

INTRODUCTION

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

The Florida State Fair recognizes that agricultural education instructors, parents, 4H agents 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 to help exhibitors and educators identify which materials are required for their age level.

J,I,S - for all exhibitors: Juniors, Intermediates and Seniors
I,S - for Intermediates and Seniors only
S - for Seniors only

Juniors (age 8-10 as of September 1, 2008)

Wholesale or Primal Cuts,
By Products

Intermediates (age 11-13 as of September 1, 2008)

all of the above plus...
Retail Cuts,
Wool Grades

Seniors (age 14 and over as of September 1, 2008)

all of the above plus....
Skeletal Anatomy
Sheep/Lamb Evaluation
Cookery

** Additional information is noted in the study manual for preparing for the Champion of Champions competition.

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).

Sheep Products and Marketing***

The products of the sheep industry are those derived from the carcass (lamb, mutton, edible and inedible by-products) and wool. The majority (70%) of the sheep produced in the United States is raised in range conditions and the states with the most lambs on feed are Colorado, California, Texas and Wyoming. The sheep industry in the eastern U.S. is mostly smaller, farm flock operations. The industry can be divided into commercial and purebred production. Though there are far more commercial sheep than purebreds, it is the purebred breeders that set the trends for the industry. Selection priorities have shifted toward larger frame size. There are a number of barriers to having a profitable sheep business: seasonal demand for lamb does not match breeding and lambing season, low per capita consumption, low wool prices, use of artificial fibers, predators, high labor requirement, inadequate slaughter and marketing opportunities. The sheep industry in the United States has declined to the point that it is only a specialty industry. Though there are more than 69,000 sheep producers in the United States, income from sheep and lamb production accounts for only four tenths of 1% of animal agriculture's share of cash receipts. Though sheep numbers in the U.S. are declining, world-wide there is one sheep for every 5.4 people.

Animal By-Products

J,I,S

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 rolled 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

Raw Material

Brains, Kidneys, Heart, Liver, Testicles
 Spleen, Sweetbreads, Tongue
 Cheek and head trimmings
 Blood
 Fats
 Intestines
 Esophagus
 Bones

Principal Use

Variety Meats

 Sausage ingredient
 Sausage component
 Shortening (candies, chewing gum)
 Sausage casings
 Sausage ingredient
 Gelatin for confectioneries (marshmallows), ice cream and jellied food products

Inedible by-products

Raw Material

Hides

Processed by-product

Leather
 Glue
 Hair

Principal Use

various leather goods
 paper boxes, sandpaper, plywood, sizing
 Felts, plaster binder, upholstery, brushes, insulation

Pelts

Wool
 Skin
 Lanolin

Textiles
 Leather goods
 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
 Dry bone

Livestock and poultry feeds
 Glue, hardening steel, refining sugar, buttons, bone china
 Animal feed, fertilizer, porcelain enamel, water filters

Feet

Neatsfoot stock
 Neatsfoot oil
 Pharmaceuticals

Fine lubricants
 Leather preparations
 Medicines
 Pet foods

Glands

Lungs

Blood

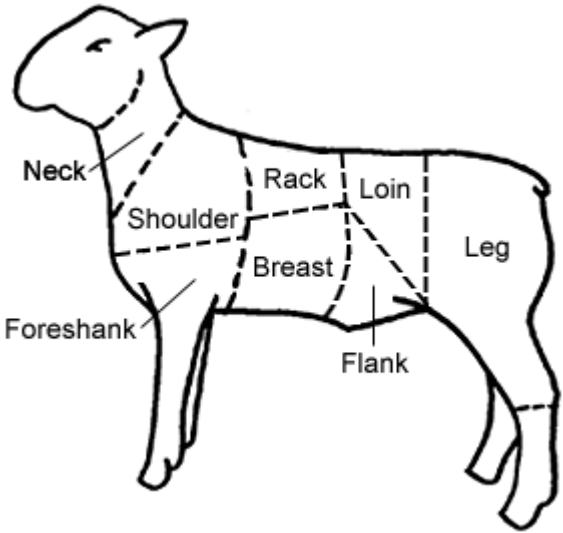
Blood meal
 Blood albumen
 Meat meal

Livestock and fish feeds
 Leather preparations, textile sizing
 Livestock, pet and poultry feeds

