PUREBRED MENORCA HORSE BREEDING PROGRAMME

General Breeding Programme Information

1. **PUREBRED MENORCA HORSE STUD BOOK MANAGEMENT BODY:**
   Name: Asociación de Criadores y Propietarios de Caballos de Raza Menorquina (Association of Purebred Menorca Horse Breeders and Owners)
   Preservation and Selection Programme website: www.caballomenorquin.com
   Stud Book website: http://men-incecca.tragsatec.es/men-incecca/
   Contact: cavallmenorca@gmail.com / Phone/Fax: +34 971 48 09 16

2. **NAME OF THE BREED: Caballo de Pura Raza Menorquina (Purebred Menorca Horse)**

3. **OBJECTIVE OF THE BREEDING PROGRAMME: Preservation and Selection**

4. **GEOGRAPHICAL COVERAGE OF THE PRMe BREEDING PROGRAMME:**

Because the breed, native to Spain, is recognised as an endangered population, as established by the current legislation of Spain, all stud farms must collaborate with the Preservation Programme. Therefore, the Breeding Programme is applicable to all countries where Purebred Menorca (PRMe) horses are currently found, which include:

- Spain
- Other EU countries: France, Italy, Germany, the Netherlands, Austria, United Kingdom, Denmark, Greece, Belgium, Sweden and Luxemburg.
- Third countries: Switzerland, Russian Federation, Belarus and Ukraine.

5. **Exceptions and Unique Aspects Covered:**

   In associations that manage endangered breeds, the use of a PRMe breeding horse and its genetic reproductive material may be limited or prohibited, in such case that said use endangers the preservation or genetic diversity of the breed, as contemplated in this current document.

6. **Participants in The Breeding Programme:**

   - **List of Stud Farms collaborating with the Breeding Programme**: as of December 31, 2020, a total of 1026 stud farms collaborated with the Purebred Menorca Horse Breeding Programme (this does not include stud farms outside of Spain). This list of collaborating stud farms is updated annually in the National Information System of Breeds—known as ARCA—together with other breed-related information of interest.

- **Other participants**[1]**:** activities to be subcontracted, with third-party names and data listed on the table below:

Activities to be Subcontracted	Subcontracted Organization	Resources
Officially recognized authorized centre for animal genetics (Technical Advice of the Preservation and Selection Programme and Genetic Assessment)	Research Group PAIDI-AGR-273. University of Seville.	
Officially recognized authorized centre for animal genetics (Technical Management of the Preservation and Selection Programme and Genetic Assessment)	MOSEVAR. Complutense University of Madrid.	
Young Horse Performance Tests with aptitudes for Dressage		X
Performance Controls at the Stud Farm	Qualified Linear Conformation Judges, and technicians who are specialized in PRMe Conformation.	
Molecular Animal Genetic Laboratory (Genotype, parentage analysis and identity verification).	Nasersa	
Gene Bank (Storage of reproductive material)	Centre de Recollida de Semen Semilla (Centre for the Collection of Semen, SEMILLA). Serveis de Millora Agrària i Pesquera (Service for Agricultural Improvement and Fisheries) Banco Nacional de Germoplasma Animal (National Animal Gene Bank)	
Reproductive Centre (collection and processing of sperm)	Centre de Recollida de Semen Semilla (Centre for the Collection of Semen, SEMILLA). Serveis de Millora Agrària i Pesquera (Service for Agricultural Improvement and Fisheries) Centre de Recollida de Semen Can Frontera. (Centre for the Collection of Sperm Can Frontera) Miquel Ferrer* Banco Nacional de Germoplasma Animal (National Animal Gene Bank)	
Development and maintenance of Stud Book Management Systems.	Tecnologías y Servicios Agrarios SA (TRAGSATEC) (Agricultural Technologies and Services Corporation)	

* Translator's Note: Person in Charge

[1] Article 8. ***Requirements to sub-contract third parties*** *for technical activities linked to the management of the Breeding Programme (including Performance Controls and Genetic Assessment, as well as other technical activities such as the handling of stud book databases, parentage….):*
-The Association continues to be responsible for complying with Breeding Programme requirements before the Authorities.
-There is no conflict of interest between third parties and the economic activities of breeders.
-Point three complies with the necessary requirements to perform the activities.
The Testing Centres, Authorised Genetic Centres, Laboratories for Molecular Animal Genetics and Gene Banks ***shall be recognized by the Authorities.***
Reproductive Centres shall be authorized in keeping with EU and National legislation for Animal Health.

Breeding Programme Structure:

I. Description of the Initial Situation

This Breeding Programme has been drafted according to the guidelines established in the EU Regulation 2016/1012 by the European Parliament and the Council, dated the 8th of June, 2016 regarding zootechnical and genealogical conditions for breeding, trade in and entry into the European Union of purebred breeding animals, hybrid breeding swine and their reproductive material, as stated in Royal Decree 45/2019, dated the 8th of February, by which the applicable zootechnical Rules and Regulations have been established for pure breeds, hybrid breeding pigs and their reproductive material. Said regulation update the National Programme 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 Programmes and Performance Tests for the genetic assessment of purebred equines are established.

The Association of Purebred Menorca Horse Breeders and Owners was founded in 1988 to preserve, improve and promote the Purebred Menorca Horse. Since 2008, the Association has also undertaken the responsibility of handling the breed's Official Breeding Programme, recognized by Spain's Ministry of Agriculture, Fisheries, Food and the Environment.

The PRMe Stud Book's *Foundational Register* was launched by the end of 1987, with the breed being accepted into the Ministry of Defence Registration Leger for Purebred Stallions and Mares at the end of 1988, with official recognition being granted at the onset of 1989. Therefore, the PRMe Stud Book was created in Spain; thus, there are no other bodies, organizations or studbooks with similar characteristics to those of the Purebred Menorca Horse. Subsequently, the PRMe Stud Book is considered original or the origin of the Purebred Menorca Horse and it defines the principles upon which the breed in Spain and in any other country is based.

