PUREBRED SPANISH HORSE BREEDING PROGRAM

General Breeding Program Information

PUREBRED SPANISH HORSE STUD BOOK MANAGEMENT BODY:
Name: National PRE Breeders' Association of Spain (ANCCE) (hereinafter the Association).
Breeding Program website: www.ancce.com
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- **NAME of the BREED: Purebred Spanish Horse (PRE).**

- **BREEDING PROGRAM OBJECTIVES: Selection and preservation of the breed.**

- **GEOGRAPHICAL COVERAGE OF THE PRE BREEDING PROGRAM :**

The Breeding Program shall be applicable in all countries where Purebred Spanish Horses are found. As of 2019, the following countries are included:

Spain.
EU countries: Andorra, Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, UK, Romania, Slovakia, Slovenia, Sweden.

Other countries: Algeria, Argentina, Australia, Bahrain, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Israel, Japan, Jordan, Kazakhstan, Mexico, Morocco, New Zealand, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Russia, Saudi Arabia, South Africa, Switzerland, Seychelles, Thailand, Ukraine, United Arab Emirates, USA, Venezuela.

When a PRE breeder from a yet-to-be-incorporated country appears, this list is automatically updated on the ANCCE website.

- **PARTICIPANTS IN THE PRE BREEDING PROGRAM:**

- **List of Stud Farms Collaborating with the Breeding Program**: As of December 31, 2019, the total number of participating stud farms reached 39,479, of which 28,453 are located in Spain. The register of stud farms and collaborating stud farms is updated annually on Spain's Ministry of Agriculture, Fisheries and Food National Breed Information System and on the Association's website together with other information of interest.

- **Other participants: ANCCE's own or third-party services seen are listed below**.

Body (Subcontracted activities)	Resources	Subcontractor
Certified Center for Animal Genetics (Genetic Assessment)		PAIDI-AGR-273 Research Group of the University of Seville

Performance tests		Linear Conformation Judges and Authorized Veterinarians, judges, etc. Authorized Centers, Riding Clubs and stud farms.
Animal Genetic Molecular Laboratory (Parentage tests)	ANCCELAB	NASERTIC / UCM (Universidad Complutense de Madrid)
Gene Bank (Storage of reproductive material)		Equine Reference Center. Yeguada de la Cartuja – Hierro del Bocado
Reproductive centers (collection, production and storage of reproductive material) • Semen • Oocytes and/or Embryos		Equine Reference Center. Yeguada de la Cartuja – Hierro del Bocado Other authorized Reproductive centers

Breeding Program Structure:

I. Description of the Initial Situation

The current version of the PRE Breeding Program has been drafted according to the guidelines established in the EU Regulation 2016/1012 by the European Parliament and of the Council dated the 8th of June 2016 regarding zootechnical and genealogical conditions for the breeding, trade in and entry into the European Union of purebred breeding animals, hybrid breeding swine and their reproductive material, as stated in the Royal Decree 45/2019 dated the 8th of February by which the applicable zootechnical Rules and Regulations for purebred breeding animals, hybrid breeding pigs and their reproductive material are indicated. Said regulations update the National Program for the Conservation, Improvement and Promotion of Livestock Breeds and modifies Royal Decrees 558/2001 dated the 25th of May, 1316/1992 dated the 30th of October, 1438/1992, dated the 27th of November; and 1625/2011 dated the 14th of November, and the Order APA/1018/2003, by which the basic requirements of the Breeding Programs and Performance Tests for the genetic assessment of purebred equines are established.

In 1912, Spain's Ministry of Defense Breeding Service (known as Cria Caballar) created the PRE Stud Book. Once the EU and the Ministry of Agriculture, Fisheries and Food issued a series of zootechnical Rules and Regulations, the PRE Stud Book was turned over to be managed by ANCCE.

Thus, the PRE Stud Book was created in Spain; there are no other bodies or organizations with similar characteristics. The PRE Stud Book is considered to be **the original book** for Purebred Spanish Horses (PRE) and therefore defines the foundation for the breed both in Spain and in other countries throughout the world.

In the Official Catalog of Livestock Breeds in Spain, the Carthusian bloodline is recognized specifically and therefore included within the scope of the PRE as a native breed due to its contributions to the origins of the breed and its influence on the current breed population.

The PRE Breeding Program, although more focused on improving the breed, also includes measures for the preservation of genetic variability. This breed is the most widespread breed in Spain, found in all Regions; the region of Andalusia has both more stud farms and horses than any other location. Purebred Spanish Horses are also found in 65 other countries, including the European Union and many other nations the world over.