Viscera and meat scraps

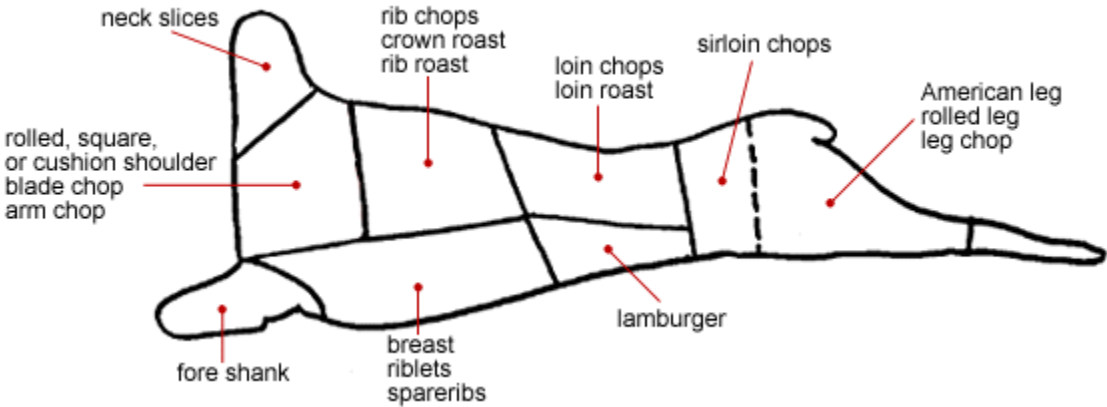
Wholesale and Primal Lamb Cuts

Fabrication of carcasses is the cutting of the carcass into wholesale and retail cuts for distribution to various markets. The size of the carcass and the preferences of the customer will determine how it is fabricated. For lamb carcasses, wholesale cuts come from standard cutting methods developed to: a) Separate fat from lean portions b) Separate tough from tender sections c) Separate thick from thin sections d) Separate valuable from less valuable cuts e) Separate retail cuts by cutting across the grain. Of the wholesale cuts, those that are lean, tender, thick, and valuable and that contain a large proportion of their muscles running in the same direction are called *primal cuts*. The ***primal lamb cuts are shoulder, rack, loin and leg.***



Retail Cuts of Lamb

At the retail markets, boxed cuts are used to generate retail cuts for the meat case. Different stores have their own styles for each cut in an attempt to meet their customers' needs. Retail specifications include size or thickness of cut, external fat trim, boneless or bone-in, and number of cuts per package. Items generated other than steaks and roasts may include stir fry, kabob, cubing material, and grinding material for processed or value-added products. Labels on meat must be specific for species, wholesale cut and retail cut names (example: Lamb Shoulder Blade Chop)





American Leg

Arm Chop

Blade Chop

Center Loin Chop














Center Rib Chop

Frenched Leg

Neck Slice

Primal Cut Bones

Shoulder Arm Cuts	 <p>Arm Bone</p>		
Shoulder Blade Cuts (Cross Section of Blade Bone)	 <p>Blade Bone (near neck)</p>	 <p>Blade Bone (center cuts)</p>	 <p>Blade Bone (near ribs)</p>
Rib Cuts	 <p>Back Bone and Rib Bone</p>		
Short Loin Cuts	 <p>Back Bone (T-shape) T-Bone</p>		
Hip (Sirloin) Cuts (Cross Sections of Hip Bone)	 <p>Pin Bone (near short loin)</p>	 <p>Flat Bone (center cuts)</p>	 <p>Wedge Bonet (near round)</p>
Leg or Round Cuts	 <p>Leg or Round Bone</p>		
Breast or Brisket Cuts	 <p>Breast and Rib Bones</p>		

(Copied with permission from NCBA, "The Guide to Identifying Meat Cuts")

Wool

The National Wool Act of 1954 provided incentive payments to producers to help them compete with foreign imports. In 1993 the incentive program was repealed with the last payments ending in 1995. This, combined with falling wool prices and competition with synthetic fiber, has caused most producers to focus on meat production. Though wool is now considered more of a by-product to sheep producers, it is still a potential source of income. Wool may be marketed by local buyers, wool pools, cooperatives, warehouse operators, or direct sales to wool mills.