Consequently, the Preservation and Improvement Programme was developed in 2008. Since then, the methodologies have been fine-tuned for the complete and objective control of conformation and functional performance. This data has been published annually since 2013 as the Catalogue of Breeding Stock, with genetic information for the breed. Currently, the annual work protocol is well advanced and standardised.

Purebred Menorca Horses are a native breed of Spain with special protection. The breed is specifically linked to the Island of Menorca from a social, cultural and environmental point of view. Its maintenance is guaranteed by its active participation and use in local festivities. Its close ties with locals and their traditions have led to the preservation and selection of the breed by breeders who have sought black, functional horses with a pacific temperament and collaborative in times of stress. All of these traits are essential when participating in festivities, riding and performing the various levels of dressage, in addition to having a conformation in keeping with the established prototype.

Such characteristics have made the Purebred Menorca Horse a sought-after breed both in Spain and internationally. More and more, the breed is demanded throughout Europe for a wide range of objectives and uses (breeding, equestrian routes, shows, carriage driving, dressage, etc.).

Today, the largest population of PRMe horses is found on the Balearic Islands, especially on the island of Menorca, from where the breed originated and owes its name. Nevertheless, it is noteworthy that there are important herds in Catalonia, Valencia and other neighbouring countries (mainly in France, Italy and Germany).

Table 1: Distribution of the Purebred Menorca Horse census as of December 31, 2020

Region of Spain	**Total Horses**		**Total**	**Stud Farms**
	Males	**Females**		
Andalusia	9	18	27	10
Aragon	5	3	8	4
Asturias	2	1	3	2
Balearic Islands	1461	1284	2745	877
Canary Islands	1	0	1	1
Cantabria	3	4	7	1
Castile-La Mancha	8	12	20	10
Castile-Leon	7	4	11	7
Catalonia	39	54	93	41
Extremadura	3	5	8	4
Galicia	4	6	10	4
Madrid	3	2	5	5
Murcia	6	0	6	3
Basque Country	5	3	8	3
Valencia	25	25	50	28
Total	*1581*	*1421*	*3002*	*1000*
Other countries	409	391	800	393

All census information included on the table above is updated annually on Spain's Ministry of Agriculture web site, specifically its National Information System (ARCA), available at: https://www.mapa.gob.es/es/ganaderia/temas/zootecnia/razas-ganaderas/

II. Aspects Concerning the PRMe Stud Book

1. Breed Characteristics, Prototype and Grading System

1.1. Breed Prototype of the Purebred Menorca Horse:

a) **General Characteristics:** these horses are eumetric (well proportioned), with a sub-convex to straight profile, medio-linear profile (medium proportions), with a slender figure and long, fine limbs and correct leg soundness; this horse boasts a strong and resistant conformation. Mares are more refined than stallions, with a longer head and body, thinner and longer necks and a more squared croup. For stallions, the minimum accepted height at the withers is 1.54 meters and 1.51 meters for mares, all with a uniform black coat colour.

b) **Head:** medium in size, long, lean head with a sub-convex to straight profile. Ears are medium sized, narrow and with slightly convergent tips. Lively black rounded eyes with protruding orbits. Wide, oblique and slightly protruding nostrils. Square muzzle and open-arched cheeks.

c) **Neck:** of average length, with a tendency towards being elongated, moderately muscular, slightly arched along the upper edge and well inserted, not deep, with both head and body. Abundant and strong mane.

d) **Body:** it is elongated, with discretely arched ribs, with high and long withers. Its back and loins are medium in length and muscled, with a straight dorsal-lumbar line that slops upwards to the highest point of the tuber sacrale. The croup is slightly sloped and much longer than it is wide. The tail is inserted low. The chest is well-proportioned, with a correct belly and flanks that do not stand out.

e) **Forelimbs:** These should be lofty and with all radii being long. Long and oblique shoulder with prominent scapular-humeral union. Elongated arm and forearm. Lean, broad and high knees. Long cannon bone. Well-sloped pasterns of adequate length. Solid, pigmented hooves are proportionate in size.

f) **Hind Limbs:** Thigh and buttock slightly muscled, proportionate in size to the body. Long legs. Hocks are broad, open and wide from the front to back. Regions below the tarsal joints have the same traits as those of the forelegs.

g) **Phaneroptic Traits:** uniform black coat, from pitch to jet black. Small white marks on the head (star) and on the limbs are accepted with criteria for elimination.

h) **Functional Traits:** Horses boast moveable, regular, rhythmic and cadenced gaits with an ease for extensions.

i) **Psycho-constitutional Traits:** Purebred Menorca Horses are warmbloods, noble, with good personality, collaborative behaviour and easy to train, which guarantees excellent horse/rider pairs.

j) **Aptitudes and Performance:** It is an excellent riding horse that satisfies all kinds of riders, whatever their level may be. These horses are adaptable to the various

categories with satisfactory results for Dressage. They have abilities for Spanish High School movements, and are also useful for light carriages.

k) **Disqualifying Defects:** In this breed, disqualifying defects include other coat colours that are not black, a height at the withers less than 1.54 meters in stallions and 1.51 meters in mares. Other equine specific disqualifying defects include cresty neck, non-accidental cryptorchidism and monorchidism.

1.2. Assessment System:

The Breeders' Association, as the manager of the PRMe Breeding Programme, is responsible for establishing the procedure for the registration of Purebred Menorca Horses in the *Definitive Register*, as well as determining the acting body and the actions, requirements and assessment (scoring/grading) commissions to be applied in these processes, always in keeping with the corresponding legislation.

