

INTRODUCTION

This manual has been developed as a study guide for the Florida State Fair Rabbit Skillathon which is part of the Champion Youth Program. The topic for this year's Skillathon is **Products and Marketing**.

The Florida State Fair recognizes that agricultural education instructors, 4-H agents, parents, and leaders provide the traditional and logical instructional link between youth, their livestock projects, and current trends in the animal agriculture industry. **PLEASE NOTE:** This manual is provided as a **study guide** for the skillathon competition and should be used as an additional aid to ongoing educational programs.

Sections are labeled **Junior, Intermediate, & Senior, Intermediate & Senior, or Senior** to help exhibitors and educators identify which materials are required for each age level.

****** Denotes additional information in the study manual for preparing for the Champion of Champions competition.

The knowledge and skills vary by age group and may include:

Juniors (age 8-10 as of September 1, 2024)

Animal By-Products
Breeds by Use and Classes

Intermediates (age 11-13 as of September 1, 2024)

All of the above plus...
Standard of Perfection
Types of Fur
Cookery

Seniors (age 14 and over as of September 1, 2024)

all of the above plus....
Carcass Grading
Skeletal Anatomy

GOOD LUCK

Products and Marketing***

Youth livestock projects focus on the selection, raising, showing, and often selling of animals. By virtue of their participation in livestock projects, youth become part of an industry that provides food and fiber for the world. The steps involved in the movement of animals and animal products from producer to consumer are known as *processing and marketing*. Tremendous changes have occurred in recent years in the ways animal products are harvested and marketed but the fundamentals remain the same. Price is dependent on *supply and demand*. We can impact supply through increased breeding, but demand is more difficult to affect. In order to maintain a stable market for animal products, consumers must have confidence in the ***wholesomeness and quality*** of what they are buying. That means the products must be safe, nutritious, and tasty. Many livestock organizations have implemented promotion programs to increase market share, improve prices and increase export markets.

Marketing may be as simple as receiving a set price per pound or may involve a pricing system known as 'Value Based Marketing'. ***Value based pricing systems*** account for quality and apply deductions or bonuses as products deviate from an accepted *baseline*. This should ultimately improve the quality of products offered to consumers, therefore boosting consumer confidence. Animal products may be marketed at auctions, by direct sales, contracts or electronically with the use of computers and satellite technology. Regardless of the marketing method, the seller is trying to receive the highest *price* while the buyer is trying to receive the greatest *value* (high quality and reasonable price).

Rabbit Products and Marketing***

In the United States rabbit industry rabbits are produced for meat, Angora wool, pets, laboratory use, and show rabbits. According to the USDA 2023 Census of Agriculture (https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_US/st99_1_032_034.pdf) more than 3,000 US farms market over 430,000 rabbits annually, and nationwide there are approximately an estimated 10 million rabbits. Though many people consider rabbits as pets and raise them as a hobby, rabbits truly can constitute a livestock enterprise. Rabbits are extremely efficient meat producers due to their high reproductive rate (25 - 50 offspring per year) and excellent conversion of feed to muscle (4 pounds feed/ 1 pound of gain for fryers). They produce a carcass with white meat, high protein, and low fat. Rabbits are a significant source of meat worldwide, led by China in which produced 932,000 metric tons of rabbit meat in 2023. Between 2007-2017, world-wide rabbit meat consumption was up 12% and amounted to 6.4 billion dollars (<https://www.newfoodmagazine.com/news/85045/global-rabbit-meat-market-grow/>). Worldwide, rabbit consumption is still growing with a projected compound annual growth rate (CAGR) of 2.5% expected in 2025. In the U.S. where rabbits are considered more of a pet, commercial rabbitries produce about 6 million pounds of rabbit meat each year (2700 metric tons). Since Americans consume 8 to 10 million pounds of rabbit meat annually, we must import rabbit meat in order to meet demands. This would indicate room for expanded production. Global rabbit consumption is projected to continue to increase each year through 2025.

A by-product of meat processing is pelts. Skins may be used for fur garments, slippers, glove linings, toy making and felt. Since colored pelts bring lower prices, white breeds are preferred as meat animals. There are some breeds with particularly fine pelts that are raised specifically for fur and others that produce wool or hair that can be harvested and spun into yarn. With the increase of synthetic fibers and artificial furs, markets for rabbit skins and pelts are diminishing.

