



Black Sided Trønder and Nordland Cattle grazing the Røros mountain plateau 2019. Photo: Nina Svartedal, NIBIO.

From almost extinct to virtually saved

This is the story of the local Norwegian cattle breeds that no longer are categorized as *critically endangered*. A pedigree database adjusted to the breeds' needs and close cooperation between farmers, breeding organisations and public authorities are key elements in this success story.

Norway has six local endangered cattle breeds. In 1990 a field survey revealed that four of the breeds had less than 50 breeding cows and none of the breeds were recorded in an appropriate pedigree database. The situation was more than critical and quick action was required. Today, in 2023, all the six breeds have reached a population size with more than 300 breeding females and the situation is no longer critical. The seven key factors behind this success story are presented in this leaflet.

PEDIGREE DATABASE

Keeping track of kinship is essential in any breeding work. It is of special importance in small populations where the two main breeding goals should be to increase the population size and avoiding a high rate of inbreeding. After the field survey in 1990, a pedigree database, The Cow Register, was established, adjusted exclusively for the breeding work on these breeds. The Cow Register is the hub of the conservation work and is today owned and managed by the

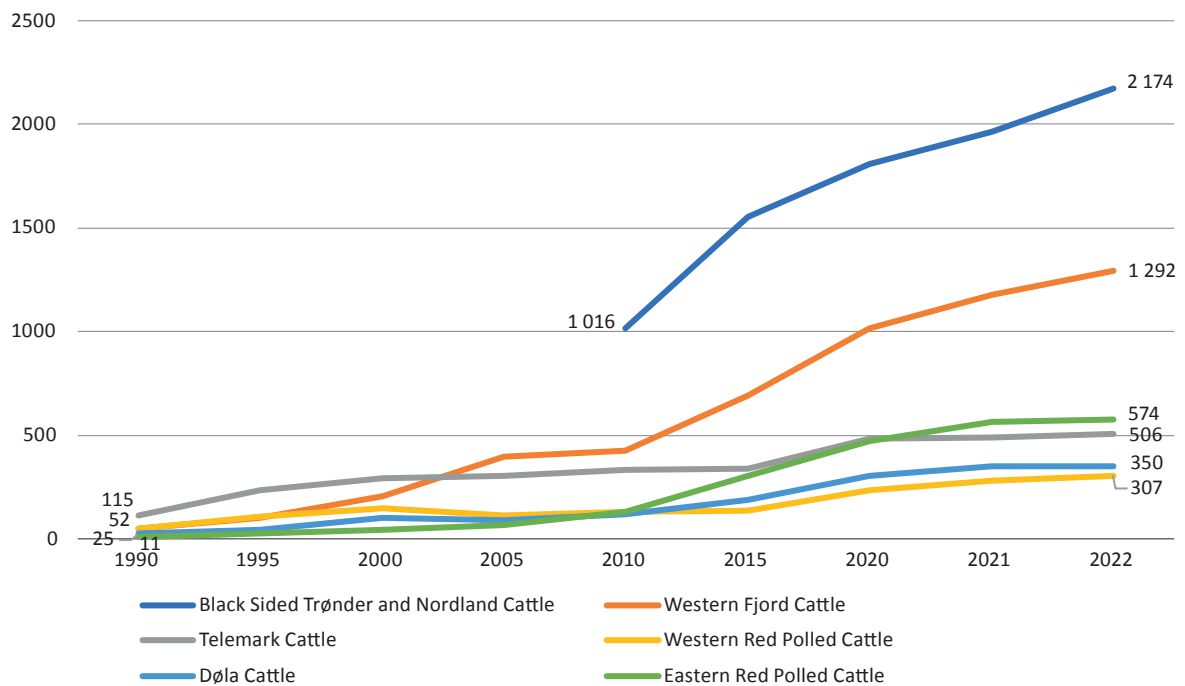


Figure 1 Number of breeding females of the endangered local Norwegian cattle breeds 1990-2022, with five years intervals 1990-2022. Figures on the Black Sided Trønder and Nordland Cattle breed was included in the database in 2010. Source: The Cow Register, Norwegian Genetic Resource Centre, NIBIO.

Norwegian Genetic Resource Centre. It is voluntary and free of charge to register animals in the database. The pedigree database is practically a complete herd book for all these breeds since animals must be enrolled in the Cow Register to be eligible for public grants for keeping these breeds. The database is thus also a good tool for monitoring population status and trends, figures that are annually reported both at national and international level.

BREED SOCIETIES

The breed societies are important networks for the breeders and have three main tasks; The members of the societies mediate animals for sale, especially for new owners of these breeds. They communicate the principles of sustainable breeding practice in small populations to new as well as established farmers. Finally, they communicate traditional knowledge on adequate production systems suitable for these breeds.

