Finnish tools for breeding healthy and good-temperament curlies

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Breeding

- Breeding refers specifically to **the intentional selection of animals for reproduction** based on desired traits, such as health, temperament, structure, or working ability.
- The goal of breeding is **to improve or maintain** specific qualities in future generations.
- It's both a **genetic and strategic process**, which often includes pedigree analysis, health/genetic testing, and selection criteria.
- A breeder decides which dogs to mate and which not to and **guides the development of the whole breed**.

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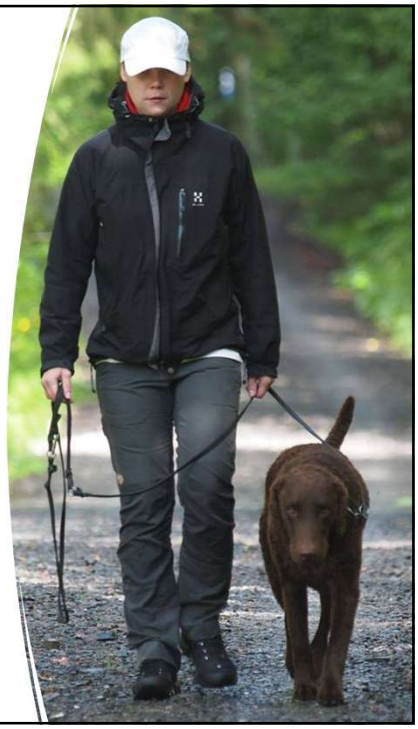
Breeding

- **What we choose** to buy, or support sends a strong signal to breeders and breeders respond to demand.
- **Having our dog health and behavior tested provides data for the "big picture"** as the public data from all tested dogs supports breeding even if all dogs aren't bred with.
- **By providing data to breeders** by sharing unofficial health results, genetic test results, behavioral feedback, or even just updates help breeders understand their breeding choices.
- **By choosing to neuter or not** as sometimes excellent dogs that could contribute positively to the breed, are neutered early.
- **By being ambassadors of the breed** by showing off well-behaved, healthy dog in public is the best advertisement for its breed.

WE ALL OWN A POTENTIAL "BREEDING" DOG



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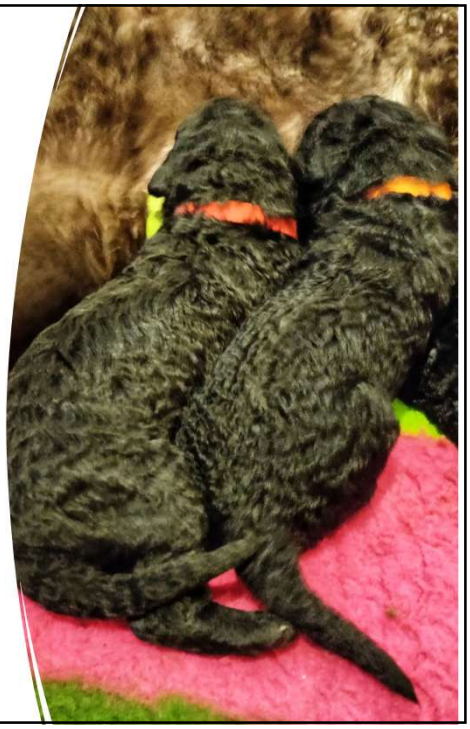
Breeding

- The trait must be **heritable**
  - The trait must be found in the population
- The trait must be **measurable**
  - The **correct trait** must be measured
  - Measurements must be **comparable**
  - For quantitative/polygenic traits a **sufficient number** of observations must be obtained over a **long period of time**



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Breeding

- What is the **breed ideal**?
- What are the **breeding goals**?
- What is the **current situation**?
- How are different **traits and health** evaluated?
- How do **individuals** differ from each other?
- **Data** – collection and communication: who and how, utilization?

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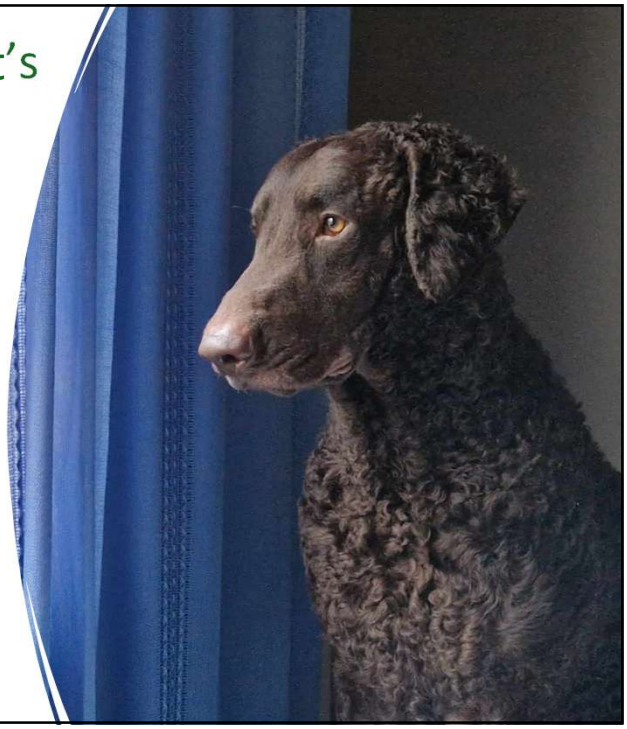
What is healthy and how it's measured

