
Halling
GAVER
NORWEGIAN UNIVERSITY OF LIFE SCIENCES
MDCCCLIX

Recommendations for implementation of optimal contribution selection of the Norwegian and the North-Swedish cold-blooded trotter

Hanne Fjerdingby Olsen, Theo Meuwissen and Gunnar Klemetsdal

Department of Animal and Aquacultural Sciences, UMB

2011

Introduction (I)

- The North-Swedish and the Norwegian trotter have a joint breeding population
  - Use of stallions across the border since the 1960's
  - Joint breeding evaluation from 1994
- Trotter: No restrictions on use of stallions other than a yearly quota of 110 mares
  - N: 936 foals/year and S: 580 foals/year (2003)
  - Extreme length of reproductive life
  - Large variation in progeny groups of sires

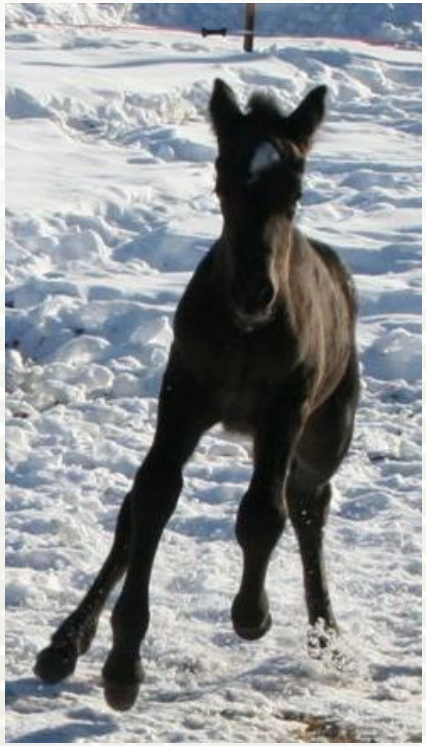
Introduction (II)

- Foaling rate and early abortion affected by inbreeding depression (Klemetsdal and Johnson, 1989)
- Optimal contribution selection (OCS)
  - Maximizes the response of selection at a predefined rate of inbreeding (Meuwissen, 1997)