ANCCE establishes agreements and procedures with breeders and governing bodies in the various countries to manage the breed in those locations. There is close collaboration regarding the dissemination of PRE Stud Book principles, which are updated by means of this current version of the Breeding Program.

As of the 31st of December 2019, the PRE herd census reached 252,852 heads (127,010 mares and 125,842 stallions) from 35,527 stud farms. In 2019, 134,994 performance tests were carried out and 150,770 heads were genetically assessed.

The PRE Breeding Program was launched in 2003. Since then, methodologies have been established and fine-tuned for the complete and objective control of conformation and functional performances. A Breeding Stock Catalog is published annually with genetic information for all horses included. Thus, the current annual working protocol is well advanced and standardized.

The most recent edition of the PRE Breeding Stock Catalog, published in 2019, includes 61 horses: 35 Young Recommended Breeding Stock (15 for Dressage, 12 for Conformation Traits for Dressage, 8 for Conformation and Dressage), 21 Improver Breeding Stock (2 for Dressage and 19 for Conformation Traits for Dressage) and 5 Elite Breeding Stock.

All of this data and information is published annually on the ARCA (Spain's National Breed Information System), which is accessible from the Ministry of Agriculture, Fisheries and Food website.

II. Aspects Concerning the PRE STUD BOOK

1. Breed Prototype of the Purebred Spanish Horse

1.1 **General Characteristics:** horses are eumetric (well-proportioned), have, in general, measurements that are equal in height and length with a sub-convex contour of the forehead. With a well-proportioned conformation, proportionality index: height at the withers*100/shoulder-ischial length (Distance of the straight segment from the union of the scapular-humerus joint to the point of buttock (ischial tuberosity)) between 95 and 105, notable general harmony and very beautiful, with appreciable sexual dimorphism. The height at the withers ranges between 1.54 and 1.72 meters for stallions and 1.52 and 1.70 meters for mares. Horses have paces that are ground-covering, brilliant, agile, energetic, cadenced and elastic, with appreciable elevation and extension, notable ease for collection and turns on the haunches. Their temperament must be spirited, noble, docile and well balanced, with a great capacity for learning.

1.2. **Morphological characteristics:** the averages for the various conformation traits (obtained from zoometric measurements and the lineal conformation score) are updated and published annually on PRE Stud Book web site. The characteristics of the various morphologic regions in a PRE are described in this section, and are related to the average values for the breed, as published every year.

a) **Head:** well-proportioned, average length, lean, with a sub-convex frontal contour, with minimal convexity of the frontal-nasal union. Ears are medium sized, proportionate to its head size, very mobile, well inserted and parallel

and facing forward. Slightly wide and discretely convex forehead. Lively, expressive triangular eyes, with non-protruding orbital arches. Relatively long and moderately narrow face (more in mares), sub-convex and free of flesh. Nose tapered into a soft curve projected from the face. Wide, non-protruding nostrils. Broad, lean cheeks, with long discreetly arched edges. Fine and mobile upper lip.

b) Neck: of an average size and length, proportionate with the height and length of the body, well-muscled (less in mares), with the throat contained and well inserted into the trunk, above the scapular-humeral union. The upper edge is slender, forming an ascending arch from the withers to the nape of the neck (less arched and straighter in mares). The neck connects deeply with the body and to a lesser extent into the head, especially in mares. Abundant and silky mane.

c) Trunk: well-proportioned and robust. Withers discretely broad and prominent, in a smooth extension following the line of the back. Consistent back, muscled and almost flat. Short, broad, muscled and somewhat arched loin and slightly ascending to the croup, always well connected to the loin and the croup. Croup well proportioned, slightly longer than wide (somewhat wider in mares), rounded and sloping slightly. In adult horses, the height at the croup is lower than the withers. Tail inserted low and well between the buttocks, with abundant, long and often wavy hair. Broad and deep chest. Moderately arched, long and deep ribs. Extended flanks and correct belly.

d) Forelegs or forehands: long, muscled and oblique shoulder. Strong and well-sloped, medium length forearm. Well developed, lean knee. Cannon of proportionate length and well-marked, ample tendon. Lean, clear fetlock with little hair. Pasterns with good conformation, slope and direction and of a proportionate length. Compact, well balanced and well developed hoof.

e) Hind legs or hindquarters: muscled thigh, lightly arched and muscled buttocks and long gaskin. Strong, big and clean hocks. The angle of the hock, when viewed laterally, may be slightly closed, thus facilitating elevated movements and collection. The body areas located below the tarsus joints should have identical characteristics to those indicated for the forelegs.

