

MEAT GOAT

SELECTION, CARCASS EVALUATION & FABRICATION GUIDE



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Introduction

This manual has been developed as a guide to the meat goat industry in evaluating live meat goats, measuring important carcass traits and standardizing cutting procedures for goat carcasses. Although the United States Department of Agriculture (USDA) has no official grades or standards for live meat goats, the terminology in this manual has been adapted from USDA Agricultural Marketing Service Institutional Meat Purchase Specifications (IMPS) selection criteria for live goats in Series 11 Fresh Goat. Pictures of live goats and carcasses were obtained in numerous cooperative research and service projects. An expert panel determined the most accurate depictions and appropriate descriptive information for the live animal, carcass and cut representations in the manual. It is intended that this manual will undergo revisions as the meat-goat industry continues to produce kid goats with higher conformation and heavier muscling.

The historical basis for the manual has been to improve the marketing of meat goats by establishing uniform communication terminology to facilitate trade in the industry. Studies for potential brand identity marketing determined that consumers were unable to distinguish meat from kid and yearling goats when goats had high and medium conformation. The fresh goat IMPS developed criteria to assess relative lean to fat and bone and provided a written description of attributes for selection criteria for live goats and meat goat carcasses.

Live goat traits that influence meat yield are conformation, relative proportion of muscle to fat and bone and relative body size as weight or heart girth and barrel body circumference. Selection 1 goats have a superior conformation that yields a high proportion of meat from the carcass, Selection 2 goats have an average meat-type conformation and Selection 3 goats have inferior conformation and a low ratio of meat to body components. External or subcutaneous fat is deposited on kid goats over the ribs and behind the shoulder, with minimal fat over the back muscle (*Longissimus dorsi*) except with high concentrate energy feeding.

Goats have a distinctive hip and leg structure that changes during cooling of carcasses to give meat goat carcasses a more elongated and stretched appearance, even with heavy muscled carcasses, compared with other meat species. The relative proportion of lean meat yield from the carcass is influenced by: carcass weight; carcass conformation; amount of kidney, heart and pelvic fat inside the carcass body cavity; and relative extent and depth of subcutaneous fat over the shoulder and ribs. Lean flank color is indicative of relative physiological age of the live goat, with a paler red more highly desired by consumers. Carcass traits that can be easily evaluated and highly influence muscle to bone ratios or consumer disireability are:

- Carcass weight (usually hot carcass weight before the carcass is chilled after slaughter).
- Conformation as Selection 1, Selection 2 or Selection 3.
- External fat score as 1= minimal/none, 2= fat over rib and shoulder, 3= excessive fat cover.
- Kidney, heart and pelvic internal fat as a percentage of hot carcass weight.
- Lean color as A (pale red), B (dark red), C (very dark red).

The USDA IMPS for Fresh Goat Series 11 describe five cutting styles that correspond to different carcass weights and subsequent cuts for institutional and retail purchasers. The IMPS codification system has platter, roasting, barbeque, food service and hotel styles with identification codes that give common language and uniform specifications for carcasses, cuts and products. Meat cuts from the different styles include foreshank, hindshank, neck, foresaddle, shoulder, outside shoulder, inside shoulder, rack, ribs, breast, back, loin, sirloin and legs. The major cuts may be boneless or closely trimmed items. Additional purchaser options may be specified to insure purchase of uniform products.



Meat Goat

Conformation Selection Criteria

The USDA Institutional Meat Purchase Specification Criteria for live goats and carcasses are based on consideration of conformation (muscle to bone). Selection 1 goats or carcasses have a high proportion (by weight) of meat to bone. Selection 3 goats and carcasses have a low ratio of meat to bone. Terminology from USDA Agricultural Marketing Service Institutional Meat Purchase Specifications for Fresh Goat Series 11 is used to describe characteristics for each selection classification.

Selection 1 live goats and/or carcasses have a superior meat-type conformation without regard to the presence of fat cover. They shall be thickly muscled throughout the body as indicated by:

- A pronounced (bulging) outside leg (*Biceps femoris* and *Semitendinosus*).
- A full (rounded) back strip (rib and loin, *Longissimus dorsi*).
- A moderately thick outside shoulder (*Triceps brachii* group).

Selection 2 live goats and/or carcasses have an average meat-type conformation without regard to the presence of fat cover. They shall be moderately muscled throughout the body as indicated by:

- A slightly thick and a slightly pronounced outside leg (*Biceps femoris* and *Semitendinosus*).
- A slightly full (flat or slightly shallow) back strip (rib and loin, *Longissimus dorsi*).
- A slightly thick to slightly thin outside shoulder (*Triceps brachii* group).