- Definition of healthy
- How we test it or observe it?
- What are the underlying factors of health?
- Genetic diversity and inbreeding



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Definition of healthy

Physical:

Free from illness or pain

Normal vital signs: temperature, heart rate, breathing
Proper body condition: not underweight or obese
Good mobility: no lameness, stiffness, or pain
Healthy skin, coat, ears, eyes, teeth
In practical terms the dog should not require a special diet or ongoing medication

Behavioral:

Mentally stable and socially functional

Chronic stress, anxiety, or aggression may reflect underlying problems.
Stable temperament and behavior appropriate for the breed
Shows normal responses to stimuli: not overly fearful or aggressive without cause
Capable of learning, socializing, and engaging in daily routines

Functional:

Performs natural behavior without strain

Can normally: breathe, move, eat and drink, reproduce and regulate temperature
No extreme anatomical features that impair quality of life

Genetic:

Low risk of inherited disorders

Free or not at high risk of inherited diseases: which are known to affect the breed
Comes from a genetically diverse background: reducing inbreeding risk
Ideally has health-tested parents: breed-specific issues

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Definition of healthy

A healthy dog is not necessarily "disease-free for life", but:

Can recover from illness or injury
Can function normally in daily life
Has a good quality of life and welfare

Note: Cruciate ligament injuries, other correctable structural defects, or chronic inflammations are not considered minor or temporary issues and may be caused by an underlying genetic defect

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Health measures

Orthopedic and Skeletal Examniations

- Hips Included in Finnish PEVISA = Hereditary Disease Prevention Program
- Measures: bone structure, joint shape, alignment, developmental abnormalities, spondylosis or vertebral anomalies.

Eye and Heart Examinations

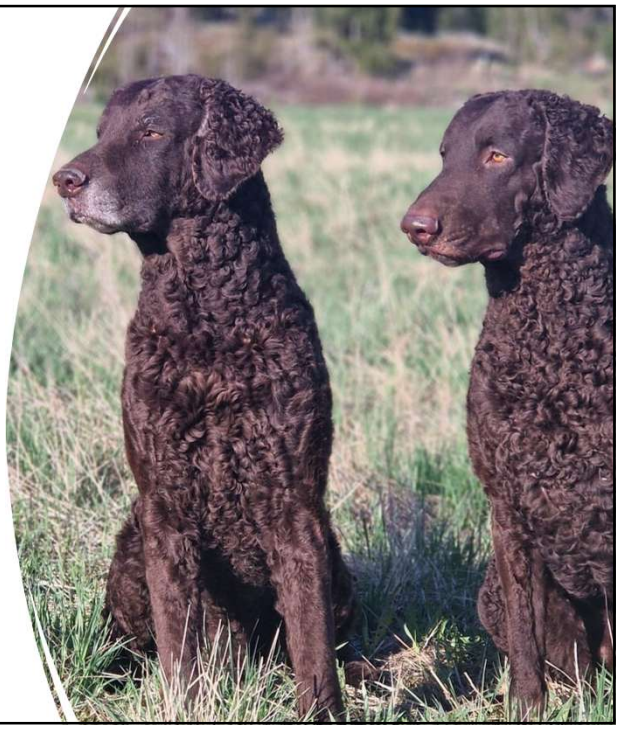
- Eyes Included in Finnish PEVISA = Hereditary Disease Prevention Program
- Measures: presence of visible/hearable abnormalities, changes suggestive of hereditary diseases

Other Health Screenings/Clinical Tests

- Basic health examinations and blood testings
- Measures: f.ex. organ function at test time or immune reaction to allergens.

Genetic testing

- Normal, carrier or affected status of known monogenic disease or disease susceptibility variants: breed specific single tests / small packages of few variants, all breed gene panels covering >250 gene variants
- EIC and GSDIIIa (some include PRA-cord1)
- DNA based level of genetic homozygosity (COI) vs. heterozygosity (diversity) (Wisdom Panel - heterozygosity and diversity and Embark – homozygosity/COI)



