# Spanish Association of Breeders of Blue Andalusian Hens

# POULTRY BREEDING PROGRAM OF THE BLUE ANDALUSIAN

## INDEX

## GENERAL DATA OF THE BREEDING PROGRAM

1. **Poultry species:** Hen.
2. **Breed Name:** Blue Andalusian.
3. **Purpose of the Breeding Program**: Conservation.
4. **Geographic territory in which it applies**: Spain.
5. **Participants in the Breeding Program**:

   **5.1 Collaborating farms:** The list of collaborating farms will be updated annually in the National Breed Information System (ARCA).

   **5.2 Other participants**: are detailed in the following table.

| Activities to be developed | Subcontracted entity (*) |
|---|---|
| Management and coordination of the breeding program | Evangelina Rodero Serrano. Department of Animal Production. University of Córdoba. |
| Qualified Animal Genetics Center (genetic evaluation) | Research Group AGR-134. Breed conservation (CORADES). University of Córdoba. |
| Animal molecular genetics laboratory (parentage analysis) | To establish a contract. |
| Reproduction centers (collection, production, storage of reproductive material) | To establish a contract. |
| Germplasm bank (storage of reproductive material) | To establish a contract. |

(*): the contact details of the subcontracted entities will be reflected on the Association's Facebook page.

# STRUCTURE OF THE BREEDING PROGRAM

## CHAPTER I. GENERAL PROVISIONS.

**1.- Introduction: Historical evolution of the breed and census data.**

This breed of hens, according to W.O. Jennings in 1921, originated in Andalusia. Among the first breeders of Andalusian hens, as quoted by the author, was Mr. John Taylor, of Shephers Blush (England), who was the first to bring Andalusian hens to England imported from Spain. At the time of Mr. Taylor's importation, Andalusian hens with true blue plumage were very scarce in Spain.

These imported birds were crossed with Mr. Taylor's original stock, resulting in vigorous and improved progeny. In describing this variety, Mr. Taylor describes it as follows: "Large, erect, evenly serrated comb; white earlobes; bluish legs; plumage bluish gray or lead-colored, each feather being edged with a lighter tint; hackles and fluff bluish black, velvety and glossy".

Its breed pattern appears in the poultry catalogs of many countries, the oldest dating from 1846 (United Kingdom) and 1874 (United States). The Andalusian Blue breed originated from black and white birds; when black birds are crossed with white birds, if the color of the latter is not dominant, the offspring appear with a gray or ashy plumage. Thus, the blue color is the hybrid expression of two other colors (black and a form of white dotted with irregular blue spots) neither of which dominates the other, but are mixed. The blue color is found on the outside of the feathers, while in the central area or attached to the rachis will present light tones, the optimum being white.

The Andalusian hen has a great prestige among poultry farmers, being one of the most internationally considered Spanish hen breeds, officially recognized as a native breed in danger of extinction in 2007 by Order APA/53/2007 of January 13 (BOE No. 21 of January 24, 2007).

The most outstanding feature that characterizes this breed is the bluish-gray color of its plumage.

The morphology of these birds corresponds to the Mediterranean hen type.

As its name indicates, this breed of hens originates in Andalusia. Currently, the approximate census of the breed is generally estimated at around 500 animals, according to the Association's own estimates, and they are distributed throughout Spain. The Andalusian Hen is one of the Spanish poultry breeds with the greatest international projection, with flocks currently found in Central Europe, Australia and the American continent.

The current situation of the breed is clearly declining, due to several factors such as the difficulty of access to animals of the breed by family poultry farmers; other health factors such as the uncertainty caused by the Avian Influenza among breeders of the breed.

In recent years, the Blue Andalusian hen breed has been favored for its great aesthetic qualities in morphological competitions, although it has never renounced its vigor and productive aptitude as a multifunctional animal.

