Chapter 3
Meat Goat Selection

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Selection as a Tool for Profit

The four cornerstones of any successful livestock enterprise include selection and breeding, health and nutrition, management and marketing. This chapter will discuss those factors pertaining to the selection of functional breeding animals that offer the producer the greatest opportunity to manage and market meat goats for profit. Any discussion on the selection of breeding or market animals is based on the ideal or prototypical standard for that specie. With that ideal animal in mind, producers can then go out and select bucks and does closely resembling the model they have in mind.

Though different producers in the goat business have different goals based on individual preferences, level of experience, physical and financial resources, existing situations and managerial abilities, the economically important traits are common to all levels of production in the real world of commercial meat goat production. The profit pyramid illustrates the hierarchy of economically important traits in commercial meat goat production (Figure 3-1). Reproductive efficiency is the foundation of profitability and includes such traits as fertility, proficiency, mothering ability, milk production and longevity to name a few. Simply put, having more kids to sell for a given number of does will influence the bottom line of the operation more than any other factor. Adding value to those traits are the growth traits of the kids such as weaning weight, yearling weight, rate of gain and feed efficiency. At the top of the pyramid are the market-oriented products such as pounds of kid sold, quantity and quality of retail meat (cabrito or chevon), mohair, cashmere, milk, etc.

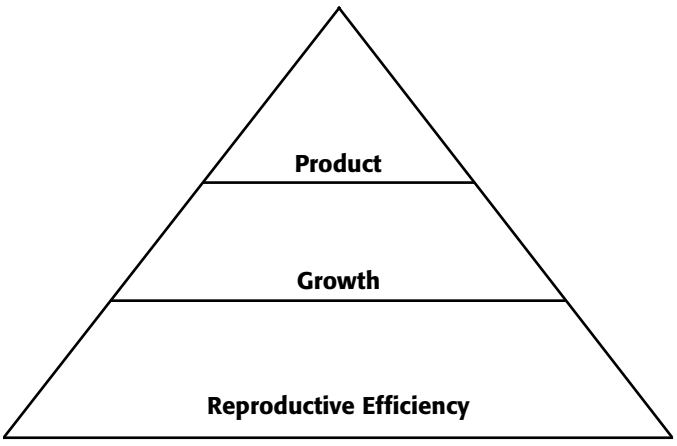

Figure 3-1. The profit pyramid.

Selection Criteria

The term selection denotes the act of choosing, and while the act of selection may be somewhat subjective in nature, there are guidelines and resources available to take a lot of the guess work out of the process. Three of the most notable include visual appraisal, pedigree and performance data. There are a variety of opinions as to which may play the most significant role, however the business environment suggests the more objective the decision-making process can be, the greater the profit potential. With that in mind, it becomes obvious that performance data based on the most economically important traits offers the most reliable information to aid in the decision-making process. While we may focus more on the performance side of selection, we also will discuss the contributions of the visual appraisal and pedigree aspects of the selection process.

Performance Information

Selection involves the choosing of the proper bucks and does for the breeding herd. The buck contributes 50 percent of the genes in any one kid and the doe contributes the other 50 percent of the kid's genetic makeup. However, if a buck is kept in the breeding herd for three or more years, and replacement does are selected with his genes for three generations, the buck actually contributes 87.5 percent of the genetic makeup of the herd. This makes selection of the buck the most important choice producers make to influence the productivity of their herd for generations to come. Performance-tested bucks can come from on-farm tests or central

test-station programs. These tests provide common environments for the contemporary test groups and feature growth and carcass (determined by ultrasound exam) trait data. This kind of information offers advantages for both buyers and sellers. Buyers get information on the buck that is useful to compare to other bucks in the test, and gives them an idea of the buck's genetic value to their herd. The advantage to the sellers is that they can use the information as a marketing tool to enhance the value, thus the price received for the buck. Additional information obtained from breeders offering on-farm performance test data include weaning weight, kidding percentage, kid weight weaned per doe, and more. An example of the more common performance-tested selection criteria, the standardized 90-day weaning weight and respective index value, is shown in Table 3-1.

