with speaking in front of other people. Your audience will learn something too! You can give your presentation at a local meeting, county presentation contest, community organization meetings, or as part of the rabbit presentation contest at the Iowa State Fair.

4-H Working Exhibit

Do you have an idea about how to involve your audience in learning something about rabbits or rabbit products? A 4-H Working Exhibit provides an opportunity for you to involve your audience in your presentation. What do you want the audience to learn, how can the audience become involved in the learning process, how can your exhibit attract people to come and participate? Plan your Working Exhibit using the answers to these questions. Think about the supplies you will need and the questions people might ask. Research your topic thoroughly so that you can be prepared for one-on-one interaction with people interested in your topic. Your audience will learn a lot from participating with you and you will gain valuable communication skills working with small groups or one-on-one with others.

Figure 30. 4-H Rabbit Royalty Contests give you the chance to demonstrate showmanship and your knowledge of rabbits.

You Learn to be a Leader in 4-H

Just like learning feeding and record keeping skills, your rabbit project is a way to learn leadership skills. Leadership is simply helping a group reach its goal. The group might be your 4-H club, all the rabbit project members in your county, a class at school, or a community organization.

To get started, you need to find out the interests or needs of the group. Based on the interests or needs of the group your leadership project might involve:

- teaching new members how to tattoo their rabbits and fill out an ID sheet,

- conducting a workshop on how to tan rabbit pelts, or

- being responsible for organizing a showmanship workshop.

Ask your 4-H and Youth leader for the **Iowa 4-H Leadership Project Handbook,** 4-H 532, for more details about carrying out a leadership project.

The rewards of leadership are many. The feeling you gain from helping others is the best reward of all.

For Additional Information

Your school library or local public library is a good place to look for the books listed below, and learning to use library resources for research is a valuable skill in itself. If your library does not have the books you want, the librarian might be able to borrow them for you from other libraries. (Sometimes there is a charge for this service, so be sure to ask.) Also, most libraries have at least one set of indexes listing magazine articles on specific subjects. Ask your librarian how to use these indexes and how to locate the articles you think might help you.

You can check local bookstores for any books you want to buy. If the stores don't carry the books you want, they can help you order them. You can contact the A.R.B.A. to buy the books they publish, or you can ask to borrow copies from an experienced breeder. (Experienced breeders and your feed and equipment supplier might also be able to suggest trade publications and other materials that will be helpful.)

Domestic Rabbit Guide. American Rabbit Breeders Association, Inc., Box 426, Bloomington, IL 61701.

Official Guide to a Progressive Program for Raising Better Rabbits and Cavies. American Rabbit Breeders Association, Inc., Box 426, Bloomington, IL 61701.

Rabbit Feeding and Nutrition. Peter Cheeke. Academic Press, Inc., Orlando, FL 32887. 1987.

Rabbit Production. 6th edition. Peter Cheeke, Nephi Patton, Steven Lukefahr, James McNitt. Interstate Printers & Publishers, Inc., Danville, IL 61832. 1987.

Rabbits for Food and Profit. Lee Schwanz. Farmer's Digest Publication, Box 363, Brookfield, WI 53005. 1982.

Rabbits. Helga Fritzsch. Barron Educational Series, 250 Wireless Boulevard, Hauppauge, NY 11788. 1983.

Raising Rabbits. Anna Kanable. Rodale Press, Emmaus, PA 16373. 1977.

Raising Rabbits the Modern Way. Robert Bennett. Garden Way Publishing, VT 1975.

Standard of Perfection. American Rabbit Breeders Association, Inc., Box 426, Bloomington, IL 61074. 1986.

Glossary of Terms

A

Abcess - A hard swelling or isolated collection of pus or purulent matter occurring in the rabbit's skin. Accompanied by localized fever and heat.

Adult - See Senior.

Agouti color pattern - A hair shaft that has three or more bands of color with a definite break between each color. Usually dark slate at the base, with two or more alternating light and dark bands or rings interspersed with black guard hairs. The head, ears, and feet usually have ticking; the belly color is much lighter and does not carry ticking. Examples: steel or gray Flemish, Chinchilla, and Belgian Hares.