1.3. Phaneroptic (visible) features: fine short coat. Grays and bays are dominant coat colors; the presence of white patches, or excessive white on head and extremities, or any other shape or size throughout the body are not an acceptable trait for this breed (except in the case of acquired characteristics). Different colored eyes or blue eyes are unacceptable (when not a characteristic of a given color coat).

1.4. Functional characteristics and aptitudes: they have brilliant, agile, energetic, cadenced and elastic paces, with significant elevation and extension, notable ease for collection and turns on the haunches. Their walk is straight, regular and ground-covering. Trot is elastic, suspended, regular, cadenced and elegant, with active use of the hindquarters, flexing the joints in collection to push forward, elevating and flexing the knees. Their canter is fluid, has impulsion and is elastic with regular strides. Horses have excellent aptitudes to carry out a variety of functions, has an easy and quick response to its rider's aids, thus they are obedient, with easy rapport with the rider and extraordinarily comfortable. Their main service is under saddle, finding great ease in Dressage

(Spanish High School, Dressage and Doma Vaquera), rejoneo (mounted bull-fighting), acoso y derribo (testing young fighting bulls), carriage driving, working with livestock and other farm chores as well as other equestrian disciplines.

1.5. **Behavioral characteristics and temperament:** PREs are rustic, sober, well-balanced and tough animals. Energetic, noble and docile. They learn well and easily adapt to diverse jobs and situations.

1.6. **Disqualifying defects:** Breed quality that does not meet the minimum required by the PRE Breed Prototype. Deformity of the supper neckline (fallen crest), ewe or inverted neck, congenital (non-accidental) cryptorchidism and monorchidism. Other disqualifying defects include: a height of less than 1.54 m for stallions and 1.52 m for mares, a proportionality index of less than 95 or greater than 105, concave or ultra-convex frontal contours. The presence of white spots on the head when these invade the eye sockets or the entire face and the limbs, when the socks invade the knee or the hock, or any spot on the body with a size greater than 3 cm in diameter on depigmented coat (excepting those acquired), as with heterochromia iridum or eyes that differ in color or blue eyes when that color is not a characteristic of the coat color, and in general, the presence of serious and very serious defects, which differ from the breed prototype, detected during the assessment process.

1.7. **Penalizing defects:** those stated for the head and neck, when these do not reach the degree for disqualification, rounded and protruding nostrils, thick upper lip, chunky and upper lip with limited mobility, over-shot and under-shot jaw, the head-neck union is chunky, hardly differentiated and very deep, there is a lack of harmony and disproportion between body areas and dimensions, hollow/sunken back, height at the withers of > 170 cm for mares and >172 cm for stallions, being higher at the point of the croup than at the withers, presence of melanomas, inadequate limb alignment and movement with poor elevation, irregular, poor extension and, especially, dishing and ambling.

2. Stud Book Structure

The Official Purebred Spanish Horse Stud Book has a MAIN SECTION with three categories:

- Birth Register.
- Permanent Register.
- Register of Non-Reproductive Horses.

The conditions that horses must meet to be included in each of these Registers are listed herein.

3. Stud Book Division and Requirements

MAIN SECTION

3.1 Birth Register: Foal Identification and Verification of Parents

A horse is registered in the Birth Register if its parents appear in the Permanent Register, when the covering, artificial insemination or embryo implant and foaling has been duly declared in keeping with the procedures and requirements established by

ANCCE. Likewise, the horse's characteristics must meet breed quality guidelines as established in this Breeding Program.

All horses registered in the PRE Stud Book shall be identified individually in accordance with the current Rules and Regulations regarding equine identification and EU legislation for animal health regarding their identification and the registration of equines. A microchip will be implanted in all horses; said horse will be assigned a unique identification code used in when registering that horse in the PRE Stud Book. Likewise, this unique code shall appear in all zootechnical documentation concerning that horse. It is preferable that the identification of foals be carried done when the foal is with its dam and in accordance to European Union legislation and the current Breeding Program Rules and Regulations. Both the covering and foaling certificates shall be presented when making the request for identification.

Likewise, to guarantee genealogical accuracy of horses registered in the PRE Stud Book, a mandatory parentage test will be performed on all equines prior to their registration in the PRE Stud Book Birth Register. Molecular genetic testing will be used, mainly microsatellite or other markers to increase the probability of excluding parents. These biological samples used will then become part of ANCCE's Sample Bank and may be used for genetic studies focusing on the preservation and improvement of the breed.

Two groups or subcategories have been established in the Birth Register:

Group A: Made up of horses whose parents have a positive genetic evaluation.

Group B: Made up by horses whose parents do not have a positive genetic evaluation.