1.2.1. Assessment commission: The Assessment or Grading Commission shall assess, review and score horses included in the *Birth Register* for their conformation and phaneroptic traits to attain the Category as "Approved Breeding Stock" for the breed, and be included in the *Definitive Register*. This Commission shall include:

- An authorized veterinarian who is responsible for specific technical aspects, including the collection of zoometric measurements and the detection of all disqualifying defects that are specific to the breed and the specie.
- A technician who is specialised in the PRMe who is responsible for assessing the breed quality based on the established breed prototype and the internal rules that regulate the steering committee for the PRMe as a breed.

1.2.2. Procedure: Assessments shall be requested by the horse's owner, in keeping with the procedures and deadlines established by the managing body, and that is indicated in the Internal Rules and Regulations and/or the Procedures Manual for Breeders. This process shall be undertaken using an elimination system, based on the disqualifying defects or by tallying all penalizing defect and the assessment of the breed quality referred to as the general traits, both phaneroptic and functional, in keeping with the various body regions, established by the procedure in the Internal Rules & Regulations of the Breeders' Association. Similarly, the information for a set of objective zoometric measurements shall be complete, which shall be integrated into the PRMe Breeding Programme.

Assessments or grading shall use the forms that have been specifically designed by the Breeders' Association and that are published on the association website.

Horses that surpass this assessment shall be listed in the *Definitive Register* of the PRMe Stud Book. When a horse is "not yet assessed," it shall remain in the *Birth Register*.

Members of the Assessment Commission shall also assess the presentation and preservation of the horse. Said Commission may grant the category as "tentatively not approved" to those horses that fail to be presented in the necessary way, with minimal conditions for the horse's correct assessment.

2. Identification of Horses and Measures to Guarantee Parentage

All horses registered in the Breed's official Stud Book shall be identified individually, preferably with the foal with its dam, in keeping with EU rights for animal health and welfare for the identification and registration of equines, and the rules established in this current Breeding Programme. The covering/breeding certificate must be presented, together with the report of birth when the pre-registration is requested. This request shall be correctly presented and within the timeframe established by the managing body, with said request being indicated in the Internal Rules and Regulations and/or the Procedures Manual for Breeders.
Covering/breeding certificates shall be requested from the PRMe Stud Book managing body by the owner of the stallion. Said form shall be duly filled out and signed by the owner/s of the mare/s so that it may be presented before the Breeding Programme managing body to correctly register the newborn foal. Likewise, to guarantee the genealogy of the horses listed in the Stud Book, mandatory parentage testing shall be performed prior to the registration in the *Birth Register,* by means of a DNA genetic marker analysis.
Once the documentation has been verified, field identification carried and parentage verified, each horse shall be assigned a single ID code, which shall be used when registering that horse in the Stud Book. This code shall appear on all zootechnical documents referring to that horse.
Horse owners are obliged to report the removal of any horse from his/her stud farm, following the procedures established in the Breeders' Association Internal Rules and Regulations. Should the removal of a horse be due to its death, this shall be declared in keeping with the deadlines, established in the current legislation in this regard. Should the removal be due to a change of ownership, at least at the conclusion of every sales year, it is recommendable to carry out the change of ownership immediately after the sale.

3. Structure of the Stud Book

Horses that comply with the breed's conformational and morphological traits, as defined by its breed prototype, described and adjusted to the mandates in the current specific rules, may be registered in the official Purebred Menorca Horse Stud Book. Said Stud Book is made up of two different sections, divided into differentiated Registers, in keeping with the age of the horses and the tests surpassed within the scope of the official Breeding Programme.

The Main Section is divided into the *Foundational Register, Birth Register, Permanent Register* and the *Non-Reproductive Horses' Register.* Within the *Permanent Register,* horses may also obtain any one of three different categories, depending on their results in the PRMe Preservation and Section Programme: *Young Recommended Breeding Stock, Improver Breeding Stock* and *Elite Breeding Stock.*

Appendix Section includes the *Auxiliary Register*.

The conditions that horses must comply with, to be included in each of these Sections, Registers and Categories, are described herein.

4. Stud Book Divisions and Registration Requirements

4.1. **Main Section:** The registration requirements for this Section depend on each of the Registers in which it is structured.

4.1.1. ***Foundational Register:*** This register includes live horses, born prior to 1 January of 1990 and that comply with the breed's conformation traits when the official PRMe Stud Book was created. It shall be considered as part of the Main Section for promoting horses in the Main Section.

4.1.2. ***Birth Register*:** Horses born out of breeding stock listed in the *Permanent* or *Foundational Register* are included herein; said horses must comply with the conditions established by the current legislation. Moreover, their traits must respond the demands established in the breed prototype, as described in Section 1.1 of this Breeding Programme. Horses remain when they have not taken assessment tests that are essential to move on to the *Permanent Register or that have taken said tests upon earning the category as "Tentatively not approved"*. Likewise, those horses having the ethnologic elements described for the breed may be included in this Register when they are the result of a crossbreed between horses registered in the *Auxiliary Register* and another included in the *Permanent Register* in keeping with the conditions that are determined to promote this breed.