B

BIS - Best in Show. A rabbit show award.

BOB - Best of Breed. A rabbit show award.

BOS - Best of Opposite Sex. A rabbit show award.

BOSV - Best of Opposite Sex of Variety. A rabbit show award.

BOV - Best of Variety. A rabbit show award.

Back - The entire top portion of the rabbit, extending from neck to tail.

Bell Ears - Ears that have large tips with a distinct fall or lop.

Belly - The lower part of the body containing the intestines. The abdomen. For purposes of defining color area, it is the underbody of the rabbit from the forelegs to the crotch area.

Belt - The line where the colored portion of the body meets the white portion just behind the shoulders. Example: Dutch breed.

Blaze - A white area on the head and nose running up between the eyes on rabbits with multi-colored fur.

Boils - See Abcess.

Bowed Legs - Legs bent like a bow or curved outwardly in the middle, applied to both fore and hindlegs.

Breed - A race or special class of domestic rabbits that reproduce distinctive characteristics of fur markings, fur texture, shape, size, and growth. A breed may be subdivided into varieties. Example: Black, Blue, and Tortoise varieties of the Dutch breed.

Breeder - A person who raises a special breed/variety or varieties of rabbits in conformity with the accepted standards of perfection.

Breeding Certificate - A written certificate by the owner of a stud buck, showing its pedigree and the date of breeding to a particular doe. Given to prove the ancestry of the young.

Broken Coat - Guard hairs broken or missing in spots, exposing the undercoat. Areas where the coat is affected by molt, exposing the undercoat.

Broken Ear - A distinct break in the cartilage which prevents erect ear carriage.

Broken Tail - A tail that is or has been broken and is out of line. This is a disqualification.

Buck - A normal male rabbit.

Buck Teeth - See Wolf Teeth.

Buff - A rich golden orange color with a creamy cast.

Bull Dog - A short, broad, bold head of pronounced masculine appearance.

Butterfly - A dark-colored area on the rabbit's nose. Examples: Checkered Giant and English Spot breeds.

C

Carcass Weight - The weight of the rabbit after it has been processed.

Carriage - The way a rabbit carries itself; the style or characteristic pose of a rabbit.

Charlie - A term meaning insufficient markings for the breed.

Cheek - The sides of the face beneath the eyes.

Chest - The front portion of the body between the forelegs and neck.

Choppy (or Chopped Off) - A condition in which a rabbit is not well filled out and rounded in the loin and rump area.

Cobby - A term meaning stout and stocky; short legged.

Condition - The physical state of a rabbit in reference to health, cleanliness, texture and molt of fur, and grooming.

Cow Hocks - Hocks that turn or bend inward, causing the foot portion to turn outward.

Creamy - A term meaning light colored. The color of cream.

Culling - The process of selecting only the best rabbits from a litter for future breeding and show stock by selling or slaughtering the least desirable specimens from a litter.

D

Density - The property or quality of a thick coat.

Dewlap - A pendulous fold or folds of loose skin hanging from the throat.

Disqualification - One or more permanent defects, deformities, or blemishes that make a rabbit unfit to win an award in competition or to take part in an exhibition. (Disqualified rabbits are not eligible for registration by the A.R.B.A.)

Doe - A normal female rabbit.

Dressing - See Processing.

E

Ear Lacing - A black or dark-colored line of fur outlining the sides and tips of the ear.

Elimination - One or more defects presumed to be temporary and curable. Cause for elimination in a show or from registration until cured or corrected.

Embryo - A kit in the early stages of development inside the doe.

Eye Circle - Even marking of color around both eyes. Example: Checkered Giant.

Eye Color - The color of the iris. The circle of color surrounding the pupil.

F

Faults - Imperfections. Conditions or characteristics that are unacceptable and will result in lower show placing but not disqualification. Examples: broken toenails, cheek spots too large, and poor tail carriage.

