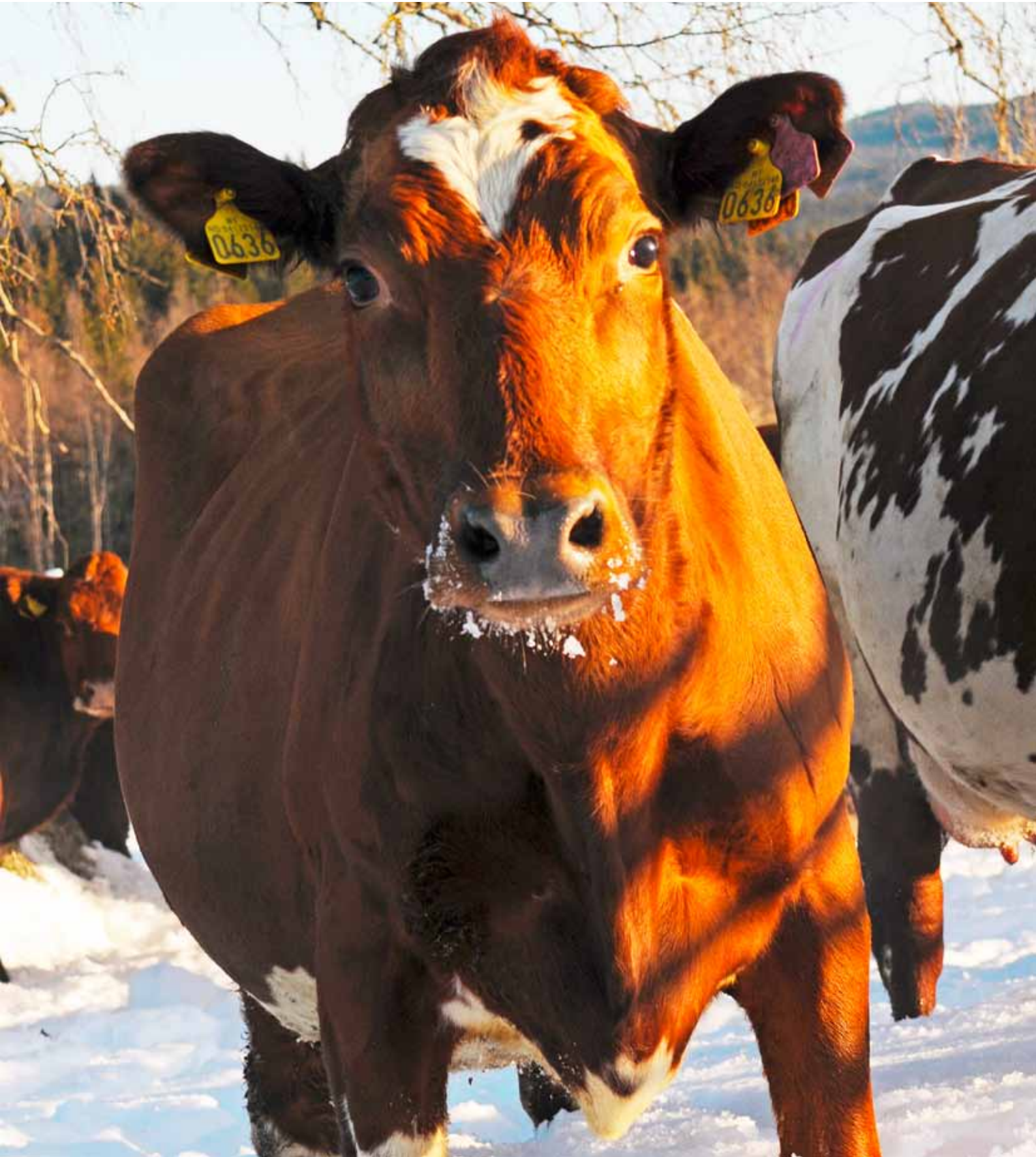


BREEDING FOR BETTER LIVES

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1-2011 >>>



genoBULLETin



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Purebred Norwegian Red (NRF) cow
enjoying a beautiful winter day.
Photo: Solveig Goplen

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Polledness - Norwegian Red unique globally

After the first proof round in 2011 Geno has two homozygous polled bulls available, 10553 Nordbø (TMI 17) and 10558 Skjenaust (TMI 5). Another one will be available after the June proof (10632 Naxbie). Every mating to these bulls will dehorn your calves genetically.