ANCCE, through the Breeding Program Management Committee, shall annually establish the requirements for a horse to be included in one of these groups. Horses may automatically change from one group to another when assessment data from their parents or when the specific conditions of a given group are modified. This information is published on the ANCCE website.

Horses that have not been assessed for their reproductive aptitudes to then move to the Permanent Register shall remain in the Birth Register. The same holds true for horses that have been tested once and have not passed the assessment; these shall remain the Birth Register (in which case, these horses will be categorized directly in Group B of the Birth Register).

3.2 Permanent Register: Scoring System and Categories

For breeding horses coming from the Births Register may be moved to the Permanent Register if and when they have reached the age of three (3) years, that fit the breed prototype and show proof of having passed a specific assessment of the breed by which the horse has earned the category of **"Approved Breeding Stock"** may be entered in the Permanent Register. Personnel authorized by the Breeders' Association shall assess the conformation and phaneroptic aptitudes that horses in the Birth Register must comply with to be entered in the Permanent Register.

The owner shall request the assessment of his/her horse to be registered in the Breeding Stock Register. This process is based on an elimination system that takes into account disqualifying defects or the total of penalizing defects as defined in the established breed prototype.

The official assessment forms, designed by ANCCE and published on its website, shall be used for all assessments. These include information such as zoometric measurements, variables related to the breed prototype such as general, phaneroptic and functional traits for the various morphological regions, including defects and information of interest that will be integrated into the Breeding Program. The results grant the category of “Approved” or “Not Approved”.

A horse that is not approved shall remain in Group B of the Birth Register (if it has only been tested once) or transferred to the Register of Non-reproductive Horses if it has obtained two rejected assessments (2 assessments resulting in Not Approved).

The category obtained (Approved or Not Approved) must appear on the horse’s Equine ID Document and in the PRE Stud Book database.

There are also two groups in the Permanent Register:

Group A: Includes horses whose parents or themselves have a positive genetic assessment.

Group B: Includes horses that do not meet the required criteria to be part of group A.

ANCCE, through the Breeding Program Management Committee, shall annually establish the requirements for a horse to be included in one of these groups. Horses may automatically change from one group to another when assessment data from their parents or when the specific conditions of a given group are modified. This information is published on the ANCCE website.

Likewise, within **Group A** of the Permanent Register, there are a number of breeding stock categories for horses exhibiting other genetic merits for the Breeding Program and that have also undergone a radiological study to rule out diseases such as osteochondrosis. Reproductive organs are also studied to rule out reproductive abnormalities:

1) Register of Young Recommended Breeding Stock: Horses in the Permanent Register between 4 and 7 years of age, that have been genetically assessed using the data obtained from performance tests established by the Breeding Program, have obtained a genetic index greater than the minimum for the characteristic or corresponding aptitude and meet the requirements for conformation, functional, breeding and health established in the Breeding Program, may be included in this register. This category is provisional and will be available as long as the horse meets the requirements.

2) Register of Improver Breeding Stock: horses that have undergone genetic assessment, that have achieved a genetic index that exceeds the average for the population for the relevant characteristic or aptitude, with a minimum reliability as established in the PRE Breeding Program and surpass the requirements according to the Breeding Program, may be included in this register.

3) Register of Elite Breeding Stock: horses may be included in this register if and when said horse has outstanding genetic qualities, above the rest of the breed, and that has achieved the category of Improver Breeding Stock for Dressage and Aptitude for Conformation and Dressage.

Assessed horses' genetic information shall be included in the PRE Stud Book and the category obtained shall appear in the Equine ID Document with a distinctive mark.

3.3 Register of Non-Reproductive Horses

A horse is registered in the Non-reproductive Horse Register if its parents appear in the Permanent Register, when the covering, artificial insemination or embryo implant and foaling has been duly declared in keeping with the procedures and requirements established by ANCCE and that provide an affirmative parentage test. However, the inclusion of horses in this Register is due to any of the characteristics listed below:

- Fails to comply with the requirements to be entered in the Birth Register by exhibiting a disqualifying defect at the time of registration.

- Has failed the Basic Aptitude for Breeding Stock twice due to disqualifying defects or other serious or very serious defects.

- Horses that exhibit (non-accidental) disqualifying defects after their assessment as breeding stock.

Once these horses enter this Register, they are not allowed to breed Purebred Spanish Horse progeny nor be included in any other register of the Main Section.

4. Stud Farm Registration System

It is a mandatory requirement to update or to register a stud farm prior to using PRE Stud Book services. Said services must be requested by the horse's owner, the stud farm representative or other person directly authorized by the owner.

