

GENETIC ASSESSMENT FOR DRESSAGE

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The PRE Breeding Program, in addition to the genetically assessing horses for their morphological characteristics (Linear Morphological Assessment), at the same time establishes the genetic values for functional characteristics (Dressage). This genetic assessment, designed by the MERAGEM Research Group, is achieved from the scores that horses have attained at the various Dressage tests and competitions.

The assessment results place the horses in one of the various breeding categories as established in the Breeding Program: Young Recommended Breeding Stock, Improver Breeding Stock or Elite Breeding Stock.





Duque CII, 2012 Young Recommended Breeding Stock, owned by M^{ra} Dolores Cortes de la Escalera and bred by José Luis de la Escalera

2011 GENETIC ASSESSMENT FOR DRESSAGE

11,217 BREEDING HORSES ASSESSED GENETICALLY

- ① 43 YOUNG RECOMMENDED BREEDING STOCK (38 Males & 5 Females)
- ② 2 IMPROVER BREEDING STOCK (2 Males)
- ③ 1 ELITE BREEDING STOCK



GENETIC VALUE (GV)

The genetic value (GV) indicates the ability, in this case of a horse, to genetically transmit specific or unique characteristics to its progeny. This genetic information is found in the DNA of the horse; once identified and selected, it can aid in improving the breed. This value is not obtained directly, but rather, it is obtained from a phenotypic assessment (Performance tests-analysis of characteristics or physical features as well as behavioral traits that are visibly obvious). This information is obtained from the actual horse, in addition to any relative that has participated in the various performance tests, which is why it is so very important to have all genetic registers for all its relatives.

The GV can predict how a horse and its offspring will behave at future Dressage tests and is expressed on a scale where the average is 100. To obtain the genetic va-

lue for a horse, this must always be compared to other horses with that same trait for that same value, due to the fact that if the GV obtained is compared to any other horse at another given point, it would not be dependable.

To be able to estimate the genetic values, it is essential to have the following information:

- 1 Performance tests for each individual horse, its ancestors and/or descendants.
- 2 Environmental factors that could have an influence on the results obtained by the horse in the performance tests.
- 3 Genealogical information.

The main advantage of having the GV of a given horse is that the breed can select the very best horses for breeding, thus improving future generations. Sometimes, there are differences between what a breeder sees or perceives by direct observation of the horse and

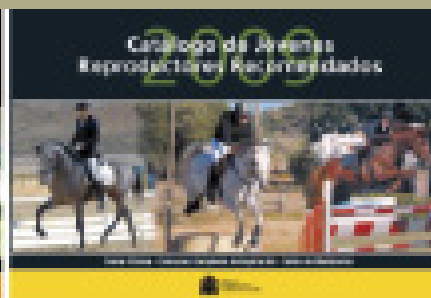
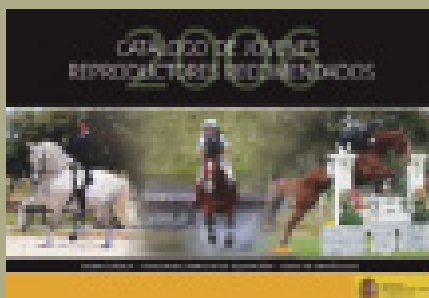
what is expected (with certain traits being transmitted to the progeny depending on the mating). For this, the assessment includes an important concept: the permanent environmental effect, which analyzes any incident that the horse has suffered throughout its life, especially during its initial years, and which conditions its phenotype.

For a horse to be genetically assessed, it is essential that it participates in the performance tests, although an assessment can be obtained based on the information supplied by its relatives.

The genetic value obtained by a horse depends on:

Genetic quality of the horse: the potential to transmit a given trait to its progeny, good characteristics for a given discipline. It is important to remember that the athletic performance of a horse in tests may be conditioned by non-genetic factors, such as the training or the rider. Thus, a horse with go-

Cover of the Young Recommended Breeding Stock Catalog for 2006-2011





“ The advantage of having the Genetic Value of a given horse is that the breeder can select the very best horses for breeding, thus improving future generations ”

od results at a competition may not have a positive genetic value due to the fact that its good performance in sports is due to efficient training and the rider's skill in the arena, but that particular horse is unable to transmit that potential to its descendents. Likewise, a horse's mediocre results in sports are not always genetic in origin.

