2017
Flagler County Fair and Youth Show, Inc.

"The Meat We Eat" Skillathon Manual

INTRODUCTION

This manual has been developed as a study guide for the Flagler County Fair and Youth Show Exhibitor Skill-a-thon which is sponsored by the Flagler County Fair and Youth Show, Inc., Flagler County Cattlemen's Association, and administered by UF/IFAS Flagler County 4-H Youth Development Program. The topic for this year's Skillathon is **"The Meat We Eat"** and will be based on animal nutrition, identification of animal parts and wholesale meat cuts, and USDA beef quality grades.

The Flagler County Fair and Youth Show recognizes that agricultural education instructors, 4-H agents, parents, and leaders provide 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 skill-a-thon competition and should be used as an additional aid to ongoing educational programs.

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

Juniors (age 8-10 as of September 1, 2015)
Animal Nutrition Concepts
Identification: Chicken, Rabbit, Swine

Intermediates (age 11-13 as of September 1, 2015)
all of the above plus….
Feed Classification
Identification: Goat and Sheep

Seniors (age 14 and over as of September 1, 2015)
all of the above plus....
Feed Tag Analysis
Identification: Beef
Beef Quality Grades

GOOD LUCK!

This manual was created by Amy W. Hedstrom, UF/IFAS Extension Flagler County 4H Youth Development Agent. Animal Nutrition information is adapted from the Florida State Fair Skill-a-thon Manual created by Saundra TenBroeck, Ph.D., Associate Professor and Extension Horse Specialist in UF/IFAS Department of Animal Sciences. Information on identification and meat cuts are taken from 2016 Flagler County Fair Animal Exhibitor Record books unless denoted otherwise.

Animal Nutrition Concepts

Junior, Intermediate, and Senior

What an animal eats, how it is digested, absorbed, utilized and what is excreted are the essence of ***nutrition***. Good nutrition is basic to good animal health and production. Proper feeding requires knowledge of nutrients in feedstuffs available to the producer and the nutrient needs of animals. It also includes an understanding of animal behavior and a management strategy that allows animals to consume all that is required without causing digestive upset. Though general rules of thumb are helpful, each situation could require adjustments in order to optimize growth and production.

Nutrients are chemical substances in the diet (feed materials) that support normal body functions. Some nutrients can be manufactured in the animal's body and are classified as ***dietary non-essential***. Other nutrients must be provided in the feed ration and are referred to as ***dietary essential***. Nutrients can be classified into six groups: *water, proteins, carbohydrates, fats (lipids), vitamins. and minerals.*

- *Water* is the most essential nutrient and is involved in all body functions. It is also the most abundant nutrient. Water is necessary for digestion, carrying food nutrients and waste products, cooling the body, and lubricating the joints. Animals receive water from drinking as well as from feeds that contain water. An animal not receiving enough water will not eat well. Factors that affect an animal's water consumption are the animal's size, feed intake, environmental temperature, humidity, and water quality.
- *Proteins* function as the basic structural unit of the animal body and in metabolism. Protein supplies the materials to make body tissue like *muscle*, internal organs, bones, blood, and skin. The dietary requirement for protein is highest in young, growing animals. All proteins are composed of simple units called amino acids. The particular amino acids in a protein determine the quality of that protein. *Protein is one of the most expensive portions of the diet*.
- *Carbohydrates* are organic compounds formed in plants by the process of photosynthesis. They constitute about 75% of the dry weight of plants and grain. Carbohydrates serve as a main source of *energy* in the body. A surplus of carbohydrates is transformed into fat and stored.
- *Fats* (Lipids) function much like carbohydrates in that they serve as a source of *energy*. Fats produce 2 ¼ times more energy than carbohydrates when digested; therefore a smaller amount is required to serve the same function.
- *Vitamins* are essential for development of normal tissue and necessary for metabolic activity. They are required for healthy eyes, nasal passages, lungs, blood, and strong bones. They are effective in the animal body in small amounts. When not eaten correctly and in the right amounts, a specific deficiency disease can result or toxicity could result if eaten in extremely high amounts.
- *Minerals* are inorganic, solid, crystalline chemical elements. They are classified as being either macro (Ca, P, Na, Cl, K, Mg & S), meaning found in high concentrations, or micro minerals (Cr, Co, Cu, F, Fe, I, Mn, Mo, Ni, Se, Si, & Zn), meaning found in trace amounts. Minerals function in protein synthesis, oxygen transport, and in skeletal formation and maintenance. Calcium, which builds strong bones and teeth, makes up nearly 50% of the total body mineral. Phosphorus composes 25% and also plays a major role in building strong bones and teeth. Phosphorous also is a key factor with Calcium and Vitman D in the transfer and utilization of energy. Other minerals make up the remaining 25%.

Specific nutrient requirements vary between species (beef cattle, goat, chicken) but also between individuals within a species. Factors such as weight, environmental temperature, and level of production (growing, maintenance, reproduction) must be considered when determining optimum nutrient levels in a ration. Though it is tempting to provide more than enough as insurance, some nutrients cause problems (toxicity) if fed in excess. *Also, the feeding of livestock accounts for 45-75% of production costs, so overfeeding shrinks profits*. Too much of a good thing is not always good.

Feed Classification and Identification

Intermediate, and Senior

The "stuff" fed to animals in order to meet their nutritional needs are called ***feeds***. The National Research Council (NRC) produces many publications on nutrient requirements of animals and nutrient content of most feedstuffs. Most youth purchase "complete rations", however, it is helpful to know what goes into those rations.

Visit the web site: http://www.ca.uky.edu/agripedia/AGMANIA/FEEDID/INDEX.asp and study feed ingredients so you can visually identify those typically used in livestock feeds (Intermediate and Senior).

Roughages – High Fiber, >18% Crude Figer (CF), Low Digestibility

- Pasture: An area of land that contains forage growth where animals may graze. Pastures are the major feed source in the U.S. for Dairy and beef cattle, sheep, goats, and horses.
- Hay: Any green forage that is grown, harvested, and then preserved for later use by dehydrating to less than 15% moisture content. Hay is an important energy source for cattle, sheep, goats, and horses. Hay can be fed as rolled bales, square bales, cubes, or ground meal.
- Silage: Silage is a high quality, high moisture plant material that has been fermented. It is convenient and economical, especially for dairy cattle, though it is increasingly used for finishing beef cattle.