5. Admittance of Animal and Reproductive Material for Breeding

The use of artificial reproductive methods is allowed: artificial insemination or embryo transfer when the semen or embryo is collected from horses appearing in the Permanent Register of the PRE Stud Book and that have a positive genetic assessment at the moment when artificial reproductive methods are implemented. In case of embryo transfer, both the donor and receiver mares must appear in the Permanent Register of the PRE Stud Book. All criteria shall be established and published by ANCCE.

The limitation or prohibition of horses and/or their reproductive material as well as the use of artificial reproductive methods may be applied, if justified by the breed's evolution and Breeding Program results. In this case, such use must be approved by the Breeding Program Management Committee and informing the authorities in advance. Likewise, this usage shall be announced the previous year to its implementation on the ANCCE website.

III. Aspects concerning the Breeding Program for Breed Selection

1. Breeding Objectives and Criteria

The main objective is to improve the morphology, conformation and functionality of the PRE Horse by maintaining genetic diversity at all times while minimizing the level of inbreeding and kinship of the PRE population to guarantee the preservation of the Breed and the Carthusian bloodline. To achieve this general objective, the following specific objectives are contemplated:

- Obtain healthy horses with no hereditary defects.
- Improve the morphological and conformational characteristics of the breed, in accordance with the breed quality established for the PRE Horse.
- Improve the conformation, understood as the improvement of the morphology directed towards a specific function, under saddle and especially Dressage.
- Improve the functional potential of the PRE Horse for the various competitive sport disciplines.
- Select and improve behavioral traits indicated in the racial prototype.

To achieve these objectives, the following selection criteria shall be taken into consideration:

Conformation-functional and behavioral criteria -- Based on the performance tests established in the Breeding Program, conformation is assessed using the Linear Conformation Score. This determines the conformation and movement parameters of interest in the PRE population by relating them with the functional performance of the horses tested with which an indirect selection of functionality is carried out.

Also, zoometric measurements are collected, which permit the subsequent conformation characterization of the horses, as well as their functional capacity for sport, especially for Dressage.

Functional criteria -- Said results are based on information obtained from the horses tested at the performance tests, which is a guaranteed and objective tool to measure functionality. Functional performance verification is performed for Dressage, with this Program being open to the incorporation of new disciplines (Eventing, Working Equitation, Spanish High School and others), if and when there is an adequate number of participating horses. Functional criteria for Dressage are noted on the performance control sheet which includes the score earned by the participating horse in each of the partial variables assessed by the judges during the official performance tests.

Together with the above, the following information shall be used to genetically assess horses:

Genealogical Data -- Genealogical information is vital, both to obtain the parentage matrix—essential in genetic assessments—and to establish the inheritance type of specific hereditary diseases and defects. Moreover, this information is required when calculating the level of inbreeding, both at individual and herd levels, as it is an indicator of genetic variability levels. These parameters are of essence for the genetic preservation of the breed and its bloodline.

Molecular Data -- The available molecular information is used for population structure studies, genetic variability, design the breed's germplasm bank or to reveal genes linked to traits of interest within the breed (morphology, functional, reproductive, etc.). Biological samples stored at ANCCE's genetic sample bank shall be used.

Reproductive, Health and Genetics – Horses may be subject to a clinical examination of their reproductive organs, including a spermiogram and an ultrasounds scan to determine the absence of congenital abnormalities and hereditary defects, with

special attention being paid to characteristics related to functional and reproductive aptitudes. Where deemed necessary, should a hereditary defect be suspected (for example, fallen crest, osteochondrosis, aniridia, melanoma, etc.) that horse shall be subject to a full genetic study using cytogenetic or molecular analysis or an inheritance test, depending on the nature of the problem. Biological samples available genetic bank shall be used.

Environmental -- These are complementary tests carried out in those cases where environmental and handling factors condition the results of the horses participating in the test; these serve as correction factors during genetic assessments. Thus, data regarding events, centers, stud farms, riders, transportation, among other factors may be collected.

The potential of these assessment variables to be inherited (heritability) is available on the Association's website and is updated regularly.

2. Detailed Description of Each Phase and Timeline

The Purebred Spanish Horse Breeding Program is structured into five (5) phases as established in the Order APA/1018/2003 dated the 23rd of April. These phases are currently carried out simultaneously throughout the year and, in accordance with this Breeding Program, thus allowing horses to be incorporated into Groups A and B.

Phase 1: Identification and Registration in the Birth Register

Once identified, horses are listed in the Birth Register or in the Register for Non-reproductive Horses, following the procedure and requirements established by the PRE Stud Book.

Phase 2: Registration in the Permanent Register

Horses are registered following the procedure and requirements established by the corresponding section of the PRE Stud Book.