Environmental factors: These are factors that influence performance at tests, thus making the results obtained better or worse, if and when environmental conditions change. Such factors could include:

- The stud farm of origin.
- The rider, who could make a bad horse outstanding or vice versa.
- The intensity of prior training.
- Stress in the horse prior to the test. Time between arrival to the grounds and access to the

arena, travel time and the transportation used.

- Type and state of the arena, weather conditions, etc.

The GV of a horse is conditioned by all of the above; therefore, to have a good estimation, it is essential to collect detailed information about environmental factors.

The variables to estimate the GV of the horses for functional aptitudes are the following:

- 1 Presentation exercise score.
- 2 Score for Dressage exercises.
- 3 Total pondered classification for Dressage exercises.

METHODOLOGY FOR GENETIC ASSESSMENT

Although there are a number of methods, when it comes to genetic assessment, the BLUP (Best Linear Unbiased Prediction) is used most. This method uses a variety of infor-

mation sources as efficiently as possible. Its most important characteristic incorporates:

- Assessment for males as well as females, including those traits that appear in a single sex.
- Assessment with information from the horse (if available) and from any other horse that has genealogical ties (any degree of kinship).
- The influence of those relatives in the assessment, depending on the degree of kinship for each.
- The kinship, with which the repeatability of the genetic value increases. This is important for those horses that do not yet have descendents or whose numbers are limited.
- Correction of environmental effects that could condition the performance of the horse.

The repeatability of GV indications depends on how the heritable





Jaque SU, 2012 Young Recommended Breeding Stock, owned by Yeguada Susaeta

“ A horse is considered Improver Breeding Stock when the Global Genetic Index is greater than 100 and its repeatability is equal to or greater than 60% ”

traits are assessed; the amount of information available (information from the actual horse, siblings, half siblings, parents, offspring, grandparents, cousins, aunts/uncles, etc.); on its structure (connection among all the horses in the performance test and the closeness of kinship among horses); on the regularity of performance tests for all relatives; knowledge of the pedigree (depth and degree of the family tree), etc.

The repeatability obtained in the BLUP assessment ranges between 0 and 1, interpreted as follows:

<i>Very Low</i>	($< 0,1$)
<i>Low</i>	($\geq 0,1 - < 0,2$)
<i>Average</i>	($\geq 0,2 - < 0,4$)
<i>High</i>	($\geq 0,4 - < 0,6$)
<i>Very High</i>	($\geq 0,6$)

Thus, the higher the number, the greater the exactness of the assessment and greater the repeatability or guarantee that this horse will repeat its behavior in sports, as seen to date (if and when the test



Quelidona de Ymas, 2012 Young Recommended Breeding Stock, owned by Yeguada de Ymas

“ To assess a horse, it is essential that it participates in the performance tests, although an assessment can be obtained based on the information supplied by its relatives ”

conditions are the same) and will transmit these traits to its descendants. A high repeatability (greater index) is achieved only after having participated a number of times in this type of test. If there is no sport-related information about the horse assessed, the repeatability of the genetic value could increase by increasing the participation of as many relatives as possible, mainly progeny, parents and siblings in performance controls.

GLOBAL GENETIC INDEX (GGI)

Global Genetic Index is an estimation that allows breeders to select horses that are genetically superior, but globally; because a single horse need not be outstanding in all traits (a horse might be good in Dressage but not in Show Jumping). The greater the repeatability of the Global Genetic Index, the higher the probability that the global assessment obtained by that horse is repeated in future tests.

To calculate the GGI, the genetic values are pondered for the following variables:

- 1 Presentation score.
- 2 Dressage test score.
- 3 Total pondered classification for Dressage exercises.

A horse earns the category of “Improver Breeding Stock for Dressage” when there is sufficient information to guarantee that it transmits this trait to its progeny.