4.1.3. ***Permanent Register*:** Horses out of/by breeding stock listed in the *Birth Register* may be included in this Register, if and when they are three years of age, meet breed quality and prove they have surpassed the specific assessment test for this breed to guarantee said horse's breed quality and that there are not disqualifying defects, in which case, said horse obtains the category as "Approved Breeding Stock". The following Breeding Stock Categories are included in this Register; they are described in Section 3 of the PRMe Preservation and Selection Programme for horses that in addition to having surpassed the minimal assessment qualifications as breeding stock, also have other outstanding merits of interest for the management of the official PRMe Breeding Programme:

a) *Young Recommended Breeding Stock*: Included herein are breeding horses that have been assessed based on their results from conformation and functional performance tests and genealogic data, and have obtained a Global Genetic Index above the established threshold for the trait or aptitude being tested for this breed.

b) *Improver Breeding Stock*: Breeding horses with a minimal number of assessed offspring, a Global Genetic Index above the established threshold for the trait or aptitude being tested and a minimal precision of 60%, as established in the PRMe Preservation and Selection Programme are included in this category.

c) *Elite Breeding Stock*: Included in this category are breeding horses that are seven years of age and older, have obtained the category as *Improver Breeding Stock* for at least two of the three Categories established in the PRMe Preservation and Selection Programme, with it being essential that said horses have obtained the Category as *Improver Breeding Stock* for conformation-functional performance and basic movements.

Upon obtaining any one of these Genetic Categories, said information regarding that horse in the official PRMe Stud Book and the individual equine identification document is indicated with a distinctive stamp being granted.

4.1.4. ***Register of Non-Reproductive Horses:*** This register is for those horses born out of/by breeding stock listed in the *Permanent Register or Foundational Register,* that comply with the conditions established by the current legislation and that are in any one of the following situations:

- A horse that fails to comply with the requirement to be listed in the *Birth Register* due to having what is considered a disqualifying defect that is appraised at the time of registration.
- A horse, which upon being assessed for the specific breed quality fails to pass, thus obtaining the category as "Not approved as Breeding Stock".
- A horse that shows disqualifying defects (not accidental) after having been assessed for specific breed quality.

These horses, once listed in this Register, may not produce Purebred Menorca descendants, nor are they listed in any other Register included in the Main Section of the PRMe Stud Book.

4.2. **Appendix Section:** ***Auxiliary Register****:* Horses are registered in this section, despite the fact that they fail to meet all the necessary requirements for registration in the official PRMe Stud Book, as said horses may be beneficial in exceptional cases and comply with the conditions indicated in Appendix II, Part 1, Chapter II of EU Regulation 2016/1012.

The PRMe Steering Committee shall propose the registration of a horse that must prove outstanding conformation and functional traits by surpassing the assessment test for breed quality, described in Section 1.2.2 of this Breeding Programme. The registration must be approved by the Breeder Association Board of Directors, always counting on the advice and the agreement of Preservation and Selection Programme technicians, who are the mandatory consultation body.

5. Promotion of Horses in the Appendix Section of the Main Section

Progeny of horses registered in the *Auxiliary Register* of the Appendix Section may gain access to the *Birth Register* of the Main Section, when they are the result of a crossbreed between breeding stock listed in the *Permanent Register* of PRMe Stud Book.

6. Stud Farm Registration System

To register a stud farm, this shall be requested voluntarily in writing and presented before the Breeding Programme management body, using the specific form and following the procedures established in the Procedure Manual for Breeders. In such case that a stud farm withdraws the registration of all horses, due to change of ownership or death, the tentative cancelation will be registered in the PRMe Stud Book. When the owner or representative so requests, said stud farm may once again be registered upon having acquired new PRMe horses.

7. PRMe Steering Committee

The PRMe Steering Committee is made up of the following members:

- President: The Technical Director of the PRMe Stud Book or the person he/she designates.
- Technical Inspector: A veterinarian who is specialised in the breed.
- Secretary: The President of the Breeders' Association or the person he/she designates.
- Member-at-Large: two members of the Breeders' Association and two technicians who are specialists in PRMe conformation.

The Committee shall establish its internal operational rules, which shall be stated in the documentation registered for said Committee. Its members may be renewed at the proposal of the President and the Secretary of the Steering Committee itself, coinciding with each change in the Breeders' Association Board of Directors.
Included among their responsibilities are:

- Ensuring the continuity, preservation, selection and improvement of the breed.
- Attending to the technical incidences derived from normal Breeding Programme operations, as well as also solving any technical claims that may be presented to then indicate the decisions made in an Incidence Register.
- Proposing changes in the breed prototype and/or specific Rules & Regulations for the Breeding Programme and the Internals Regime, as considered appropriate for approval by the General Assembly of Members.
- Proposing changes in the conformation and functional competition Rules and Regulations, as deemed convenient for approval by the General Assembly of Members.
- Proposing before the Breeders' Association Board of Directors, as may be necessary, the limited use of breeding horses and their reproductive material, if and when said use endangers the preservation or genetic diversity of the breed
- Proposing before the Breeders' Association Board of Directors the registration of horses in the *Auxiliary Register*, in exceptional cases, but always with the advice and agreement of technicians from the Preservation and Selection Programme acting as the mandatory consultation body.
- Certifying technicians who are specialists in PRMe conformation, establishing the criteria for their updating and continued training, and guaranteeing the correct development of their functions in keeping with the current legislation in this regard.
- Training and certifying authorized staff, as well as carrying out the follow-up and verification of their actions.
- Dictating appropriate instructions and establishing the necessary document for the correct functioning of the Breeding Programme.
- Organising the call for assessment of breeding aptitudes in keeping with the current rules for the breed.

8. Admission of Horses and Reproductive Material for Breeding

Natural coverings are authorized for any breeding horse recognized by the breed, included in the *Permanent Register* or in the *Foundational Register* of the PRMe Stud Book, and that complies with all of the requirements established in these current rules, but always within the scope of the current zoometric-health legislation. Authorizations for the usage of artificial reproduce methods are limited: artificial insemination and embryo transfer are exclusively for horses with one of the Genetic Categories contemplated in the PRMe Breeding Programme: *Young Recommended Breeding Stock, Improver Breeding Stock* or *Elite Breeding Stock.* These methods shall comply with the criteria established by the officially recognized Breeding Programme managing body, but always within the framework of the current zoometric-health legislation. At all times, the usage guidelines may be established by the Preservation and Selection Programme to guarantee the maintenance of the population's genetic variability. In this regard, the Breeding Programme managing body may limit or prohibit the use of breeding horses and their reproductive material, if said usage endangers the preservation or genetic diversity of the breed. The limitations and prohibitions to use breeding horses, should its application be necessary, shall always count on the advice and agreement of the technicians who are responsible for the Preservation and Selection Programme. Said technicians shall operate as the mandatory consultation body. Such limitations and prohibitions undertaken based on objective criteria established by those responsible for the Preservation and Selection Programme (purely conservational as the excessive use of certain breeding horses could affect the existing genetic variability, could lead to the fixation of certain undesirable traits within the population, etc.).

