

Meat Goat Genetic Evaluation System (MGGES) for the US Meat Goat Industry



Selection is an important decision-making aspect of genetic management in a meat goat enterprise. Effective selection requires detailed animal performance records. Performance records need adequate processing to determine values of genetic merit for individual goats.

The Meat Goat Genetic Evaluation System (MGGES) is a genetic evaluation service provided to US meat goat producers through a partnership among Tennessee State University (TSU), Alabama Cooperative Extension System (ACES), and the Brazilian Corporation of Agricultural Research (EMBRAPA). The system is part of a network of small ruminant genetic databases (GENECOC) developed by Dr. RNB Lobo at EMBRAPA (Lobo et al., 2010). Historical performance data from the TSU research herd was used to start MGGES. Financial support was granted to the partnership by the USDA Southern SARE program to expand MGGES to private herds and encourage meat goat breeders to apply this advanced genetic management program.

The aim of MGGES is to provide information for improved goat selection for seedstock and commercial producers. Information is provided as expected progeny differences (EPDs) for recorded traits. An EPD is a comparative prediction of how kids of a buck (or doe) will perform for a trait. Predictions are based on a buck's own performance, the performance of his relatives (e.g., sire, dam, siblings), and the performance of his kids. Using EPDs is an advancement beyond using phenotypic deviations such as weight ratios that are limited to within-herd comparisons. Goats can be ranked by EPD for traits of interest within a herd and across herds. Across-herd rankings depend on good pedigree information and shared ancestry across herds. These evaluations are most important when making sire selection decisions because sires have a greater impact of genetic change in a herd than does.

The system provides options for breeders to enter their own herd information or have assistants within the MGGES partnership enter their data. A breeder can enter and access data of his or her herd from a personal computer with internet access. Once enrolled in MGGES, a breeder receives a login username and password for system access. Alternatively, breeders can record their annual performance data on a MGGES worksheet and sent the worksheet to the TSU lab by e-mail, fax, or postal mail. The data is then entered into the herd account by lab assistants.

The first step for new herds in the system is the entry of all breeding stock into the database. It is imperative that each animal have a unique identification number that is not shared by any other animal in the herd. The exclusive and unique ID will serve as the permanent MGGES code for that animal. The code will be the 3- to 4-letter herd prefix and ear tag/tattoo identification number (example: TSU8114). After an animal receives its code, the identifier cannot be reused on another goat. All related information on the goat including breed, birth date, pedigree, and sex are also entered for each herd doe and service sire.

Data collection occurs during different periods of a production cycle. The three main periods are the breeding season (buck-doe pairings), kidding season (birth dates, birth weights, sex, etc.), and weaning period (date, kid weights, dam weights, etc.). Post-weaning data may also be entered. The quality of herd evaluations is improved by using the contemporary group, animal identification, and scale recommendations in Browning (2007); however, **do not** perform the age adjustments or data corrections described. Submit only the raw field data to MGGES. Information on the type of management system used is also entered so that management style can be factored into the genetic evaluations. Participants of MGGES also have the opportunity to submit fecal samples to TSU and

ACES so that worm egg counts can be determined and a worm burden EPD generated.

A set of EPDs will be generated for reproductive and growth traits and worm egg count. The EPDs are provided in the form of herd summaries and are also available in the herd MGGES account. Breeders can use the EPDs to rank sires for improved selection within and across herds. Herds enrolled in MGGES will be linked to the TSU herd so that sires in the research herd can also be used as a benchmark for comparison.

The system includes tools that calculate inbreeding coefficients for selected goats and generates lists of inbred animals. Other special features for large herd management include the ability to construct a multi-trait selection index and an option to choose particular buck-doe pairings that maximize the herd genetic gain and(or) control inbreeding. These tools permit breeders to select animals according to economic indicators in their individual operations.

Data is stored on a dedicated GENECOC internet server, ensuring confidentiality of the data and the information obtained. Controlled access is limited

by login username and password for each herd. Producer groups determine if a group- or breed-wide sire summary is posted for public viewing.

A large-scale performance testing program such as MGGES is designed for data entry from seedstock (purebred herd) operations. However, the benefits are shared by seedstock AND commercial managers in the form of improved selection decisions for purchased replacement animals. In some instances, a commercial herd may serve as a progeny testing platform for a sire. It is recommended that participating seedstock managers take a 'whole-herd reporting' approach in which data from all eligible does and kids are recorded, even if a doe did not produce a kid or if a kid grew off poorly or died before weaning. Every doe and kid in the herd represents a data point and improves the accuracy of genetic evaluation for their sires and the herd collectively.

Browning, R. Jr. (2007). On-farm performance testing for meat goat doe herds. MGB 701.14. Tennessee State University, Nashville. 4 p.

Lôbo, R.N.B., Facó, O., Bezerra Oliveira Lôbo, A. M., and Vasques Villela, L. C. (2010). Brazilian goat breeding programs. Small Ruminant Research, 89(2), 149-154.

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