Energy Feeds – Products with < 20% Crude Protein (CP) and < 18% Crude Fiber

- Oats: Oats are a widely grown energy source used mostly with show cattle and sheep. Oats are excellent for young animals starting on feed.
- Wheat Middlings: Wheat Middlings contain fine particles of wheat bran, wheat germ, wheat flour, and other wheat processing by products. It is commonly fed to swine.
- Corn: Corn is the most extensively produced feed grain. It is the most widely used and best energy feed due to its high starch and high palatability. Corn is the primary grain fed to all swine and poultry as well as finishing cattle and sheep on feed.
- Milo (grain sorghum): 98% of grain sorghum in the U.S. is used in livestock and poultry rations. It does contain an extremely hard seed coat which needs to be processed before feeding. Milo is most common in dry regions with not enough rain for corn production.

- Molasses: Molasses is an extremely palatable and excellent high energy source. Its quality is determined by its sugar content coming from cane, beet, citrus, or wood molasses. It is frequently used in diets of young animals being introduced to dry feed.

Protein Supplements – Products with >20% Crude Protein (CP) from animal and plant origin.

- Dried Whey: Dried Whey is produced by separating the cheese coagulum from milk, cheese, or skimmed milk. It is mostly used in swine and poultry rations.
- Meat and Bone Meal: Meat and Bone Meal is produced from the dry rendered products of mammal tissues. It is very high in calcium and phosphorous and widely used as a protein supplement, especially in poultry and swine feed.
- Cottonseed Meal: Cottonseed Meal is finely ground flakes that remain after moist oil has been extracted from whole cotton seed. It contains no less than 36% CP and is high in phosphorous. It is an excellent protein source for ruminants but should be limited in monogastrics.
- Soybean Meal: Soybean Meal is produced by grinding the flakes which remain after extracting the oil from whole soybeans. It has the highest nutritional value of any plant protein source and can be used for all species.

Feed Tag Analysis

Senior

It is required by law that all commercial feed products carry a proper label. You should be able to read and understand the information on a feed tag. Some of the information included will be: net weight in pounds, company brand name (trade name), product name (class or use), product type (textured, pelleted, extruded, etc.) purpose statement, warning or cautions, active drug ingredient (when applicable), guaranteed analysis (protein, fat, fiber, etc.), feed ingredients in order of content, company name and address, detailed use directions, other feeds (suggestions for other feeds in the total program). Go to a feed store and look at the tags on several types of feeds and determine which feeds are best suited to your program and which are the best value in terms of nutrients per dollar. Be prepared to interpret the information on a feed tag.

GUARANTEED ANALYSIS:

Crude Protein: not less than __%. This number represents nitrogen content of feed and does not give a clear picture of protein quality (e.g. amino acid profile) With lysine being the first limiting amino acid, many swine diets will list the minimum amount of lysine as well.

Crude Fat: not less than __%, typically 1 to 3%. At equal volumes fat contributes 2.25 times the amount of energy compared to carbohydrates. Increased crude fat levels can decrease digestion of forages (e.g., hays and grasses). Fat can be added to the diet in hot weather to maintain energy level when intake decreases

Crude Fiber: not more than __%. The higher the Crude Fiber, generally, the lower the digestibility energy of the feed. The price should reflect this lesser energy, but frequently does not.

Ingredients: listing on the tag does not necessarily identify individual feedstuffs. Instead, it uses *categories* of feedstuffs, e.g., *grain products* (such as corn, oats, barley, wheat), *processed grain by- products* (bran, brewers grain, hominy), *plant protein products* (soybean meal, cottonseed meal, etc.), *molasses products* (cane or beet molasses, dehydrated molasses, wood molasses), and *forage products* (alfalfa meal or leaf meal). The phrase, *roughage products*, identifies the presence of cottonseed hulls or other types of hulls or ground hays. This total must be shown as a percentage of the feed. Their presence will cause the crude fiber guarantee to be abnormally high (16-26% or more) and, as indicated above, lowers the digestible energy content.

The feed tag will also list sources of minerals, any preservatives used, and any vitamin supplements present or used.

The fictitious tags below are included to encourage you to think about what information is actually available on the feed tag and to consider what it means to you in your feeding program. Take a close look at the Crude Protein, Crude Fat, Crude Fiber, and Ingredients listed below and compare them to the labels on your feed at home. The purpose of this exercise is to make you aware of what information is contained on a feed label and to determine if the contents are appropriate for your animal's dietary needs.

Pig Starter Feed

GUARANTEED ANALYSIS

Crude Protein, Minimum 40.0%
Lysine, Minimum 3.6%
Crude Fat, Minimum 2.5%
Crude Fiber, Maximum 3.8%
Calcium (Ca), Minimum 1.65%
Calcium (Ca), Maximum 2.15%
Phosphorus (P), Minimum 1.5%
Salt (NaCl), Minimum 0.9%
Salt (NaCl), Maximum 1.4%

Laying Pellets

GUARANTEED ANALYSIS

Crude Protein, not less than 18.0%
Crude Fat, not less than..... 3.0%
Crude Fiber, not more than..... 9.0%
Calcium (Ca), not more than..... 3.8%
Calcium (Ca), not less than..... 2.4%
Phosphorus (P), not less than..... 1.2%
Iodine (I), not less than..... 0.00015%
Salt (NaCl), not less than..... 1.0%
Salt (NaCl), not more than..... 2.0%

INGREDIENTS

Ground Newspapers, Ground Uncooked Turkey Feathers, Ammonium Nitrate, Super Phosphate, Tincture of Iodine, Used Crankcase Oil, Hardwood Sawdust, Ground Marble Chips, Vitamin A & D Oil, Ground Shoes (without Rubber Soles), Barber Shop Sweepings, Salt.