While dehorning may be a routine operation on most dairy farms, there are significant costs associated with dehorning. These costs vary a great deal depending on the size of dairy, personnel employed to do the dehorning and equipment utilized. The most difficult cost to ascertain is the setback a calf goes through resulting from dehorning. Dehorning cattle via genetics using polled sires is a cost effective and animal welfare appropriate practice.

Around 60% of Norwegian Red (NRF) calves born in Norway are polled. The aim is to have a polled breed in 15 – 20 years. The polled gene in the Norwegian Red population comes from three of the 8 local Norwegian breeds that were merged together over 75 years ago.

Tor Arne Sletmoen
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*Norwegian Red
cow on pasture in
Northern Norway.
Photo: Mari Bjørke*

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➤ Norway is the host for this year's EAAP congress, and Stavanger is set to greet 1000 participants from all over the world.

Annual meeting

➤ EAAP (European Federation of Animal Science) is a European organization for domestic animal science. A congress is held every year in one of the member countries. The 62nd annual EAAP meeting will take place in Stavanger from August 29th to September 2nd, and roughly 1000 participant from around the world are expected.

Many different topics

"Agricultural organizations and the scientific community in Norway are collaborating to make this congress possible", says Torbjørn Auran, the President of the local organizing committee for EAAP 2011. Auran further explains that about 800 paper and posters will be presented, divided into the following sections: genetics, nutri-

tion, management and health, physiology, cattle production, sheep and goat production, pig production, horse production, and livestock farming systems. There will also be symposia in the fields of food quality and aquaculture. There will be a lot to keep track of, with 8 to 10 parallel sessions!

Plenary session

A plenary session is devoted to the main theme of the congress, The importance of animal production for food supply, food quality and environment, will be held Tuesday morning. Odd Vangen, who is the President of the local scientific committee, is planning on having three "gurus" hold lectures to provide a wider perspective on these important issues within animal production.

Also Interbull meeting

Various courses and meetings will be held in connection with the EAAP congress, including Interbull's annual meeting, with about 250 participants. This will take place in Stavanger two days before the EAAP congress. The EAAP congress itself will be held in the conference center called the Stavanger Forum. However, participants will also be able to gain some experience of Norwegian agriculture, the research community in the Stavanger region, as well as Norwegian nature thanks to the arranged technical tours. In addition, a symposium will be held at "Måltidets Hus" in Stavanger, a national center specializing in industrial gastronomy.

"The local community has really pitched in to help us. The Stavanger Region tourist board, Stavanger municipality, and the Rogaland County branch of Innovation Norway have all cooperated with us," Auran points out.

Also for farmers

More information about the congress and registration forms for EAAP 2011 can be found online at www.eaap2011.com. It is also possible to register only for individual days for those who prefer this option. Even though the majority of participants will be researchers and advisors, the congress is open to all. The plenary session in particular should be of interest to farmers as well.



The 62nd annual EAAP congress will be held in Stavanger from August 29th to September 2, 2011. About 1000 participants from around the world are expected.

First proof round 2011



© Elly Geverink

Velsvik (10432) is an ideal mate for crossbreeding on cows needing improvement in solids and fertility. His daughters are number one for fertility - particularly for non-return rates on lactating cows - and they also give high fat and protein percent.

Velsvik (10432) ranked first at TMI of 27, beating out Motrøen (10556) and Bosnes (10402) who tied with TMI of 22. Hjulstad (10245) and Eik (10540) tied at TMI 21 while Raastad (10115) and Nord-Braut (10468) tied at TMI 20. The newcomer, Eggtrøen (10579), challenged the top TMI bull, Velsvik, with a TMI of 26.

