Conservation and Sustainable Development of Murboden Cattle in Austria

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Content

Introduction
  breed history

Material & method
  conservation program, Genebank registration, recording, data set for breeding program

Results & discussion
  population development, breeding program marketing scheme

Conclusions
Murboden Cattle

Classic multi-purpose breed
- **Draught power**
- Beef - mainly from oxen
- Milk - less important

1900 > 50,000 animals
1950 draught power not needed any more
1970 crossbreeding with German Frankenvieh
Genetic bottleneck

1972 Herdbook discontinued, re-established 1978
   ~ 200 supposedly purebred females
1982 < 500 breeding animals (incl. crossbreds)
   1st conservation program
   nucleus herd on state farm
   collect all breeding animals „phenotypically Murboden“
   collect as much pedigree information as possible
   planned mating/use of genebank
   material compulsory
Conservation, Genebank

4th conservation program
Avoidance of inbreeding, develop products

Genebanking started in 1997
Bull selection by breeding organisation and genebank together
Bulls only rented for semen collection

Use of genebank material (64 bulls total)
18 to 35 AI-bulls/year used in conservation breeding
longtime storage
Registration, recording

Herdbook closed in 2000

Phenotypical assessment of all registered breeding animals compulsory!

Recording part of conservation program

Beef  4046 cows (2014)
Milk  285 cows (2014)

Data set

25,000 calvings (20% first calvings, up to 10 calvings/cow)
16,000 weighing data (200d)
2950 slaughterhouse data sets
approx. 500 herds > 450 bulls
Population development
AI bulls in program

Use of genebank material!

Data: EFABIS
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Inbreeding rate (fd) effective population size

Generation equivalent 2014 = 4.5

Use of genebank material!
Breeding program 2015

Look for a method applicable in practical breeding!

- Combination of classic breeding value and inbreeding control
- Estimation of breeding values for easy calving, daily gain & carcass traits
- Develop easy to use breeding value index for small populations
- Integrate index into existing structures
Breeding program 2015
Estimation of genetic parameters

Easy calving

<table>
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<tr>
<th></th>
<th>direct</th>
<th>maternal</th>
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<tbody>
<tr>
<td>direct</td>
<td>0.17 ± 0.04*</td>
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<tr>
<td>maternal</td>
<td>-0.44 ± 0.10*</td>
<td>0.07 ± 0.02*</td>
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* p < 0.05

Heritabilities high but not unusual!
- Recommend estimation of breeding value according to normal Austrian model
Marketing scheme

Marketing project since 2006
Murbodner association/marketing organisation/ big Austrian food retailer
  Oxen from pedigree herds
  Premium beef label „Murbodner Qualitätsochse“
Heifer and cow program since 2011 – product development
  Sausage „The Murbodner“ – traditional type but pure beef
2015 products well established on market
Conclusion

Population highly endangered after severe genetic bottleneck

- Involve all stakeholders to shape program
- Use of genebank material to control inbreeding rate
- Recording of production traits
- Development of quality products for marketing

⇒ New sustainable breeding program

- Development of weighted index considering productivity and genetic diversity
Looking ahead....

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