One of the most significant contributions that rabbits bring to mankind is their usefulness in laboratory research and diagnostics. Over 200,000 rabbits per year are used in medical schools, laboratories, and hospitals to aid in areas like cardiac surgery, hypertension, virology, infectious diseases, toxins and antitoxins, and immunology. These institutions must adhere to strict government guidelines in the care and use of these animals and they in turn place stringent guidelines on their suppliers.



1. The rabbit was the first animal model of cancer caused by a virus.
2. Rabbits are used to produce antibodies, used for research into infectious diseases and immunology.
3. Rabbits are used as models for cystic fibrosis and cholera.
4. Louis Pasteur used rabbits to develop his rabies vaccine.
5. Rabbits are important in the study of cardiovascular disease, particularly hypertension and arteriosclerosis.
6. Rabbits are key for studies on cancer, glaucoma, ear infections, eye infections, diabetes, and emphysema.
7. Surgical lasers were developed using rabbits.
8. Rabbits are used to research the influence of high cholesterol.
9. Rabbits love liquorice root.
10. Rabbits can use a litter box.

Source: <https://www.understandinganimalresearch.org.uk/what-is-animal-research/a-z-animals/rabbit>

Animal By-Products

Animal by-products are anything of economic value other than the carcass that comes from animals during harvest and processing. They are classified as edible or inedible for humans. There may be some disagreement about what is edible, but we can all agree that there are many uses for what is left after the carcass is placed into the cooler. In developing countries by-products may become jewelry, religious implements, tools, fuel, construction material, fly swatters, or musical instruments. In developed countries, advances in technology have created many products from non-animal sources (synthetics) which compete with animal by-products, thus reducing their value. Still, by-products represent multibillion dollar industries in the United States and other developed countries. An added benefit of changing inedible parts of carcasses into useful products is that the decaying materials don't pile up and cause environmental problems. **Rendering** is the term for reducing or melting down animal tissues by heat and the rendering industry refers to itself as the "original recyclers". The creativity of meat processors in finding uses for by-products has led to the saying "the packer uses everything but the squeal".

Edible by-products

<u>Raw Material</u>	<u>Principal Use</u>
Brains, Kidneys, Heart, Liver, Testicles	Variety Meats
Cheek and head trimmings	Sausage ingredient
Blood	Sausage component
Fats	Shortening (candies, chewing gum)
Intestines	Sausage casings
Bones	Gelatin for confectioneries (marshmallows), ice cream and jellied food products

Inedible by-products

<u>Raw Material</u>	<u>Processed by-product</u>	<u>Principal Use</u>
Hides	Leather	various leather goods
	Glue	paper boxes, sandpaper, plywood, sizing
	Hair	Felts, plaster binder, upholstery, brushes, insulation
Pelts	Wool	Textiles
	Skin	Leather goods
	Lanolin	Ointments
Fats	Inedible tallow	Industrial oils, lubricants, soap, glycerin
		Insecticides, weed killers, rubber, cosmetics, antifreeze, nitroglycerine, plastics, cellophane, floor wax, waterproofing agents, cement, crayons, chalk, matches, putty, linoleum
Bones	Tankage	Livestock and poultry feeds
	Dry bone	Glue, hardening steel, refining sugar, buttons, bone china
	Bone meal	Animal feed, fertilizer, porcelain enamel, water filters
Glands	Pharmaceuticals	Medicines
Lungs		Pet foods
Blood	Blood meal	Livestock and fish feeds
	Blood albumen	Leather preparations, textile sizing
Viscera and meat scraps	Meat meal	Livestock, pet and poultry feeds

Rabbit Breeds by Use and Classification

A descendant of the European wild rabbit, the domestic rabbit is used for many purposes in the United States. In terms of numbers of owners, the pet segment of the industry is the largest (over 6 million rabbits). There are roughly 23,000 members of the American Rabbit Breeders Association and the majority of them raise rabbits as a hobby or to exhibit at shows. In 2022, over 400,000 rabbits were marketed for meat purposes and those producers typically raise hundreds to thousands of rabbits each year. Schools and universities use rabbits for teaching and research purposes. Other uses might include “feeder rabbits” for carnivorous pet reptiles, or for endangered or injured animals like eagles, condors, alligators, and wolves. There are also seed stock producers who provide high quality breeding animals for new producers. With all of the potential uses for rabbits, it is no surprise that there are 52 breeds of rabbits described by the American Rabbit Breeders Association (ARBA) in their Standard of Perfection. They are classified by **color, type, shape, weight, fur, wool and hair**. <https://arba.net/recognized-breeds/>.