Manufactured By: LEAST IN THE EAST

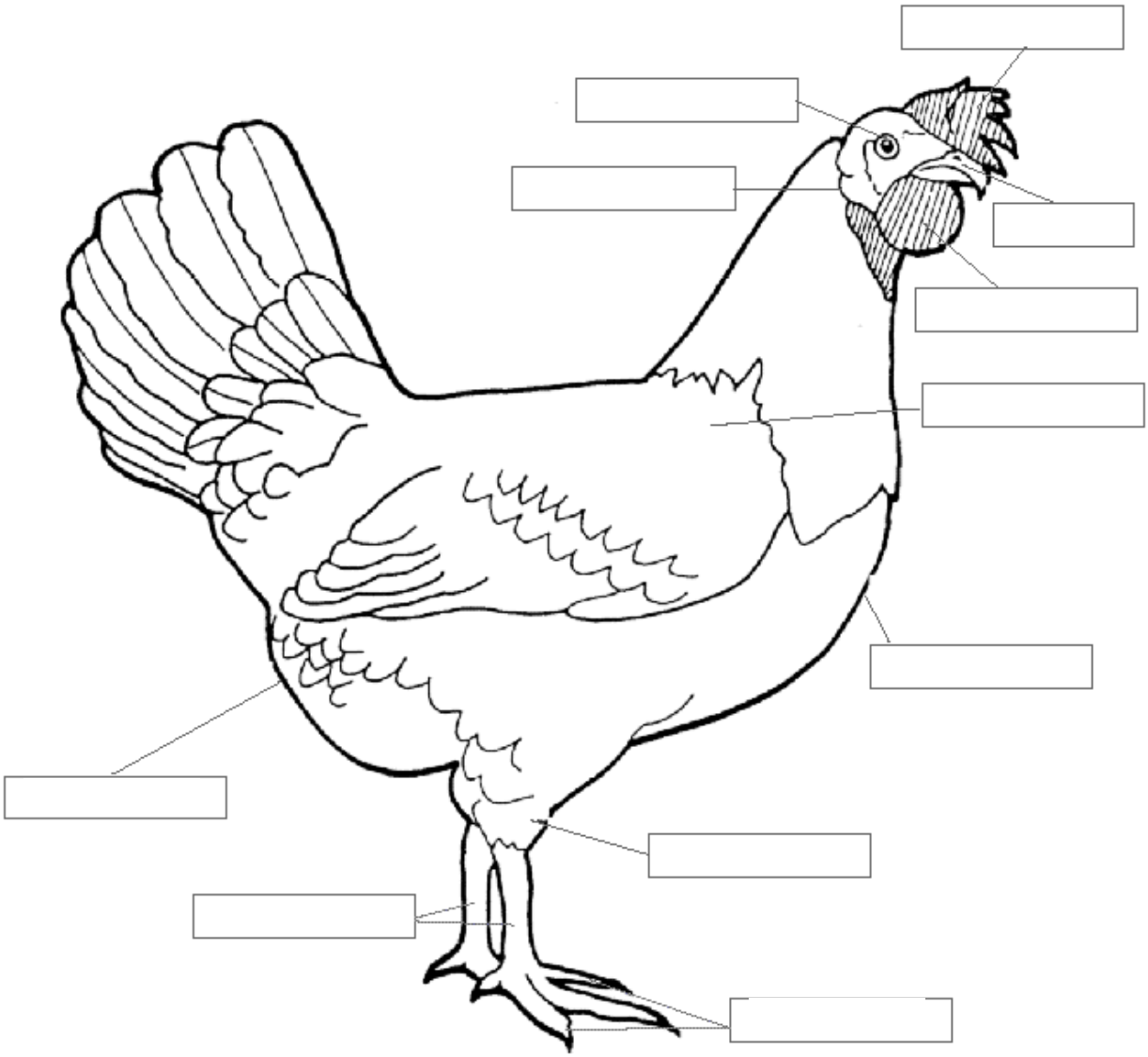
Selling Directions: For price-conscious feeders who are not interested in results.

Check out the feed labels in your barn and compare the quality!

Identification

Junior, Intermediate, and Senior

Label the Parts of a Chicken

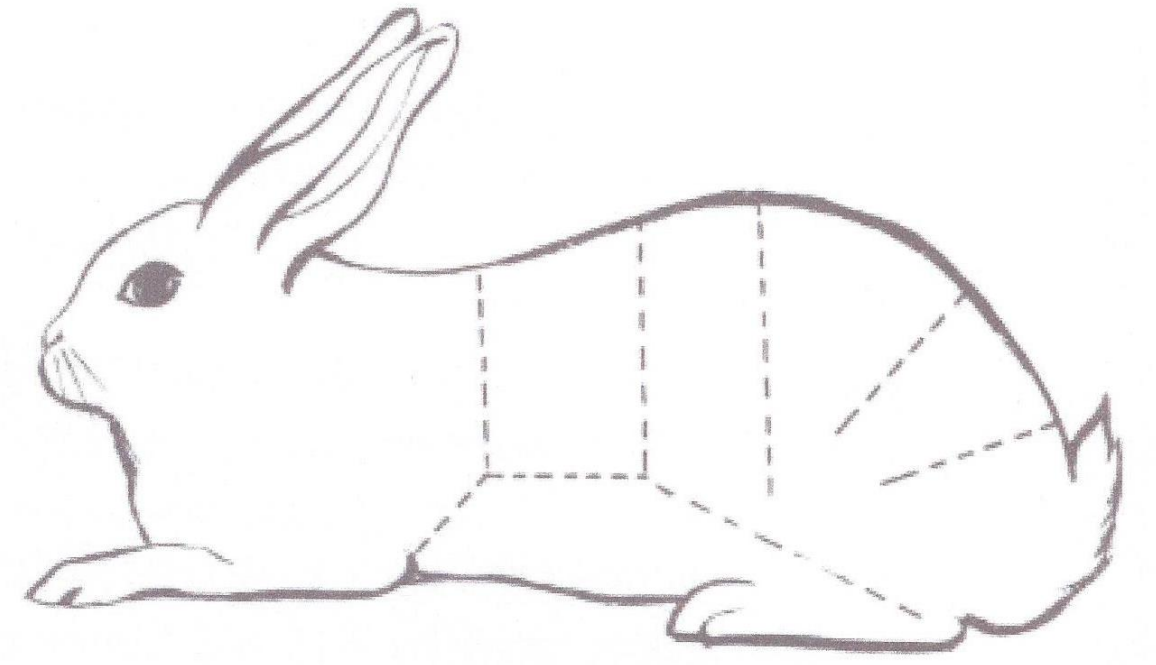


Use each word only once:

beak	breast	comb	earlobe
eye	hock	shanks	shoulder
toes	vent	wattles	

Label the Parts of a Rabbit

Junior, Intermediate, and Senior



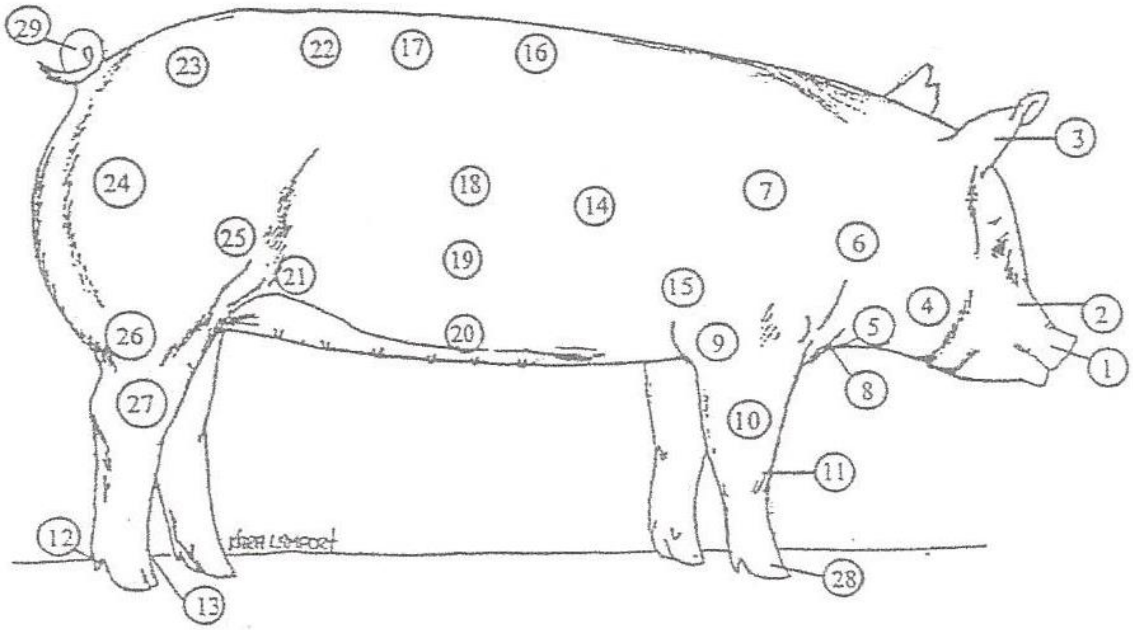
Use each word only once:

Leg	Tail	Eye	Cheek	
Belly	Shoulder	Dewlap	Ears	
Hip	Loin	Flank	Rump	Rib

Junior, Intermediate, and Senior

Label the Swine Parts

External Parts of Swine
Figure 3



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10.	11.	12.
13.	14.	15.
16.	17.	18.
19.	20.	21.
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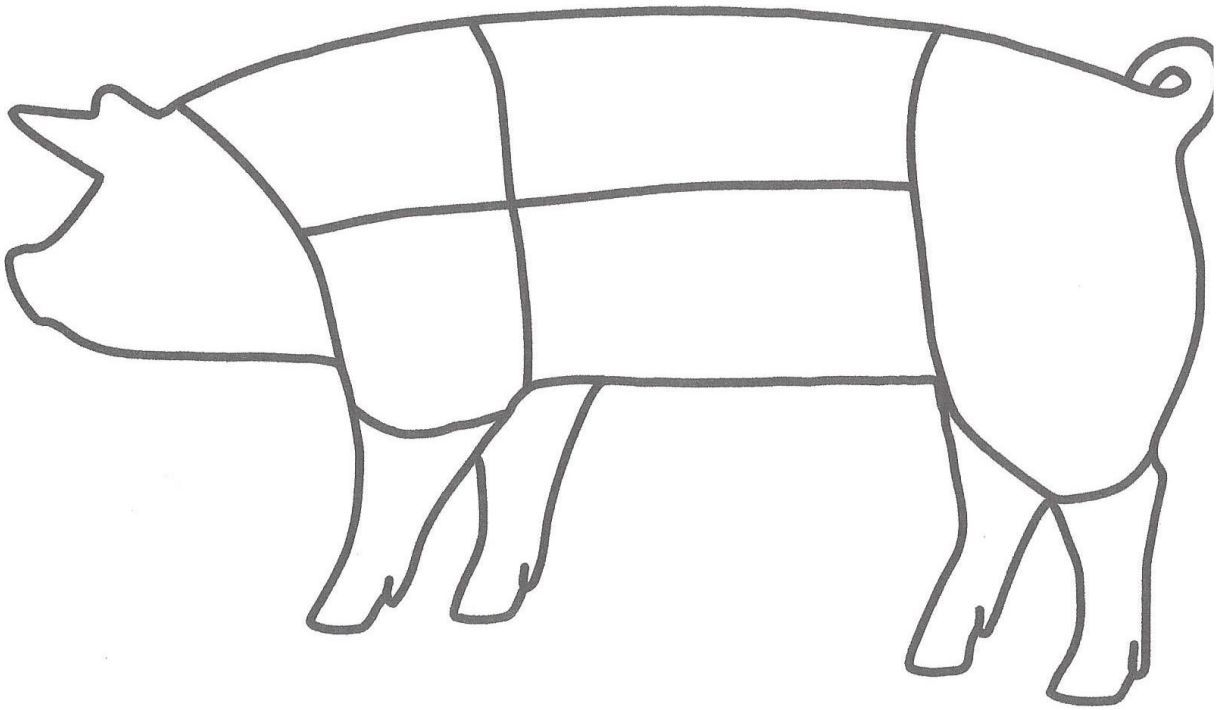
25.	26.	27.
28.	29.	