The March proof round in Geno in 2011 delivered 3 promising new bulls for the international markets to consider: polled Eggtrøen (10579), horned Holmås (10587) and homozygous polled Skjenaust (10558). Eggtrøen (10579) has great numbers for production including a milk index of 123, and above average numbers for most traits with the exception of 83 for calv-

ing ease (advised not to breed to virgin heifers). Holmås (10587), a red, half-brother to Bosnes (10402), is a good all-around bull with TMI of 17 and above averagemilk index (115); he will sire smaller than average daughters. The new homozygous polled bull, Skjenaust (10558) has a TMI of 5, lower than his half-brother, Nordbø (10553), due mainly to a less correct udder (94 for udder index).

Noteworthy strengths for the top TMI bulls this quarter include Hjulstad's (10245) all-time, all-breed high udder index (137) and Velsvik's (10432) non-return rate for cows (123), fat percent (131), calving ease (122) and outstanding indexes for fertility (124), resistance to mastitis (115) and other



© Elly Geverink

Daughter after homozygous polled bull Nordbø (10553). All matings to Norbø will dehorn all your calves genetically.

diseases (128). Bosnes (10402) and Eik (10540) tied for the highest milk index of the proof at 126.

Nordbø (10553) retained his place as the number one homozygous polled bull at TMI of 17.

Selection of elite sires

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Example of inbreeding control: 10278 Haga received a total merit index of 18 after the March 2010 proof round. After correcting for the inbreeding index, his selection value was only 7.2. The bull was consequently removed as an elite sire. Photo: Elly Geverink.



The current breeding objective for Norwegian Red is presented in Table 1. We have chosen to express this in terms of relative weights of traits and/or groups of traits. There are two ways of selecting animals based on a particular breeding objective: the method of independent culling levels and the index selection method.

Selection methods

By establishing independent culling levels, a certain level of merit is

assigned for each individual trait. No animal which scores below these levels will be selected. In the index selection method, a total merit index is calculated through adding together the breeding values for the individual traits multiplied by their relative weights. Animals with the highest total merit index will be selected. As ascertained already in 1942 by the pioneers of animal breeding, Hazel and Lush, the index selection method is clearly superior

to the independent culling levels method. As may be seen in Table 1, NRF selects for 11 trait groups. In this case, selection based on total merit index is 60–70% more effective than the independent culling levels method.

Control inbreeding

In addition to genetic merit the degree of inbreeding should also be taken into account when selecting elite sires. Since the January 2007 proof round, this has been accomplished

➤ The process for deciding who will become an elite sire is the most important factor for the development of the NRF breed. This is the foundation for the pace and direction of genetic change of the individual traits and development of inbreeding. Ensuring that the best bulls are selected is therefore of decisive importance.



Table 1. Norwegian Red breeding objective

Trait	Relative weight
Milk	28
Mastitis	21
Fertility	18
Udder conformation	15
Growth rate	6
Leg conformation	6
Temperament	2
Diseases other than mastitis	2
Milkability	1
Stillbirth	0,5
Calving difficulty	0,5

will be by far the best means for genetic improvement of the NRF population. In practice, however, it is difficult to fully implement this. The breeding values of 43 traits are presented in the sires catalog, along with polledness status and “fishy off-flavour gene” status. Almost every bull has a “defect” to some degree for at least one of these. If such “defects” are important, then the bull may be perceived as unattractive by the farmers. Bulls which are hardly ever used will have little influence on the development of the breed, and are unsuitable as candidates for elite sires.

Selection of NRF elite sire in practice

For NRF we run genetic evaluations four times each year. The bulls receive their first official proofs when they have at least 150 daughters with health information. Bulls who are predicted to reach that minimum three or six months in the future will have preliminary results. Based on evaluations of their preliminary breeding values, a number of promising bulls are selected and placed into quarantine for semen production. The reason for this is

that the potential candidates should have a sufficient supply of semen (10–15,000 doses) at the time of their first official proofs. Because the low reliability of preliminary breeding values, we may occasionally miss a bull in this process. The breeding values of some promising bulls drop, while others surprise us by increasing.

After each proof round, elite sires for the next three month period are selected among those bulls with official breeding values and sufficient supplies of semen. This list is initially based on the selection values, and then adjusted in light of the previously mentioned competing considerations. The list of proposed elite sires is then submitted to the Geno board, which has the final say in the selection of NRF elite sires.