On October 20th, 2015 the Spanish Association of Breeders of Blue Andalusian Hens was recognized by the *Dirección General de la Producción Agrícola y Ganadera* of the Andalusian Regional Government for the management of the Stud Book of the breed, approving the regulations of the mentioned Book, as well as the Breeding Program by the following legal Resolutions: *DGPAG* of *29/01/2016* and *02/02/2016*.

At present, the farms collaborating in the breeding program are 9 breeders who are members of the Spanish Association of Breeders of the Blue Andalusian *(ACGAAPE)*. In addition, there are 32 breeders who are not currently members and collaborate in the Breeding Program, and at least 10 breeders with animals of the breed, but not registered in the Stud Book, are known. Likewise, there is evidence of the existence of some other breeders located in England, Belgium, the United States and Australia. The farms will be updated annually in the National Breed Information System *(ARCA).*

The individualized list of farms participating in the Breeding Program (from now on BP) are listed in ARCA. This list will be updated and published annually in ARCA and when the necessary data protection license is obtained, it will be posted on the *ACGAAPE* Facebook page.

Due to the conservation nature of the BP, all breeder farms with animals registered in the Stud Book must participate as collaborating farms in the BP activities.

A clear problem of this breed is its great atomization, distributed in small flocks, sometimes distant and poorly related to each other. The competitions, contests and morphological shows are contributing to the dissemination of the breed and fostering the relationship between breeders.

The Association has a website and a group page on Facebook:
(https://www.facebook.com/andaluzazulblueandalusian/)
(https://www.facebook.com/groups/177032649595388/)

Blue Andalusian birds are located in Andalusia and are produced in small poultry houses and semi-free range.

In any case, breeders rely on this breed as a production animal very well adapted to small-scale poultry production (family farms) and also for organic production.

**2.- Aim and purpose of the Breeding Program (BP).**

The purpose of this document is to describe the structure and operation of the BP for the Andalusian Blue poultry breed, complying with the contents established in Article 26 of Decree Law 45/2019, of 8 February, on zootechnics, for the case of associations and breeding programs excluded from the scope of Regulation (EU) 2016/1012, of 8 June 2016, on animal breeding, as is the case with poultry breeds.

As detailed in Chapter VII, the main purpose of this program is the *in situ* and *in vivo* conservation of the Andalusian Blue poultry breed and its production system.

**3.- Definitions.**

For the purposes of this BP it is understood:

a) Farm owner: the natural or legal person who appears as the owner of a farm in the General Registry of livestock farms *(REGA).*
b) Owner of the animal: the owner of the farm where the animal is located, except in the case of animals temporarily ceded for the formation of breeding flock.
c) Breeder: owner of the breeding lot from which the animal originates.
d) An "active farm" is considered to be a livestock farm that has animals active in the stud.

**4.- Scope of application.**

The provisions of this BP shall be binding on the Association and on the owners of farms in Spain with animals registered in the Stud Book of the Andalusian Blue poultry breed (members and non-members of the Association).

## CHAPTER II. CHARACTERISTICS OF THE BREED.

**5.- Racial prototype.**

**5.1.- General Aspect.**

Its morphology corresponds to the Mediterranean hen type: light body, medium size, graceful and elegant carriage. The weight for adult males (1 year): 2,760 to 3,175 kg; and for adult females (1 year): 2,040 to 2,495 kg.

**5.2.- Shape of the rooster**.

- Head: moderately long and deep.
- Face: full and smooth, fine texture.
- Beak: long to moderate, delicately curved.
- Eyes: large, full.
- Comb: simple, of medium size, smooth, straight and well set, firm and even on the head, even and deeply serrated, having at least 4 well defined teeth and at most 6 teeth, the optimum being 5 teeth. The middle one slightly longer and proportionally wider than the other four; spur of the crest slightly following the curve of the neck.
- Wattles: long, thin and smooth, red color.
- Earlobes: almond-shaped, smooth, of moderate size.
- Neck: rather long, well arched, with abundant hackles floating on the back.
- Wings: large, well folded; primary and secondary, broad and overlapping in natural order with the wing closed.
- Back: broad and long throughout, raised at the back and dropping slightly towards the tail; long and abundant fluff.
- Breast: broad, deep and well rounded. Carried erect and forward.
- Tail:
    - In males: large and full, broad and overlapping tail coverts, positioned at 45º angles above the horizontal. Long, uniformly curved sickles with abundant coverage.
    - In females: long and closed tails, resembling a brush; positioned at 35º angles above the horizontal. Broad and overlapping tail coverts.
- Thighs: Moderate size, long, showing the knee well below the line of the body.
- Shanks: long and clean.
- Toes: straight and in number of four.
- Carriage: graceful and elegant.

