



## *Spikes are not Inferior - or, Are They?*

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No, they are not inferior as animals. They may be undesirable as breeders, but inferior, no. So let's stop using the word inferior and superior, they may be desirable or undesirable as breeders and only then if the trait you wish to change is genetically controlled, i.e. coat color, body weight, antler points, etc. If white calves are desired, one would not use an Angus bull, but that doesn't make him an inferior animal. Because coat color is inherited (genetically controlled), the Angus is undesirable as a herd sire, but inferior as an individual, no.

In 1960, Dr. W.B. Davis believed "the male fawn produces a spike set of antlers its first year," but if he were living today, he would have reviewed the literature and probably revised his book accordingly. He probably would say, "Most spike-antlered deer are yearlings, but not all yearlings produce spike antlers." It is unfortunate his students cannot or will not do the same. Their minds seem to be as concrete "all mixed up and firmly set."

This article is in response to the articles by Don Haley and S.W. Stedman in *Texas Trophy Hunters*, P.T. Brown in *North American Whitetail*, and John Wootters in *Petersen's Hunting*. It is also intended to be an introduction to the genetic research at the Kerr Wildlife Management Area, Hunt, Texas.

The views presented in this article are the views of the author and should not be assumed to be those of the Texas Parks and Wildlife Department.

I have no strong feelings one way or another concerning harvesting or protecting spikes and/or does, trophy management, deer hunting, or high fences. I have a background in population genetics and statistics and wish to present some data collected from a specific experiment conducted at the Kerr Wildlife Management Area.

In the article by Haley, Steve Nelle was quoting data from the Kerr Wildlife Management Area (KWMA). The data, which was said to present the "naked truth", came from the final report of a five-year pilot study dated May 26, 1987, which used only

five animals in each of two groups. This study consisted of only 10 yearling deer, which were classified as spike or fork (1) according to the sire (2). The five deer in the spike group came from one spike sire which was mated to four different females, one which had no pedigree and three which were sired by spike sires. The five deer in the fork group came from a single-forked sire which was mated to only three different females. This is not a line of deer and certainly not a population. It would not be considered an adequate sample from which to make broad statements concerning fork vs spikes; it is, however, large enough to suggest trends and provide support for further investigation.

Several quotes from the report are presented and the data and figures which were available to Mr. Nelle are presented in Tables 1-6 and Figures 1-6. Although the tables have been expanded, the original data from the study are included and was used to determine the actual and percent differences between the two groups of deer.

There are a few words in the report, and in the following quotes which I feel should be changed. Five progeny from a single sire do not make a line and five progeny do not make a population. They are a sample which was used to estimate a population mean and as pointed out in the quotes, a very small sample. They do however indicate a trend and as pointed out in the report should be studied further with a larger sample. The words superior and inferior should not be used.

#### **Selected quotes from the TP&W Report:**

*Abstract:* "At 1.5, 2.5, 3.5 and 4.5 years of age, the means for antler weight, main beam spread, main beam length, basal circumference, and number of points of the offspring of the fork-antlered sire line were greater than those of the offspring from the spike-antlered line. However, when analyzed using analysis of variance procedure with one degree of freedom, the population means were not statistically different. This was due to a small sample size."

*Procedures:* "In January, 1983, five buck fawns sired by a fork-antlered yearling buck and five buck fawns sired by a spike-antlered yearling sire were permanently marked by freeze branding, ear tagged, and released into a 96-acre experimental pasture at approximately six months of age. Each year, in October, all bucks were captured, weighed, and antler measurements obtained. Antler measurements included main beam spread, main beam length, basal circumference, number of points, and antler weight."

*Trend analysis:* "Antler development and body weights between the two populations of deer based on the sire line from 1.5 to 4.5 years of age are shown in Figures 1-6. Although there is no statistical difference between the means of the two populations of deer by sire line, there is a definite separation in trends of the two population means for all parameter measurements, with the fork-antlered sire line always being superior to the spike-antlered sire line."

*Conclusions:* "When data was analyzed by sire blood lines, there was no statistical difference between the two population means at 4.5 years of age. However, trends in the means indicated that the two populations did remain separate. This would indicate that the sample size used in the two populations was not adequate. The trends in the differences in the two populations are much the same as the population trends in the "Antler Formation in White-tailed Deer Study" which had a much larger sample size and

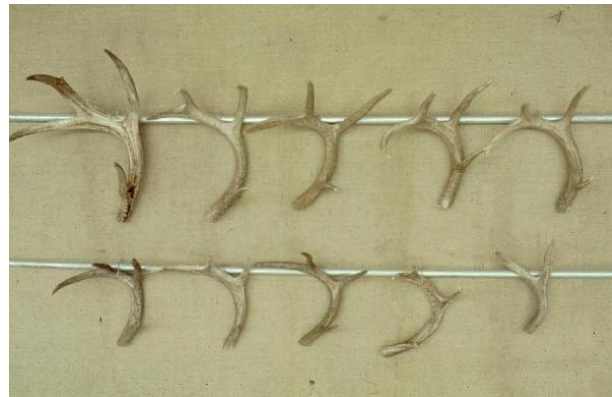
which had statistically different populations based on antler development and body weight.”