Before marketing, wool is graded or sorted based on the **yield, color and staple length**. Yield is the proportion (%) of clean wool present in a given amount of grease wool. The two major classes of wool are carpet wool and apparel wool. Carpet wool is lower quality wool due to the variation in diameter, length and color. Apparel wool, used for clothing, blankets, etc., is the most common used in the U. S. coming from fine, medium and long wool sheep.

USDA wool grades and microns are the two systems used to describe average fiber diameter or *fineness* in raw wool. The **USDA wool grade** predicts **the lengths of yarn that can be spun from 1 pound of clean wool**. Length of yarn is expressed in hanks and equals 560 yards. Both are based on the diameters of the fibers in microns (1/25,400 of an inch or 1/1,000,000 of a meter). The blood system that was based on Merino breeding is obsolete.

Wool Pricing

Clean price is based primarily on **fiber diameter and fiber length** which determine the end use of the raw fiber. Uniformity, fiber strength, color, crimp, softness and contaminants will affect price as well, but to a lesser degree.

Grease price is how most all fleeces are sold as this is how the wool leaves the farm. It is determined by measuring or estimating clean price and combining that with a value for yield and subtracting whatever handling fee is assessed.
 Grease Price = (Clean Price X Yield) – Handling

Wool Judging

Wool judging is a subjective evaluation of raw wool. Judging begins with grading fleeces by estimating grade, length and yield. Grade is best estimated by observing crimp frequency. Staple or fiber length is the second trait estimated and is fairly easy to observe. The third trait to estimate is yield. Generally, coarse fleeces have a higher yield than finer fleeces and long stapled fleeces have higher yields than short stapled fleeces. Any non-wool component in the fleece would decrease the yield. A fleece that feels heavy for its size will probably have a lower than average yield and vice versa. In addition to these estimations, wool should be evaluated for character, color, uniformity and wastiness. When determining character you need to look for a distinct and even crimp throughout the entire fiber length. This improves the general appearance and spinning quality of the fleece. Bright, white to cream colored fleeces are the most desirable. Too much black fiber affects the purity of the wool. Uniformity refers to the minimum of changes in fiber diameter. Uniform fleeces require less sorting. Sound wool comes from healthy sheep. Wool fibers need to be strong and elastic. If they break during processing they are wasted.

<http://www.sheepusa.org/>

Wool Grading Systems		
Average Fiber Diameter (Microns)	USDA Wool Grades	Blood System (obsolete)
under 17.70	Finer than 80s	Fine
17.70 - 19.14	80s	
19.15 - 20.59	70s	
20.60 - 22.04	64s	
22.05 - 23.49	62s	½ Blood
23.50 - 24.94	60s	
24.95 - 26.39	58s	3/8 Blood
26.40 - 27.84	56s	
27.85 - 29.29	54s	1/4 Blood
29.30 - 30.99	50s	
31.00 - 32.69	48s	Low 1/4 Blood
32.70 - 34.39	46s	
34.40 - 36.19	44s	Common
36.20 - 38.09	40s	
38.10 - 40.20	36s	Braid
>40.20	Coarser than 36's	

Lamb Quality and Yield Grading

USDA grade standards are established for slaughter lambs, slaughter yearlings, and slaughter sheep (mutton) to group carcasses based on market desirability. If carcasses are graded, both quality and yield grades are assigned. Quality grades are evaluated subjectively based on factors that relate to the palatability of the cooked meat (maturity and flank fat streaking, flank firmness) and conformation which is used to predict the percentage of the carcass comprised of the more valuable, lean cuts. Yield grades are assigned based on a measurement of fat at the 12th and 13th rib as a predictor of the yield of closely trimmed, boneless or semi-boneless retail cuts from the leg, loin, rack and shoulder.