Selection 3 live goats and/or carcasses have an inferior meat-type conformation without regard to the presence of fat cover. The legs, back and shoulders are narrow in relation with its length and they have a very angular and sunken appearance.

Numbering System for Selection Classifications

Each selection classification can be divided into 100 parts. The highest selection for live goats is 199, and 300 is the lowest selection score. Selection scores are usually assigned to the nearest 10 parts, e.g. 110, 240 or 320.

| Relative Conformation | Selection Classification | | |
|----------------------------|--------------------------|-----------------|-----------------|
| | No. 1 | No. 2 | No. 3 |
| Highest conformation score | 1 ⁹⁹ | 2 ⁹⁹ | 3 ⁹⁹ |
| Middle conformation score | 1 ⁵⁰ | 2 ⁵⁰ | 3 ⁵⁰ |
| Lowest conformation score | 1 ⁰⁰ | 2 ⁰⁰ | 3 ⁰⁰ |



Market Kid Goats

Selection Classification Comparisons



Selection 1 1⁵⁰



Selection 2 2⁵⁰



Selection 3 3⁷⁰

Market Kid Goats

Selection 1 1⁵⁰

Selection 1 kid goat shows a typical meat goat in the middle of the classification or 150. The three views of this goat show superior meat conformation with thick muscling throughout the body that will give a high meat-to-bone ratio. Moderately thick muscling appears through the chest, and the muscling over the back strip is full and rounded. The outside leg has bulging muscling, and the outside shoulder is moderately thick. The kid goat exhibits the desired muscle-to-bone ratio desired to give superior meat yield.



Selection 1 1⁵⁰

Selection 2 2⁵⁰

Selection 2 classification requires moderate muscling throughout the body. This goat shows average muscling desired for the conformation selection class, a Selection 250. The chest muscling is moderate, and the back strip muscling is flat, reflecting slight fullness along the back. The outside leg has only slightly thick muscling, and the shoulder muscling is slightly thin. The leg muscling is slightly higher than expected for a goat, and the shoulder muscling is thinner than desired for a goat in the middle of Selection 2 classification. This goat with Selection 250 classification will have a medium meat yield, because of the average muscle-to-bone ratio.



Selection 2 2⁵⁰

Selection 3 3⁷⁰

Selection 3 goats have inferior meat conformation. This goat has slightly thin muscling through the breast and along the back and very thin muscling through the leg. The legs, back and shoulder are narrow compared with the body length. The sunken appearance at the top of the shoulder, below the loin, top of the rump and base of the leg indicates the lack of conformation and poor yield of meat from this goat. These pictures show that goats will appear different in different lighting conditions. The three views above show the same goat, but under different light, so that the coat color is a different shade in the three pictures. Shadows also will change the visual impressions of live animals.



Selection 3 3⁷⁰

Goat Carcass Evaluation

Carcasses of meat species are evaluated to give an estimation of the ratio of muscle to fat and bone or the amount of edible meat that will be gained. Goats and their carcasses have unique muscle, fat and bone growth and development that require evaluation of different carcass traits than the characteristics usually used in the other red-meat species to estimate meat yield. The major back muscle, the Longissimus dorsi, is often too small to be measured accurately in most carcasses weighing less than 60 pounds, so the relative thickness of muscles in the different carcass parts is used to determine the carcass conformation. The same descriptive terminology for muscling used for live goats is applicable for describing the conformation of goat carcasses.

Goats deposit fat in the kidney and pelvic regions before developing a pocket of fat behind the shoulders and over the ribs. The fat will be trimmed when the carcass is fabricated into cuts, so fat will reduce the lean yield from the carcass. Unless a goat is overly fat, subcutaneous fat will not be deposited over the top (dorsal) surface of the L. dorsi muscle. The amount of fat is judged subjectively by assigning an external fat score. Color of the lean is not necessarily related to overall palatability, but a lighter, pinker flank muscle indicates a goat with less physiological maturity. The meat from younger goats is generally preferred by consumers to meat from yearling or older goats.

Selection Classification Comparisons



1⁵⁰



2⁵⁰



3⁵⁰



Kid Goat Carcasses

Carcass Selection 1⁵⁰

Goat carcasses in Selection 1 have superior meat conformation with the highest meat-to-bone ratios and highest yields of meat. This carcass has thick leg muscling with bulging outside leg muscles. The back muscle (*L. dorsi*) is full through the loin and ribs. The junction of the loin and leg and the shoulder show thick muscling. The muscling is uniform throughout the body. The carcass shown is typical of a Selection 1⁵⁰ carcass that is midway between the highest Selection 1 and lowest Selection 1 conformation scores. The meat-to-bone ratio and meat yield are high in Selection 1 carcasses.