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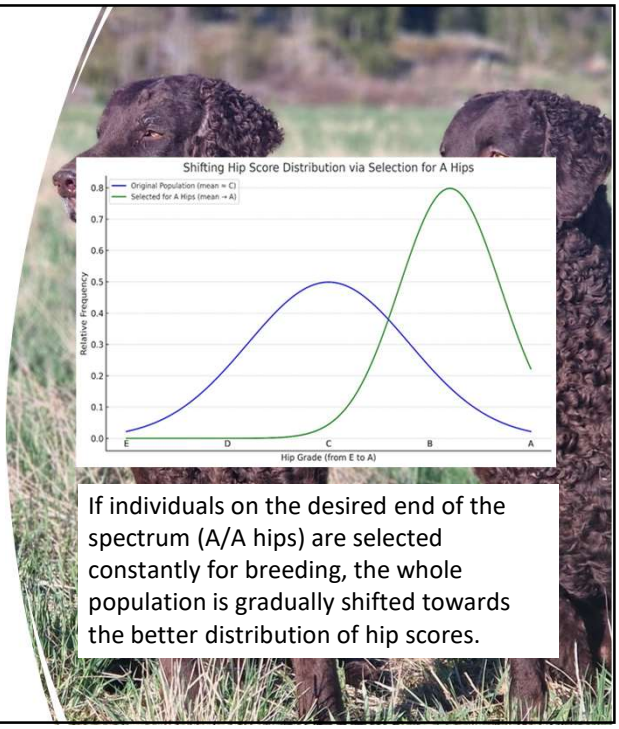
POLYGENIC TRAITS

For Breeding: As many individuals as possible should be health tested if applicable and all the health and temperament information about the dogs should be available.



If individuals on the desired end of the spectrum (A/A hips) are selected constantly for breeding, the whole population is gradually shifted towards the better distribution of hip scores.

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Health measures

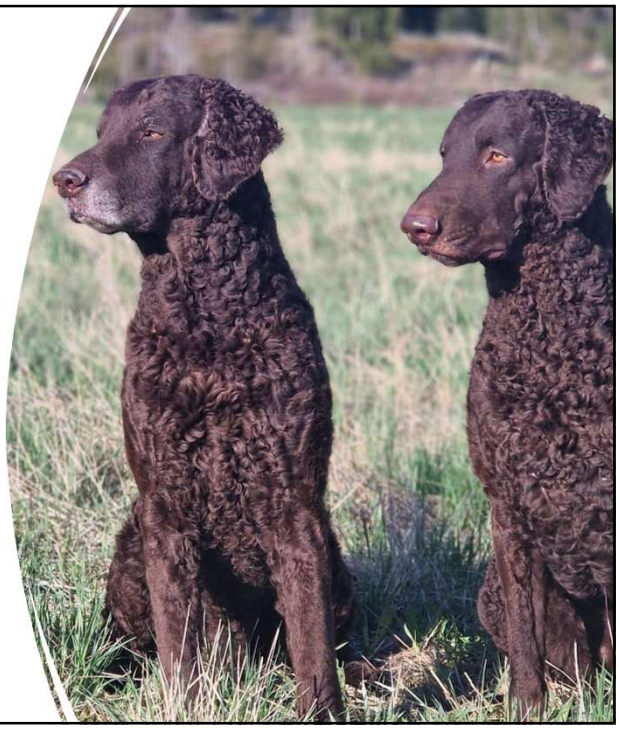
Genetic testing

- Normal, carrier or affected status **of known monogenic disease** or disease susceptibility variants: breed specific single tests / small packages of few variants, **all breed gene panels covering >250 gene variants**

Only ~1% of the whole genome, few CCR specific

- PRA-cord1, EIC and GSDIIIa
- **DNA based level of genetic homozygosity (COI) vs. heterozygosity (diversity)** (Wisdom Panel - heterozygosity and diversity and Embark – homozygosity/COI)

Quantitative not qualitative, not to be used as a criteria for breeding decisions – parents with 25 % COI may produce offsprings with 25%, 35 % or 0 % COI. Additionally, there is also such as good homozygosity.



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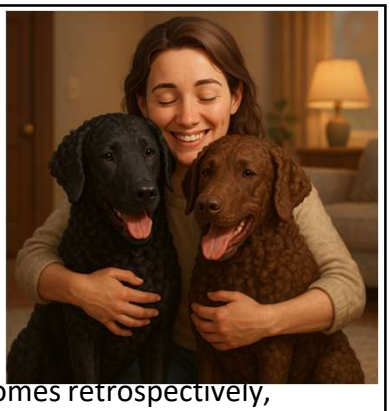
Health measures



Health and genetic testing does not measure for:

- subjective experience and symptoms, future health outcomes, underlying causes, subclinical or early-stage conditions, disease onset, severity, or progression, general resilience, behavior or temperament traits and the real-life impact.

Owner's observations do!

- Insight to their dog's experience and symptoms, health outcomes retrospectively, insight to underlying causes, how are subclinical or early-stage conditions shown, how/when the disease starts, the severity and progression of symptoms, and the real-life impact.
- Relies on one's skills to understand dog's normal and pain related signals
- Conditions without specific tests
  - epilepsy, limping, skin problems, digestive issues etc.
  - The "smaller things" that can be treated at home by owners

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What are the underlying factors of health?

