

## **The role of Central Performance Test Stations for meat goats**

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A central performance test is where animals from different herds are brought to one central location where performance is recorded. The rationale is that observed differences are more likely due to genetic differences, which will be passed onto offspring, rather than environmental differences, which will not be passed onto offspring. The goal of a central performance test (CPT) is to identify genetic differences among animals.

Central performance tests have been around for many years and have been used to different degrees in other meat producing livestock species. CPTs have strong points, but they also have weaknesses. In this article I will present some of the issues to consider when deciding how much emphasis that Boer goat, or other meat goat, breeders should place on CPT.

What is the purpose of a central performance test?

Short answer: To identify genetic differences among animals

Goat producers (buck buyers) are interested in buying a buck that will improve the next kid crop. Several breeders may claim that they have the best animals. How does the buck buyer evaluate which genetics will make the most improvement in his own herd?

Breeder A's yearling bucks are heavier than Breeder B's bucks, but how does the buyer determine how much, if any, of the extra weight will be realized in the offspring? Breeder A may spend more money on feed than Breeder B. Breeder B may put more effort into controlling internal parasites than Breeder A. The buyer wants to know which buck's kids will be the best in his herd, on his ranch, and in his management system. The buyer wants to determine how much of the performance can be attributed to genetics and how much can be attributed to environment.

The purpose of the CPT is to bring bucks from several ranches together to measure performance in one environment, so that observed differences are better indicators of genetic differences. CPTs typically begin shortly after weaning and continue for the amount of time required for an animal to reach a typical slaughter weight. Average daily gain during this time is the most economically important trait measured in meat goat CPTs, because goats are sold by the pound. Other traits that can be measured in young growing males are scrotal circumference, ribeye area (by ultrasound image), and feed intake. It is desirable to test young animals because 1) genetic progress can be improved with a shorter generation interval and 2) those animals that aren't selected for breeding can be slaughtered at an age when they still have relatively high carcass value. It is desirable to test males because their genetics can be passed onto many offspring each year, whereas each female will produce a few kids each year. The CPT is designed to evaluate

differences in objectively measured traits rather than subjectively measured traits such as visual appraisal of conformation.

The species that seem to have made the most use of CPTs are swine and beef cattle. One of the reasons for the higher adoption rate has been that the test environment and the commercial environment are relatively uniform. The CPT environment is quite similar to a commercial feeding operation. But, with meat goats, there is typically a broader range of production systems. The genetics that do well on a high protein concentrate diet may, or may not, be the best genetics during a Texas drought when the goats need to survive on wind, water, and scenery.

The choice of an environment used for a CPT when the animals may be used in a variety of production situations is usually a compromise. The goal of a CPT is to identify genetic differences among animals managed alike. If performance is limited by available nutrients, then the range of performance will not be large enough to identify differences among animals. Therefore, animals on a CPT should be fed well. However, the genetic differences of interest will need to be realized in the environment in which the progeny will be raised. Therefore, the CPT environment should be similar to the commercial environment of goats raised for meat production. If the environment that does not limit performance is the same as the commercial environment, there is no conflict. If the two environments are different, a trade-off must be considered. Most CPTs use an environment designed so that nutrition is not the limiting factor to an animal's growth.

Breeder X had the highest average daily gain on his 10 bucks on the CPT. Does that mean that his herd is better?

Not all breeders select their kids to test in the same way. Consider Breeders A, B, C, D, and E:

The CPT data is available to buyers who can see which bucks have the highest rate of gain when all animals are managed alike. Each breeder that participates in a central performance test selects which animals to test. Knowing that the information will be available to potential customers, a breeder has an incentive to enter animals that are expected to do well on the test. In a CPT, breeders select a proportion of their kids to be tested. Breeder A has 20 kids to choose from and he enters his best 10 kids (top 50%). Breeder B has 200 kids to choose from and he also enters his best 10 kids (top 5%). Therefore, if these 2 breeders have the same level of genetic merit in their kid crop, the larger herd's top 10 goats are more highly selected than the smaller herd's. So, comparison of herd averages is biased.

Breeder C has been selling breeding bucks for several years. He has several repeat customers and he has already promised his best customer a chance to buy the top bucks from his kid crop at weaning. Therefore, he selects his test-station bucks after selling a few high value kids. Breeder D is new to the breeding stock business, he wants to make a name for his herd and he selects his very best kids to enter the CPT. Breeder E has been recording growth rate of his kids for several years at his own ranch. He knows which does produce the kids that do well on a performance test. He also sells some buck kids at weaning, but because he has performance records on all his animals from his own scale, he realizes that the best-looking kids at weaning are not necessarily

the kids that will perform best in a postweaning performance test. Therefore, his method of selection of kids for the CPT is different from breeders C and D.

Performance of individual goats on test can be compared fairly. The issue of different methods of selection of which kids get tested, limits the comparisons to only the goats on test, unless pedigree information is used along with the performance data to predict genetic merit of relatives of the tested animals. The genetic merit of sires of bucks on test can be predicted if sufficient sons are represented. Using pedigree information only partially resolves the selection issue, because the performance data still come from a selected sample of the sons.

Test station data can be used to effectively identify genetic differences among animals. To extend the data to make statements about differences among the overall genetic merit of different breeders' herds or to compare one breed versus another is risky because of differences in selection across breeders.

Are CPTs the best way to make genetic improvement?

Short answer: It depends.

CPT can be used to make substantial genetic improvement in traits that can be measured in young growing males. The question of choice of environment in which to conduct a CPT for meat goats may have different answers depending on how the progeny of the tested animals will be raised. However, the fact that only a small proportion of animals are entered into a CPT limits the amount of genetic information that can be gained. CPTs are not designed to improve traits that cannot be measured in young growing males, such as female fertility or number of kids born.

The breeders that participate in a CPT do so for a variety of reasons. They may want to compare performance of their goats versus goats from other breeders. They may be interested in using the data to select, from among their own kids, their own herd sire for use in their own herd. They may enter because it will provide publicity for their herd because potential buck buying customers read the test reports.

The breeders that participate in a CPT also take a risk. They are showing the performance of their goats to everybody who is interested. Others may still claim to have better goats. But at the end of the CPT, everyone can know which goat had the highest average daily gain.

If several breeders are committed to genetic improvement through the use of central performance testing, the program can make a considerable contribution despite the limits mentioned above.

Performance recording of all animals within a herd can be used along with pedigree information to overcome some of the limitations of CPT. If several breeders are using a performance recording program and there are related animals being used in several herds, an across-herd genetic evaluation of all animals can be produced. Such a program has been employed by the dairy cattle industry for several decades. Most beef breeds now have such programs. The National Sheep Improvement Program has been used to produce across-flock genetic evaluations

for the US Suffolk and Targhee breeds for the past few years. Other sheep breeds are making efforts to develop their database to the point where they can also have an across-flock genetic evaluation. Boer breeders interested in maximizing genetic improvement may want to work together to pursue development of a Boer genetic evaluation program.

Central Performance Test stations can be used to help meat goat breeders make genetic improvement. CPT may be the best method of genetic improvement for meat-producing livestock species when within herd performance recording is not practiced to a large degree. Performance recording of all animals within a herd can be used along with pedigree information to overcome some of the limitations of CPT.