Phase 3: Performance Tests

Participation requirements

All Purebred Spanish Horses registered in the PRE Stud Book participate in the Breeding Program selection process as long as they meet European Union regulations and the conditions established in the current Breeding Program.

Performance Guidelines and Testing Methods and Traits to be Itemized

Conformation-Functional performance tests are conducted on horses as of three years of age using Linear Conformation Score methodology during performance tests at stud farms *(Assessment for Basic Aptitude as Breeding Stock)* or at events (competitions, young horse selection tests, federation events, testing centers, etc.). In all cases, proper interaction between judges is guaranteed to allow valid comparisons of the horses. To do so, phenotypic data for conformation is collected on forms approved by the Association; these, in turn, are computerized for genetic-statistic processing, as well as other information regarding the horse, the judge performing the test and other environmental factors. Furthermore, zoometric measurements (length, height, angles, perimeters, etc.) are collected, which allow the subsequent

conformation characterization of horses, as well as their functional capacity for dressage. The morphological scores shall be granted by a judge, belonging to the group of linear conformation judges for the breed.

The performance test for **Dressage** shall take place during the Young Horse Selection Tests organized by ANCCE, at Dressage Competitions organized by the Royal Equestrian Federation of Spain (RFHE) or the International Equestrian Federation (FEI), whether national and international. Likewise, tests may be carried at other events that comply with the conditions and necessary technical requirements to perform the genetic assessment of horses. Phenotypic information is compiled on the established forms for each category and/or age group.

Phase 4. Genetic Assessment

Genetic Assessment Requirements and Methods

Performance test data, together with the genealogical data, shall be used to perform breeding stock genetic assessments for morphology and their aptitude for Dressage. For these assessments, a suitable methodology shall be used, generally based on the mixed models of the BLUP (Best Linear Unbiased Predictor), by applying an animal model in which all the known relationships between participants at all the performance tests and the results obtained are taken into consideration. This genetic assessment methodology may be substituted or complemented by other, more advanced methodologies (Bayesian method, randomized regression, Thurstonian models, etc. or even genomic selection).

The various environmental factors that are significant in an analysis of variance (GLM) shall be included in the genetic model as correction factors.

Before performing the genetic assessment of the horses, the genetic parameters of the variables to be valued shall be estimated. This information will be updated on the ANCCE website.

The required minimal reliability[1] varies depending on the Genetic Category being sought. A Global Genetic Index is estimated for each horse by pondering the genetic values for the various traits assessed, based on their importance for breed improvement. The Genetic Index formula is published on the Association's website and is periodically updated.

Upon concluding the genetic assessment, horses may obtain one of categories described below. To eligible, the horse must fulfill the conformation, reproductive and health requirements, after undergoing a radiological study to rule out diseases such as osteochondrosis; reproductive organs are examined to rule out reproductive abnormalities. Each category is temporary and is valid as long as the horse meets the established requirements.

Young Recommended Breeding Stock for Conformation Traits for Dressage: For those horses listed in the Permanent Register of the PRE Stud Book, participants in the performance tests established in this Breeding Program, between 4 and 6 years of age when the performance test is carried out and that have achieved a genetic index for conformations traits for dressage exceeding 70 percent (within 30% of horses with the best genetic index) and meet the required criteria annually established by the Association obtain this category. This percentage may be modified from time to time.

[1] 1- ((VarianceErrorPrediction)^2/AditiveVariance)

Young Recommended Breeding Stock for Dressage: Horses may participate in the established performance tests (functional Dressage tests), between 4 and 7 years of age when the tests are carried out, when said horse attains a genetic index for Dressage exceeds the average for the population and meets the required criteria, which is established annually by the Association.

Improver Breeding Stock for Conformation Traits for Dressage: Breeding horses that are 7 years of age or older, that have already obtained a genetic index for conformation traits for Dressage above the average for the PRE population, with minimal reliability of 0.6 (repeatability), that have sufficient descendants in the category as Young Recommended Breeding Stock and meet the required criteria established annually by the Association may obtain this category.

Improver Breeding Stock for Dressage: Breeding horses that are 7 years of age or older, that have already obtained a genetic index for Dressage exceeding the PRE population average, with a minimal reliability of 0.6, have sufficient descendants in the category as Young Recommended Breeding Stock and meet the required criteria annually established by the Association are eligible for this category.

Elite Breeding Stock: This category is open to those horses that are 7 years of age and older, and that show exceptional genetic qualities, above and beyond the rest of the PRE population. They must have achieved the category of Improver Breeding Stock for Conformation Traits for Dressage and for Dressage in addition to meeting the required criteria annually established by the Association.

