

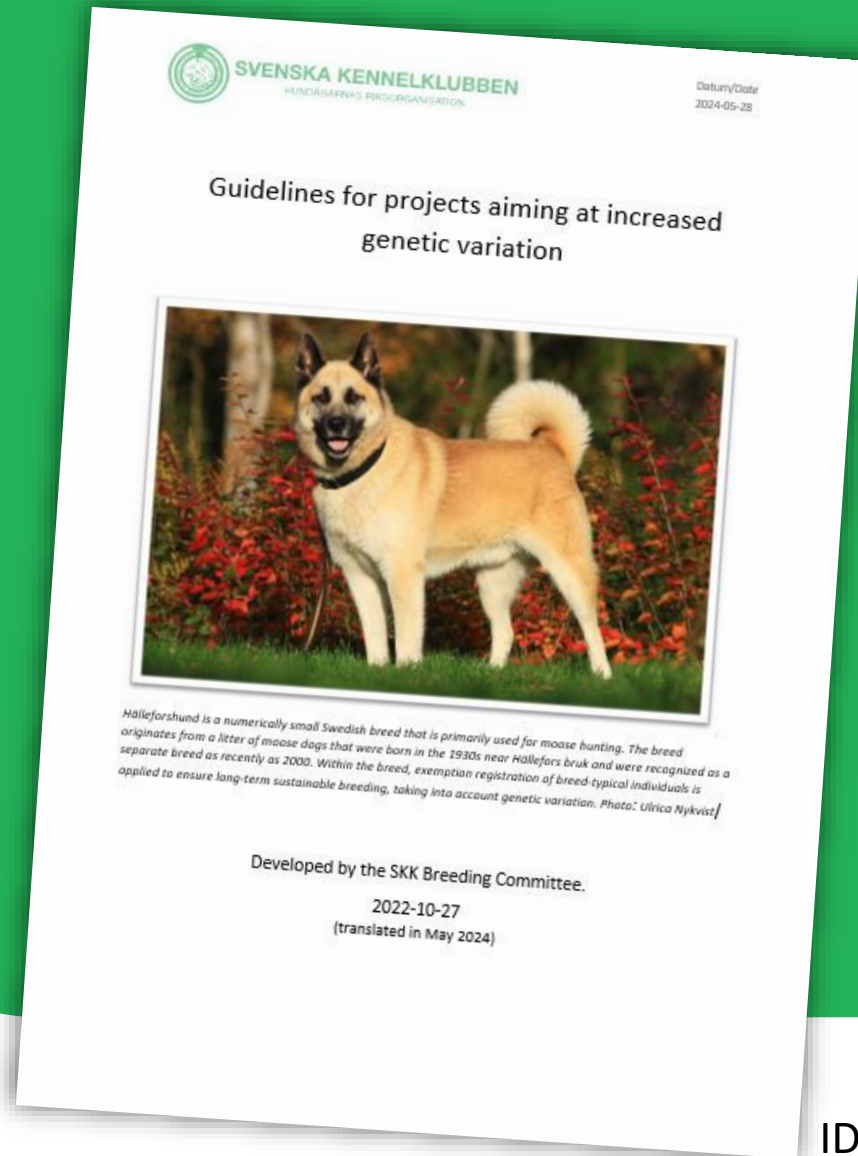


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Cross breeding and open breed registers from a practical and organisational point of view

Helena Skarp,
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Geneticist at Dept. for
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SKK



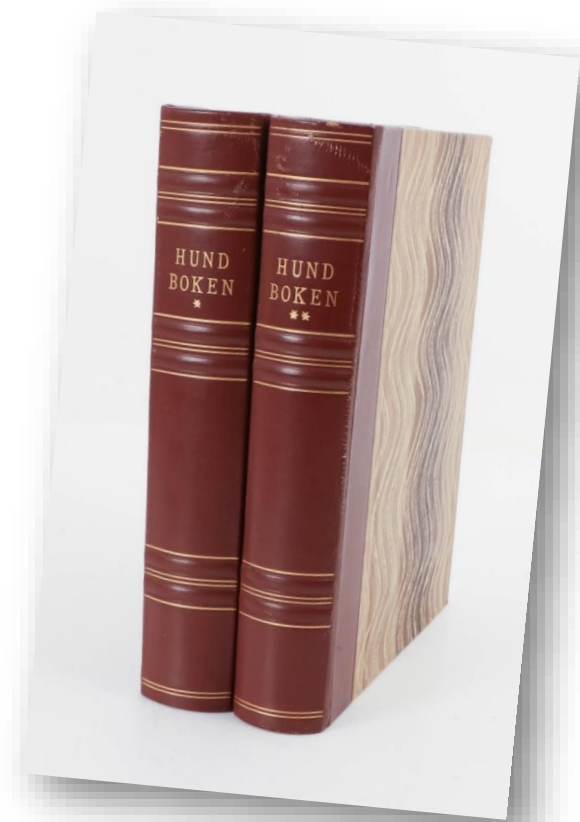


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Outcrossing, not a new invention