**5.3.- Shape of the hen.**

- Same morphological characteristics as the rooster, except for the differences due to sex.
- Comb: simple, of medium size, deeply serrated, having at least 4 well defined teeth and at most 6 teeth; the optimum being 5 teeth. The front part of the crest and the first tooth erect, and the remainder of it falling gradually on one side; of fine texture and free of folds and wrinkles.
- Neck: rather long, gracefully arched.
- Tail: long, well open, carried at an angle of 35º above the horizontal, wide and overlapping tail coverts.
- -Shanks: preferably clean of spurs.

**General coloration:**

- Comb, face and wattles: bright red.
- Earlobes: white.
- Eyes: reddish brown.
- Beak: horny.
- Shanks and toes: slate blue (dirty white and black for white and black breeders, respectively).
- Hens' eggs: white.

**5.4.- Color varieties.**

**- Plumage of the rooster**:

Valid plumage colors are:

- Blue:
  - Head: very dark blue, shiny.
  - Hackless: uniform, medium shade of slate blue, each feather distinctly edged with very dark lustrous blue.
  - Front of neck: slate blue bordered.
  - Wings: slate blue, with each feather edged with darker lustrous blue.
  - Back and saddle: slate blue bordered.
  - Tail: slate blue, with each feather edged with dark lustrous blue.
  - Breast: slate blue bordered.
  - Body: slate blue bordered.
  - Thighs: slate blue.
  - Undertone: slate blue.
  - Feathers: slate blue.
  - The optimum blue color is considered when there is the greatest contrast between the blue edge of the feather and the whitish interior of the feather.
- Dirty white: head, ruff, front of neck, wings, back and saddle, tail, breast, body, thighs and down will be white with some slate feathers sprinkled. Predominating at all times the white color over the blue feathers of light slate color.
- Black: head, hackless, front of neck, wings, back and saddle, tail, breast, body, thighs and down shall be black.

**- Plumage of the Hen:**

As in the rooster in all its sections, except for the hackless and fluff that do not exist.

**6.- Productive characteristics.**

It is a breed of hens of the Mediterranean trunk of the species, semi-light, very hardy with a double aptitude; it produces good quality meat and white shell eggs in interesting quantities as free range.

**7.- Morphological qualification system.**

The morphological evaluation of the animals will be carried out once they have reached the age of 8 months, and provided that they have reached a sufficient body development. It will be carried out by means of visual inspection to verify that they comply with the breed prototype and do not present any of the disqualifying defects listed in this section. The morphological inspection process will qualify the animals as "apt" or "not apt" for reproduction.

**7.1.- Special disqualifications.**

In order to safeguard the essential characteristics of the breed, in the morphological evaluation, those animals, both males and females, that present any of the defects described below cannot be qualified as "fit for breeding":

a) Red on the earlobes occupying one third or more of its surface.
b) Any color that alters the uniformity of the plumage color of each of the three permitted types (blue, dirty white and black).
c) Shanks in a color other than slate blue.
d) Non-correct combs. To be considered correct, the combs must have well serrated teeth. The comb should have no double teeth or a split in the comb (a carnation).
e) Feathered shanks.
f) Excessively rounded earlobes similar to those of the Minorcan rooster/hen.
g) Tail with an excess of inclination, the angle being above 70º.
h) Excess weight of 300 grams in adult animals (1 year old), both for roosters and hens.