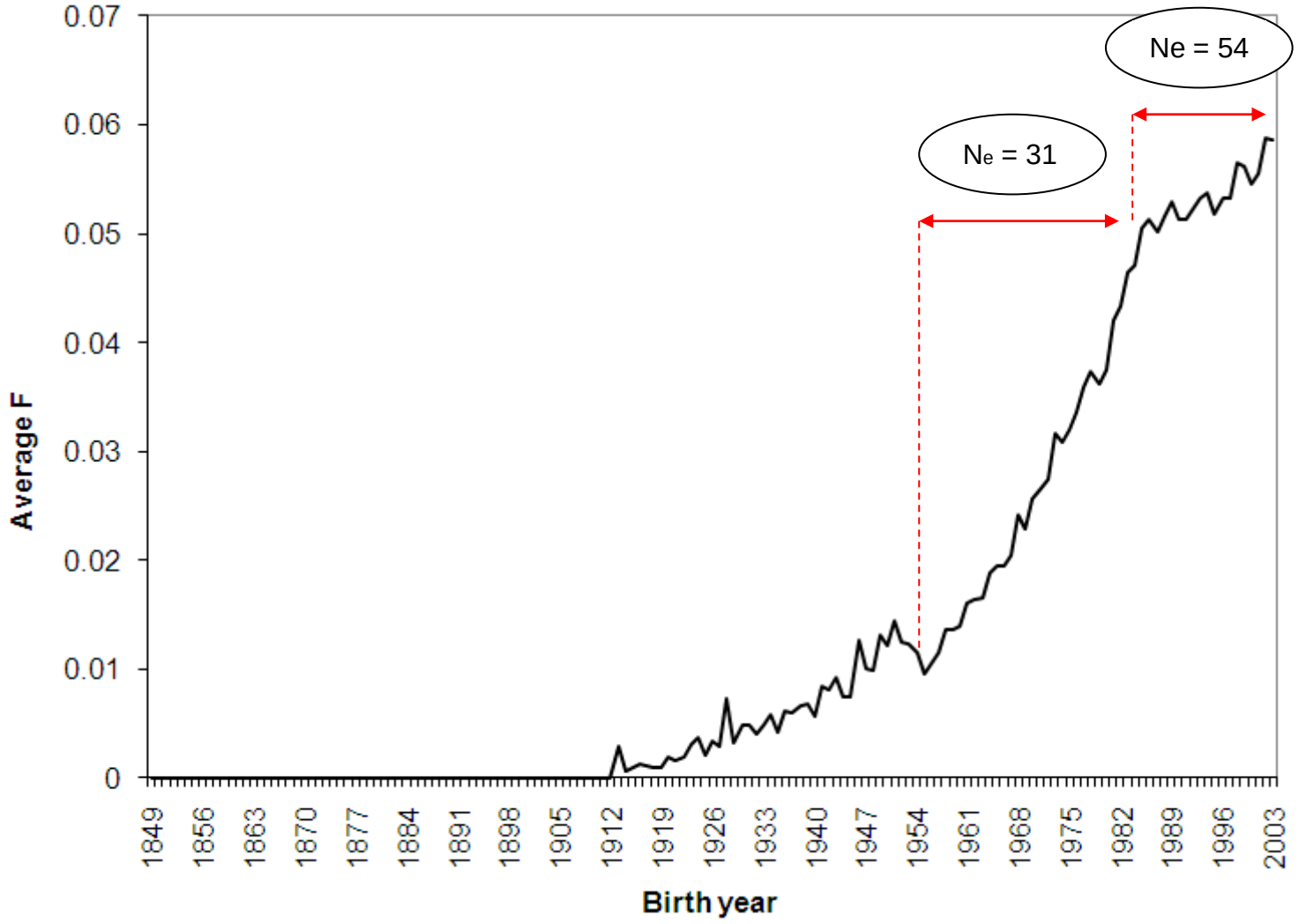
Aim: Recommend how OCS could be implemented in the breeding of cold-blooded trotters

Material and methods

- Data: 51,829 animals, born 1971-2003
- OCS implemented with the software Gencont (Meuwissen, 2002)
  - Overlapping generations
- Scenarios:
  - Restrictions on number of mares per stallion
  - Different constraints on rate of inbreeding