Large breeds - 14 to 16 pounds mature weight
 Medium breeds - 9 to 12 pounds mature weight
 Small - 2 to 4 pounds mature weight.

Some examples of rabbit breeds and their uses are:

Californian - is considered a good **commercial** breed due to their good growth characteristics and white (normal) fur. They are often raised for show. (Medium)

Checkered Giant – A popular show breed, the Checkered Giant is one of 11 breeds with **defined markings**. It may also be used as a meat and a fur breed (Medium to Large)

Dutch - is a popular show breed and are most noted for their **distinctive markings**. Their small size also makes them a good lab animal. (Small)

Holland Lop - is one of the breeds recognized by the ARBA as a **pet breed** and are popular at shows. (Small)

English and French Angora - breeds which produce high quality **wool**. Because the wool is harvested by shearing or plucking, the animal does not need to be slaughtered to harvest the product. (Medium)

Florida White – The Florida White was developed for laboratory use, third best **commercial** breed due to their good growth characteristics, also used for show. (Small)

Flemish Giant – Originally a **commercial** breed, this breed is a popular show breed, and as the name implies, is of impressive **size**. (Large)

New Zealand - is considered an outstanding **commercial** breed due excellent growth characteristics and meaty carcass. They are used as a show animal and the white variety is very popular for laboratory use. (Medium)

Rex – their plush, velvety **fur** used by the garment industry makes them a pelt breed, but they are also good **commercial** rabbits and are a popular pet and show breed. (Medium)

Satin – is named for its silky **fur** but is also a good **commercial** breed. (Medium).

Standard of Perfection

Standard of Perfection is the basis of the rabbit judging system. The Standard of Perfection for each breed is broken into sections with the most points being placed on the items of greatest importance for that breed. Standard of Perfection is used to create an image of the ideal animal in a particular breed. Judging rabbits is still done by comparing one rabbit to another but a judge must have a working knowledge of the breed Standard of Perfection while comparing rabbits for placing. By combining comparison judging with a point system, a judge should get the most accurate placing. An example of Standard of Perfection for the Dutch breed follows. For Dutch rabbits, markings are the most important aspect for judging with 50 points placed on this section. Each breed will have Standards of Perfection with detailed explanation of the ideal rabbit as well as faults and disqualifications.

Dutch Standard of Perfection

General Type	<u>27 Points</u>	Markings	<u>48 Points</u>	Fur	<u>10 Points</u>
Body Type	17 Points	Cheeks	12 Points	Color	<u>10 Points</u>
Head	5 Points	Blaze	5 Points		
Ears	2 Points	Neck	3 Points	Condition	<u>5 Points</u>
Eyes	1 Point	Saddle	10 Points		
Feet, Leg and Bone	2 Points			Undercut	8 Points
		Stops	10 Points	Total =	100 Points

**Standard and Guide for Judging Meat Classes
(from 2021-2025 Standard of Perfection)**

Single Fryer Class

Single fryers, not over 10 weeks of age, minimum weight of 3 pounds, maximum weight of 5 pounds.

Point Schedule:

Meat type	50
Condition of flesh	40
Fur	10
Total points.....	100

Meat Pens

Pens consist of 3 rabbits of the same breed and variety, not over 10 weeks old, at least 3 pounds but no more that 5 pounds each.

Point Schedule:

Meat type	40
Condition of flesh	30
Uniformity of body and weight	20
Fur	10
Total points.....	100

A video explaining the evaluation of a meat pen is available at:

<https://www.youtube.com/watch?v=6dmYfwatVwo>.

Roaster Class – All animals entered must be under 6 months of age, over 5 1/2 pounds and not more than 9 pounds.

Stewers Class – All animals are at least 6 months and at least 8 pounds.

Types of Fur

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The manufacture of fur garments or trim requires specific characteristics for which standards have been defined. The hair/fur classifications for show are normal, rex, satin, and wool.

