
OUTCROSS PROJECT

regarding increased genetic diversity
in the Field Spaniel

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Current situation

According to common experiences that have emerged in discussions at FSK's Breeder Meetings, it is not uncommon to encounter low libido in both males and females, as well as males with poor semen quality. Experience suggests that it is not uncommon that puppies are born with lower vitality compared to other breeds, and that the females have problems with lactation in the first few days.

The estimated average genetic inbreeding coefficient for the Field Spaniel is 38.6%. Compared to the English Springer Spaniel at 23.5%, English Cocker Spaniel and Welsh Springer Spaniel at 28.3% (*Bannasch et al., 2021*).

The average litter size for the Field Spaniel was 5.4 puppies per litter during 2014–2020. This is low compared to breeds of approximately the same weight range.

The statistics below were compiled by a breeder in the Project group, based on shared experiences gathered through contact with breeders and stud dog owners, as well as at FSK's Breeder Meetings.

In 2021 and 2022, the surveyed Swedish, Norwegian, and Danish breeders conducted a total of 33 breeding attempts.

Out of these attempts 20 (60%) were successful resulting in a mating, and 13 (40%) did not result in a mating. Of the 20 successful matings 12 (60%) resulted in litters, and 8 (40%) did not result in any puppies. Out of the total 33 attempts, 12 litters were produced, meaning 36% of the mating attempts resulted in puppies.

Two planned artificial inseminations (AI) using fresh/chilled semen and two planned AIs using frozen semen during 2021 and 2022 resulted in one puppy, using frozen semen.

In 2021-2022, 24 males underwent semen testing. Among 15 males tested aged between one and five years old, 9 had good sperm quality, 3 were sterile, and 3 had poor quality. Among 7 males tested aged between six and nine years old, 5 were sterile, 1 was almost sterile, and 1 had 50% motility. Among 2 males tested aged ten years and older, both were sterile.

Numerous studies show that inbreeding has a negative impact on traits associated with reproduction and survival, known as fitness traits. The term used to describe this effect is inbreeding depression. This can manifest as reduced fertility in parent animals or impaired growth and vitality in offspring.

The population in Sweden is small, and several dogs are closely related to each other. There is also close kinship with dogs in Norway, Denmark and Finland due to continuous breeding, import and export between the countries.

Goals

- increased genetic diversity and widened gene pool
- increased willingness to breed
- increased fertility
- increased vitality in puppies
- improved lactation

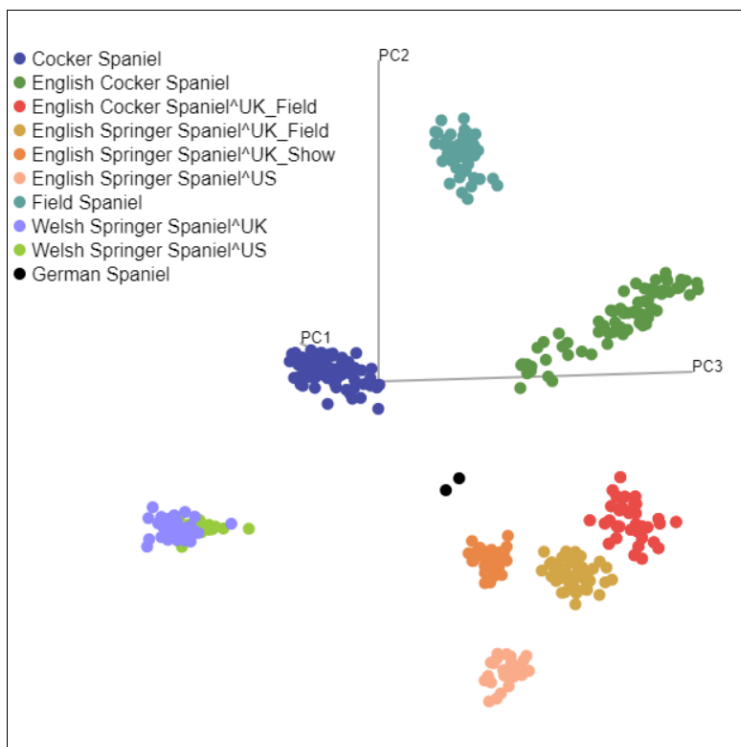
How to do it

The plan for implementing the project is through outcrosses to other breeds.