At first appearance doeling 5018 may be the obvious choice of the three based on her actual weaning weight record, however, as the test data is standardized in an effort to level the playing field as far as comparisons go, by adjusting for age of dam, size of litter and 90-day weaning weight, it becomes clear that doeling 5044 with the adjusted 90-day weaning weight of 59 pounds and the weaning weight ratio of 111 is the keeper of the three. Of course, depending on how many replacements producers need, they may very well select doelings 5018 also because her adjusted 90-day weaning weights was respectable, and their weaning weight ratio was above 100 (standard average for the test group).

Realizing that the reproductive rate in the doe herd is the major determinant of income in commercial meat goat operations provides perspective when considering performance data and the financial implications.

The economically important traits not only are the result of individual matings, but also are influenced by the various breeds and lines or families within their respective breeds. In Table 3-2, dam line 2 has been more productive and therefore potentially more profitable than either of the other two dam lines. As producers consider their own situations, resources and abilities, it is important to recognize several of the economically important traits that will respond to selection instead of focusing on only one particular trait to place emphasis on. Table 3-3 summarizes data from studies conducted at Tennessee State University.

To more fully realize the benefits of a deliberate selection program, producers should maintain a good set of records that documents the results of planned matings, breeding season results, kidding season results and weaning performance. Records can be as simple and straightforward as ledger entries or as sophisticated as computerized spreadsheet entries. A simple catch-and-weigh system for getting the birth weight of kids is shown in Figure 3-2 and Figure 3-3 shows a setup to get weaning and doe weights.

Expected Progeny Difference

Beef producers have had a tremendous tool available to assist in their selection processes for the last 20 to 25 years known as expected progeny difference (EPD). This tool, based on performance data collected by producers and sent to their breed

Table 3-2. Estimated gross revenues for three groups of does.

($120/cwt for kids, 36 to 50 lbs., Sel. 2, 9/8/06)

Dam line	*Per litter weaned*		*Per doe exposed*	
1	**56.6 lbs**	**$67.92**	**40.6 lbs**	**$48.72**
2	**64.8 lbs**	**$77.76**	**56.7 lbs**	**$68.04**
3	**62.0 lbs**	**$74.40**	**53.8 lbs**	**$64.56**

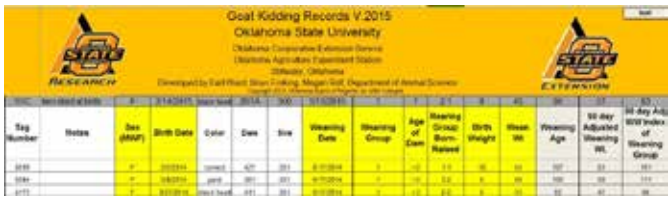

Table 3-1. Goat Kidding Records.

Tag No. Kid	*Sex (MWF)*	*Birth Date*	*Color*	*Dam*	*Sire*	*Weaning Date*	*Weaning Group*	*Age of Dam*	*Rearing Group Born-Raised*	*Birth Weight*	*Weaning Weight*	*90-day Adjusted Weaning Age*	*90-day WW Index of Weaning Weight*	*Weaning Group*
5018	F	3/2/14	correct	427	251	7/17/14	1	>3	1-1	10	55	107	53	101
5044	F	3/4/14	paint	261	251	6/17/14	1	>3	3-2	6	49	105	52	111
5173	F	3/27/14	black head	411	251	6/17/14	1	>3	2-2	6	33	82	47	88