Fine Coat - The condition of a coat that is too fine in texture and lacking body. Guard hairs are too weak and thin in structure, similar to hairs making up the undercoat.

Flabby - The condition of a rabbit when the flesh or fur hangs loosely. Not trim and shapely.

Flank - The sides of the rabbit between the ribs and hips and above the belly.

Flat Coat - The condition of a coat that lies flat or close to the body, lacking spring or body. Fine coat coupled with lack of density.

Fly Back - The property of fur that causes it to return quickly to its normal position when stroked toward the head of the rabbit.

Flying Coat - The condition of a coat that is loose and fluffy, caused by undue length and thinness of under wool and weak guard hairs.

Foot - The part of the leg on which the rabbit stands. On the foreleg, that portion below the ankle or pattern. On the rear leg, that portion below the hock joint.

Forehead - The front part of the head between the eyes and the base of the ears.

Foreign Color - Any color of fur, eyes, or nails that is different from the prescribed standard of perfection for the breed or variety.

Four Class Rabbits - Rabbit show category for all breeds having ideal adult weight under 9 pounds. There are four show classes for these rabbits: senior bucks, senior does, junior bucks, and junior does.

G

Genotype - The genetically inherited characteristics and potenial of the rabbit stock.

Gestation - The period of time that a doe carries young in its uterus. Pregnancy. Normal length is 28-32 days.

Glossy - The reflection of luster or brightness from naturally healthy fur in rabbits. Improved by grooming.

Guard Hair - The longer coarser hair of the coat, offering protection to the undercoat and providing wearing quality and sheen to the coat.

H

Hairline - A narrow white line running between the ears, connecting the blaze and collar on the Dutch.

Hindquarters - The after-portion or posterior section of the body, made up of loins, hips, hind legs, and rump.

Hip - The thigh joint and large, muscular first joint of the hind leg.

Hock - The middle joint or section of the hind leg between the foot and hip.

Hog Fat - The condition of a rabbit obviously over-fattened and, as a result, out of proportion to the true type of the breed.

Hump Back - The condition of having a hump or protrusion on the back, marring a gracefully arched outline.

I

Inbreeding - A breeding program involving the mating of closely related rabbit stock, such as brother and sister.

Inherited - The degree to which a trait or characteristic is passed on from a parent to offspring.

Inner Ear - The concave (curved inward) portion of the ear.

Intermediate - A show class term referring to rabbits that are at least 6 months old and no older than 8 months and that fulfill the weight requirements of the breed.

Inventory - A list of everything on hand that is necessary to the project. A beginning inventory is taken at the start of a project year. An ending inventory is taken at the close of a project year.

J

Junior - A show class term referring to rabbits that are under 6 months of age and that fulfill the weight requirements of the breed.

K

Kindling - The process of giving birth to kits.

Kit - Baby rabbit.

Knee - The second joint of the leg, connecting the thigh and leg. In animals, more properly called the "hock." The second joint of the foreleg is the elbow.

Knock Kneed - See Cow Hocks.

L

Lapin - French word for rabbit. Also, in the fur trade, it is dyed rabbit fur.

Lazy Tail - A tail that is slow to assume its normal position when it is moved.

Linebreeding - A breeding program involving the mating of rabbits that are both descended from the same animal but are related several generations back. For example: mating first cousins, uncle to niece, or aunt to nephew.

Litter - Young rabbits of a doe born at the same time.

Live Weight - The weight of a rabbit before it is dressed for market.

Loin - The part of the back on either side of the spine and between the lower rib and hip joint.

Loose Coat - The condition of fur lacking density in the undercoat, coupled usually with fine guard hairs and resulting in lack of texture. Does not indicate a slipping coat.

Lopped Ear - Pendulous ear. Not carried erect. Falling to the side or front.

Luster - Brightness and brilliance of fur.

M

Malocclusion - An inherited defect where the upper and lower jaws do not let the teeth meet, resulting in long, uneven teeth extending out of the rabbit's mouth.

Mandolin - The body of the rabbit is pear shaped, having the appearance of a mandolin laid face down. Back and saddle arch toward loins to make noticeably large, broad hindquarters.