Carcass Selection 2⁵⁰

This Selection 2 goat carcasses exhibits moderate muscling throughout. The leg is slightly thick- muscled with slightly bulging outside leg muscling. The *L. dorsi* in the loin and rib along the back are slightly full. A depression is at the loin and leg junction that indicates a lack of muscling in this region. The shoulders are slightly thick. The side view shows a deficiency of leg depth and lack of muscle thickness in the back and shoulders. This carcass is typical of a carcass in the Selection 2⁵⁰ classification.



Carcass Selection 3⁵⁰

Selection 3 goat carcasses produce a lower yield of lean meat compared to the body weight and size. The carcass narrowness indicates the lack of muscling throughout the carcass. The leg muscling on this carcass is moderate, with a slightly full outside leg. The loin and ribs have very shallow muscling, as indicated by the depression along the top of the back. The shoulder muscling is slightly thin. The thinness of the carcass gives a shrunken appearance. This carcass is typical of one in the midrange of the Selection 3 classification.



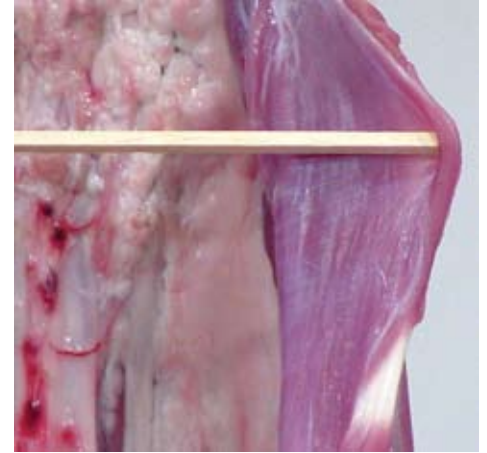
Kid Goat Carcass Evaluation Traits

Flank Lean Color

Lean color is observed on the inner portion of the flank muscle. The amount of pigments in the muscle increase with animal age, resulting in a darker color. Younger kid goats have a light, grayish pink flank. Goat meat consumers have indicated a preference for meat with lighter color.



A30



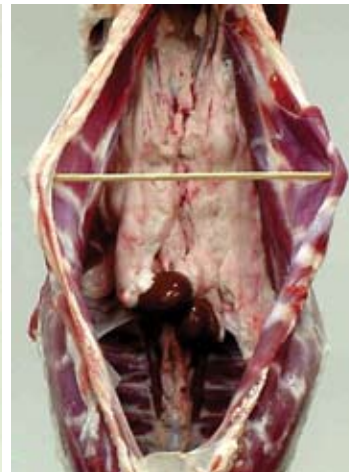
B30

Kidney, Heart and Pelvic Fat

Kidney, pelvic and heart (KPH) fat are reported as a percentage of the carcass weight. Trained observers can make accurate visual estimations of the actual % KPH fat based upon the degree to which the KPH fat fills the body cavity relative to the carcass size. Learning to estimate the amount of KPH fat is best accomplished by removing the fat from the body cavity and weighing it to calculate the percentage of fat compared with the carcass weight. KPH fat is left in goat carcasses until the carcass is fabricated into parts to reduce moisture loss from the carcass and to add weight for sales through the different meat marketing channels.



1%



2%



3.5%

Subcutaneous Fat Cover Score

Subcutaneous body fat is deposited differently in goats than in the other red-meat species. The external fat is usually deposited behind the shoulder and over the ribs, but not over the back. Objective measurement of fat depth is difficult, but the estimation of external fat is important, because the fat will be trimmed from the carcass and parts before sale of retail cuts to the consumer. The fat cover score reflects the relative degree of fat covering the carcass. More fat is found over the ribs and behind the shoulder than over the rear legs and back. Overly fat carcasses have a thin layer of fat over the back and a very thick pad of fat over the shoulders and ribs.