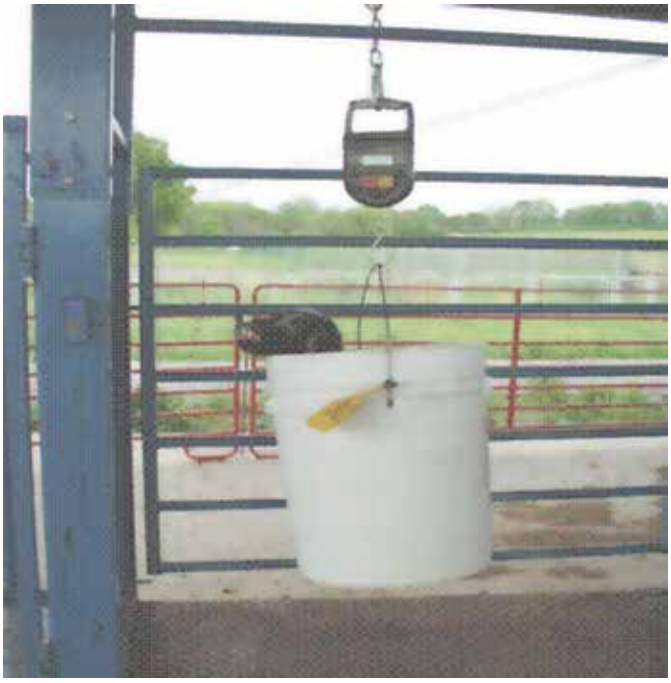

Figure 3-2. Fish scales and a plastic bucket make an excellent birth weight measuring system.

associations, has provided a high tech means to improve the genetics of the respective breeds, as well as increase the efficiency and profitability of beef production for the commercial cow-calf segment of the beef industry. Some of the meat goat associations have recognized the benefits of this genetic selection tool, and they have begun developing similar efforts to provide EPDs for their producers. For example, the American Boer Goat Association is developing a model similar to that used in the

Figure 3-3. Postal scales mounted between two pieces of plywood make a nice weighing system for weanlings and does.

sheep industry, which allows for multiple births in the calculations. They wrote a grant and received funding for a cooperative effort between their association, Virginia Polytechnic Institute and State University and Texas A&M University to develop a sire evaluation model. They have collected more than 2,000 records during the last two years for The Begin Program, focusing on the economically important traits such as maternal characteristics, reproduction and growth performance. As they gather more information they may offer stay ability of does (in production) at some point in the future. Though much of this information may not be available for three to five years, the plans are to include much of the performance information on the registration certificates in the future.

Table 3-3. Evaluation of three breeds for doe fitness and reproductive traits.

Trait Boer	*Breed of Doe*			
	Kiko	*Spanish*	*Standard Error*	
Per doe weaning kids				
Litter size, kids/dam	1.51[B]	1.69[AB]	1.79[A]	0.07
Litter weight, lbs	58.30	66.40	61.60	1.20
Litter weight/unit doe weight, %	53.50[B]	64.30[A]	66.70[A]	2.60
Per doe exposed to bucks				
Litter size, kids/dam	1.03[B]	1.54[A]	1.54[A]	0.09
Litter weight, lbs	40.48[B]	61.82[A]	53.24[A]	1.60
Lameness, cases/doe/year	**2.02[B]**	**0.58[A]**	**0.79[A]**	**0.16**
Internal parasitism, cases/doe/year	**0.54[B]**	**0.10[A]**	**0.17[A]**	**0.06**
Fecal parasite egg counts, eggs/gram[C]	**2.79[B]**	**2.60[A]**	**2.45[A]**	**0.06**
Annual doe survival rate, %	**78.50[B]**	**99.10[A]**	**93.90[A]**	**3.10**

[AB] Means with different letters differ significantly.
[C] Log-transformed mean.
Source: TSU 2006, Browning et. al.

Pedigree Information

Pedigree information, simply stated, suggests and/or verifies the parentage or breeding history of an individual for one or more generations in its family lineage. It can be as accurate and entertaining as coffee shop gossip or as authentic as actual documentation of the respective breed registry. Usually, the pedigree information of an individual offers little more than its ancestral origins, but in some cases, depending on the source or purpose of the information provided, it can include additional specific and/or performance information. Figure 3-4 shows a case where limited performance information is provided in addition to the family history of the individuals.