Owner's choices:

- good care, balanced nutrition, life habits and possibility to live species-/breed-specific life

Biological Factors:

- **Genetic Diversity and Low Inbreeding Coefficient**
- Avoidance of Known Genetic Disorders
- Balanced Conformation (Anatomy suitable for purpose)
- Healthy Reproductive Traits
- Robust Immune Function
- Longevity and Disease Resistance

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Genetic diversity and inbreeding

What happens when diversity is lost?

A genetically diverse population is more resilient to diseases and less prone to inherited disorders.

Low diversity increases the risk of:

- **Genetic Disorders**
- **Reduced Fertility and Reproductive Success**
- Behavioral and Cognitive Issues
- **Weakened Immune System**
- **Shortened Lifespan and Vitality**
- Population-Level Vulnerability

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Genetic diversity and inbreeding

By which choices can diversity be **maintained**

- Avoid overusing individual sires and also pay attention to dams in case of curlies. Use a wide range of dogs.
- Utilize the full population – also geographically.
- Include "ordinary" dogs in breeding and Preserve rare bloodlines.
- Monitor and limit inbreeding levels. The pedigree based inbreeding coefficient (COI) should be kept low (< 6.25%, 4-5 generations).

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Genetic diversity and inbreeding

By which choices can diversity be **maintained**

- Limit how much each individual is bred to prevent genetic bottlenecks.
  - Maximum number of litters or a percentage of the population (e.g. 5–10% of a generation).
  - Repeated pairings of the same individuals should be avoided.
- Use genomic tools if available, but wisely, ask help from professionals
- **Promote collaboration and transparency.** Open sharing of health results and general observations, genetic test outcomes.
- Cross breeding – a controversial solution for upgrading diversity

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What is good-temperament and how it's measured

- Good temperament is the most important trait in dog
  - We share homes with our dogs 365 days per year
- Good temperament includes several aspects, for examples
  - Behaviour with other dogs
  - Behaviour with family / unknow people
  - Behaviour when left home alone / travelling in the car / new environment
  - Hunting instincts
  - Energy level
- Good temperaments means different details for different people
  - How active or "lazy" the dog is?
  - How suitable his behaviour is where we live?
  - How good we are to train him to handle difficult situations?

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What is good-temperament and how it's measured

- The dog with good temperament lives his life without fears, anxiety and aggression in everyday life
  - Dog can react if something sudden happens, but he calms down easily
- Different ways to collect data
  - "Official" tests by Finnish Kennel Club (mental test MH and LTE)
  - Retriever tests and trials
  - Dog shows
  - Everyday behaviour in different situations (your own observations)
  - Owner questionaries by breed club (and communication with owner as a breeder)
  - Commercial test Smartdog
- The dogs without proven test data???

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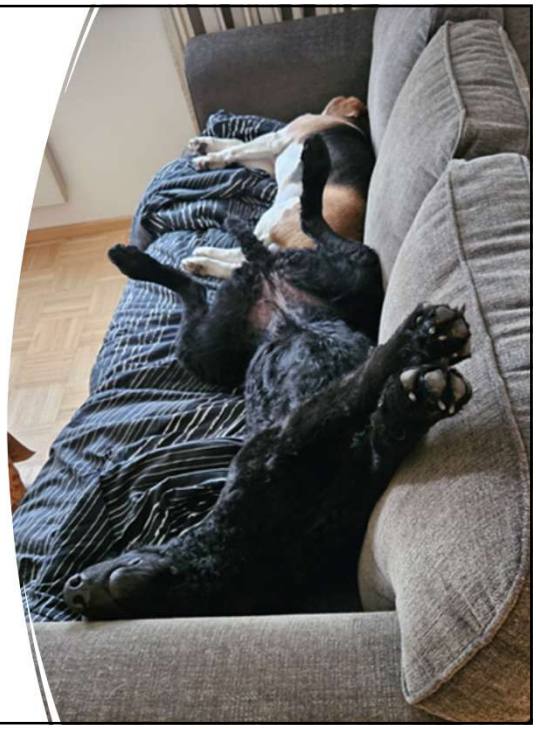
Definition of Good Temperament

- **Behavioral: Mentally stable and socially functional**
- Behavioral health is part of welfare. Chronic stress, anxiety, or aggression may reflect underlying problems.
- Stable temperament and behavior appropriate for the breed
- Shows normal responses to stimuli: not overly fearful or aggressive without cause
- Capable of learning, socializing, and engaging in daily routines



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Definition of Good Temperament

Temperament of CCR according the breed standards (UK / FCI and USA)

UTILIZATION: Retriever.

BEHAVIOUR / TEMPERAMENT: Intelligent, steady, reliable. Bold, friendly, self confident and independent. May seem aloof.