## CHAPTER III. THE STUD BOOK OF THE BREED.

**8.- Structure of the Stud Book (SB).**

The Stud Book of the Blue Andalusian is structured in two sections: a *Main Section* (with three categories), in which the animals with known ascendants or those belonging to the old Foundational Registry will be registered, which are identified according to what is established for the systematic identification of the animals in the SB, which is included in the Internal Regulations (IR); and an *Annexed Section* for animals of which a progenitor is unknown and which have not been part of the old Foundational Registry.

**8.1.- Main Section (MS).**

The Main Section consists of three categories based on age and knowledge of pedigree. It also includes animals from the old Foundational Register.

- Foundational Category (F)
- Candidate or Birth Category (C).
- Definitive Category (D).

**8.1.1. - Foundational Category (F).**

In this category, animals from the former Foundational Registry are registered, which for all purposes will be considered pure Blue Andalusian breed.

**8.1.2.- Category of Candidates or Births (C).**

In this category, animals of both sexes born of breeding stock registered in one of the sections of the Stud Book are registered. The registration of specimens in this category requires that the birth has been declared within eight months of the date of birth.

The animals must be born, their parentage must be confirmed by birth certificate or molecular markers, and the animals must be free of defects that determine their disqualification.

The chicks registered in this category of births will remain in this category until they are transferred to the Definitive category (D), or in its case to the Annexed Section (AS) if the requirements for this are not fulfilled, after having reached the age of 8 months and after having passed the morphological evaluation. If they do not pass the morphological evaluation, they shall be removed from the SB.

**8.1.3.- Definitive Category (D).**

Male and female animals coming from the category of Candidates or Births when they have passed the morphological qualification as "Suitable for Breeding", and their definitive identification has been carried out, are registered in this category. For all purposes they are considered pure Blue Andalusian breed.

**8.2.- Annexed Section (AS).**

Males and females older than 8 months whose genealogy is unknown or could not be totally or partially contrasted, but have passed the morphological qualification as " Suitable for Breeding " and have already incorporated the definitive identification are registered in it.

**8.3.- Measures to guarantee the reliability of the filiation.**

As deemed necessary by the Management Commission of the Breed Conservation Program, random sampling for parentage control by DNA genetic marker analysis will be carried out as established in section 13 of Chapter VI.

## CHAPTER IV. EXPLOITATIONS OF THE STUD BOOK OF THE BREED.

**9.- Register of the Stud Book.**

All farms in the Stud Book (SB) will be included in a register of farms managed by the Association of Breeders of Blue Andalusian Hens, as established in the IR for the registration of farms in the SB.

Changes of ownership of the farm must be communicated to the Association, either by the old or the new owner, within 30 calendar days of the authorization of such change by the competent authority in the matter.

It should be emphasized that, as mentioned in point 1, due to the Conservation nature of the BP, all breeder farms with animals registered in the SB must participate in the activities of the SB.

**10.- Active exploitation.**

An "active farm" will be considered to be a livestock farm that has active animals in the Stud Book (SB). The owners of the animals must communicate to the Association, in the form determined by the Association, within 30 calendar days, the additions by acquisition and the deletions of the animals registered in the SB.

In the event that only the former owner communicates the change, the animal will be located in the new farm in the "active" status. The Association will automatically place the animal on the old farm in the "low" status.

The change of ownership of a specimen registered in the Foundational or Definitive categories of the SB shall be accompanied by the pedigree certificate.

**11.- Other obligations of the Stud Book.**

In addition to what is established in the previous paragraphs, the breeders or owners of the animals shall:

a) Identify breeding flocks and ring the specimens born in the annual campaign with the rings corresponding to that campaign.

b) Collaborate with the Technical Director of the SB and the breed controllers in carrying out the necessary actions for the correct registration of their animals in the Stud Book.

c) Facilitate and collaborate with the competent authority in the inspections carried out.