”The knowledgeable breeder, who is about to seek to improve an essential detail in his breed and finds that suitable material is lacking within the breed, should not hesitate to obtain what he needs from outside the breed”

SKKs Hundboken 1957





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IDHW 2019 – The Concept of Breed Theme





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Conclusions from IDHW 2019

Long term and short term goals

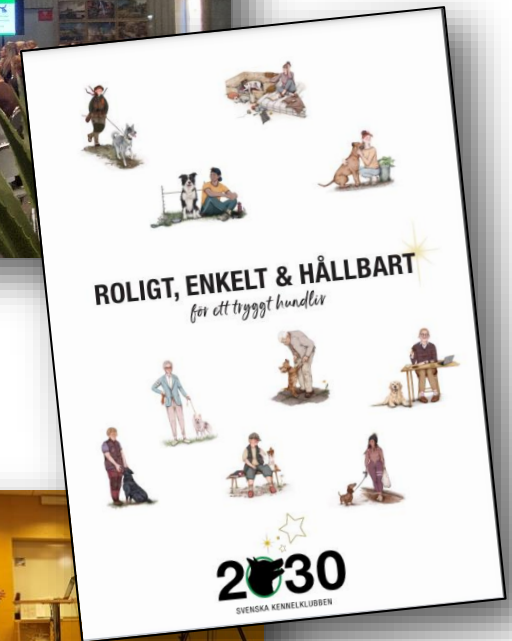


The primary focus of these recommendations is health and welfare of all dogs.

- Long term:
 - Open studbooks between related breeds and/or breeds with common breeding goals in a controlled way.
 - Cross breeding projects should be used when a health or welfare problem can not be solved within breed.
 - KCs databases should be open for all dogs
- Short term:
 - Create a positive attitude to the concept of more open studbooks.
 - To encourage the development of crossbreeding projects.
 - Encourage KCs to record all dogs on a database.

Information and education about genetic variation, open breed registers and outcrossing projects

- Conference for Breed Clubs 2022 – Genetic Variation and the Concept of Breed
- Webinars for breeders and breed club representatives
- Part of the education for breed club breeding advisors and central in breed specific breeding strategies (RAS)
- SKK Vision 2030





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Genetic variation in focus

Dog breeds must be 'rebooted' to halt health problems, says expert

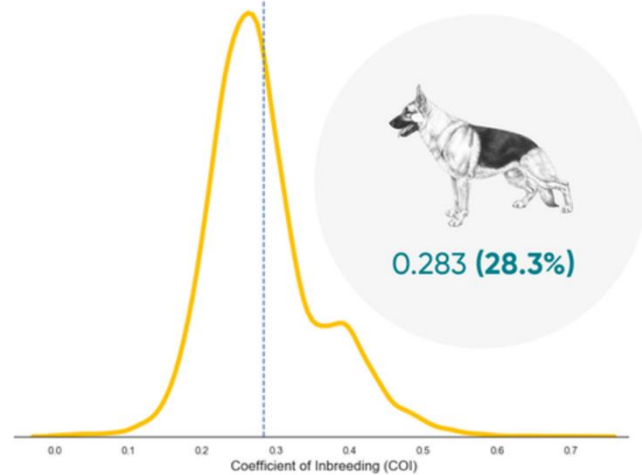
Exclusive: Prof Clare Rusbridge calls for careful cross-breeding to introduce new genetic material



📷 Cavalier King Charles spaniels have high rates of a spinal disease called syringomyel. Photograph: Irina Nedikova/Getty Images/iStockphoto

RESEARCH

Coefficient of Inbreeding (COI) in German Shepherd Dogs



embark⁺
for Breeders

--- Average German Shepherd Dog COI
— All German Shepherd Dogs

Most Dog Breeds Highly Inbred

Study Suggests Inbreeding Contributes to Increase in Disease and Health Care Costs

by Trina Wood | December 02, 2021

Bannasch et al. *Canine Medicine and Genetics* (2021)
<https://doi.org/10.1186/s40575-021-00111-4>

RESEARCH

The effect of inbreeding, body size and morphology on health in dog breeds

Danika Bannasch^{1*}, Thomas Famula², Jonas Donner³, Heidi Anderson³, Leena Honkanen³, Kevin Batchelor¹, Noa Safra^{1,4}, Sara Thomas^{5,6} and Robert Rebhun⁵

Body size, inbreeding, and lifespan in domestic dogs

Jennifer Yordy^{1,2} · Cornelia Kraus^{3,4} · Jessica J. Hayward¹ · Michelle E. White¹ · Laura M. Shannon · Daniel E. L. Promislow⁷ · Adam R. Boyko¹



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Genetic variation in focus

Attention within the Kennel Club organisation combined with attention from media, researchers and DNA-testing companies

➔ Increased awareness of the loss of genetic variation and risks with low genetic variation.