Temperament: **Self-confident**, steadfast and proud, this active, **intelligent** dog is a charming and gentle family companion and a determined, durable hunter. The Curly is alert, biddable and responsive to family and friends, whether at home or in the field. Of independent nature and discerning intelligence, a Curly sometimes appears **aloof** or self-willed, and, as such, is often less demonstrative, particularly toward strangers, than the other retriever breeds. The Curly's **independence** and poise should not be confused with shyness or a lack of willingness to please. In the show ring, a correctly-tempered Curly will steadily stand his ground, submit easily to examination, and might or might not wag his tail when doing so. In the field, the Curly is eager, persistent and inherently courageous. At home, he is calm and affectionate. Shyness is a fault and any dog who shies away from show ring examination should be penalized. Minor allowances can be made for puppies who misbehave in the show ring due to overexuberance or lack of training or experience.

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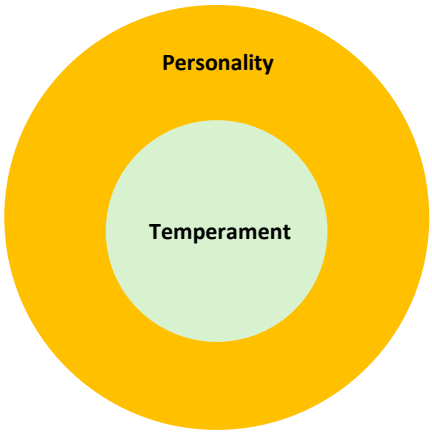
What are the underlying factors of behaviour?



- Temperament is inherited
- Personality and behaviour
  - How a dog behaves in different situations, what is typical for the breed in the situation (when he meets another dog, new people, hard noise, game etc)
  - Temperament but also enviromental factors affect the personality
- Personality traits can change when dog gets older
  - Younger dogs are more active than older ones, males more active than females etc.

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Personality traits in dogs

- Fearfulness – Boldness (Pelokkuus – rohkeus)
- Social interest, friendliness (Sosiaalisuus, ystävällisyys)
- Activity level (Aktiivisuus)
- Aggression (Aggressiivisuus)
- Will to co-operarate (Yhteistyöhalukkuus)
- Dominance (Alistuvuus – dominoivuus)
- Inhibitory control (Impulsiivisuus – itsehillintä)
- Interest in game (Metsästyskiinnostus, riistavietti)

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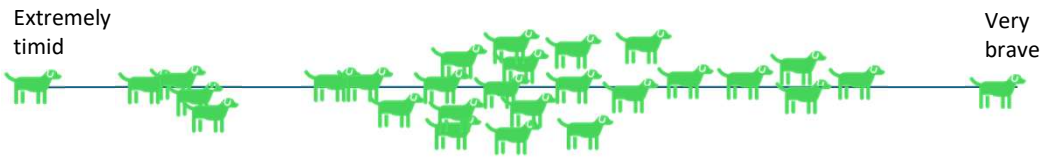
Personality traits in dogs

- Personality traits vary along a spectrum rather than in fixed categories
- Not every dog is timid or brave, there are different levels of fearfulness or boldness
  - Some are more friendly, more interested in people and some are more aloof (note! Aloof ≠ shy or timid)



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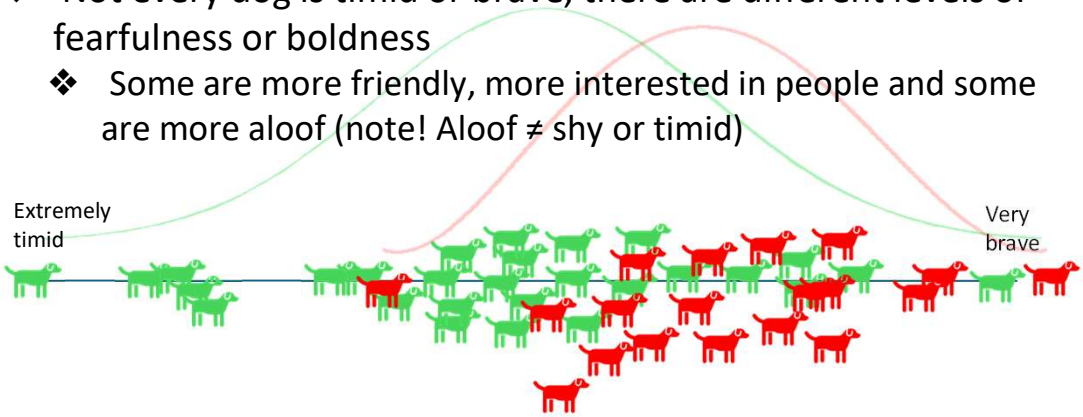

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Fearfulness – Boldness

- Boldness can be called as self-confident
- In the worst cases the fear decreases the wellfare of the dog
- A dog can be scared of one thing or several
  - A dog can be scared of slippery floors but doesn't mind hard noices
  - A dog is scared of unknown people, dogs, being alone, new places, hard noices, slippery floors, high places, flys etc
- It is typical that fear gets worse when dog gets older
  - First dogs show minor signs of fear (like flattened ears, licking lips), the later the fear can show as panic, dog wants to escape, is shaking, tried to hide or can be aggressive
  - Fear of loud noises-> fear of thunder -> fear of rain
- Fears (and boldness) are strongly inherited

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Social interest

- Clear differences in social interest between the breeds
- Friendliness toward unknown people is strongly inherited
- Differences between the breeds and individuals in trainability

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Aggression

- Aggression is normal part of canine (and other animal) behaviour
- Aggression level is the key and varies between the breeds
  - Varies also between the individuals
- Sometimes behind the aggression: pain, fear
- Sometimes difficult to measure
  - Many dogs only show the aggression within their own territory or in a specific situation, such as guarding resources.