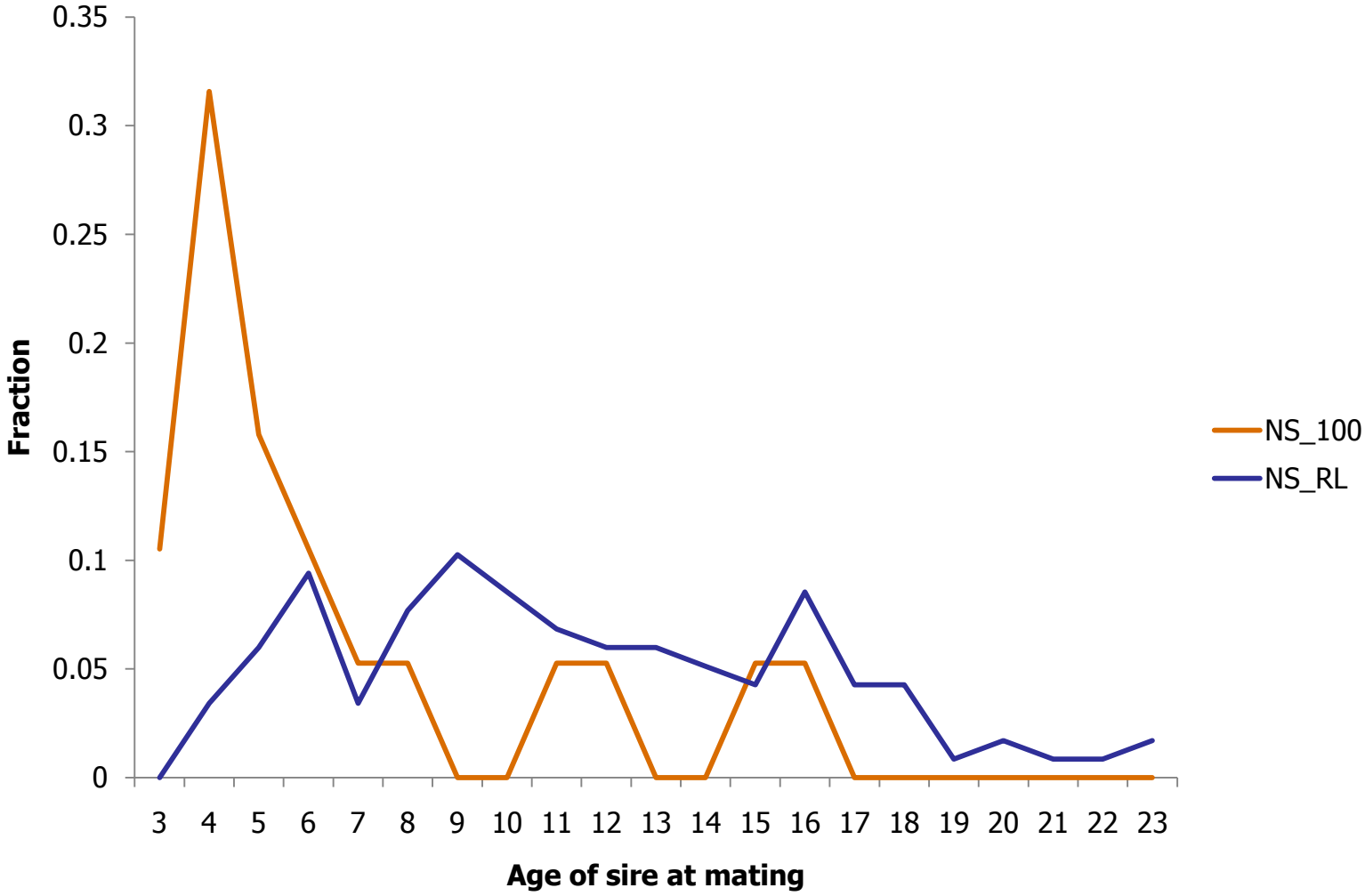
Inbreeding - a retrospective view



Simple statistics

	NS_RL	NS_nolim	NS_100	NS_60
# sires	117	10	19	31
Fraction used in RL	1.00	0.70	0.58	0.55
Fraction approved, not used in RL	0	0.20	0.16	0.13
Fraction non-approved	0	0.10	0.26	0.32
Mean EBV	1.60	2.16	2.17	2.10

Age of sires at mating



Discussion (I)

- Sign of burn-in problems
  - Current coancestry pattern within the population
  - Few selected stallions with large number of mares per stallion
    - Not practical applicable solution
    - Use of restrictions on number of mares/sire/year were introduced

Discussion (II)

- In real life:
  - 10% of mating sires covered 50% of the mares
- OCS recruites young sires and culls old sires
- Other sires being selected than in current breeding system

Conclusions (I)

- Recommended to implement OCS in the Norwegian and North-Swedish cold-blooded trotter
  - Requires active recruitment of stallions
  - Culling of old stallions
  - Annual breeding permission for stallions

Conclusions (II)

- Constraints on number of mares per stallion recommended
  - Can change over time as coancestry will be more balanced
- Efficient use of OCS requires improved recording to secure sire availability
  - E.g. alive, not gelded, disqualifying conditions

Submitted – Journal of Animal Breeding and Genetics


Thanks for your attention!