Marked - A rabbit's fur usually white, which is broken up by an orderly placement of another color. Also refers to rabbits that carry the pattern of the Tan variety.

Massive - A term meaning bulky and heavy. Ponderous or large.

Meaty - The quality of being able to carry a large proportion of meat for the size and type of rabbit. A noticeable meatiness at the forequarters, back, saddle, loins, and haunches.

Molt (Moult) - The process of shedding or changing the fur twice each year. The baby or nest fur is molted at two months. The first natural coat of fur is fully developed at 4 to 6 months.

Muzzle - The projecting portion of the head surrounding the mouth, nose, and lower jaw.

N

Neck - That part of the rabbit connecting the head and body.

Nest Box - A kindling box inside the hutch or cage hole where the kits are born and live for the first 18 to 21 days.

O

Off-Colored - Applied to several hairs or patches of fur foreign to the standard color of the rabbit.

Open Coat - See Loose Coat.

Outbreeding - A breeding program involving the mating of unrelated rabbits of the same breed.

P

Pair - A male and a female rabbit.

Palpation - A method of examining by touch used to determine if a doe is pregnant and will bear young.

Patches - Small sections of fur with a color foreign to the standard of the rabbit.

Paunch - The prominent portion of the abdomen of the rabbit.

Pedigree - A written chart of the male and female ancestors of a rabbit, showing the date of birth and the parents, grandparents, and great grandparents of the rabbit.

Pelage - The fur coat or covering.

Pepper and Salt - A flat, unattractive appearance of black and white ticking.

Phenotype - The appearance of the individual rabbit.

Poor Coat - A term describing fur that is not in good condition through molting, rust, poor grooming, or ill health of the rabbit.

Processing - The process of killing and preparing a rabbit for market.

R

Rabbit - A domesticated rodent of the genus Orctolagus Cuniculus.

Rabbitry - A rabbit-raising enterprise or a place where domestic rabbits are kept.

Racy - A term meaning slim, trim, slender in body and legs, harelike, alert, and active.

Registration - The process of certifying that a rabbit meets the qualifications established by the A.R.B.A. for that breed and has a three-generation pedigree (see above). Requires examination by a licensed registrar.

Ribs - The curved portions of the sides immediately back of the shoulders and above the belly.

Rump - The hind portion of the back and bones.

Rust - A reddish-brown coloration of fur, usually appearing on the side, flanks, or feet of rabbits, having the appearance of iron rust and being foreign to the standard color. Rust usually appears in American Blues, Black Havanas, and Lilacs. May be caused by fading through over-exposure to the sunlight, dirty hutches, or dead hair about to molt.

S

Saddle - The rounded, intermediate portion of the back between the shoulder and loin.

Sandy - The color of sand, as in sand-gray Flemish Giants. Gray with reddish brown cast interspersed with dark guard hairs.

Screw Tail - A tail that is twisted. A corkscrew tail has more than one turn and is a disqualification.

Self or Self-Colored - The condition of having the same-colored fur over the entire head, legs, body, and tail. Not having ticking, agouti hair pattern, or shadings.

Senior - A show class term referring to rabbits that fulfill the weight requirements of the breed and that are 1) 6 months of age and older in those breeds having two show classes (Junior and Senior) or 2) 8 months of age and older in those breeds having three show classes (Junior, Intermediate, and Senior).

Service - The mating act of the buck with the doe.

Shadow Bars - Weakness of self-color in the fur of both fore and hind feet, appearing in the form of white or lighter colored bars running across the feet. Acts as a severe cut or penalty in scoring. Occurs more often in the agouti breeds than in selfs.

Shoulder - The uppermost joint of the foreleg, connecting it with the body.

Silvered - A term describing an abundance of silver-white or silver-tipped guard hairs interspersed through the fur that produces a lustrous silvery appearance.

Six Class Rabbits - Rabbit show category for all breeds having ideal senior weight of 9 pounds and over. There are six show classes for these rabbits: senior bucks, senior does, intermediate bucks, intermediate does, junior bucks, and junior does.