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The Balance is Essential

- It is clear, we would like to have bold, self-confident dogs
- BUT how confident and bold? How much is enough or can dog be too bold?
- How should friendly Curly behave?

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FROM THEORY TO PRACTICE

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Behaviour assesment – MH mental description

- Measures fearfulness – boldness
- Bold dogs
  - Calms down easily even if he scares something = are easier to live with
  - Are curious in new situations
  - Friendly or aloof with new people (and many times with new dogs too)
  - More playful, easier to train
- **The results are found at Koiranet database**

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Retrievering test (NOU)

- Brings information about individuals
- Required for Finnish champion title
- Required for entering cold game test (nome-b) and working test
- Difficult to use in scientific research
- Tests social behaviour, willing to swim, carry game, co-operate with handler, fear of loud noises (gun fire), selfconfident
- Needs training, at least a little bit

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Behaviour assesment – SmartDog Test

Strenghts (and reverse sides) of Curlies in SmartDog Test

- Understand human gestures well, they solve different kind of problems quickly
- Good inhibitory control and they are calm -> helps problem solving and everyday life with dog.
- On the other hand good inhibitory control and calmness are challenge, it is not always so easy to make Curly keen on training
- Persistent -> try to solve unsolvable task, don’t give up
- Logical deduction (by negation) is one of the most difficult task in the test, Curlies understand it more often than other breeds -> they get to know new things easily, learns with fewer repetitions, can't handle repetitions, gets bored easily

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KoiraNet (DogNet) Open Database

Open access for anyone to data of dog shows, trials and health results for hip joint, elbow, patellar luxation, eye examination, heart examination, spondylosis

Retrievable information e.g. : 31% of Finnish Curlies take part in Retrievering test (NOU) and about 29% take part in MH mental description

Not only good results are shown, but all the results are public

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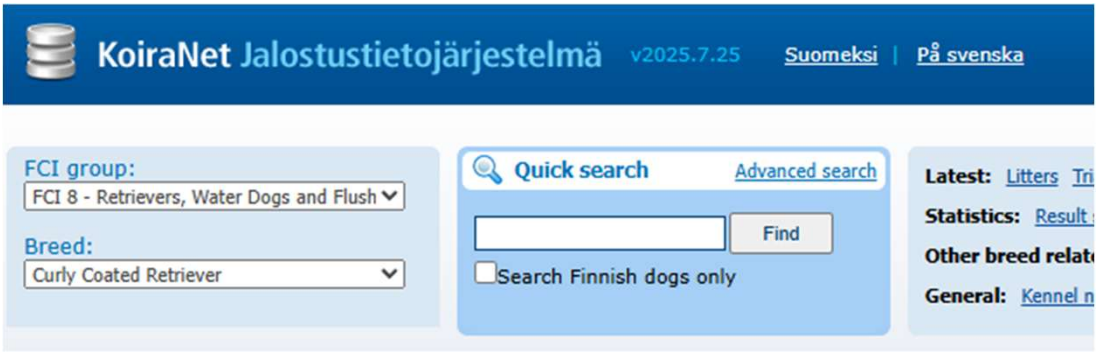
KoiraNet (DogNet) Open Database

https://jalostus.kennelliitto.fi/



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Other Tools for Finding Information

- Genetic test results for curlies
  - CCR Club of Finland maintains Epilepsy, EIC, PRA cord1 and Bloat lists, to which owners can submit information about their dogs
  - The breeding committee aims to obtain information from breeders about the diversity and COI values provided by genetic panel tests.
- Information about other health results or issues
  - The breeding committee encourages owners to take part in Finnish Kennel Associations health questionare of which results can be retrieved on demand
  - We strive to maintain an open and transparent atmosphere for discussion regarding health conditions
- Genetic diversity as such
  - Some numbers and information can be mined from the health and breeding statistics
  - Test matings: to see pedigree based COI is automatically calculated
- International co-operation
  - Curly Archieve

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Other Tools for Finding Information

- In Finland (and other Nordic countries) ”everyone” owns the potential breeding animal
  - Most of the dogs are intact
  - If spayed / castraded it is typically done when dog is older than 1-1,5 years
  - 65% of Curlies have been x-rayed for hip dysplasia
- Breeder – owner interaction
  - Typically breeders are regularly in contact with puppy buyers
  - Breeders have a huge resposibility to encourage the owners to take part in tests, shows, health checks
- Some tests, like MH, don’t need special training, basic manners are enough
  - Dogs shows are for everyone, 60 % of Curlies have shown at least once in a life time
- Atmosphere
  - We enjoy being together in the shows, training sessions, tests etc
- Breeding Strategy

