



What the Boer goats tell us.

In one of the seminars that I have given around the country I open with the statement “Boer goats tell us what they are, if we will just learn to listen to them and hear what they are saying.” The Boer goat tells us what they are through their structural confirmation, through their skeletal dimension, through their muscularity and through their physical bearing or attitude. The best ones have a bearing or attitude as if to say, “I am the most beautiful goat in the world, and you have the privilege of looking at me!” This property is called *Eye of the Eagle* in South Africa and *Aristocratic Bearing* in Australia. I am sure you have seen a Boer goat with this property. In the show ring it is the goat that “shows itself”.

What this article will endeavor to accomplish is to assist the reader in formulating a breeding strategy for Boer goats that will improve the breed through a study of the South African Boer Breed Standards, and careful observation of the physical properties and traits of the Boer goats that are available to him including a study of the genetic background of these animals as well. Through observation of these properties and traits and study of the information presented in this article the reader should be able to make predictions and extrapolations as to the qualities and properties of the offspring or progeny from mating’s performed in the Boer goat herd. While this article discusses phenotype properties, genetics, and recognition of genotype contributions in the animal should also be considered in a breeding program.

Since I began writing this article several years ago I have discovered the writings of the famous South African Animal Scientist Dr. Jan Bonsma. I have also discovered the website: bovineengineering.com produced by Mr. Gerald Fry from Arkansas. Through their writings, both gentlemen are having a profound impact on me and my study of the Boer goat. While their writings concern cattle, primarily beef cattle, I am convinced through my personal observations and development of empirical hypotheses that I have made during almost 20 years of observing Boer goats in the pasture and the show ring that there may be a strong correlation between all breeds of animals and how they cope with environmental issues in their struggle to survive and reproduce. Throughout this article I will be sharing some of the knowledge gleaned from these two men.

I have developed several seminars about South African Boer goats that I have presented in various countries worldwide. In each seminar the first slide that I put on the screen says, “The goats tell us what they are, we just have to learn to understand what they are telling us”.

The first set of breed standards for the South African Boer goat was established around 1959 by the South African Boer Breeders Society. The primary reasons for establishing breed standards were to assist the Boer goat breeders in setting goals and guidelines to maintain and improve the breed and to provide for uniformity in production.

I first encountered the South African Boer Goat Breed Standards at an ABGA judging school in 1997. After reviewing the standards several times and reflecting upon their meaning it occurred to me that what the South Africans had done was a work of genius. On a single sheet of paper, they had set forth all the physical characteristics necessary for an efficient goat meat production system in the pasture. They described a goat that had survivability, adaptability, a calm disposition, fertility, good mothering ability, and made a living under harsh conditions with low quality food. I realized that each of the physical properties set forth in the standards contributed to one of the desirable properties mentioned above. I have also observed that the Boer goat can be described through a combination of ratios, proportions and angles some of which will be presented in this article.

The standards described a robust animal that was healthy and thrifty. The animal had medium bone and a lot of meat on the carcass. The Boer goat was intended to be the meat goat of the world and has gained wide acceptance all over the world as just such an animal.

Recently a new publication has come from South Africa that enhances a discussion of the standards in that this book details what undesirable characteristics can be expected when an animal has certain undesirable traits. The experience that the South Africans have had raising Boer goats for perhaps a hundred years or more can provide us with insights to improve the Boer goat in the U.S.

The calm disposition of the Boer goat is reflected in the gentle brown eye and the soft pendulous ear. An animal with a calm disposition is easy to handle and manage. A goat with a wild eye and/or stiff protruding ears will be wild and hard to manage. The rounded dark horns with adequate separation also contribute to a calm disposition and a buck that will not break the legs of other bucks when sparing and won't get their horns caught in a tree and hang themselves. Flat or bladed horns that flare rapidly from the body indicate a wild animal that is hard to handle.

Horns that are too tight on the neck will rub the neck and can cause skin irritation, sores, and infections. In addition, horns that are too upright predict a rounded bulging forehead and a concave nose bridge that may result in an underdeveloped lower jaw. A flat sharp-edged horn is usually too heavy and the points of the horn bend outwards. The forehead is usually too prominent with a hollow between the eyes. Does with this type of horn tend to be too masculine in appearance and the buck's horns tend to be too close together.