USDA Quality Grades for slaughter lambs, yearlings and sheep are:

Prime, Choice, Good, Utility, Cull

Lamb from young sheep is considered more desirable than mutton from older sheep.

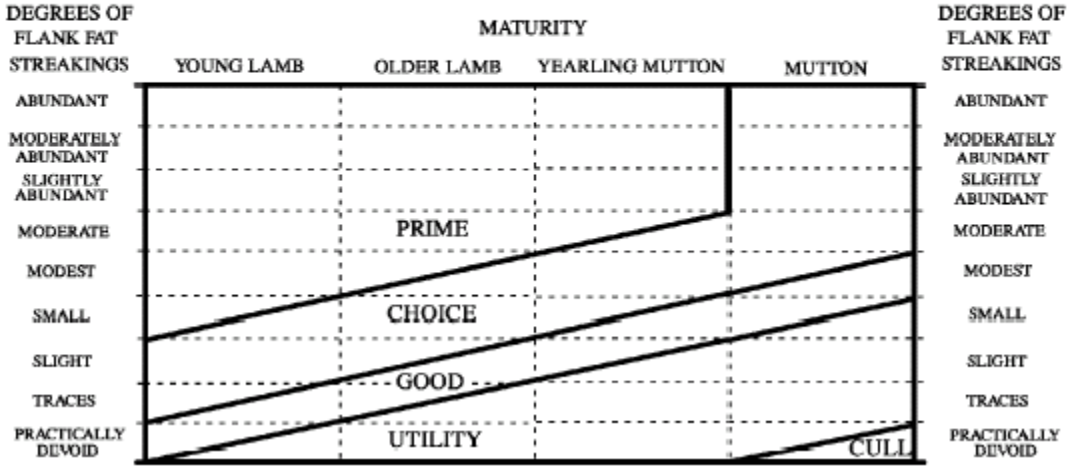
Carcass maturity is evaluated on: Spool vs. Break Joint, Color of the Lean, Texture of the Lean, Size, Shape and Color of the Ribs

Flank Streaking is a predictor of eating quality and there are 9 degrees that can be assigned: Abundant, Moderately Abundant, Slightly abundant, Moderate, Modest, Small, Slight, Traces,

Practically Devoid

Carcass conformation is considered as a part of the overall quality grade with ideal being: Wide in relation to length, Plump and full muscling, Short neck and shanks, High ratio of high value to low value cuts

**RELATIONSHIP BETWEEN
FLANK FAT STREAKINGS, MATURITY AND QUALITY**



USDA Yield Grades are represented by the numbers **1 through 5**. Yield grade 1 is the highest yielding, while yield grade 5 is the poorest yielding.

Yield grading is calculated using the adjusted fat thickness over the ribeye muscle between the 12th and 13th ribs as follows:

$$\text{Yield Grade} = .4 + (10 \times \text{Adjusted fat thickness, 12}^{\text{th}} \text{ rib, inches})$$

USDA Yield Grades for lamb and fat thickness ranges

Yield Grade	Fat Thickness
Yield Grade 1	.00 to .15 inch
Yield Grade 2	.16 to .25 inch
Yield Grade 3	.26 to .35 inch
Yield Grade 4	.36 to .45 inch
Yield Grade 5	.46 inch or greater

Lambs are typically harvested at 115 to 135 pounds and yield carcasses weighing between 45 and 85 pounds (dressing percentage = 40%). Heavier carcasses that are lean with adequate fat cover receive the highest prices. There are value-based marketing systems currently in place that use a more detailed estimation equation for determining cutability. The factors used are carcass weight, Adjusted fat thickness, body wall thickness and rib eye area. Live and carcass quality and yield grades are outlined with photos of sample carcasses at the following web sites:

<http://www.meatjudging.org/Resources/2003%20RMC%20Judging%20Clinic/Lamb%20Carcass.htm>

<http://www.meatjudging.org/Resources/Terminology/Lamb%20Carcass%20Terminology.pdf>

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 steaks or chops. 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 tenderer 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.