REGULAR EXTENSION OF THE GENE BANK

Easy access to frozen semen makes the farmer's breeding work simpler. Some farmers prefer natural mating for their cows, whereas other farmers prefer not to take the risk of hosting their own breeding bull and are thus dependent on access to frozen semen. In Norway, the breeding organisation Geno has since the 1990 annually bought 1-3 bull calves of the endan-

gered local cattle breeds for semen production and extension of their gene bank. Geno is a cooperative, owned by Norwegian dairy cow farmers and covers all expenses for this semen production and storage of the frozen semen.

SUSTAINABLE BREEDING IN SMALL POPULATIONS

Communicating how to breed sustainably in small populations has been prioritized from both animal breeding scientists and public servants involved in the conservation work. The main message has been to use as many animals as possible in the breeding without any breeding matadors and the avoidance of close kinship matings. The main breeding goals should be 1) increase the population size and 2) avoid high rate of inbreeding.

EASY AND FREE ACCESS TO BREEDING ADVICE

Since 2016 the pedigree database The Cow Register has been utilized to estimate the inbreeding coefficient on simulated offsprings between cows and gene bank bulls or farm bulls. Studying the pedigrees and assuring no common ancestors three generations back, was the only way of avoiding quick increase of inbreeding in the population before 2016. Printing pedigree certificates and estimating the offsprings' inbreeding coefficients are services free of charge for the farmers breeding the endangered local cattle breeds.



Young heifers of Western Fjord Cattle, summer 2022. Photo: Nina Svartedal, NIBIO.

To test the effect of the breeding work in the period between 1990 and 2020, effective population sizes (N_e) were estimated for all the six breeds in ten years span based on pedigree information¹. Figure 2 shows

that the breeding work since 1990 has been sustainable when it comes to effective population sizes as N_e has increased or been above 100 by every decade.