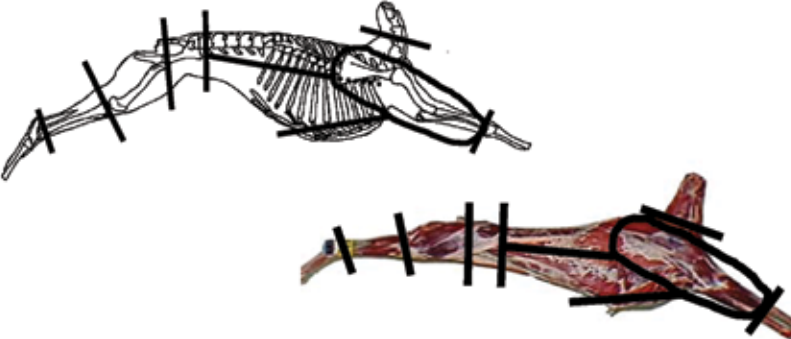

1

2

3

USDA Institutional Meat Purchase Specifications

Fresh Goat Series 11

| IMPS Style | Carcass Weight Range | Recommended Skeletal and Muscular Cuts |
|--------------|----------------------|---|
| Platter | 15 lb. or less |  <p>Diagram showing skeletal and muscular cuts for a platter-style goat carcass (15 lb. or less). The skeletal view shows a single vertical line through the spine. The muscular view shows a single vertical line through the center of the carcass.</p> |
| Roasting | 15 to 30 lb. |  <p>Diagram showing skeletal and muscular cuts for a roasting-style goat carcass (15 to 30 lb.). The skeletal view shows two vertical lines through the spine. The muscular view shows two vertical lines through the center of the carcass.</p> |
| Barbeque | 20 to 40 lb. |  <p>Diagram showing skeletal and muscular cuts for a barbeque-style goat carcass (20 to 40 lb.). The skeletal view shows three vertical lines through the spine. The muscular view shows three vertical lines through the center of the carcass.</p> |
| Food Service | 30 to 40 lb. |  <p>Diagram showing skeletal and muscular cuts for a food service-style goat carcass (30 to 40 lb.). The skeletal view shows four vertical lines through the spine. The muscular view shows four vertical lines through the center of the carcass.</p> |
| Hotel | 40 lb. or more |  <p>Diagram showing skeletal and muscular cuts for a hotel-style goat carcass (40 lb. or more). The skeletal view shows five vertical lines through the spine. The muscular view shows five vertical lines through the center of the carcass.</p> |

| Style | Platter | Roasting | | Barbeque | | Food Service | | Hotel | |
|--------------------|------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| Carcass weight lb. | 15 or less | 15 to 30 | | 20 to 40 | | 30 to 40 | | 40 and above | |
| Cut name | | Average weight | Weight range | Average weight | Weight range | Average weight | Weight range | Average weight | Weight range |
| Leg | | 3 | 2-4 | 7.5 | 3.3-10 | 8.2 | 1.7-12 | 11.3 | 7.6-19 |
| Hind shank | | | | | | 1.4 | 0.6-6.7 | 1.6 | 1.1-2.4 |
| Loin | | 4 | 3-6 | | | | | 2.8 | 1.8-3.8 |
| Back | | | | 2 | 1.2-5 | 5.8 | 4-18.8 | | |
| Rack (rib) | | | | | | | | 6.5 | 4-17.4 |
| Ribs | | | | 7.5 | 4.7-12.6 | 3.7 | 2.7-5.6 | 6.2 | 3.3-13.6 |
| Shoulder | | 9.6 | 7-11.5 | | | | | | |
| Outside shoulder | | | | 3.8 | 0.9-6.6 | 6.3 | 1.1-7.7 | | |
| Square shoulder | | | | | | | | 10.5 | 6.5-21.2 |
| Fore shank | | 1 | 0.5-1.5 | | | | | 2.2 | 1.3-8.9 |
| Neck | | 0.8 | 0.5-1.4 | 1.2 | 0.8-1.9 | 1.5 | 0.7-2.3 | 1.7 | 0.8-3.3 |

Purchaser specified options in IMPS allow the customer to precisely define the parameters of the meat product to be purchased. The options also may guide the processor in fabricating carcasses into cuts to provide uniformity in the product appearance, composition and quality. Additional details are in the Fresh Goat series 11 IMPS at <http://www.ams.usda.gov/lsg/stand/imps.htm>.

Fresh Goat IMPS Purchaser Specified Options

- Style (platter, roasting, barbeque, food service, hotel)
- Cut identification (primal cut or location on carcass)
- Boneless or bone-in, tail length, special cutting instructions
- Added ingredients such as enhancement solutions
- Conformation selection (1, 2, 3)
- Class – buck, doe, wether
- Maturity – kid, yearling, goat
- Breed type, forage type, organic certification
- Slaughter – Halal, Kosher
- Refrigeration – fresh (refrigerated) or frozen
- Weight or thickness of portion cut, cut fat trimming
- Netting/tying and packaging and packing requirements
- Quality assurance requirements



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