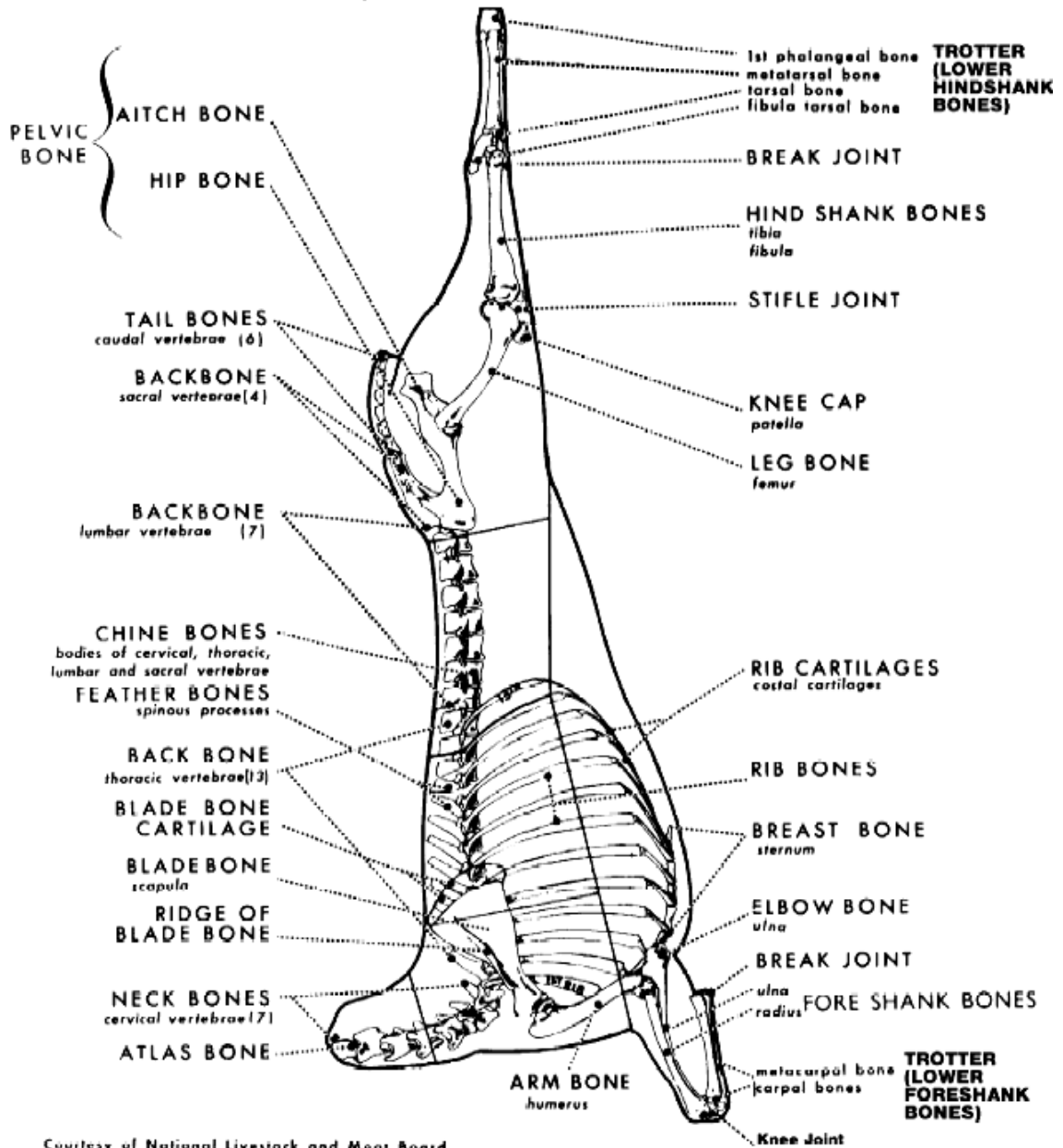
Pressure Cooking – Cooking under pressure produces steam which aids in softening connective tissue. Pieces of meat may be browned then cooked with a small amount of water in a special vented pressure cooker.