The procedure shall be as follows:

1. At the onset of each year, those who are responsible for the Preservation Programme shall perform genetic variability and inbreeding studies of the current population, based on genealogic and molecular information available for the breed. Based on these studies, the Breeders' Association could receive specific recommendations to limit or prohibit the use of certain breeding horses, based on purely conservationist criteria (thus limiting their excessive use within the population).

2. The PRMe Steering Committee shall ponder those recommendations and shall implement the appropriate measures to control the problem pointed out by the technicians and to guarantee the genetic variability of the population, by means of this exception that limits or prohibits the use of breeding horses with conservationist criteria.

III. Aspects Relative to Breeding within the Scope of the PRMe Preservation and Selection Programme

1. Selection Objectives and Criteria

- General Objective: Attain horses with a conformation—in keeping with the established breed prototype—adapted to their functional aptitudes and with qualities that facilitate their handling for Dressage while at the same time allowing them to become outstanding in the disciplines for which they have been selected, maintain the existing genetic variability and favouring the general growth of herd numbers.
- Specific Objectives:
  - Attain horses with certain morphological and conformational traits that favour the indirect improvement of their functional performance (functional conformation), but always within the establish breed prototype.
  - Attain horses with an adequate functional aptitude to excel in competitions for various disciplines such as Dressage and Menorcan Dressage, both at the national and international level.
  - Select horses while maintaining genetic variability at all times, minimising endogamy and kinship of the population to guarantee the preservation of the breed and increase general census numbers to avoid extinction.
- Selection Criteria:
  The available information regarding the selection criteria being applied in this Preservation and Selection Programme is expanded in the documents Appendix 2. It may be revised and updated based on the developments of the PRMe Breeding Programme. The Selection Criteria being applied include:
  - Genealogy and molecular: To guarantee the appropriate genetic management and the preservation of the population, from time to time, an estimation of parameters linked to the existing genetic variability are projected and various parameters are included in the Breeding Stock Catalogue to help breeders design mating to best preserve the breed.
  - Functional conformation and basic movements: Based on conformation performance controls during field tests, applying Linear Conformation Score methodology (See Table 5 in Appendix 2), conformation traits and movements of interest in the population are selected for the relationship with performance at functional tests, to carry out an indirect selection of these.
  - Functional Performance for Dressage:
    - Partial scores: score obtained by each individual horse for each of the variables assessed by the judges at official performance test where the horse participates.
    - Points per test: Final average score earned by the horse at each of the official performance tests where it participates.
    - Total Weighted Classification: Ranking of a horse in the final classification for each performance test in which that horse participates, weighted from 100 to 0, with 100 being first place and 0 the last.

- Functional Performance for Menorca Dressage:
    - Points per test: Average final score earned by a horse for each of the official performance tests in which it participates.
    - Menorcan Movements: Score earned by a horse executing specific Menorcan movement exercises, carried out at official performance tests where it participates.

The available information regarding the selection criteria applied to this Preservation and Selection Programme is detailed in the Appendix 2 document.

2. Performance Controls and Preservation Methods

All Purebred Menorca Horses registered in its Stud Book may freely participate in the performance controls and preservation actions undertaken within the scope of the Breeding Programme. Such actions are in keeping with the specific rules for the Young Horse Selection Tests, developed within the framework of Order APA/1018/2003. These always comply with the EU and national legislation in terms of animal health and welfare for the identification and registration of equines and with the conditions established in this current Breeding Programme for each one.

The **Performance Controls for Functional Conformation and Basic Movements** is carried out on horses as of three years of age, by means of Linear Conformation Score methodology on stud farms or at meetings, always guaranteeing the correct connection among the various qualifiers/appraisers to facilitate a valid comparison of the breeding horses. For this task, official forms are used to collect phenotypic field data, approved by the Breeding Programme managing body. Phenotypic data is collected regarding conformation and horse's gaits, which are then computerised for later genetic-statistical processing, together with information about each individual horse, the qualifier/appraiser that performs the controls and/or other environmental factors. This information shall contain all essential data for the genetic evaluation of horses.

Performance Controls for Dressage are performed based on:

- Young Horse Selection Tests for Dressage: Organised by the managing bodies, authorized by the relevant authorities, thus allowing the participation of horses that comply with the current legislation to participate in official performance controls.
- Official Dressage Competitions: Organised under the supervision of Spain's Royal Equestrian Federation, the International Equestrian Federation or its delegations, in which horses complying with the current legislation may participate.

Phenotypic information and data are collected using official forms, approved by Spain's Royal Equestrian Federation or the International Equestrian Federation for each category and/or age group. This information shall contain all the necessary data for the genetic evaluation of the horses.

Performance Controls for Menorca Dressage are carried out based on official Menorca Dressage Competitions, organized under the supervision of the Balearic Island Equestrian Federation, and open to all horses participating in the controls. Phenotypic information is collected using official forms, approved by the aforementioned body for each category and/or age group. This information shall contain all the necessary data for the genetic evaluation of the horses.