The goal is to introduce genetic variation, which is why the chosen breeds should not be too closely related and should have few health issues. The focus needs to be on health, temperament, and hunting traits (function). Appearance and conformation characteristics are easier to restore.

Relatedness/genetic distance between spaniel breeds (information from SKK's Geneticist 2023-02-08):
"The Cocker and the English Cocker are genetically closest to the Field Spaniel. The working variety of the English Cocker appears to be slightly farther away genetically than the "regular" English Cocker. The Springer Spaniel is somewhat farther away genetically, and the Welsh Springer Spaniel is somewhat even farther away. Genetic distance is one aspect to consider when choosing a breed. Even more important is finding individuals for outcrossing that are well-evaluated in terms of health and behavior, and are judged to possess the desired traits to be introduced into the breed."

(NOTE! The 'Cocker' above and 'Cocker Spaniel' in the image below is the American Cocker Spaniel, as opposed to the English Cocker Spaniel. With 'UK_Field,' it refers to the working variety of the breed. 'German Spaniel' is the Wachtelhund. Each 'dot' in the image represents a DNA-tested individual of the respective breed. The closer the individual dots are in the image, the closer they are related.)



Ref: Jonas Donner, Wisdom Health.

Planned breeds to outcross to, due to fertility, hunting traits, temperament and health:

- English Cocker Spaniel
- English Springer Spaniel
- Welsh Springer Spaniel

The three breed clubs have been consulted and have expressed a positive stance towards the project.

Requirements for breeding animals

To make an outcross where a Field Spaniel is paired with a dog of another breed, approval must be obtained from the Field Spaniel Club before the breeding is done. Approval from the FSK is not required for breeding X-registered dogs.

The Field Spaniel:

- Follows the rules and recommendations set by SKK and FSK's RAS regarding breeding.
- It's good but not mandatory, if the individual has mated naturally and has earlier offspring.
- Any previous offspring should be evaluated regarding health.
- Breedings within the outcross project should be done through natural mating, although AI can be used if the individual has mated naturally before.
- Not too young individuals (minimum 2 years old).
- Avoid, if possible, closely related individuals, such as two sisters.

Donor breed:

- Has previously been used in breeding and is well-evaluated.
- Is a bit older (preferably a veteran) so that previously produced offspring have been evaluated, and one can avoid families with health and/or temperament issues.
- Clinically healthy and has undergone all the tests required and recommended within the relevant breed.
- Has undergone all the tests required and recommended within the Field Spaniel breed.
- Possesses suitable mental/functional characteristics.
- In addition to the above, one may consider conducting a DNA test in the form of a "panel test" for a large number of mutations, although it is not a requirement. Even though these tests are not normally recommended, in an outcross project it can be a precaution to reduce the risk of introducing unwanted disease traits into one's own breed.
- Has A/B hips and has a family (offspring are most important, otherwise siblings & parents) with a similar hip dysplasia (HD) status as the Field Spaniel.
- If tested for elbow-dysplasia (ED), the result is Normal (0).
- Eye examination within one year before mating.
- Heart auscultation with a result of Normal within one year before mating.
- Has closely fitting lower eyelids.
- Has large open ear canals, without problems such as ear infections, etc.
- The temperament is of great importance; should have a willingness to cooperate with humans/"will to please", be able to socialize with dogs of both genders, not exhibit resource guarding (e.g., guarding socks/toys/food/dummies/game), not display fears/aggressiveness, not be independent/disobedient/be prone to roaming, and not have separation anxiety.

Additionally for the English Cocker Spaniel:

- DNA-tested or hereditarily free from prcd-PRA.
- DNA-tested or hereditarily free from familial nephropathy (FN).
- If a DNA test has been developed: DNA-tested or hereditarily free from renal dysplasia (RD).