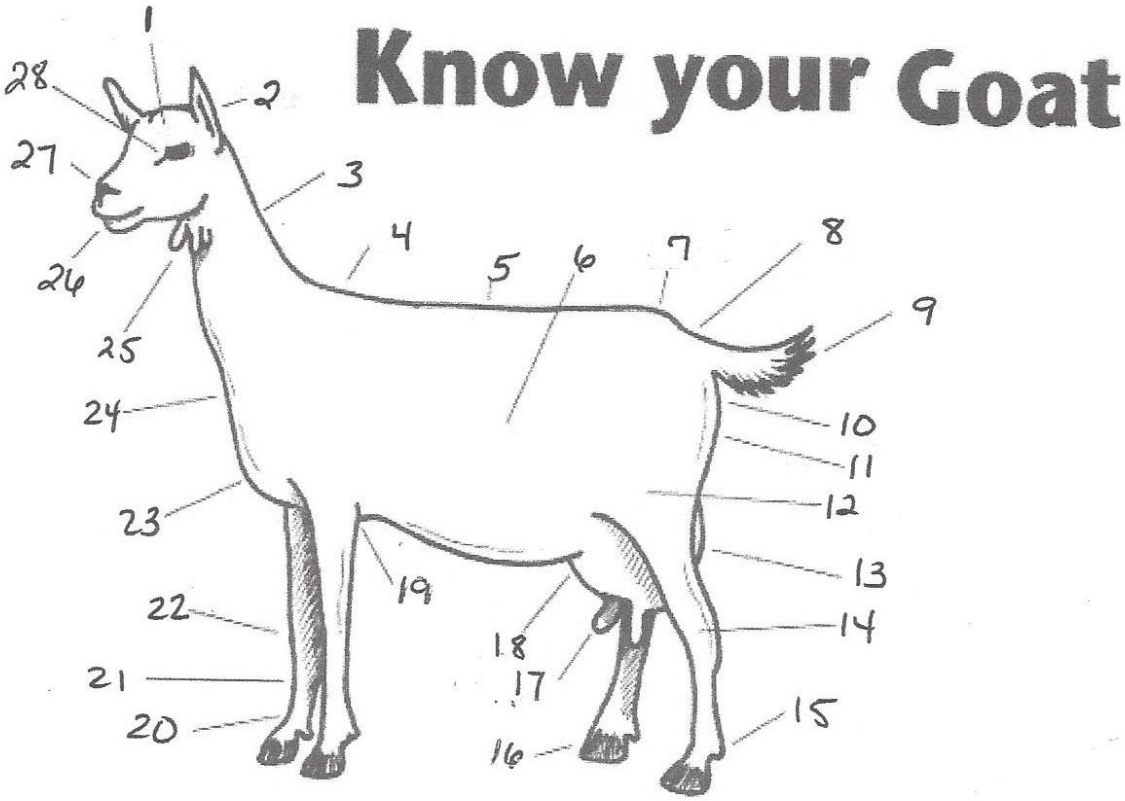
Label the Wholesale Meat Cuts

Junior, Intermediate, and Senior



Intermediate, and Senior

Label the Parts of a Goat



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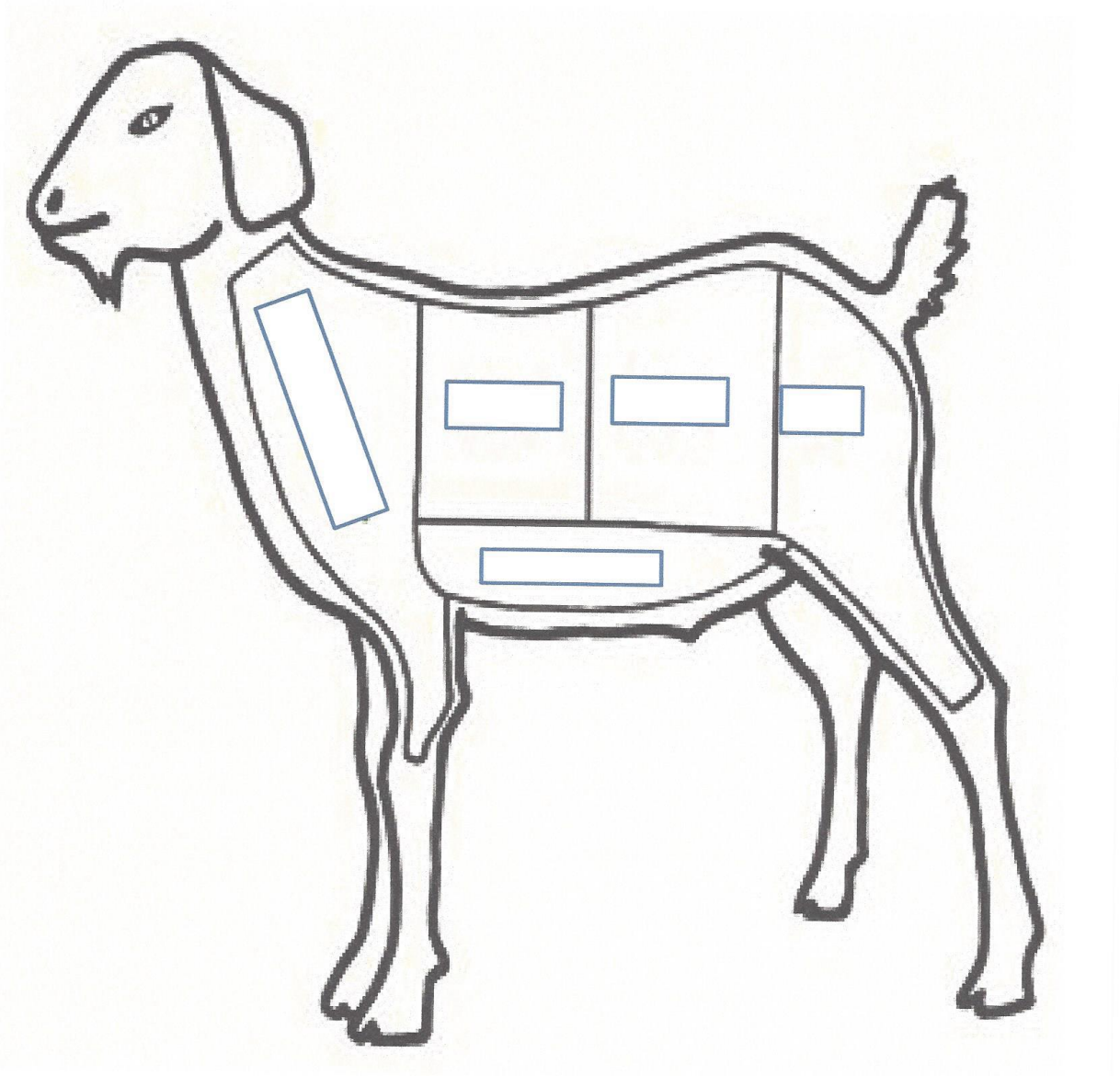
Label the Wholesale Meat Cuts