➔ Great interest and acceptance for outcrossing projects

Dog breeds must be 'rebooted' to halt health problems

Exclusive
introduce



📷 Cavalier King Charles Spaniel
Photograph: Irina

Coefficient of Inbreeding (COI) in German Shepherd Dogs

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RESEARCH

The effect of inbreeding on health and morphology

Danika Bannasch^{1*}, Thomas Famula², Jonas Donner³, Heidi Anderson³, Leena Honkanen⁴, Kevin S. Schaefer⁵, Noa Safra^{1,4}, Sara Thomas^{5,6} and Robert Rebhun⁵

Anna Kraus^{7*}, Jessica J. Hayward¹, Michelle E. White¹, Laura M. Shannon⁸, Daniel E. L. Promislow⁷, Adam R. Boyko¹



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Several alternatives to increase genetic diversity

- Exemption registration
- Defining breeds as varieties of breeds
- Outcrossing/cross breeding
- Open breed register



In Swedish Hälleforshund, exemption registration of breed typical individuals is applied routinely to ensure long-term sustainable breeding
Photo: Åsa Lindholm



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Outcrossing

- Introduction of genetic variation by mating with another breed (donor breed)
- Back crossing in later generations
- For each generation, genetic contribution from donor breed is halved
- Repeated outcrossing needed for long-term effect on the population
- Selection for desired traits, to preserve genetic variation



Alvar is a second generation (F2) individual after a Norwegian Lundehund and Buhund outcross, to increase genetic variation in the Lundehund breed

Photo: Marit Hansson Morgestad



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Open breed register

- Open breed registers between related breeds, in a controlled way
- Exchange usually one directed
- Often closely related breed
- Potentially more efficient and less administration

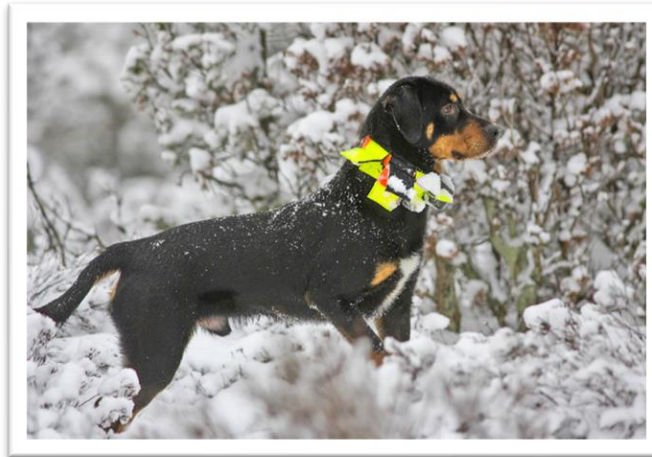




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Registration of offspring

- Offspring will be registered in an Appendix to the breed register for three generations, in accordance with FCI guidelines
- After three generations of back-crossing, individuals will be registered in the original breed register