Likewise, the genetic categories for Young Recommended Breeding Stock, Improver Breeding Stock and Elite Breeding Stock may be obtained by all those horses that have been genetically assessed for **other equestrian disciplines** (Eventing, Working Equitation, Spanish High School, and disciplines other than Dressage):

- Young Recommended Breeding Stock include horses between 4 and 7 years of age that have obtained a genetic index for a given discipline that is greater than the general PRE population average and meet the required criteria established annually by the Association for this category.
- Horses that are 7 years of age or older may obtain the genetic category of Improver Breeding Stock for a given discipline upon obtaining a genetic index for that discipline that is above the PRE population average, with a minimal reliability of 0.6, have sufficient descendants in the category as Young Recommended Breeding Stock and meet the required criteria as established annually by the Association for this category. All horses participating in the performance tests established by the PRE Breeding Program shall be assessed annually, based on their own results and those with whom they share genetic kinship, as long as there is enough data.
- Horses that are 7 years of age or older, that display genetic qualities well above the rest of the breed, have obtained the category of Improver Breeding Stock in the specific discipline and meet the required criteria established annually by the Association are eligible to be included in the genetic category as Elite Breeding Stock

Phase 5. Catalog of PRE Breeding Stock

Following the annual genetic assessment, the Official PRE Center of Genetics shall send the results of the genetic assessments to ANCCE.

This information shall be announced and published using the various means of communication available to ANCCE as well as in the Catalog of PRE Breeding Stock for horses that have obtained a genetic category.

Those horses that have achieved any of the categories contemplated in the PRE Breeding Program shall be awarded a diploma accrediting their inclusion in said category. Also, this fact shall be noted in their Equine Identification Document (EID). Additionally, information about these breeding horses shall be disseminated so as to facilitate their use within the breed.

All updated and available information shall be used by ANCCE to draft and publish the Catalog of PRE Breeding Stock. This Catalog is later distributed and promoted through those means considered most effective. Likewise, ANCCE could privately facilitate the owners with reports regarding the results obtained by their horses, as long as the Breeding Program technical managers consider it necessary or recommend it.

The annual Catalog of PRE Breeding Stock includes all horses, both mares and stallions that have obtained a Genetic Category following the criteria described herein.

The objective of the Catalog of PRE Breeding Stock is share with others information regarding horses with Genetic Categories. This, in turn, serves to promote their use in breeding while at the same time encourage greater genetic progress by contributing to the reduction of the breed's generational interval.

3. PARTICIPANTS IN THE BREEDING PROGRAM. RIGHTS AND OBLIGATIONS OF COLLABORATING BREEDERS

A number of organizations are actively involved in developing the PRE Breeding Program. These include:

- ANCCE as the organization responsible for developing the PRE Breeding Program.
- The Official Center for Animal Genetics Research Group PAIDI-AGR-273 from the University of Seville designated by ANCCE for the PRE Breeding Program and genetically assessing all horses.
- The Germplasm Bank is determined by ANCCE to be responsible for developing the PRE Breeding Program.
- Officially recognized reproductive centers.
- Collaborating stud farms: All breeders with horses registered in the Purebred Spanish Horse Stud Book may participate in the Breeding Program and shall abide by all of the applicable rules governing said Program. Breeders whose horses participate in performance tests established by the Breeding Program shall be included in the list of collaborating stud farms published every year on the National Information System ARCA and on the website of ANCCE.

Obligations of collaborating stud farms:

1. Committed and active participation at the various activities programmed.
2. Facilitate the collection of data to official ANCCE staff: morphologic assessment, lineal conformation score, biological samples for genetic controls, etc.
3. Allow the collection of semen from stallions that being verified for their genetic assessment to make up the PRE Germplasm Bank.

Collaborating stud farms shall have the right to receive timely information relative to the level of genetic variability of their stud farm and the genetic assessment of their horses.

4. DISSEMINATION OF IMPROVEMENTS AND SUSTAINABLE USE OF THE BREED

The program to disseminate the PRE Breeding program is the responsibility of ANCCE. It includes a series of activities that strive to share the genetic progress attained with the rest of the PRE population. Full dissemination and outreach are procured to improve the entire breed and therefore attain maximum genetic progress in a minimal amount of time. With this program, ANCCE's main objective is to obtain horses with good conformation and aptitudes for sports that are competitive in the various disciplines where they participate.

Among the possible promotional measures, the most outstanding include:

- Technical support for stud farms to obtain both the genetic improvement of the breed as well as maintaining the genetic variability of the PRE population.