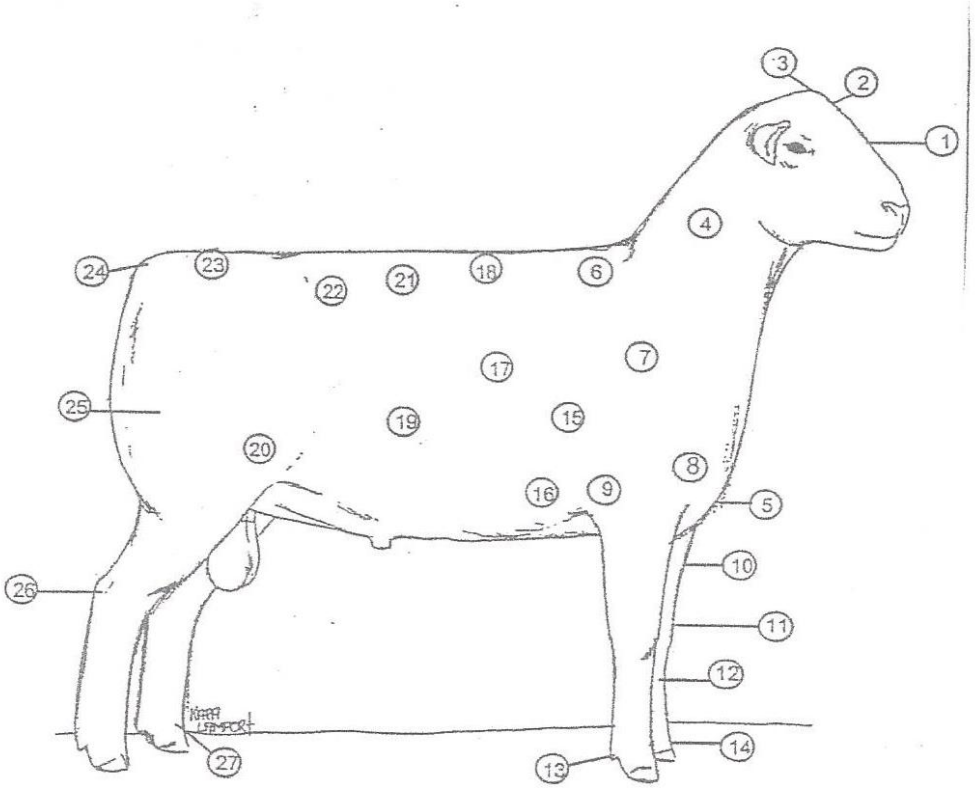
Intermediate, and Senior



Label the Parts of Sheep

Intermediate, and Senior

External Parts of Sheep
Figure 2



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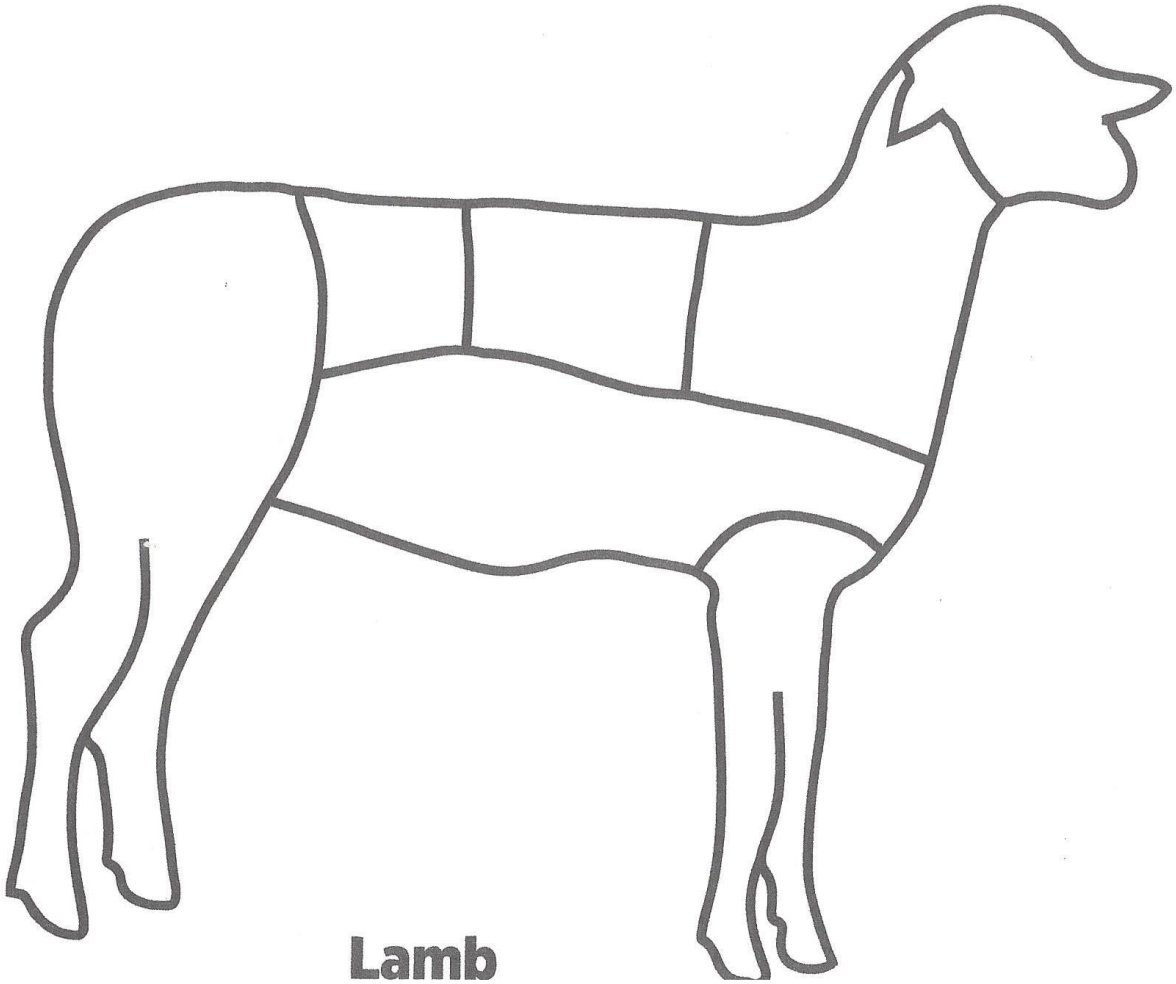
25.	26.	27.