Visual Appraisal

The visual appraisal part of the selection process is an appropriate part of the process because it provides producers an opportunity to evaluate the overall appearance and condition of the animal. Although this part of the process is the most subjective, there are some guidelines indicating the optimum form and function for the various classes of animals to be selected. First and foremost, only healthy animals free of disease and parasitism should be selected. Buying from a reputable source with health records on the animals will go a long way in preventing purchasing problems. A healthy animal will appear alert and active, move freely without hesitation or restriction of motion. It will have a full, shiny, hair coat free of debris and patchiness. It should not exhibit any labored breathing, sneezing or coughing. Mucous membranes around the eyes and gums should appear a bright pink in color. It should stand with good posture and its head up. A goat is an intelligent animal and should express some interest in what is going on around it. It should be interested in eating and drinking at meal time.

When considering the conformation of a meat goat, the producer needs to think about the ultimate purpose of the animal, as well as the functionality and durability of the breeding stock. When viewed

Lot 99 **Doe** **3-12-2005** **Tennessee State University**

TSU 614 FOUNDATION SPANISH

TSU 5083
AAS GOLDMINE IV
JFK JESSIE III
0K047WSU6

BREED: SPANISH x KIKO F1
NOTE: Sire is Willingham 100% Spanish. Dam is 100% NZ Kiko.
Adjusted 90-day weaning weight = 39.9 lbs Weaning weight ration = 95

Lot 100 **Doe** **3-13-2005** **Tennessee State University**

SUNNY ACRES SAMARI
TGF UPHONDO P883
ABGA 96207076 TGF
TSU 5115

TSU 418 FOUNDATION PB KIKO

BREED: BOER x KIKO F1
NOTE: Sire is performance tested Marvin Shurley 100% Boer. Dam is purebred Kiko.
Adjusted 90-day weaning weight = 55.5 lbs Weaning weight ration = 132

Figure 3-4. Examples of pedigree information for meat goats.

from the side, the goat should be well proportioned from head to tail. The back should be level from the point of the withers to the tail. It should be deep-bodied as measured from the back to the chest floor. The slope of the shoulder should approximate a 45-degree angle where the neck blends into the body. Following down the leg, through the knee, which should be straight, to the pastern joint above the hoof, it should approximate a 45-degree angle (similar to the shoulder) with the sole of the hoof or ground. The hind legs should be straight such that you could drop a string from the point of the hip to the ground, and it would lie along the backside of the cannon bone of the hind leg from the hock to the ankle. The majority of the length of the animal should occur from the last rib to the point of the hip (pin bone), and not from the last rib to the point of the shoulder.

From the front view, the chest floor should appear wide. The legs should set at the four corners of the body, being straight through the knees down through the hooves, which should point straight forward, not in or out. There should be an adequate spring of ribs, which will provide sufficient space for the rumen and forage capacity for the goat. The shape of the animal, thickness or bulkiness and movement is determined by the muscling of the animal. Muscle tissue is round and bundle-shaped. The more muscular animals will appear thicker, with a more bulging and rounded mass of bundled tissue. Fat is flat, and overly-conditioned animals will appear very blocky, square and slick, with the fat filling in around the muscles to give the animal a boxy look.

Structural correctness or soundness is something producers must be concerned with from the standpoint of utility and durability of the breeding stock through the years. It expresses itself mainly through the skeletal structure and the way the muscle ties in with the bone. If the goat has adequate bone, it will carry itself well, maintain good posture and withstand a lot of wear and tear through the years. Most of the important principles also were covered in the discussion on conformation. However, with respect to does in particular, structural correctness includes consideration of the udder and teat placement.

Udder Structure and Teat Placement

The udder structure is very important to the longevity and productivity of a doe. A doe must have a sound udder to raise kids until weaning and therefore be profitable.

A doe's udder should have a good form and attachment. The udder should be well rounded and the floor of the udder should not hang below the hocks of the doe (Figures 3-5 and 3-6).