- Training of breeders by means of educational activities such as conferences-exhibitions, symposiums, workshops, courses, clinics, as well as digital training courses.

- Publications, breeding stock catalogs with information about genetic assessments and genetic categories, as well as dissemination programs about the breed, its products and usage.

- Programs to distribute semen straws, embryos and genetic material for progeny tests or as may be the case, natural coverings, or to lease a breeding horse to promote the use those with exceptional genetic characteristics, or those that have earned one of the categories established by the PRE Breeding Program.

- Events for select horses and other exhibitions or tests. Every year, several events are held for breeders, both in Spain and internationally, to promote the Purebred Spanish Horse, in addition to SICAB, the International PRE Horse Trade Fair. Moreover, ANCCE organizes the Young Horse Selection Tests as well as performance controls for functional aptitudes; this data is used to genetically assess horses.

- Organize the sales of select breeding stock and genetic material. The use of horses with good genetic traits is promoted, especially those horses that have earned any one of the genetic categories contemplated in the PRE Breeding Program. This promotes the sales of both select breeding horses as well as their genetic material.

- Promotional and export plans. The various traits and aptitudes of the breed are shared and disseminated through promotional programs at trade fairs, competitions, programs in the media, and displays, among others, and all in several languages. Advertising campaigns are launched, together with awareness and promotional campaigns, export plans, information systems and marketing strategies being carried out.

- Computer software/web service to estimate inbreeding levels of each horse and the average per stud farm, design mating between breeding horses, try to verify and reduce global inbreeding levels within the breed (the PRE breed in general and more specifically the Carthusian bloodline).

- Organizing conferences-exhibits showing the results obtained in complementary studies performed within the scope of the PRE Breeding Program and by participating in research projects to ensure the proper dissemination of information for use by breeders. Assessment of possible modifications to this Breeding Program may also be taken into consideration.

- The continuous update of contents and maintenance of the ANCCE website, in both English and Spanish, as a national and international platform for the dissemination of information, as well as promotion of the Breed, its products and uses regarding the PRE Breeding Program.

- Dissemination of information on web sites and in social media.

- Draft and develop work methodologies for breeding/coverings, data collection, performance tests, etc.

- Promotional tools for breeding. ANCCE promotes the use of breeding stock catalogs as well as other IT tools to promote the use of breeding horses with outstanding genetic traits and that have earned any one of the genetic categories listed in the PRE Breeding Program.

The aforementioned list of measures proposed to promote the breed must be complemented with actions seeking the preservation (of the breed), as recommended by the FAO, including the creation of a Germplasm Bank.

5. PUREBRED SPANISH HORSE BREEDING PROGRAM COMMISSIONS

The committees involved in the Purebred Spanish Horse Breeding Program shall operate in a coordinated manner, and these include:

- **The General PRE Stud Book Council** acting as the governing body in representation of ANCCE in the most immediate tasks affecting the Stud Book, the definition, structure, composition and competences of which are defined in the ANCCE statutes.

- **The PRE Breeding Program Management Committee** as an ANCCE dependent organization with the following responsibilities:

    - Facilitate the coordination and follow-up of the PRE Breeding Program, safeguard the PRE as a breed and determine the procedures, documents and specific forms to be used.

    - Work as a liaison between the General Government (of Spain) and ANCCE in zootechnical terms and, as would be the case, exercise as an organization to study, analysis and propose zootechnical actions for the breed.

- Review the development of the Breeding Program from time to time, propose the necessary modifications for the efficient compliance of the objective, or present, where relevant, proposals for regulations.

- Present proposals before the competent authorities that permit a better execution of the current regulations.

- Propose, as might be the case, changes in the PRE Breeding Program and in the design of mating and limitations to establish a number of descendants per Breeding Horse, based on its genetic category with the aim of achieving maximum genetic progress, without drastically decreasing PRE herd diversity.

- Coordinate, evaluate, report about and analyzing the situation of the performance tests and the genetic assessments.

- Provide the necessary means to train authorized personnel, as well as establishing information routes and the training of the breeders.

- Guarantee the correct application of Rules and Regulations by authorized personnel and to periodically evaluate and report on the achievement of the objectives.

- Attend incidents and claims deriving from the development of the PRE Breeding Program.

The PRE Breeding Program Management Committee shall include members of ANCCE and staff from the Official Center for Animal Genetics.

The Committee shall approve its own operational Rules and Regulations and in all cases, shall meet at least once every six months, and as often as the situation requires, by means of a summons from its President. The Committee may assign work groups and specific sub-committees to study and propose specific matters.

Similarly, breed inspectors and those who, bearing in mind their professional competence, are expressly invited by the President, may also attend the meetings.