1 NIBIO Brage: Inbreeding Trends in Norwegian Cattle Breeds at Risk (unit.no), NIBIO-report; 7(154) 2021

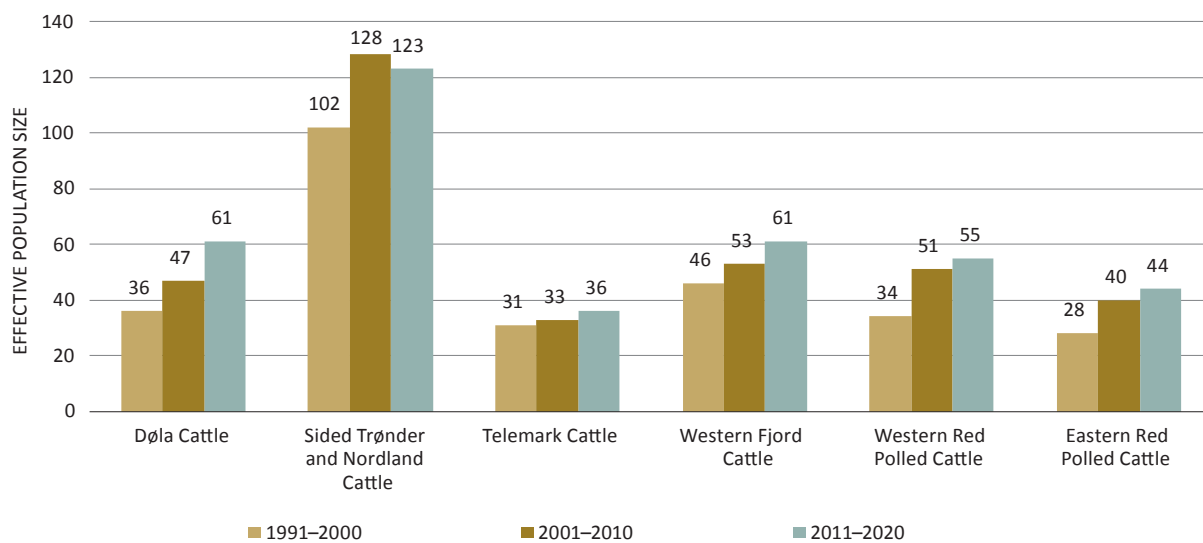
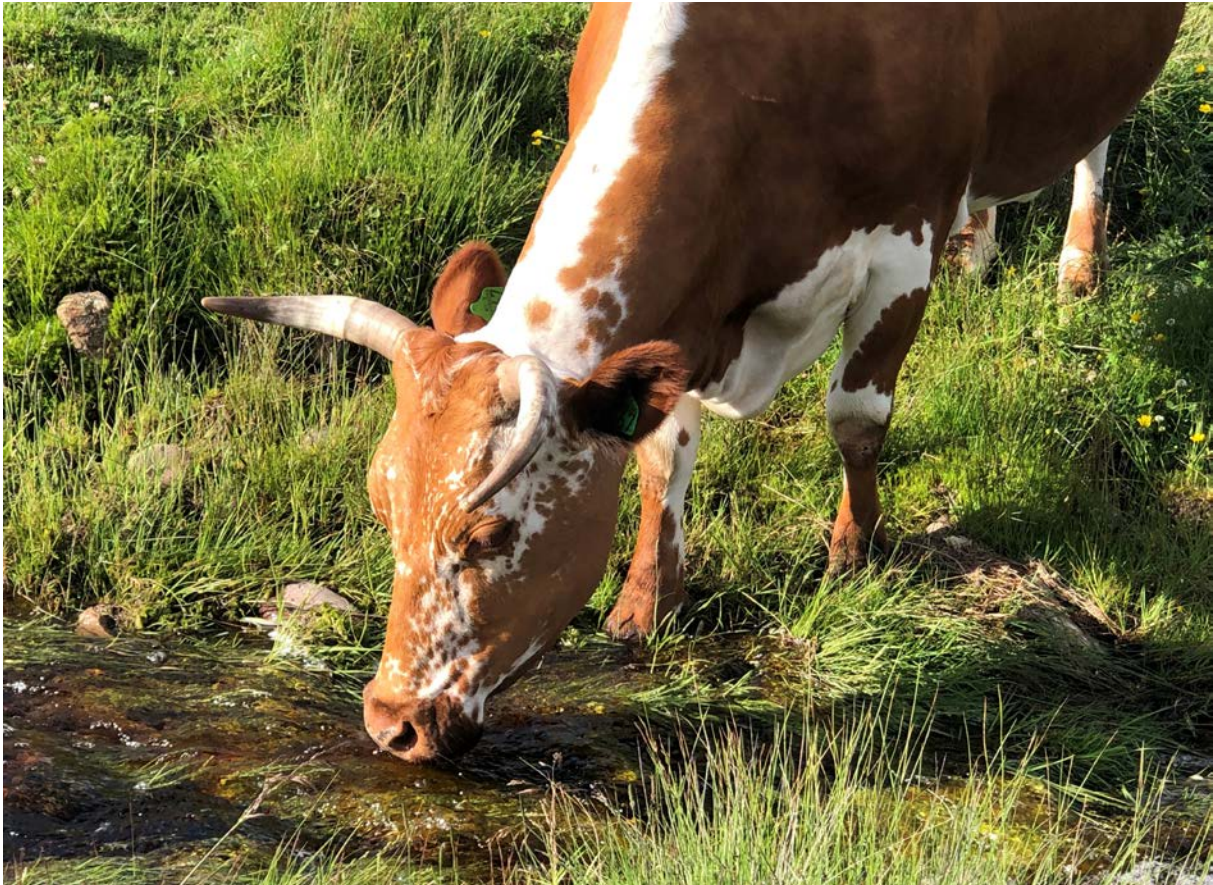


Figure 2 Changes in effective population sizes 1990-2020 for Døla Cattle, Sided Trønder and Nordland Cattle, Telemark Cattle, Western Fjord Cattle, Western Red Polled Cattle and Eastern Red Polled Cattle. Source: The Cow Register, Norwegian Genetic Resource Centre, NIBIO.



Telemark Cattle drinking from a stream at a mountain summer farm, summer 2022. Photo: Nina Svartedal, NIBIO.

NEW AREAS OF USE

All the six endangered local cattle breeds are traditionally dairy cattle breeds. However, since 2015 more than 50 % of the cows are kept as suckler cows in meat production. Today, almost 75% of the cows are kept as suckler cows and the growth in population sizes take place mainly within meat production.

PRODUCTION SUBSIDIES TO BREEDING COWS AND BULLS

The last, but not least, key factor behind the successful conservation work is the subsidies that were implemented in the year 2000. It took eight years before the subsidy extended 100 Euro per cow per year and today the annual grant is 370 Euro per cow per year. The grant is recognized as an acknowledg-

ment of the farmers' effort in their conservation work rather than a substantial contribution to the farmers' income. However, this recognition is highly appreciated by the farmers.

FUTURE CHALLENGES

The trend in Norwegian farming today is fewer and fewer farms, especially farms with cattle. So far, this negative trend has not affected the positive and increasing trend in population sizes for the six local endangered cattle breeds. It may, however, be only a question of time before the trend of closures also affects the farms utilizing these breeds, unless the agricultural policy manages to establish a more optimistic attitude among the farmers.

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