Soft pendulous ears that flow down the side of the head is desirable. An animal that has short, stiff protruding ears may produce an animal that is wild and difficult to maintain. A folded ear with the fold coming from the head is undesirable and can cause an unhealthy situation. If the animal is dipped for external parasites such as lice or mites the South Africans feel that this type of folded ear can hold moisture and create an environment for bacteria and infection. A flipped ear or one that is folded at the tip of the ear is not considered a cull fault because it can be fixed by cutting the ligament at the fold or pulling the ear straight shortly after birth. Both types of folded ears can be highly inheritable according to discussions that I have had with Professor Wolfgang Holtz who heads a genetic research group in northern Germany. Professor Holtz is the man responsible for bringing the Boer goat to Germany from Namibia in 1980.

The wide set eyes, strong nostrils and powerful under jaw ensure that the animal will be wide in the shoulders and wide in the loin and possess a powerful presence. The width between the eyes is directly proportional to the width in the shoulders and the width in the loin.

A long powerful head with a Roman nose or oval shape from the tip of the horns to the muzzle is an indication of breed character. Dr. Jan Bonsma was a professor of animal science at the University of Pretoria, Republic of South Africa. Over a 20-year period he developed a breed of cattle in South Africa called Bonsmara. The name of the breed is a combination of his name and the Mara Research Station where the cattle were first bred. Dr. Bonsma has written several books and numerous articles concerning the interaction of various species of animals with their environment. The Bonsmara breed is noted for their functionality and their ability to thrive in a subtropical desert climate while producing fast growing calves and tender red meat. Bonsma discovered that one of the physical adaptations to a hot desert climate was the Roman nose. The extra space in the nasal area of the skull provides extra room where the air can cool the blood before it enters the brain. In this way the animal can better handle the heat and reduce panting which increases energy and ultimately increases heat. The Roman nose can be seen in many species of African animals including Afrikaner cattle, gemsbuck, dama gazelles and of course the Boer goat.

Professor Bonsma realized that the most important factors influencing cost of production are:

1. Fertility – (high calving percentage).
2. Low mortality – (adaptability).
3. Heavy weaning weight – (good milk production).
4. Rapid growth and low food to weight gain ratio.
5. Good conformation – (a high amount of quality meat).
6. Animals with a placid (calm) temperament which make management easy.
7. Longevity

As I read more of Bonsma's writings I am amazed at how similar the South African Boer goat and the Bonsmara breed of cattle become. When he developed the new cattle breed over a 20-year period he found that the composite of 5/8 Afrikaner and 3/8 British beef breed (3/16 Hereford for meat and 3/16 Shorthorn for milk production) was the best combination for being heat tolerant, functional efficiency and survival under hot desert conditions. Many of his considerations were the same as the original South African breeders were in developing the South African Boer goat.

Before 1940 it was thought that tropical degeneration of the British breeds of cattle was caused by malnutrition as the protein content of natural pastures in the Southern hemisphere is low, reaching critically low levels during the late summer and early winter. Dr. Bonsma began a large-scale nutritional experiment at the Messina Livestock Research Station in 1937 using a large group of heifers of different British beef breeds. Through this experiment Bonsma discovered that malnutrition was not the problem because there were several heifers that thrived much better than others. Careful observation found that those animals that showed the least climatic stress (heat stress) thrived best. Those animals that showed signs of stress on hot days had a very high respiratory rate, they panted, their tongues hung out and they dribbled profusely.

Because Bonsma wanted to measure every aspect of the livestock that he worked with, he made numerous observations on the animals in his experiment. These included regular weighing, 14 different body measurements, body temperature, pulse and respiratory rates, hair count per square centimeter and tick counts. Hair diameters were measured and complete hair coats of different types of cattle were shorn off, weighed, and put through a felting machine.

These elaborate tests proved beyond doubt that the hide and coats of cattle played a tremendous role in the process of heat dissipation, which is of the utmost importance for the animal to maintain its thermal equilibrium in the environment. He found that "animals that suffer from hyperthermia have increased respiratory and pulse rates with concomitant metabolic, physiological and endocrinological disturbances."

Bonsma discovered that animals with a respiratory type of body conformation, a wide-forehead and convex facial profile were much better adapted to the tropics and sub-tropics than those with a digestive type of body confirmation and a dished forehead and profile.

"It has been shown in several critical experiments, and it is only logical, that the larger the surface area of the nasal sinuses, the greater is the surface area available for evaporative cooling during panting." Excess panting takes more energy and generates more heat in the long run.