Commercial Normal Fur Classes – all normal furred breeds. A coat of fur which “**flies back**” to its smooth normal position when stroked from the hindquarters to the shoulders. All breeds not having commercial normal fur are shown in their respective breed or wool classes.

Colored – All colors except white. White – Usable portion of the pelt to be white.

Point Schedule

Texture..... 40 points

Guard hair offers resistance when stroked toward head, flies back and lies smoothly.

Fine, soft undercoat should be interspersed thickly with heavier/thicker guard hair.

Density..... 30 points

Underfur soft, fine, dense interspersed with guard hairs which extend above and provide a protective surface. Quality should carry down sides to stomach.

Balance and Condition..... 30 points

Combination of texture, density and uniform length with a differential between guard hair and underfur not to exceed 1/8 inch. The coat should be uniform, tight, clean, bright, and free of stain.

TOTAL.....100 points

Breed Fur and Wool Classes

Judged by the fur and wool standard for their respective breeds

White Breed Fur/Wool Class – Any white or variety with a white usable portion of the pelt.

Colored Breed Fur/Wool Class – All colors except white. Color not to be considered.

Fryer Fur – White and colors judged together, must be entered in fryer or meat pen class.

An interesting video that demonstrates how to harvest fiber from an Angora rabbit is available here: <https://www.youtube.com/watch?v=eJokunZfwpo>.

Meat Facts ***

100g Roasted	Calories (g)	Fat (g)	Saturated Fatty Acids (g)	Protein (g)	Iron (mg)
Beef	216	9.9	3.79	29.58	2.9
Chicken	190	7.41	2.04	28.93	1.21
Goat	108	2.58	.79	29	3.3
Lamb	206	9.52	3.4	28.22	2.05
Pork	212	9.66	3.41	29.27	1.1
Rabbit (stewed)	206	8.41	2.51	30.38	2.37

Meat Cookery

Methods of cooking meat include dry heat or moist heat. Dry heat cookery methods improve flavor of meat through crust formation and caramelization but increase chewiness and decrease tenderness because of protein hardening. Moist heat cookery methods increase the tenderness of meat cuts that are comprised of muscles containing large amounts of connective tissue. Cookery under moist conditions for long periods at relatively low temperatures generates steam that then converts the collagen in connective tissue into gelatin. Methods should be selected based on initial tenderness of the cut, desired quality characteristics of the resulting product, available cooking facilities/equipment, and the amount of time available for preparation.

Dry Heat

Dry Heat methods of cooking are suitable for tender cuts of meat or less tender cuts which have been marinated. Use cuts low in collagen and elastin.

Roasting - This method of cooking is recommended for larger cuts of meat. Meat is seasoned and placed in an open roasting pan with a cooking thermometer placed in the center to determine degree of doneness.

Broiling - This method is most suitable for tender, usually thin cuts of meat. Less tender cuts may also be broiled when marinated. Meat is directly exposed to the source of heat from above or from both sides at the same time. It involves high heat and produces a distinct caramelized flavor.

Grilling - This method is actually a method of broiling. Meat can be grilled on a grid or rack over coals, heated ceramic briquettes or an open fire.

Pan-Broiling - This method is faster and more convenient than oven broiling for cooking thinner cuts. It involves conduction of heat by direct contact of the meat with hot metal. Fat drippings are poured off as they accumulate.

Pan-Frying - This method differs from pan-broiling in that a small amount of fat is added first or allowed to accumulate during cooking. Pan-frying is for ground meat, small or thin cuts of meat.

Stir-Frying - This method is similar to pan-frying except that the food is stirred almost continuously. Cooking is done with high heat, using small or thin pieces of meat.

Deep-Fat Frying - This method is cooking meat immersed in fat. This method is only used with very tender meat.

Microwave Cookery - High frequency electrical energy causes molecules inside the product to vibrate creating friction and heat without heating the surrounding air. The rapid speed of microwave cooking makes it ideal for frozen cuts in institutions and restaurants. Consumers complain that microwaved meat is inferior in flavor.

Moist Heat

Moist Heat methods of cooking are suitable for less tender cuts of meat. Moist heat cooking helps to reduce surface drying in those cuts requiring prolonged cooking times. With moist heat cookery, meat may lose some water-soluble nutrients into the cooking liquid. However, if the cooking liquids are consumed, as in stews or soups, nutrients are transferred and not totally lost. Meat should never be boiled because high temperatures toughen protein.