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Breeding Strategy

- Ensures responsible, long-term development of the breed
- Identifies and addresses health risks, genetic concerns, and behavioral issues
- Maintains breed functionality, welfare, and viability
- Promotes informed breeding decisions across the breeder community

In Finland The Breeding Strategy Document:

- Is reviewed and updated every 5 years to ensure that the strategy stays relevant and science-based
- Is developed in cooperation with breed clubs, breeders, breed club members and the Finnish Kennel Club (FKC); officially approved in the breeding clubs general meeting and breeders agree to follow it.
- Reflects the latest data on health, behavioral evaluations, population structure, and breeding practices

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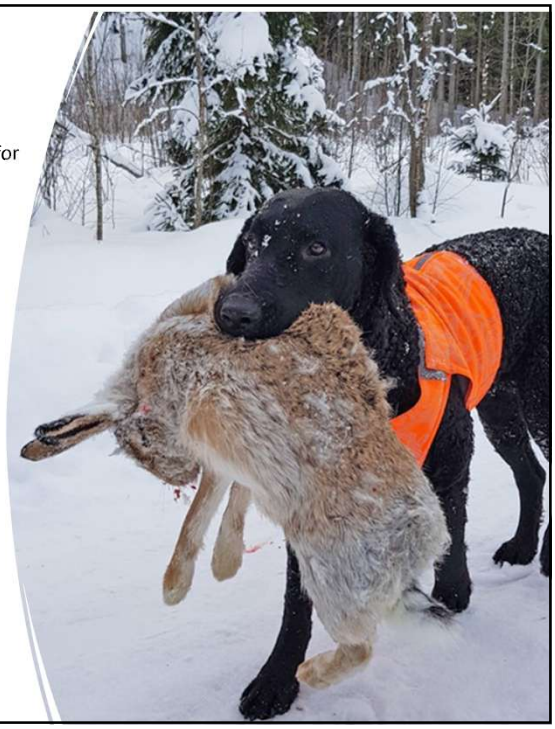
CCR Breeding Strategy (FI)



Goal

Maintain a functional, healthy, and type-typical breed. Must remain suitable for original use: retrieving small game. Balance between working ability and conformation is essential. Avoid split into working vs. show lines

Population & Genetic Concerns
Average 41 puppies/year in Finland (trend is going down)
Effective population size (Ne): 43–51 (critical threshold is 50–100)
Inbreeding coefficient (COI avg 2011–2020): 3.6%
Popular sires & line concentration are increasing genetic bottlenecks
Need for broader use of breeding individuals & international cooperation

Health Profile
PEVISA requirements: Hip dysplasia screening, Eye examination
Other recommended tests: GSD IIIa, EIC, PRA-cord1
Genetic diversity (2016 median heterozygosity): 32.3%
Epilepsy, EIC, PRA are also tracked via voluntary registries

Temperament & Performance
Generally described as: calm, confident, social yet reserved
Strong performance in MH-tests and character tests
About 25–30% participate in retrieving test (NOU1)
Most common issues: game handling (rough grip) and reluctance to retrieve certain species

Breeding Objectives

Maintain and improve genetic diversity
Avoid overuse of individual dogs (max ~9 puppies/stud/generation)
Promote temperament and working traits
Encourage health testing and international collaboration
Transparent sharing of health, performance, and pedigree data

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CrossBreeding – Threat or Possibility?

In Finland, breed crossbreeding projects under the Finnish Kennel Club are strictly regulated, scientifically grounded, and carefully monitored.

Projects are:

- **Initiated by breed clubs or associations**, not individual breeders and approved by the Finnish Kennel Club based on a well-justified plan.
- Crossbreeding is done **systematic**ally and **scientific**ally, with health and temperament testing of all breeding dogs, **long-term monitoring of offspring** and registration in a special crossbreeding registry or FI-registry tagged with breeding restrictions
- **The offspring are bred back into the original breed over generations**, aiming to retain the breed's identity while improving its health (BC3 = 93,75 % original breed)
- The goal is to improve the health, genetic diversity, and viability of a breed that is suffering from issues like: severe hereditary diseases, extremely small gene pools, structural or functional problems due to extreme traits, **NOT to make "Designer Dogs"**

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CrossBreeding – Threat or Possibility?