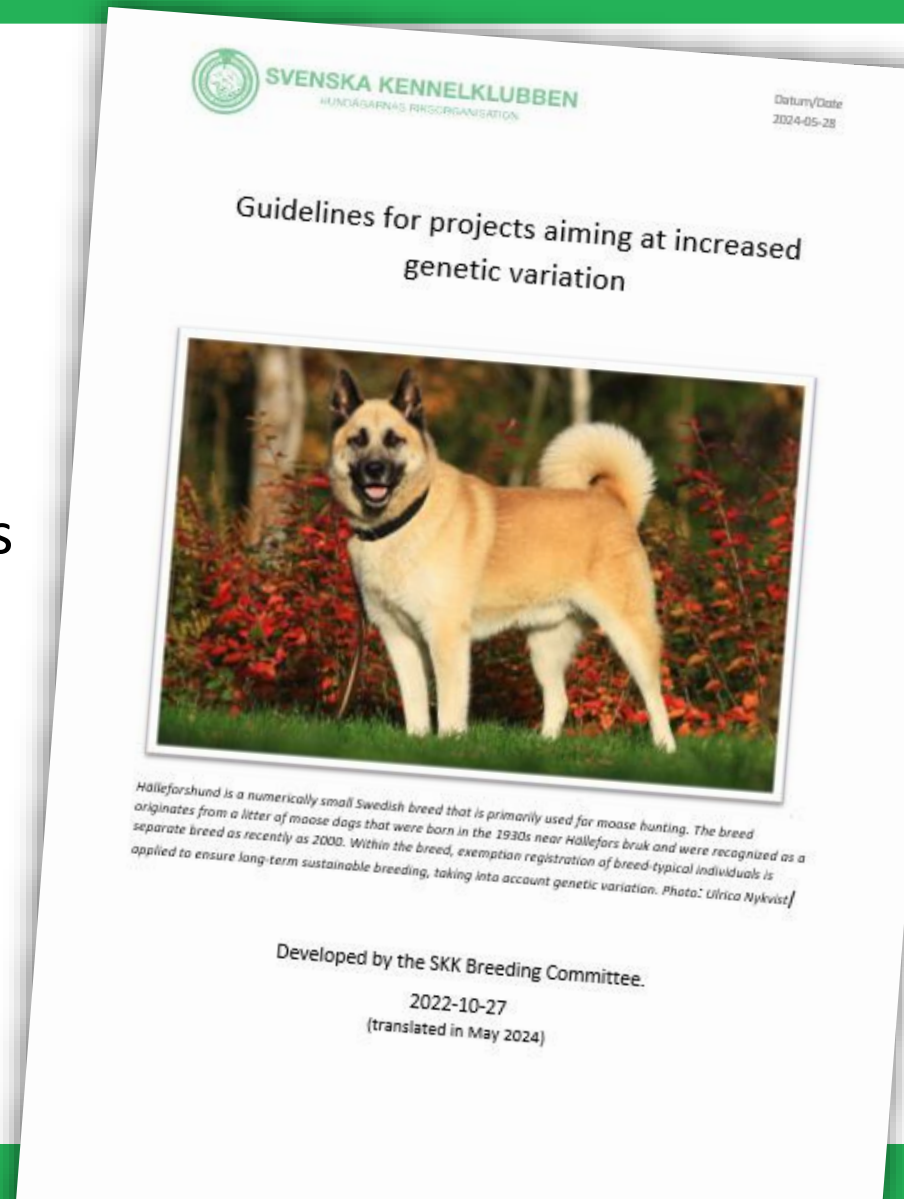


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Guidelines for increased genetic variation

- ✓ Mapping the current situation
- ✓ Defining the objective
- ✓ Choice of approach
- ✓ Suitable donor breeds
- ✓ Requirements for breeding animals
- ✓ Evaluation of offspring
- ✓ Planning an continuity
- ✓ Check-list for application

No quick fix!





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Planning of project

- ✓ Inform and include breeders, members and dog owners at an early stage
- ✓ High demands can be set on individuals from donor breed
- ✓ Morphological traits in general easier to restore than e.g., behaviour and function
- ✓ Do not place unreasonably high demands on the crossbred animals for breeding



Drentsche Patrijshond



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Open breed register Swedish Scenthound breeds

Numerically small Swedish hunting dog breeds

Goals: increase genetic variation, maintain and improve health and hunting traits

Donor breeds:

Similar hunting preferences and appearance (size, colour)

Brandlbracke and Tirolerbracke

➡ Smålandsstövare

Srpski gonic ➡ Schillerstövare



Schillerstövare



Smålandsstövare



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Outcrossing Cavalier King Charles Spaniel

Goals: increase genetic variation, improve health (heart disease and syringomyelia)

Donor breeds

- Not too closely related
- Healthy breeds (no heart disease or SM)
- Skull shape considered
- Behaviour suitable for a companion dog
- Similar size



Danish-Swedish farm dog (DS), Lhasa Apso (LA),
Japanese Spitz (JS)



Queenoustie's MR X
F1 DS × Cavalier



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Outcrossing, Cavalier King Charles Spaniel



Litter 2, Februari 4, 2024
Lhasa Apso × Cavalier



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Outcrossing, Cavalier King Charles Spaniel



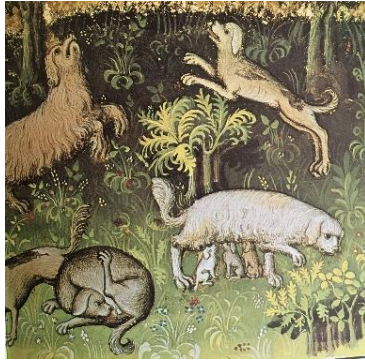
Litter 5, April 24, 2024
Japanese Spitz × Cavalier



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Time to shift focus...

...from the process of founding breeds



... to long-term sustainability.



Photo: Hans Olsson



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Thanks for your attention!



Litter 3, March 20, 2024 DS × Cavalier

- Short film about outcrossing projects, FKK (9 min)
[What is crossbreeding and how can it be used in dog breeding? – YouTube](#)