For this information to be used in the Breeding Programme, all data and information described in Appendix 2 shall be collected, together with information regarding environmental aspects that could condition the horses' performance at said controls, using the proposed forms and that are necessary for the genetic evaluation of the horses.

3. Genetic Evaluation Requirements and Methods

Phenotypic data relative to any given traits contemplated in this Breeding Programme, shall only be included in the genetic evaluation when said data have been generated on the registration system described in the previous section. This shall guarantee that a reliable estimation may be made for the breeding values that correspond to these traits/criteria.

The selection criteria applied in the Purebred Menorca Horse Preservation and Selection Programme are presented in Appendix 2 for each of the official performance controls previously described. All horses registered in the official PRMe Stud Book and that have participated in official performance tests and their known ancestors are included in the parentage matrix for genetic evaluation, including at least up to the fourth generation.

The genetic evaluation is based on mixed BLUP (Best Linear Unbiased Predictor) models. By applying an animal model in which all of the known kinship among the participants in the performance control are considered, the results obtained for these as well as the various environmental factors that could condition said results are factored in. The minimal precision demanded varies depending on the Genetic Category sought be a given horse. By weighing the breeding values for the various traits evaluated, based on their importance in improvement, the Global Genetic Index is estimated for the performance assessment of each horse, the formula for which is indicated in Appendix 2. Thus, the horses may be:

- *Young Recommended Breeding Stock*: Horses with a Global Genetic Index greater than the population average in the Category for which said horse is being assessed: functional conformation and basic movements, Dressage and Menorcan Dressage.
- *Improver Breeding Stock*: Horses with a minimal number of offspring that have been genetically evaluated, have a Global Genetic Index greater than the average for the population and a minimal precision of 60% in the Category for which it is being tested: functional conformation and basic movements, Dressage and Menorcan Dressage.
- *Elite Breeding Stock*: Horses that have attained the Category as *Improver Breeding Stock* for at least two different Categories, with it being paramount that at least one of these is that of *Improver Breeding Stock* for functional conformation and basic movements.

4. Detailed Description of Each Phase of the Preservation and Selection Programme with Timeline

The Purebred Menorca Horse Preservation and Selection Programme is structured into five phases:

4.1. Phase 1. All available genealogic, molecular and performance control information for the breed is prepared and sent.

Every year, during the first quarter of the year, the Breeders' Association send all genealogic, molecular and performance control information generated throughout the previous year to the technicians who are responsible for the Preservation and Selection Programme. This information is incorporated into the Preservation and Selection Programme to address the expected actions for the preservation and selection of the breed.

4.2. Phase 2. Performance Controls and activities linked to the *ex situ* preservation for the New Year.

At the onset of each year, official performance controls to be held by the Breeders' Association throughout the year are organised for Dressage, Menorcan Dressage and functional conformation and basic movements.

Likewise, the necessary actions for *ex situ* preservation are programmed in keeping with the legislation of Spain for zootechnical aspects. These include promoting the development of the Gene Bank, as a backup copy to guarantee *in vitro* preservation of a maximum amount of the existing genetic variability (selected using optimal contribution system). Other actions are the dissemination of the breed within the territory as a measure for *in vivo* preservation, thus favouring the maintenance of horses outside their original habitat.

4.3. Phase 3. Preparation of information, verification of existing variability, genetic evaluation and the sending of results.

The technicians who are responsible for the Preservation and Selection Programme prepare the information received to address the study of the existing genetic variability based on the genealogic and molecular information available, as described in Appendix 2. Also, genealogic information and that of the performance controls is used to carry out the genetic evaluation of horses, following the methodology described and the selection criteria explained in Appendix 2.

Once the breeding values for the various traits evaluated are obtained, the technicians who are responsible for the Preservation and Selection Programme estimate the Global Genetic Indexes described in Appendix 2. All available information—from the standpoint of preservation and selection—is sent to the Breeders' Association, as well as the proposal of horses that shall obtain the official Genetic Categories described above.

4.4. Phase 4. Report the results to owners and obtain complementary information to draft the Breeding Stock Catalogue.

Once the lists have been received, the Breeders' Association contacts horse owners with the relevant genetic information to request complementary data, which is essential for the PRMe Breeding Stock Catalogue: confirm the state of the horse (alive/dead, non-gelded/gelding), obtain illustrative photographs, etc.

4.5. Phase 5. Draft, edit, distribute and promote the PRMe Breeding Stock Catalogue

With all available and updated data and information for the preservation and improvement of the breed, the technicians who are responsible for the Preservation and Selection Programme draft and edit the annual PRMe Breeding Stock Catalogue. It includes all horses, both stallions and mares that have obtained any one of the Genetic Categories, in keeping with the criteria indicated above. The final document is turned over to the Breeders' Association in a format that facilitates its correct distribution and promotion, using the means considered the most effective to encourage the use of breeding horses with one of the aforementioned Genetic Categories. The idea is to attain greater genetic progress by reducing the breed's generational interval. Likewise, each horse with a Genetic Category included in the catalogue offers various parameters to aid breeders when designing matings to preserve the breed.

Table 2 shows the annual timeline proposed for the preservation and selection activities included in the PRMe Preservation and Selection Programme.

Table 2: Proposed Annual Timeline

Activity / Month	1	2	3	4	5	6	7	8	9	10	11	12	Body**
Prepare and send genealogic, molecular and performance information from the previous year													EG
Performance controls and *ex situ* preservation activities													EG
Prepare information, variability verification, genetic evaluation and send results.													RT
Report results to owners and obtain complementary information for the Breeding Stock Catalogue													EG
Draft, edit, distribute and promote the PRMe Breeding Stock Catalogue													EG & RT

** EG is the PRMe Breeding Programme management body; RT refers to the technicians who are responsible for the Preservation and Selection Programme. Every five years, the technicians review the genetic parameters used when genetically evaluating horses, as well as the scale for the publication of all available information.