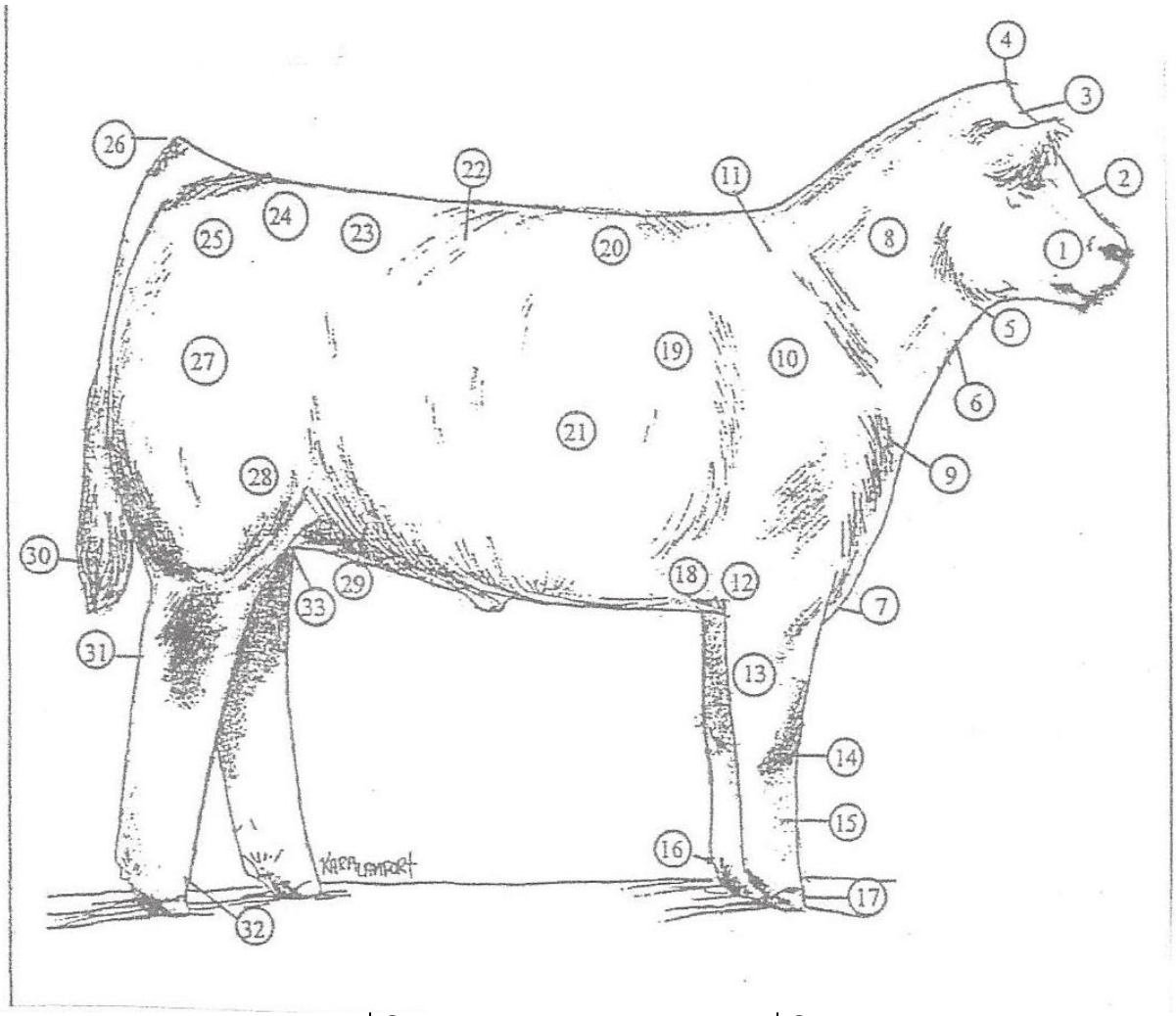
Intermediate, and Senior

Label the Wholesale Meat Cuts



Senior

Label the External Beef Parts



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16.	17.	18.
19.	20.	21.
22.	23.	24.
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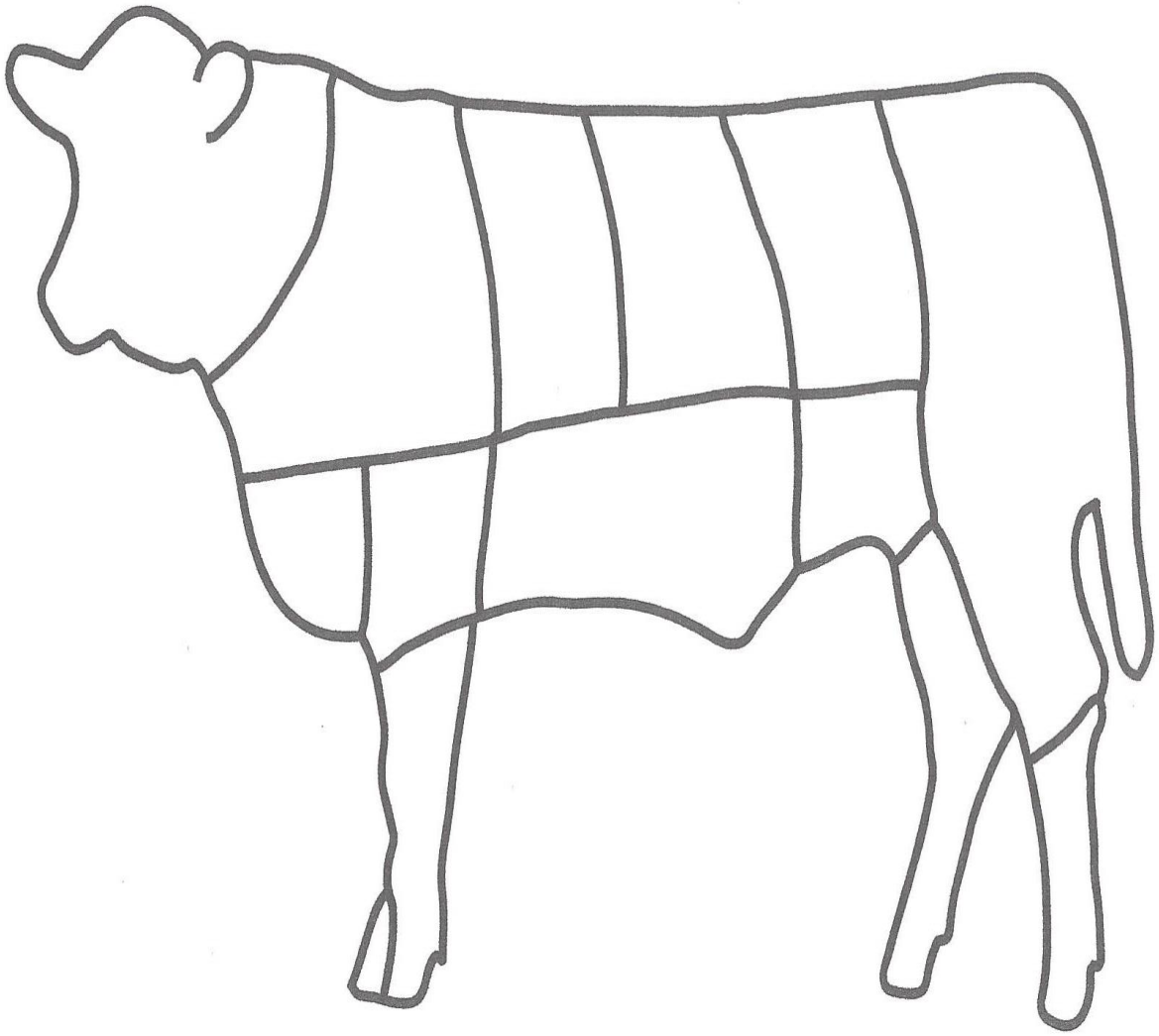
28.	29.	30.
31.	32.	33.

Label the Popular Meat Cuts

Senior



Senior

USDA Beef Quality

Beef Quality Grades: A quality grade is a composite evaluation of factors that affect palatability of meat (tenderness, juiciness, and flavor). These factors include carcass maturity, firmness, texture, and color of lean, and the amount and distribution of marbling within the lean. Beef carcass quality grading is based on (1) degree of marbling and (2) degree of maturity.

Marbling: Marbling (intramuscular fat) is the intermingling or dispersion of fat within the lean. Graders evaluate the amount and distribution of marbling in the ribeye muscle at the cut surface after the carcass has been ribbed between the 12th and 13th ribs. Degree of marbling is the primary determination of quality grade.

*__INTER__muscular fat – The fat that lays in thick layers on top of muscles as well as between muscle groups.

*__INTRA__muscular fat – (marbling) the thin wisps of fat that thread their way between fibers within the muscle. This is the fat that gives meat its rich texture and much of its flavor.

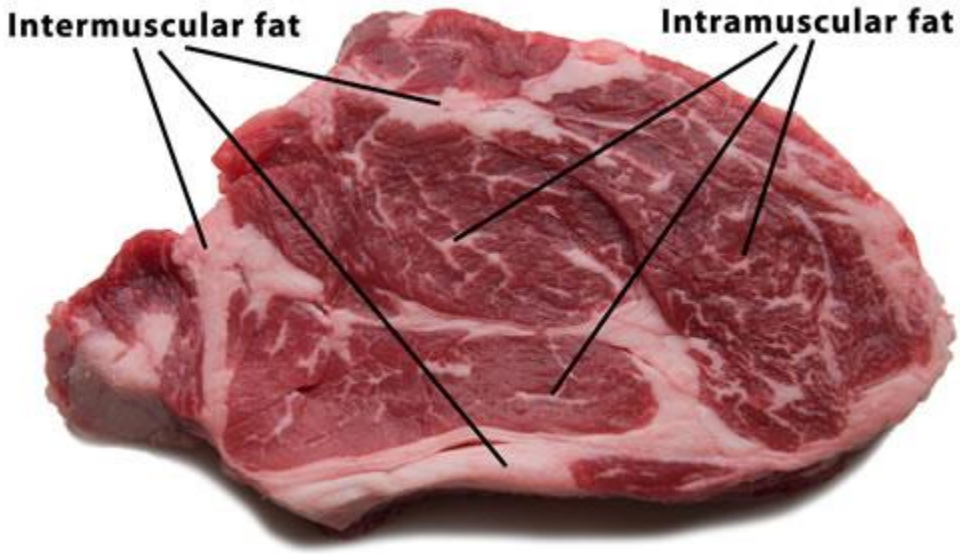