*Recommendations:* “Another study should be considered in the future with another group of deer in order to increase sample size and remove the influence of individual deer performance. Data should be analyzed by number of points as yearlings rather than by sire line.”

### **End Quotes**

The report also pointed out that there were two deer which were exceptions to the trend and it was those two deer which Mr. Nelle chose as the basis for his “naked truth” statement. There was one in the fork group which was a 3-point yearling and produced the second smallest set of antlers at 4.5 years of age based on antler weight and a 4-point yearling from the spike line which as a yearling had more points and antler mass” than two of the yearlings in the fork group. These two deer are actually very important, because they led to the recommendation that “data should be analyzed by number of points as yearlings rather than by sire line.” This conclusion was proven correct at the conclusion of the heritability portion of this study, which has been published in *Heredity*, a scientific journal. That portion of the study concluded that heritability for antler traits was high, and therefore, individual selection would be more effective than family or line selection.

The tables show the difference between the average for the spike and fork groups for 4 years and also the percent difference. In all cases, the fork group is greater than the spike group, and ranges from 6.7%-15.2% advantage for main beam spread; 13.1%-54.4% for main beam length; 13.5%-22.4% for basal circumference; 12.9%-108.3% for total points; 31.3%-125.6% for total antler weight; and 10.2%-15.3% for live body weight. It is difficult to understand how this data can be interpreted to prove that there is no difference between spike and fork-sired deer on the one hand and to state that only 20% of the spikes are inferior and 80% “will likely develop into decent bucks if allowed to grow to maturity.” If you will review the tables carefully, they will reveal that in almost all cases, the fork group was equal or better at 3.5 years than the spike group at 4.5 years.



*Antlers of 3.5 year-old bucks all of which received a 16% protein ration ad libitum. The 5 antlers at the top are from bucks that were fork-antlered at 1.5 years of age. The 5 lower antlers are from bucks that were spike-antlered at 1.5 years of age.*

In future issues of this Journal, I plan to report results and success genetics, heritability and research findings from a genetic experiment, conducted at the Kerr Wildlife Management Area (KWMA), which spans 20 years and has adequate numbers to give a better feel for the inheritance of antler characteristics and body weight in whitetailed deer. The KWMA has the largest pedigreed whitetail deer herd in the world and the combined data from this herd includes records on more than 1,600 deer and 1,103

sets of antlers from 384 different deer. Thirty of which have data for 6 sets and 90 which have data for 4 sets of antlers. Of these 90 deer, 30 were spikes at 1.5 years and the rest were forks.

The “magical ingredient” referred to by Nelle is not magical at all, but a long known genetic fact - like begets like. It was not the fault of the Kerr study that hunters, managers, and landowners used the information incorrectly. Even the least knowledgeable rancher knows he cannot produce a herd of show cattle while rearing them on the rocks of the hill country. He also know he can't take a herd of grade cattle and produce show stock simply by feed alone. Stedman apparently knows nothing about gene frequency, random breeding, genetic equilibrium or selection and accuses “Mother Nature's” bell-shaped curve and its magic of all the things he cannot explain by nutrition and age. He also describes the distribution of B & C scores as a “statistical phenomenon.”

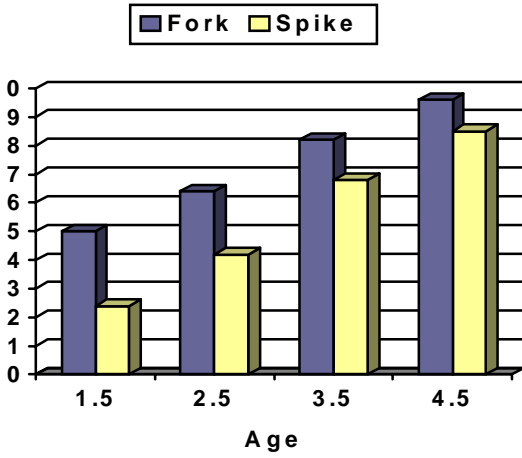
There are Cow/Calf, Purebred and Showstock cattle operators and these same types of management styles may be found in deer operations. The cow/calf is similar to a deer manager who wants to provide many deer of any quality for his hunters, the purebred manager may produce fewer deer of a better average quality for his hunters and the showstock manager strives to produce trophy class deer, but for fewer hunters. These managers would obviously have different objectives, herd densities, culling levels, etc. and it makes no more sense to have only one management style for all deer than it would to have only one for all cattle.