The proposed timeline may be modified due to unforeseeable factors.

The Breeder Association may also facilitate individual owners with reports of interest regarding the results obtained by their horses, when the technicians responsible for the Preservation and Selection Programme consider it necessary or recommendable.

V. Dissemination of Improvements and the Sustainable Use of the Breed

To guarantee that the preservation and selection actions carried out reach as many stud farms as possible, a series of measures have been developed to share the improvements and promote the sustainable use of the breed.

1. Technical Advice at Stud Farms:

a) **Computer Programme / web-based service** to estimate inbreeding levels when designing mating between breeding horses, trying to control and reduce global inbreeding levels within the population.
b) Call for **informative meetings** regarding technical Breeding Programme questions to guarantee that breeders have correct and complete information.
c) **Technical Advice** for breeders to solve doubts and technical question regarding the Breeding Programme, to guarantee its adequate development and better understand of the actions performed.

2. Training Breeders:

a) **Breeder Training Courses** on subjects of interest for the Breeding Programme regarding performance controls, the application of genetic evaluation results when designing matings, verification and control of inbreeding levels within the population, etc.
b) **Training Courses and standardisation of assessment criteria for technicians specialised in PRMe morphology/conformation:** linear conformation qualifiers/appraisers and conformation judges to guarantee the collection of objective information and in the correct format to perform the genetic evaluation of breeding stock, and the application of uniform criteria when assessing the breed quality of PRMe horses.
c) **Continued training courses for riders** to improve the performance in sports of horses competing at contests to contribute to promoting and publicising of the breed.
d) **Conferences-exhibits with the results** obtained from the complementary studies carried out within the scope of the Breeding Programme and the participation in research projects to guarantee the correct dissemination of information and its later use on behalf of breeders, as well as the assessment of possible proposals for changes in this Breeding Programme.

3. Verification of Breeding Stock:

a) Design and develop a **Gene Bank** to guarantee the *ex situ in vitro* preservation of PRMe genetic resources.

b) **Authorise the use of assisted reproduction techniques** in genetically tested horses, to verify the existing genetic variability levels and their impact on the population to favour the spread of its positive characteristics.
c) Develop actions that favour the **export of select breeding stock and the genetic material of genetically tested horses,** to guarantee the correct dissemination of the improvements achieved at both the national and international levels and to favour the *ex situ in vivo* preservation of the population.

4. Publications and Other Educational Actions:

a) Edit and distribute **promotional material** of the breed, its products and usefulness in several languages to guarantee the correct comprehension on behalf of potential clients and maximum possible international promotion.
b) Publish and announce the **Breeding Stock Catalogue** to promote the use of genetically tested breeding horses, which facilitates the task of breeders to correctly design matings for the preservation and selection on their stud farms.
c) Continual updating of Breeders' Association **web site** contents and updating as a platform for national and international outreach and promotion of the breed, its products, uses and information regarding the Breeding Program, for which its **translation** into other European Union languages (English) is essential.
d) Organise **select breed events** for the breed and develop actions that favour and promote the participation of PRMe horses in such events.
e) **Promote the participant of horses** at relevant sports events and official performance controls to promote their use and guarantee their inclusion in official genetic evaluations for those disciplines for which they are selected.

APPENDIX 1. SELECTION CRITERIA CHOSEN TO ATTAIN THE OBJECTIVES PROPOSED IN THE BREEDING PROGRAM AND GLOBAL GENETIC INDEXES APPLIED

The data included in this Appendix are subject to reviews and as may be the case, annual modifications, based on the sports performance data used to estimate the results and development of the PRMe Breeding Program. Herein is a detailed description of the selection criteria that is being applied to the PRMe Breeding Program to attain the objectives stated above:

- **Genealogic and molecular:** To guarantee the correct genetic management of the population, from time to time, a series of parameters of interest are estimated. The results obtained with the available information in mid-2018, taken from the reference population of live horses at the time of the estimation, is presented below:
  - The average number of maximum known generations: 2.27.
  - The average number of complete known generations: 1.45.
  - The average number of equivalent known generations: 1.79.
  - Actual number of founders and ancestors in the population of reference (active horses in the Stud Book): 57 and 55, respectively.
  - The number of ancestors that explain 50% of the existing genetic variability: 28.
  - The average inbreeding level of the population: 0.85%, complemented with the individual inbreeding estimation.
  - The average relatedness coefficient among active breeding horses: 1.82%.
  - The values for Wright's F-statistics: Fis=- 0.000875, Fst= 0.000272 and Fit=- 0.000603.
  - The estimation of the effective size of the population using different routes:
    - Logarithmic regression in equivalent generations: 65.83.
    - Regression in equivalent generations: 64.58.
    - Regression for the date of birth: 70.03.
    - Logarithmic regression for date of birth: 67.29.
    - Individual increase of ancestry: 82.40.
    - Individual increase of inbreeding: 54.08.

Likewise, Tables 3 and 4 provide complementary data about PRMe genealogic studies.

Table 3: Estimation of the main parameters for the genetic preservation of the population, grouped together based on the number of maximum known generations.

GenMax	N	F	%F	FP	AR	Ne	Completeness*
0	549	0.000			0.0018		
1	770	0.000			0.0124		0.879
2	1134	0.007	0.041	0.163	0.0198	75.60	0.618
3	1386	0.013	0.157	0.082	0.0230	78.70	0.249
4	721	0.018	0.337	0.053	0.0239	99.70	0.042
5	92	0.013	0.457	0.028	0.0253		0.002
6	3	0.005	0.333	0.016	0.0199		0.000

* GenMax is the maximum number of generations. N is the number of horses. F is the inbreeding. %F is the percentage of inbred horses per generation. FP is the average inbreeding of inbred horses in each generation. AR is the average relatedness coefficient. Ne is he effect size if Ft>Ft-1. Completeness is the level of completeness or pedigree completeness for the pedigree in each parent generation according to MacCluer et al. (1983).