Photo: amazingribs.com

Degrees of Marbling: You are responsible for knowing three USDA grades associated with degrees of marbling: Prime, Choice, and Select. Abundant marbling is considered Prime, Moderate marbling is considered choice, slight marbling is considered select, and small traces of marbling are considered standard.

**Information provided by Texas A&M Extension - Meat Science*

What's Your Beef?

A guide to understanding USDA's beef grades.

Prime beef is produced from young, well-fed beef cattle. It has abundant marbling, and is generally sold in hotels and restaurants. Prime roasts and steaks are excellent for broiling, roasting or grilling.

Choice beef is high quality, but has less marbling than Prime. Choice roasts and steaks from the loin and rib will be very tender, juicy, and flavorful and are suited for broiling, roasting or grilling. Less tender cuts are perfect for braising, roasting or simmering on the stovetop with a small amount of liquid.

Select beef is very uniform in quality and normally leaner than Prime or Choice. It is fairly tender, but, because it has less marbling, it may not have as much juiciness or flavor. Select beef is great for marinating or braising.

Produced by the U.S. Department of Agriculture
Agricultural Marketing Service
www.ams.usda.gov/grading

background photo courtesy KyleWiTh

**Information provided by United States Department of Agriculture*

**Photo: www.theperfectsteak.com.au*