Slipping Coat - A coat that is shedding or molting a profusion of hairs.

Slobbers - Excessive salivation creating wet or extremely moist and unsightly fur around the mouth and lower jaw and forelegs.

Smut - A term describing slate grey fur that is foreign to the standard color for the breed. Example: Creme D'Argent.

Snaky - A term describing the slender, narrow body that is typical of the Himalayan.

Snipey - A term describing a narrow and elongated head, with an appearance of undue leanness.

Solid-Colored - The condition of having the same color uniformity over the entire animal, not mixed with any color. Having no markings or shadings.

Sport - A rabbit not true to the characteristic markings of its breed. Examples: English Spots, Rhinelanders, or Checkered Giants lacking white color.

Spraddled Legs - A term describing forefeet bowed outward when viewed from the front. Knock-kneed. Hind feet not set parallel with the body. Turned outward from the hock joint.

Stocky - A term meaning compact, stout, and cobby.

Stops - In the Dutch, the white part of the hind foot extending upward from toes and ending abruptly about one third of the way to the hocks.

Strain - A race or stock of rabbits in any standard breed of the same family blood, having the quality of reproducing marked racial characteristics.

Stringy - The quality of having a ropy or sinewy finish, noticeable in the larger breeds of rabbits if not properly fattened for market.

Sway Back - The condition of having a distinct fall or scoop in that portion of the back between the shoulders and hindquarters, as distinguished from a gradually arching back.

Sweep - An unbroken flow of designated markings. There should be no gaps or congested areas.

Symmetry - A harmonious proportion of head, ears, legs, and body structure conforming to the standard type of the breed represented.

T

Tail Carriage - The way in which a rabbit carries its tail. A tail being carried to one side or the other has poor tail carriage.

Tattoo - A code punched in the ear as a permanent method of identification.

Texture - The character of fur as determined by feel or touch, such as "fine" or "coarse" texture.

Ticking - A wavy distribution of longer guard hair throughout the fur. Ticking is usually produced by black-tipped guard hairs and adds to the beauty of the fur. Examples: Chinchillas, Flemish Giants, and Belgian Hares.

Trio - One buck and two does.

Tucked Up - The trim appearance of a Belgian Hare, with rounded body and breast and belly gathered in closely to form an arch when the rabbit is sitting.

Type - A term used to denote body conformation of a rabbit or shape of a particular part of a rabbit, as in "head type." The general description of the physical makeup of the rabbit.

Typical - A term describing an ideal representative of any given breed or variety as applied to type, color, or fur quality.

U

Under Color - The base of the fur shaft. Shaft next to the skin. Not the belly fur of the rabbit.

Uterus - Organ in the doe in which developing kits are contained and nourished before birth. Also called the womb.

V

Variety - A subdivision of any recognized standard breed, distinct in color of fur from other subdivisions.

W

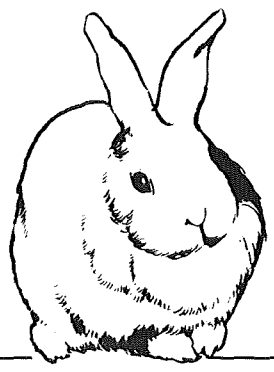
Wall Eyes (Moon Eyes) - The condition of having a milky film over the cornea or appearance similar to a moonstone. Colored eyes having an extremely light iris, giving the eye a glazed appearance.

Weaning - The process by which young rabbits become independent of the doe for their nourishment. A young rabbit is weaned when it is between 4 and 8 weeks old, depending on the breeding schedule used and the breed of rabbit.

Wolf Teeth - Protruding or elongated teeth in the upper and lower jaw caused by improper alignment of the upper and lower front teeth preventing normal eating action.

Wool - A term describing the fur of Angora rabbits. The guard hairs and under-fur being 2 1/2 to 5 inches long and resembling fine wool in texture.

Wry Tail - Abnormally bent, curled, or twisted tail. Permanently held to one side. A disqualification for a rabbit.



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