Does should have a minimum of two functional teats (Figure 3-7). Some breed associations will have standards that disapprove of more than two teats, but for commercial meat goat operations more than two teats can be acceptable. This depends upon how the teats are arranged on the udder.

Does with only one teat will not have the ability to raise more than one kid per breeding season. Does with more than two functional teats may have the ability to nurse or raise more than two kids. Does with more than two teats or cluster of teats on either side of the udder could cause production problems in the future.

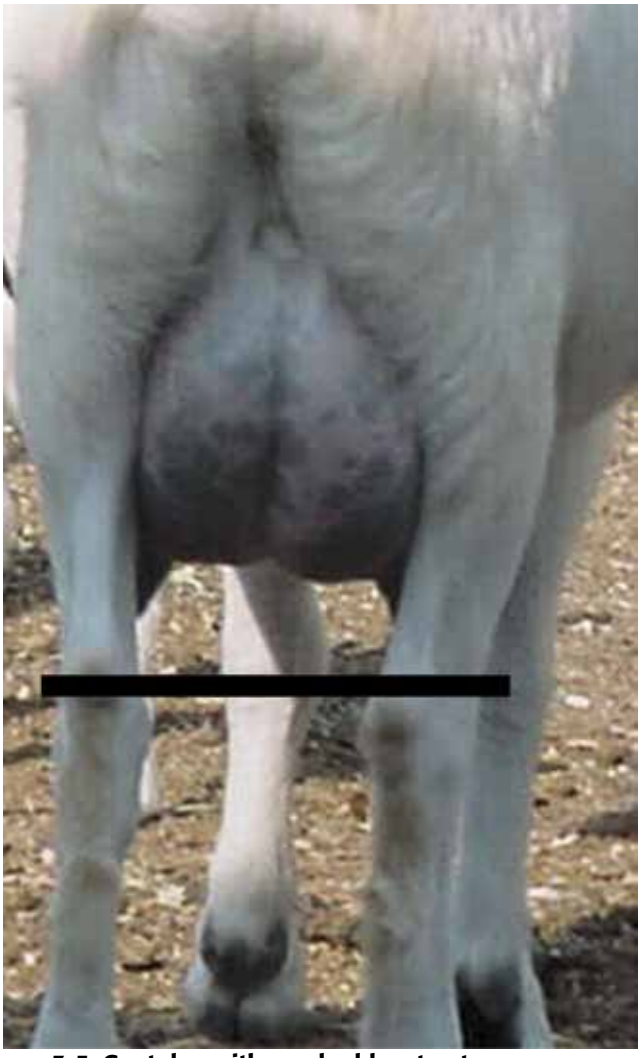

Figure 3-5. Goat doe with good udder structure.

Figure 3-6. Goat doe with bad udder structure.

Figure 3-7. Does udder with two functional teats.

Figure 3-8. Does with fish teats. Left: unacceptable; Right: acceptable.

Does with multiple teats (clusters) on one side or the other of the udder could cause confusion and frustration when a new kid is trying to nurse. These teat arrangements also could cause udder problems such as mastitis during the life of the doe.

Some does will have what is commonly referred to as fish teats (Figure 3-8). These are teats that are fused together. Some breed associations disapprove of fish teats unless they have at least 60 percent separation from the base of the teat. This means that at least 60 percent of the height of the teat is separated from the other teat. At the same time, it is acceptable for there to be two teats present, if one teat is functional and the other teat is a nonfunctional spur (Figure 3-9).

Figure 3-9. Teat with spur.

Figure 3-10. Doe with bottle teats.

As a doe matures, problems with the udder such as bottle teat or mastitis may appear. Mastitis is a bacterial infection of the mammary gland (udder) and will decrease the doe's milking ability. A bottle teat is a teat that appears swollen down to the very end of the teat (Figure 3-10). This teat then is difficult for a small kid to nurse. Once a doe has these problems, they will be problems for the rest of the doe's productive life. A doe that develops these problems should be considered for culling out of the herd.

References

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