It would seem reasonable to assume that cattle with broad heads and a convex profile (Roman nose) would be able to cool their brain tissue more effectively than those with narrow heads and a concave profile. Afrikaner cattle are extremely well adapted to hot and arid conditions. That they also have relatively large, broad heads with a convex Roman profile appears to be of great importance to their physiological adaptation, and not merely a fancy point dreamed up by breeders. (All of the discussion presented above about Bonsmara was taken from extracts of "Genesis of the Bonsmara" by Jan Bonsma.)

I have included this discussion to show that there seems to be a correlation between many breeds of animals that have been developed over time to thrive in harsh, hot desert climates, particularly Africa. The Roman nose of the South African Boer goat was not an accident rather it was an adaptation over many years of indigenous breeds that make up the modern Boer goats. The Roman nose is a way for the Boer goat to dissipate heat and live comfortably in hot climates without excessive respiration and panting. I suspect that the skin and hair coat as well as the numerous folds of skin down the neck of Boer bucks also contribute to their functionality and survivability related to heat tolerance. Bonsma noted that animals adapted to hot desert climates usually had a dark (usually red) hide that had a sleek short haircoat and the skin had high vascularity and very active sebaceous glands. He noted that the color of the hide was seldom black as black absorbs too much heat.

Continuing from "Genesis of the Bonsmara", "thanks to Bonsma's unique method of scale photography, the Bonsmara is the only breed in the world that can boast a pictorial genealogy from the very beginning of the breeding work until the new breed was established. It is also unique in that every mating was based on scientific data, where the concept of "Man Must

Measure” (Bonsma’s famous book written in 1983 entitled, “*Livestock Production – Man Must Measure*”) was always taken into consideration.”

It interesting to note that the Bonsmara breed association in South Africa prohibits showing animals in the show ring, rather they let the production data of the individual animals speak for the animal and the skill of the individual breeders. An animal does not get entered in the registry unless production data set forth in the breed standards are met. A producer will not be admitted into membership in the association until he has registered at least 30 head of cattle.

Bonsma felt that it was more important for producers to compete among themselves using production data of their cattle instead of parading pretty animals around a show ring. Perhaps we could learn something from his philosophy considering what has happened to the Boer goat breed because of the show ring and emphasis on non-productive and non-functional traits found in show winners.

Since a goat does not have teeth in the upper jaw it is imperative that the teeth in the lower jaw match perfectly with the pad of the upper jaw. Since the primary diet of the Boer goat is leaves, twigs and weeds (they are browsers and eat primarily a meter and above the ground as opposed to grazers such as sheep and cattle that eat primarily a meter down to the ground) the teeth and pad must match for the animal to cut the weeds, leaves and twigs that consist of 80% or more of their diet in the pasture. Raising the goat in a pasture is desirable as the trace minerals in the browse help the goat get a more balanced and healthy diet. Too much separation between the teeth and upper jaw pad in either direction (underbite or overbite) produces an animal that cannot eat properly in the veldt or pasture. The breed standards allow for a 5 mm separation between the teeth and the pad of the upper jaw with the lower jaw teeth extended out past the upper jaw (underbite or overshot jaw) when the animal is 24 months or older in the ABGA standard and a 6 mm separation when the goat is 36-month-old in the South African standard. In both cases 5mm or 6 mm is about the diameter of a cigarette filter or a pencil eraser. Prior to 24 months or 36 months in each respective case the jaws must match perfectly. (I saw a young buck dismissed from the ring at the National Show in Sydney, Australia a couple of years ago that had less than 1/64” space in the teeth and jaw separation – the standard says the jaws must match and even 1/64” is a separation. It was a shame to see this buck dismissed as I felt he had the potential to be the champion if his jaw had not been misplaced.)

It is important that the body’s depth has balance. If the body depth is too shallow the chest becomes smaller, and the flank becomes higher. If the body depth is too deep the neck will be too thick and the flank will be lower. Does with these characteristics are less fertile and poor breeders. When the body depth is cylindrical or too shallow the chest is weaker, the curve below the shoulder is too sharp and in many cases the goat has a serious devil’s grip. Also, the legs are thinner, the back is slightly concave, the buttock is weaker and in some cases the muzzle is pointed which may result in parrot mouth or overbite in the jaw.

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