Meat Facts ***

100g Roasted	Calories (g)	Fat (g)	Sat'd 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

LAMB SKELETAL CHART

Location, Structure and Names of Bones



Courtesy of National Livestock and Meat Board

SHEEP SHOWMANSHIP

Training Sheep for Showmanship

Leading

1. To lead a sheep, place one hand on the jaw, keep the head up and alert and put the other hand on the dock or behind the ears. Keep fingers together so no finger marks are left on the wool.
2. Pull up on the dock to get the sheep to move or apply pressure behind the ears. The hand used on the dock or behind the ears does not have to touch the sheep but it should be ready to control the sheep if it gets spooked.
3. When touching the sheep, keep your fingers together.

Turning

1. To turn the animal, keep your hand on the jaw, not the throat, and turn its head toward your belt buckle.
2. Slowly move the sheep toward you, switch hands until you stand at the opposite shoulder. This keeps the sheep between you and the judge and allows him or her an uninterrupted view of the animal.

Bracing

1. Bracing is tightening the lamb's muscles so it will feel firm and heavily muscled. This is done when the judge handles the animal. This also gives you more control during the handling process.
2. The feet should be positioned correctly before pressure is applied so the animal will maintain its balance.
3. Once the feet are placed correctly then pressure is applied as firmly as possible, but the sheep should not move and its top should remain straight. Pressure is applied by placing your knee in the animal's chest and by using your hands to elevate the head slightly.
4. Do not pick sheep's front feet off the ground.

In the Show Ring

Proper Dress –

All exhibitors will be required to be clean and neat and dressed in white, green, dark blue or dark black jeans or slacks with a solid white shirt with a white collar. FFA and 4-H accessories are strongly recommended. No caps or hats. Closed-toed shoes or boots are required.

Proper Showmanship Procedure

1. Enter the showing with a smile on your face. Circle the judge in a clockwise pattern.
2. Be considerate of the animals around you. Walking at a normal pace should leave room in front and behind your animal. This room is necessary to keep other exhibitors from feeling crowded.
3. Don't crowd your own animal into line. Look for an open place and then move into position to set it up. Always set up the side closest to the judge first. For example, if the judge is viewing the side of your animal, set the two side legs closest to the judge first. If the judge is viewing the rear of the animal, set the two rear legs first.
4. Always keep your eye on the judge. A good showman knows where the judge is in relation to his/her animal at all times. This enables the showman to follow the judge's directions and commands.
5. When given a command, complete it as quickly as possible.
6. Know information about your sheep in case the judge asks questions.

Proper Posing Techniques

1. There are three positions to be aware of when showing:

Rear View - when the judge is behind the sheep, the exhibitor stays in front of the sheep, hands on the jaw, not the throat, of the animal with the feet set the proper distance apart.

Side View- when the judge is facing either the left or right side of the sheep, the show person sets the legs nearest the judge first. The exhibitor has the most control if he or she reaches over the top of the animal, keeping the sheep between his or her leg at the shoulder and the arm used to set the feet. Some judges prefer reaching under to set the animal's feet.

Front View- when the judge stands in front of the sheep, the show person stands off to the side, near the shoulder, with the hand on the jaw keeping the animal's head in line with the brisket and backbone. The head should be set at an angle best for the sheep, front legs parallel to each other and set at a distance slightly narrower than shoulder width, and rear legs should be parallel to each other set at distance slightly wider than the front legs.

Changing Sides- to change sides keep your hand on the jaw and slowly move around the front of the sheep until you stand on the opposite side. This allows you to keep the animal between yourself and the judge for an uninterrupted view.

2. After the animal is set up, move to its shoulder opposite the judge and kneel, making sure to keep the head up and the topline straight. Most judges prefer you not put your knees on the ground, so you do not get sawdust or dirt on the sheep or lose control in the show ring.
3. Remember to concentrate on your animal's position and watch the judge. You should have a calm, confident manner in the show ring.

* As a tip, on the day before the show, take time to study the show arena. Look for unlevel areas and keep them in mind when showing on show day. You want to set your animal's rear legs in low areas and the front legs on high ground.