# Breeding programmes and examples of support programmes for rare breeds

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  - Selection versus conservation
- The Noriker breeding programme
- Support schemes
  - The Austrian approach
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## The dilemma of variation

- Breeding programme
  - A system of activities to move a population closer to a breeding objective over generations
- Breeding objective: good performance, in some sense
- All animals should perform well, i.e., variation is undesirable, bad performers are excluded
  ⇒ selection



## The dilemma of variation

- Selection is very effective in large populations
  - Changes the mean, not so much the variation



## The dilemma of variation

- Variation is under threat in small populations
  - Not so much the phenotypic variation than the genetic variation
- Genetic drift and inbreeding
  - Loss of adaptability
  - Inbreeding depression



## The dilemma of variation

- What to do when breeds are endangered
  - Accept undesirable phenotypes for the sake of avoiding reduced variation?
  - Continue to select according to breeding objective, with the hope that selection also weeds out the negative effects of inbreeding?
- No easy answer
  - Depends partly on the degree of endangerment

## Rare „Austrian“ horse breeds

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- Definition of „Austrian“ is not straightforward
  - Many horse breeds were established during the times of the Austro-Hungarian empire
  - Populations are scattered over the successor countries

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## Rare „Austrian“ horse breeds

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- Noriker
- Lipizzaner
- „Old Austrian Warmblood“
- Shagya Arab
- Hucul

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## Noriker

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- Draught horse
- Truly autochtonous
- Pop size:
  - 2800 mares
  - 200 stallions
- Mostly owned by farmers

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## The Noriker breeding programme

ARGE Noriker
Arbeitsgemeinschaft der Norikerzüchter Österreichs

- Breeding method: pure breeding and selection
- Characterisation of conformation
- Field test for mares and station test for stallions
- Central presentation and grading of stallions
- Stud book

⇒ all elements of a classical breeding programme

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## Lipizzaner

Lipizzan International Federation

- Unique cultural heritage
- State studs
  A, HR, HU, IT, SK, SLO, RO
- „Elite breeding“ by studs
- Private breeders in Austria
  ~ 250 horses
- Private breeders draw from pool of state studs

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## „Old Austrian Warmblood“ Shagya Arab, Hucul

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Photos, ÖNGENE

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## Common features of the three breeds

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- Total population size (world wide) is small
  - Probably ≤ 1000 in each case
- Most of the breeding animals outside Austria
- Breeding is less dominated by state studs than in the case of Lipizzaner
- Need for concerted conservation action across borders

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## „Old Austrian Warmblood“ Shagya Arab, Hucul

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- Current conservation measures in Austria
  - Definition of breeding programmes
  - Establishment of responsible organisations
  - Computer supported mating plans for avoidance of inbreeding based on pedigree information „OPTIMATE“

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## Financial support of rare breeds

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- According to EU directive 1257/99
- Basic support for breeding stock of all 5 breeds
  - Support is higher for stallions than for mares
- Additional support for breeding programmes implementing computer supported mating plans („Old Austrian Warmblood“, Shagya Arab, Hucul)

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## Conditions for financial support

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- Organisation
  - Definition of breeding goals and breeding programme
  - Registration
  - Parentage testing
  - Selection strategies
  - Mating plan (if additional support is given)
- Individual
  - Must be eligible for support according to 1277/99
  - Ownership of agricultural land

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## Support, €/year

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| | Basic Support | Additional support |
|---|---|---|
| Mares | 145 | 145 |
| Stallions | 435 | 145 |

- Mares have to be covered at least every second year
- Stallions must be used for mating

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## Experience with support program

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- Success !!!

Population sizes have stabilised or increased

| Breed | 1997 | 2004 |
|---|---|---|
| Noriker | 2738 | 3218 |
| Lipizzaner | 66 | 148 |
| Old Austrian WB | 18 | 15 |
| Shagya Arab | 87 | 196 |
| Hucul | - | 60 |

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## Experience with support program

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- Computer based mating program is difficult to handle
  - Potential mates are not only of Austrian origin
  - Reluctance of breeders to accept „computerised mating decisions“
- Current debate on continuation of this scheme

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## Conclusions

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- Support of rare breeds has significantly boosted population numbers of autochtonous rare breeds and is therefore highly successful
- Solutions have to be found for breeds with cross-national dispersion
- Let us use the new union of nations as a big opportunity!

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