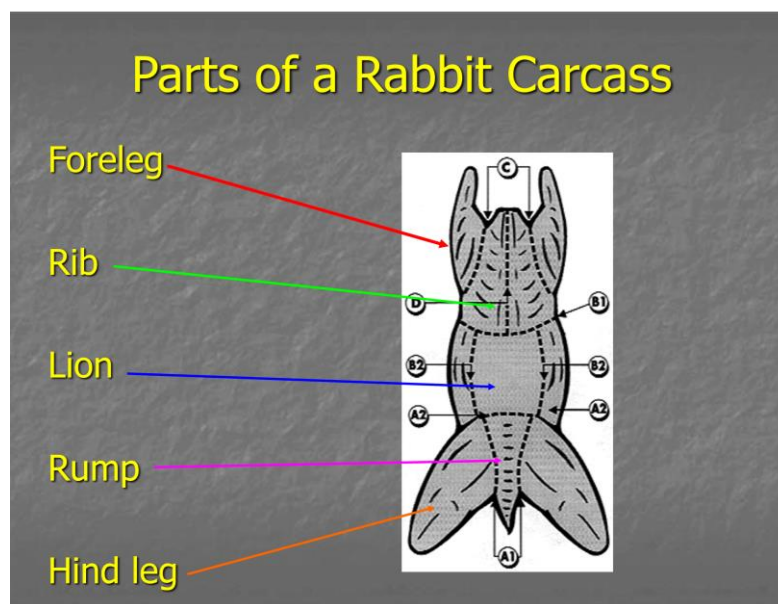
Braising - In some regions of the country the term "fricassee" is used interchangeably with braising. The surface of the meat is seasoned, covered with flour and browned. Afterward the meat is placed in a covered pan with a small amount of liquid and cooked at low temperatures to soften the connective tissue and yield a more tender product.

Stewing – Small pieces of lean meat can be browned on the surface then covered with liquid and gently simmered in a covered pan until tender. Care should be taken not to let the temperature of the liquid exceed 195°F, because boiling toughens meat protein.

Simmering - Involves cooking in water at low temperatures (180°F) like stewing except more water is used and the meat is usually not browned first.

Pressure Cooking – Cooking under pressure produces steam which aids in softening connective tissue. Pieces of meat may be browned then cooked with a small amount of water in a special vented pressure cooker.

Poaching - Cook in a liquid that is not actually bubbling at 165 to 180 degrees. It is usually used to cook delicate foods such as fish and eggs. It takes one third less time than roasting. Poaching helps to keep shrinkage of meat to a minimum.



Source:

<https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Frichland.extension.wisc.edu%2Ffiles%2F2010%2F11%2FProducingQualityMeatRabbits.ppt>

Rabbit Carcass Quality Grading

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Fresh or frozen, rabbit meat is sold all year round. It can be used in most of the ways in which chicken is used. Like other lean meat, poultry, and fish, rabbit meat is a good source of high quality protein. Commercial rabbitries sell fryers to processors who harvest and market the meat. Typical harvest weight and age for a fryer is 5 pounds at 10 weeks of age. A fryer is a rabbit less than 12 weeks of age producing a carcass weighing between 2 and 3 pounds meaning a live weight of 4 - 5.5 pounds (50-59% dress). The flesh of a fryer or young rabbit is tender and fine grained, and of a bright pearly pink color. Roasters are typically 4 months or older of any weight but usually over 5.5 pounds carcass. The flesh of a roaster or mature rabbit is more firm and coarse grained, and the muscle fiber is slightly darker in color and less tender, and the fat may be creamier in color than that of a fryer or young rabbit. The market for roasters is very small and therefore they sell for much lower prices.

Rabbit meat sold in commercial outlets must be processed following local or state health codes. USDA sets standards for rabbit grading. Grading is voluntary and costs are paid by the producer. The program, United States Classes, Standards, and Grades for Rabbits, establishes a basis for quality and price relationship and allows more orderly marketing. Ready-to-cook rabbit carcasses or parts are assigned one of three possible quality grades: A, B, or C with A being the highest quality. Specifications outlined include coagulation in the veins, reddening of the flesh, presence of foreign material, broken bones, bruises, defects, deformities, degree of muscling, firmness of muscling, and interior fat. The standards summarized in the following chart **will be provided** to members when asked to determine quality grade of rabbit carcasses.