Additionally for the English Springer Spaniel:

- DNA-tested or hereditarily free from dyserythropoietic anemia and myopathy syndrome (DAMS).
- Gonioscopy tested with the result normal.
- DNA-tested or hereditarily free from PRA-Cord1.

Additionally for the Welsh Springer Spaniel:

- Gonioscopy tested with the result normal.

X-registered dogs (F1, F2, F3):

- Follow the rules and recommendations set by SKK and FSK's RAS regarding breeding.

Number of outcrosses

In an outcross to another breed, the first generation (F1) will have 50% of the genetic material from the Field Spaniel. When backcrossing the F1 to the Field Spaniel, the genetic contribution is halved in each generation. In the 4th generation (F4), the dogs will have 6.25% of their genetic material from the donor breed.

For a more long-term effect, repeated outcrossing is necessary.

Initially, we aim to carry out at least three outcrosses.

The goal is to use all three of the proposed breeds for greatest genetic diversity. If suitable individuals cannot be found in all three breeds, individuals from two breeds will be used.

In the continued breeding of the outcross dogs, we are open to various possible alternatives, depending on the evaluation of the litters. For example:

- Repeatedly breeding back to Field Spaniels.
- Pairing some of the different outcross generations (F1, F2, F3) with each other, before breeding back to the Field Spaniel again.

Evaluation of the offspring

The offspring from the first (F1), second (F2), and third (F3) generations are not registered in the Swedish Kennel Club's regular pedigree dog registry (the SE registry), but in the SKK's side registry the X-registry.

Evaluation of the F1, F2, and F3 generations is conducted through BPH (behavior and personality assessment) and surveys. There are not excessively high conformational demands on the F1, F2, and F3 dogs.

Guidelines, rules and recommendations for the continued use of the offspring in the project are detailed under the heading "Requirements for breeding animals."

Communication and anchoring

Communication have occurred and will continue through ongoing Breeder Meetings and information in newsletters for members.

Information for those involved in the outcross project, including breeders, stud dog owners, and buyers of outcross puppies, expectations regarding examinations and follow-ups will be outlined, for example not neutering but keeping the dog available for breeding, etc.

Information will be available on the FSK website regarding the project, and there may be an opportunity to express interest in participating as a puppy buyer.

The Breed club in the breed's home country and other Field Spaniel clubs worldwide will be informed about the project.

Schedule for implementation and follow-up

Within 5 years, the goals are:

- At least three (3) outcross breedings have been done.
- Evaluation of the first generation (F1) has been completed.
- The first generation (F1) from all combinations has been used in breeding, i.e., the second generation (F2) has been born.
- Evaluation of the project has been conducted, and decisions about any further outcrossings have been made.

Within 10 years, the goals are:

- The third generation (F3) is born, as well as the first generation of Field Spaniels registered in the regular SE registry.
- A more extensive evaluation of the project has been conducted, and decisions have been made on how to proceed regarding increased genetic variation within the Field Spaniel breed.

Work process

This basic plan for the project has been developed in consultation with the Breeding Committees of the Swedish Kennel Club and the Swedish Spaniel and Retriever Club. Additionally, SKK's Geneticist have been in contact with the Field Spaniel Klubben's board. Representatives from SKK and SSRK participated in one of FSK's Breeder Meetings in the spring of 2022 to provide information and answer questions. FSK's breeders have also been informed about the Clumber Spaniel Club's outcross project with a working English Cocker. The breeders have also been involved in proposing relevant breeds for the outcross project. During one of FSK's Breeder Meetings in 2022, a Project group was appointed with the task of developing an application/project plan. In the fall of 2022, the question was raised in FSK's breeders group on Facebook about who wanted to participate practically in the project, and seven breeders then expressed their interest. In the spring of 2023, the project plan was sent out for review to all FSK members, which received a great response and demonstrated significant commitment to the breed and the project.

The text is jointly written by the Project group based on notes/discussions from Breeder Meetings in 2022, as well as the work of the Project group in 2022/2023. Factual texts are derived from Breed-Specific Breeding Strategies (RAS) and SKK's Guide regarding projects for increased genetic variation.