Aspect	*Designer Dog* Breeding	Official Crossbreeding Projects
Purpose	Create new, often trendy mixes (e.g., Labradoodle), no back crossing	Preserve or rescue existing breeds; improve health or working traits, back crossing
Commercial Intent	Usually commercial, profit-driven	Non-commercial, welfare- or preservation-driven
Breed Recognition	Not recognized by official kennel clubs	Conducted under official kennel club supervision
Scope	Often large-scale breeding	Strictly limited (e.g., 2–5% of registered dogs over 4 years)
Transparency	Often lacks documentation or public data	Fully documented and transparent; results shared publicly
Genetic Goals	Focus on appearance or novelty	Introduce healthy genes, correct harmful traits (e.g., breathing issues)
Welfare Considerations	May overlook long-term health or welfare	Aimed at preventing extinction, improving welfare, or restoring lost traits
Legal/Policy Motivation	Not typically policy-driven	Sometimes used to avoid breed bans (e.g., in countries like Norway)

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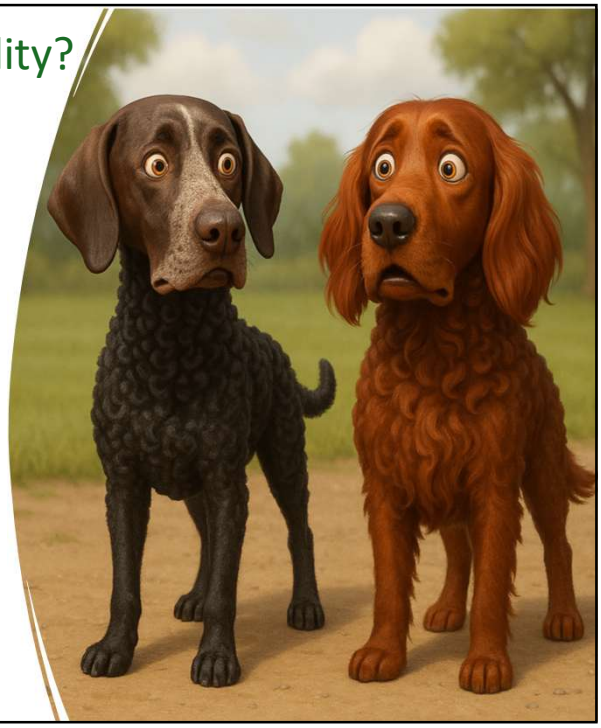
CrossBreeding – Threat or Possibility?



Theoretical and Strategic Foundation

- Crossbreeding should begin only with **clear justification -** low genetic diversity, high disease burden, or loss of functional traits.
- The breed's current state (e.g., inbreeding, health stats) must be analyzed
- Suitable breeds are selected for crossing partner based on genetics, health, and temperament.
- The plan must be approved by the Finnish Kennel Club and involve collaboration with experts and stakeholders.

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CrossBreeding – Threat or Possibility?

Practical Implementations

- Parent dogs must be carefully chosen for health, structure, temperament, and genetic fit.
- Multiple crosses over many years with tight monitoring of all puppies from F1 generation up to third backcross (F1 + BC1–3).
- Registration should be pre-agreed with the Kennel Club.
- Crossbred dogs may face limitations in shows and breeding but can fully participate in dog sports and family life.

Follow-Up and Long-Term Monitoring

- Monitor health, structure, longevity, and reproduction for at least 2–3 generations.
- Conduct temperament testing and working ability assessments.
- Evaluate what traits the cross introduced, what requires backcrossing, and how the crossbred line compares to purebreds.

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CrossBreeding – Threat or Possibility?

Communication and Documentation

- Maintain full transparency.
- Publish all data openly and document every decision and outcome.
- Educate breeders and owners on the project's purpose, what to expect from crossbred dogs, and how to responsibly use them in breeding.

Long-Term Goals and Actions

- Set a plan to integrate selected crossbred individuals back into the breed.
- Identify which lines should continue in breeding.
- Ensure lasting benefits to the breed.
- Update the breed standard if crossbred traits significantly differ.

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By which choices can diversity be **maintained**

- **Avoid overusing** individual sires and also pay attention to dams in case of curlies. Use a wide range of dogs.
- **Utilize the full population** – also geographically.
- **Include** "ordinary" dogs in breeding and **Preserve** rare bloodlines.
- **Monitor and limit inbreeding levels.** The pedigree based inbreeding coefficient (COI) should be kept low (< 6.25%).
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- **Promote collaboration and transparency.** Open sharing of health results, breeding use, and genetic test outcomes.

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Picture: Tarja Newsonen

THANK YOU!

- **We don’t breed diseases or traits – we breed whole dogs.**
- Health and temperament are the most important breeding priorities – appearance must never outweigh them.
- Preserving genetic diversity requires thoughtful compromises: Dogs without public achievements but who are healthy and have good temperaments must also be considered for breeding.
- Practical breeding and textbook genetics don’t always align – what’s theoretically ideal may not be the best choice for the breed in practice: in some cases, carrier-to-carrier combinations might also be ethically and responsibly used.
- The breeder’s responsibility and ability to evaluate the dog holistically is crucial: How can good temperament be demonstrated without formal test results? Owners’ feedback is often subjective, but still valuable.
- **The Curly Coated Retriever** currently has a good situation in terms of health and temperament – **We carry the responsibility to preserve it and diversity by making good breeding choices together.**

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