## CHAPTER V. IDENTIFICATION OF THE ANIMALS.

**12.- Animal identification system (rings).**

Each animal for which registration is requested must be identified with a ring approved by the European Entente (EE).

All animals shall be identified individually by means of a ring or by electronic identification (transponder). Only the rings of the European Poultry and Rabbit Entente will be valid, except in those cases specified in these regulations. The following data shall appear on the rings:

1. Letter of the country (In our case "E").
2. Ring diameter (16 mm for females and 18 mm for males).[1]
3. Ring number (the number corresponding to each ring, which in some cases is preceded by a letter).
4. Year of birth (determined by the last two digits, plus a ring color that varies from year to year).

The animals shall be identified provisionally at birth, in such a way that the father and mother can be known unequivocally, being replaced by the definitive identification when the animal's development allows it.

For those adult animals not identified by the method indicated above, they will be identified directly by the technical personnel of the Association at the time of morphological qualification with the means available to this personnel.

Rings shall be supplied annually by the Breeders Association, opening the distribution of these on February 1st and closing on June 30th of each year. This period may be extended for reasons of force majeure.

In a complementary manner, other identification marks may be used to facilitate the management and differentiation of the animals in the zootechnical and environmental context of the breed.

Only those birds that are individually identified according to the procedures and times established in the regulations of this BP will be registered in the SB, which is subject to the modifications or impositions established by the legal norms in force at each moment approved by the different Public Administrations in matters of animal health, identification and registration of the animals of the avian species. Likewise, it is subject to the provisions of the IR of the Association for the management of the Breeding Program of the breed.

## CHAPTER VI. REGISTRATION OF GENEALOGIES.

**13.- System of registration of genealogies.**

The pedigree of the animals will be controlled as follows:

[1] The use of rings of different sexes shall not be considered as excluding.

Breeders shall make a declaration of mating and the corresponding declaration of births in accordance with official forms. The declaration of mating shall be made no later than eight months after mating or together with the declaration of birth.

At the moment of registration of the animals in any of the sections (main or annexed) a blood sample will be taken for its conservation in a sample bank, for a possible filiation control.

3.- The verification of affiliation of the animals registered in stud books will be carried out by means of a random sampling among those registered in the Definitive Category. The number of animals to be genotyped will be proposed by the Management Commission of the BP.

In any case, it may be established that, on a mandatory basis, parentage control shall be carried out in the populations that the Management Commission of the Breed Conservation Program deems necessary.

4.- The parentage control will be developed by genotyping with a battery of a minimum of 11 microsatellites approved by the Management Commission and the recommendation of the team of geneticists in charge, called AGR-134 Breed conservation for sustainable rural development (CORADES) of the University of Cordoba. For cases of difficult exclusion, an alternative panel of 10 other markers, also approved by the Management Commission, will be available. The analyses will be carried out in an officially accredited molecular genetics laboratory.

The Breeders' Association shall have a database that allows for the proper registration of pedigrees and ensures the ability to generate data for use in the Breeding Program, in accordance with the provisions of Article 14 of Royal Decree 45/2019 of February 8 on zootechnics.

Such database shall include at least the information specified in Article 14.7 of the aforementioned Royal Decree 45/2018.

**14.- Admission of animals and reproductive material for reproduction.**

For an animal or its reproductive material to be considered suitable for breeding or *in vitro* conservation, it must pass the morphological evaluation to verify correspondence with the breed prototype and the absence of disqualifying defects described in Section 7.1 of this Breeding Program.

It is contemplated that the use of a purebred breeding animal and its reproductive material may be limited or even prohibited if such use would endanger the conservation or genetic diversity of the breed.

## CHAPTER VII. DESCRIPTION OF THE OBJECTIVES OF THE BREEDING PROGRAM.

The main objective is to ensure the conservation of the Blue Andalusian poultry breed in its natural environment, increasing its effective size and improving its typical phenotypic characteristics of identity and hardiness.