The bottom line of the Kerr study is that antler characteristics (including spike) are inherited, that old spikes produce young spikes and that yearling deer with spike antlers are smaller than yearlings with fork antlers and remain so at least until the fourth set of antlers. This is a very important finding for the manager who wishes to move into the “purebred” or “showstock” class. It is of no value to the cow-calf operator. It doesn't matter if you harvest all or none of the spike bucks any more than if you use a purebred or scrub bull. All females will produce offspring, only the quality will differ.

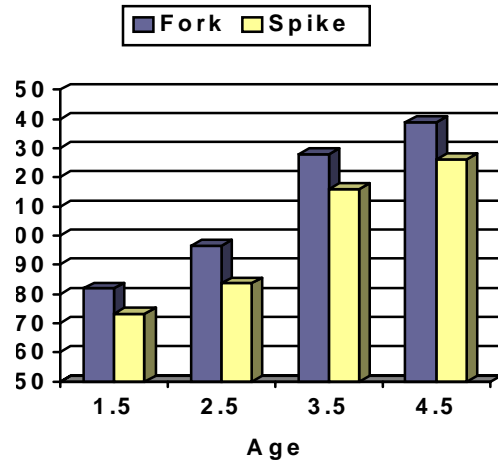
Readers of this magazine are probably not interested in the cow calf type operations, but in purebred or probably showstock operations. There is no other herd of deer like the Kerr deer herd and no other published genetic research available. There are some deer breeders, but no geneticist actively involved in long term whitetail deer genetic research. This type research requires many years and hundreds of animals. The KWMA herd is a very valuable herd and one which everyone interested in whitetail deer should be aware of and actively involved in assuring its continued existence.

If anyone is interested in a concentrated dose of genetics and statistics and a summary of research at the KWMA and will so indicate to the editor, he will forward the names and addresses to me and I will schedule and present an all day seminar at the Kerr Wildlife Management Area. I would also invite each reader to visit the KWMA, see the facility and listen to the presentation by Bill Armstrong.

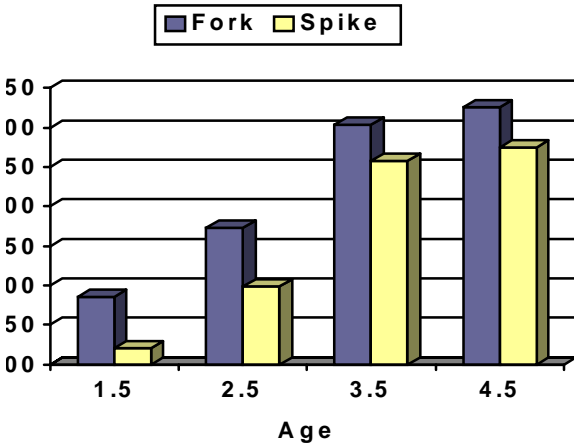
TOTAL ANTLER POINTS



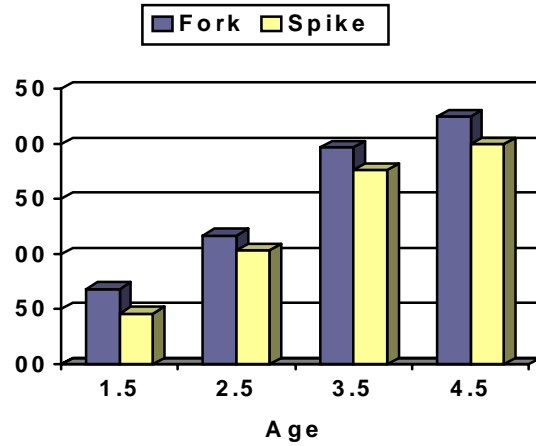
LIVE BODY WEIGHT (lbs)



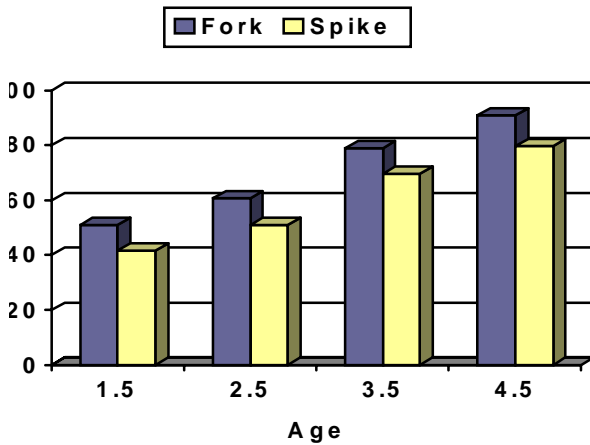
MAIN BEAM LENGTH (mm)



MAIN BEAM SPREAD (mm)



BASAL CIRCUMFERENCE (mm)



TOTAL ANTLER WEIGHT (gms)