Table 4: Estimation of generational interval and average age of the parents at the birth of their offspring in Purebred Menorca Horses using four different routes.

Type of interval	N	Interv	StDesv	MSE*
Stallion-colt interval	332	12.729	5.795	0.318
Stallion-filly interval	686	12.260	5.233	0.200
Mare-colt interval	329	9.730	4.594	0.253
Mare-filly interval	688	9.509	4.512	0.172
Total Interval	2035	10.997	5.197	0.115
Father-son age	2122	12.299	5.414	0.118
Father-daughter age	1972	12.460	5.404	0.122
Mother-son age	2115	10.081	4.795	0.104
Mare-filly age	1971	9.867	4.648	0.105
Total Age	8180	11.179	5.219	0.058

* N is the number of data used. Interv are the mean averages. StDesv is the standard deviation. MSE are the standard errors for the mean.

Individual inbreeding values are regularly estimated together with the relatedness among horses that are candidates as breeding stock. Likewise, the individual genetic conservation index, together with those parameters that may be suggested by those responsible for the Preservation and Selection Program at any given point in time, are also estimated to ensure the correct genetic monitoring of the population.

- **Regarding Functional Conformation and Basic Movements:** Currently, work is being undertaken on the selection of those conformation traits of interest in the population due to their relationship with functional performance to then continue with indirect selection. The levels of heritability obtained for the numerous control variables are:

Table 5: Heritability levels for the conformation and functional variables included on the Linear Conformation Score for the breed.

TRAIT	NAME	h2	TRAIT	NAME	h2
1	Width of head	0.396	24	Length of forearm	0.502
2	Length of head	0.548	25	Length of anterior cannon	0.343
3	Depth of head	0.380	26	Perimeter of the knee	0.371
4	Frontal-nasal profile	0.669	27	Perimeter anterior cannon	0.347
5	Expression of the head	0.370	28	Lateral view of anterior limb alignment	0.563
6	Length of neck	0.421	29	Lateral view of anterior of hoof-pastern alignment	0.483
7	Head-neck union	0.491	30	Angle of anterior hoof with regards to pastern	0.442
8	Shape of the upper edge of neck	0.704	31	Shape of the hoof	0.491
9	Shape of the lower edge of neck	0.424	32	Anterior cranial view of limb alignment	0.764
10	Height at the withers	0.608	33	Anterior cranial view of limb alignment	0.585
11	Shape of the withers	0.563	34	Lateral view hock alignment	0.603
12	Length of shoulder	0.492	35	Caudal view of posterior hock alignment	0.738
13	Angle of shoulder	0.265	36	Quality of the black coat	0.637
14	Depth of thorax	0.483	37	White spots	0.938
15	Length of back	0.288	38	Activity at walk	0.534
16	Length of loin	0.198	39	Quality of rhythm at walk	0.387
17	Shape of dorsal-lumbar line	0.516	40	Amplitude of walk	0.623
18	Length of croup	0.342	41	Flexibility of walk	0.475
19	Slope of croup	0.546	42	Amplitude at trot	0.614

20	Length of buttock	0.076	43	Flexibility at trot	0.429
21	Wither- highest point of the sacral tubercle balance	0.580	44	Impulsion at trot	0.628
22	Width of chest	0.461	45	Balance at trot	0.496
23	Width of thorax	0.518	46	Suspension al trot	0.616

Only the heritability levels for the variables considered at Performance Controls for Functional Conformation and Basic Movements are presented, not the genetic correlations existing among them due to the reduced amount of data currently available.

- **Functional Performance for Dressage:** Table 6 presents the traits included in the genetic evaluation for this equestrian discipline (together with its genetic parameters-heritability and genetic correlations).

Table 6: Genetic parameters (heritability on the diagonal in bold and genetic correlation above the diagonal) estimated for the traits included in the genetic evaluation for Dressage.

Traits	**Partial Scores**					**Global**	
	Walk	**Trot**	**Canter**	**Submission**	**Exp Future***	**PPR**	**CTP**
Walk	**0.18**	0.623	0.656	0.808	0.805	0.835	
Trot		**0.17**	0.873	0.916	0.939	0.922	
Canter			**0.18**	0.959	0.952	0.941	
Submission				**0.14**	0.995	0.996	
Exp Future					**0.17**	0.998	
PPR						**0.14**	
CTP							**0.13**

* Exp Future corresponds to the variable for future expectation (previously known as general impression). PPR is the score per test. CTP is the total weighed classification for which a univariate analysis is performed.

- **Functional Performance for Menorcan Dressage:** The traits included in the genetic evaluation for this equestrian discipline are:
  - Score per test with heritability level of 0.30.
  - Menorcan movements with heritability level of 0.12.

  The existing genetic correlation between these traits is 0.896.

Likewise, to grant genetic categories, the genetic values obtained for the traits of greatest interest are weighted, based on their importance for improvement, with which the Global Genetic Index (GGI) is obtained with the following specific weights:

- **GGI for Functional Conformation and Basic Movements: 20% V5 + 10% V9 + 30% V12 + 30% V13 + 10% V20;** where V5 is expression of the head, V9 is the shape of the inferior edge of the neck, V12 is the length of the shoulder, V13 is the angle of the shoulder and V20 is the length of the buttock.
- **GGI for Menorcan Dressage: 80% VG PF + 20% VG MM**; where PF is the weighted average for the final score of the Dressage exercise and MM is the average points for Menorcan movements.
- **GGI for Dressage: 50% VG PD + 50% VG CTP;** where PD is the average score for Dressage exercises and CPT is the total weighted classification.