To this end, the breeding program for this breed is aimed at conservation, mainly *in vivo*, although the conservation of *in vitro* material is also planned.

**15.- Conservation objectives and criteria.**

The general objective of the breeding program for the Blue Andalusian is to maintain the breed, its purity and genetic variability in its natural environment.

The specific objectives of the Breeding Program and the criteria for their achievement are as follows:

- **Objective 1:** To conserve *in vivo* and *in situ* and in a sustainable manner the breed in its unique ecosystems while maintaining the peculiarities for the animals and the environment;

  Criteria for Objective 1. Maintenance of the real and effective population size; optimal population structure according to location, breeding flocks, sexes and ages; annual growth rate and replacement rate.

- **Objective 2:** Increase phenotypic and morphological quality;

  Criteria for Objective 2. Proportion of animals in the basic and definitive categories of the SB.

- **Objective 3**: Maintain genetic variability and minimize the increase of the population's con-sanguinity. Based on the genealogical information and the analysis of genetic markers, the following criteria are applied:

  Criteria for Objective 3 by genetic markers: Genetic variability parameters in the total population of the breed and in the floks: Wright's F values, allelic richness, polymorphic information index, conservation index, heterozygosity levels, gene flow and genetic distances between breeding flocks, among others.

  Criteria for Objectives 3 from genealogy: Values of the individual coefficient of inbreeding; value of the individual coefficient of kinship; value of the coefficient of coascendancy of the programmed matings. Number of connections between breeding flocks. Number of founding individuals, etc.

- **Objective 4**: To conserve germplasm in vitro in the form of seminal doses, embryos or oocytes and DNA.

  Criteria for Objective 4: Quantity of existing genetic material in germplasm banks, number of semen doses and the number of donors from which they originate. Number of animals with DNA samples conserved in the DNA Bank.

In this breed, in vitro conservation and the use of germplasm is highly affected by technological limitations, so the type and quantity of material conserved depends on the progress of reproductive techniques.

All criteria are applied on an evolutionary basis, comparing the values of one year with respect to the previous year.

The choice of breeders and germplasm donors will be based on their morphological quality and genetic conservation index. Family groups are also identified in order to propose circular matings with the aim of not unbalancing the number of offspring per male and in favor of minimum kinship in the matings. The most appropriate strategy is proposed by the Breeding Program Monitoring Commission after analysis of the indicators collected in the reports. These, in addition to the general results at breed level should include individual information for each flock that will be transferred annually to each breeder individually.

**16.- Program Management Committee.**

The Management Commission is the technical management body of the Program for the Conservation of the Blue Andalusian Poultry Breed, in charge of studying and deciding on those issues and procedures that could affect the design, implementation, development and execution of the aforementioned Program.

The Management Commission of the program will be made up of the following members:

1.- President of the Breeders' Association, who will also chair the Commission.
Secretary of the Breeders' Association, who shall also act as Secretary of the Commission.
3.- The Technical Inspector of the breed designated by the Autonomous Community of Andalusia.
4.- The Executive (or Technical) Secretary of the Breeders' Association.
5.- The Technical Director of the Conservation Program.
Assistance may be sought from specialist researchers related to the particular topic in which it is required.

**Functions of the Management Committee.**

It is the responsibility of this Commission:

- Approve and review conservation objectives and criteria.
- Planning and technical monitoring of conservation measures.
- Coordination of activities.
- Plan the activities to be proposed to the Germplasm Bank and the molecular genetics laboratory.
- Propose annually the list of animals to be genotyped and the triplets to contrast the filiation.
- Validate annual genetic reports.
- Review the player catalog.
- To commission the necessary studies for the optimization of the Breeding Program.
- Permanent technical advice on all issues related to the Breeding Program.
- Propose the necessary updates to the RRI for the correct development of the Breeding Program.

**17.- Non-compliance.**

Non-compliance with the requirements established in the previous articles by a farm may result in the non-registration of its animals in the Stud Book and even expulsion from the Conservation Program, provided that the Program Management Commission so considers.