Ready-to-Cook Rabbit Carcasses Quality Standards

	A Quality		B Quality		C Quality	
Conformation:	Normal, slight deformities		Moderate deformities		Pronounced deformities	
Fleshing:	Thick, well rounded, and full – well fleshed considering kind and class		Fairly thick, fairly well rounded – fairly well fleshed considering kind and class		Under-developed covering of flesh considering kind and class	
Muscle Texture	Firm		Fairly firm		Soft or flabby	
Cuts and Tears:	Carcass^{1a}	Parts^{1a}	Carcass^{1b}	Parts^{1b}	Carcass	Parts
Loin, Rump, Hind Legs	¼ in.	¼ in.	½ in.	½ in.	No limit, provided meat yield is not materially affected	
Elsewhere	½ in.	½ in.	1 in.	1 in.		
Disjointed and Broken Bones:	Carcass^{2a}	Parts^{2a}	Carcass^{2b}	Parts^{2b}	Carcass^{2c}	Parts^{2c}
	1 disjointed, no broken	1 disjointed, no broken	2 disjointed, 1 broken	1 disjointed, no broken	No limit disjointed, 5 broken	1 disjointed, 1 broken
Missing Parts:	None		None		None	
Discolorations: Carcasses	Lightly Shaded³	Moderately Shaded^{4a}	Moderately Shaded^{4b}		Moderately Shaded	
Loin, Rump, Hind Legs	1 in.	None	2 in.		No limit	
Elsewhere	2 in.	None	3 in.			
Trimming:	Carcasses or parts may be graded after a defect has been removed.					
Freezing Defects	Slight darkening provided the carcass or part has a generally bright appearance. Occasional dry areas and small areas of clear or pinkish colored ice may be present.		May lack brightness. A few dry areas and moderate areas with layers of clear, pinkish, or reddish colored ice may be present.		Large dry areas and no limit on amount or color of ice present.	
<p>^{1a} A cut or tear up to ½ in. in length is permitted at the rump adjacent to the backbone. Cuts or tears caused by skin removal are permitted provided they do not result in an indentation in the muscle tissue, and do not detract from the appearance of the product.</p> <p>^{1b} A cut or tear up to 1 in. in length is permitted at the rump adjacent to the backbone. Cuts or tears caused by skin removal are permitted provided they do not result in an indentation in the muscle tissue, and do not detract from the appearance of the product.</p> <p>^{2a} The ends of leg bones may not be shattered or broken beyond the point where the muscle tissue begins.</p> <p>^{2b} The ends of leg bones may not be shattered but may be broken beyond the point where the muscle tissue begins.</p> <p>^{2c} The ends of leg bones may be shattered or broken beyond the point where the muscle tissue begins.</p>						

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| <p>³ Evidence of incomplete bleeding, such as more than an occasional slight coagulation in a vein, is not permitted.</p> <p>^{4a} Areas adjacent to the bone may have moderate discolorations, provided they do not exceed an aggregate area of ¼ in. and are free of blood clots.</p> <p>^{4b} Evidence of incomplete bleeding shall be no more than slight. Discoloration shall be free of blood clots.</p> |
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Source: https://www.ams.usda.gov/sites/default/files/media/Rabbit_Standard%5B1%5D.pdf.

Another good resource for explaining rabbit carcass evaluation is located at:
https://www.canr.msu.edu/uploads/resources/pdfs/4h1508_4-h_rabbittracks_meat_quality.pdf.

Home Processing Rabbits

Several good resources exist for those wanting to process rabbits for meat at home. Some examples include:

<http://extension.msstate.edu/content/slaughtering-and-dressing-rabbits>

https://florida4h.ifas.ufl.edu/rabbit-project/MarketRabbits/ActivityMP_Intro.html

<https://extension.umaine.edu/publications/1044e/>

Rabbit Skeleton

When fabricating the carcass into wholesale and retail cuts, skeletal anatomy provides the framework and landmarks for each of the cuts. Identification of bone-in retail cuts is much simpler when you have a good grasp of the bones associated with each region of the carcass.

Rabbit Skeleton