Have it all

The main challenge in the selection of elite sires is to find a compromise between minimizing the use of the rather ineffective independent culling levels method, while simultaneously producing a list of top bulls which is acceptable to the members. Once in a while, we find bulls which would contribute positively to the breed’s overall genetic improvement, but which have such poor results for individual traits that it would be irresponsible to send out a large number of semen doses from them. In such cases, we may consider using a few hundred doses on cows which are strong where such bulls are weak, for the purpose of recruiting sons in the future. In this way, a “lopsided” bull could still contribute as a sire of bulls without his weak trait(s) having any notable significance on the cow population.

by employing a selection value for selection of NRF elite sires. This value is an index, where the total merit index counts for 70% while the bull’s mean relationship with the cow population counts for 30% (bulls less related to the cow population receive the highest inbreeding index).

Competing interests

Given that that the relative weights are “correct”, selection of elite sires based solely on the selection value



Norwegian Red (NRF) successful in

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The sale of NRF semen in Poland has shot up after Geno Global entered an agreement with the Polish company Konrad. This company has a total of 100 employees, 16 of whom work with genetics and semen sales. Its two other areas of activity are live animal sales and the production of beef. Bogumil Sobczynski, who works with sales in one of the western regions, explains that Konrad is the largest importer of cattle semen in Poland. In addition to Geno Global, Konrad also has contracts with companies including Semex, CRI, and VikingGenetics.

Regional differences

The drive northwest from Warsaw leaves no doubt about Poland's potential as an agricultural country. Immense flat acres with fertile topsoil can be seen in all directions in what can be called Poland's dairy belt. Dairy production is concentrated in the



Bogumil Sobczynski from Geno Global's partner Konrad can testify to the rising demand for NRF genes in Poland.

northern and central parts of the country, while much of the industrial production is found in the south. Bogumil Sobczynski tells us that the farms are bigger in the west and that zero grazing is the norm. Maize is an important ingredient in the feed rations. More extensive production, with some grazing, is found in the east. The herds there are smaller and almost all of the farms use artificial insemination.

Because the dairies are traditionally in the east, the dairy farmers in the west earn less money because of a deduction to cover transportation costs.

Vending machines

A recent development in dairy turnover has been the establishment of automatic vending machines for milk. A number of farmers have set these up in shopping centers to sell unpasteurized

FAKTA

POLISH DAIRY PRODUCTION

- Annual production: 11.9 million tons of milk
- 2.5 million dairy cows (582,000 in the herd books)
- 30 dairy cows per herd in the herd books
- 91.5% of cows in the herd books are Holstein
- Approximately 200,000 dairy farms sell milk to the dairy
- Yield of approximately 4,600 kilograms (6,900 kilograms in the herd books)
- Milk price for the farmer: \$0.43 to \$0.53
- Milk price in the stores: \$0.71 to \$0.89



» Poland has a large dairy products industry which is undergoing dramatic changes as a result of the country's having joined the European Union. The Polish market is on its way towards become the most important for Geno Global in terms of volume.

Poland



ized milk. According to Bogumil, this has been greeted with enthusiasm by consumers. Farmers earn \$1.07 per liter, more than twice what most earn by selling milk to the dairy. Unpasteurized milk is also sold in stores, and some consumers believe this milk is healthier than normal milk.

Breeding organization for sale
The Polish Federation of Cattle Breed-

ers and Dairy Farmers was founded in 1995 through the fusion of 16 local cattle breeders' unions, and has been responsible for keeping the herd books. The organization has been publically owned, but the authorities now want to sell it to the farmers. Bogumil explains that the farmers have adopted a wait-and-see attitude, both because they think the stocks are too expensive and because they are not sure wheth-

er the company has a viable future.

Bogumil Sobczynski from Konrad tells us that Polish dairy farmers have to pay semen prices ranging from \$10 for an average bull to \$70 for an elite sire. The biggest farms have their own inseminators, while the smaller farms have to pay anywhere from \$8.50 to \$17 to cover technicians' fees and travel expenses. Heifers require an average of 1.5 inseminations per pregnancy while cows require 2.3 to 2.7 inseminations per pregnancy.

Awakening interest

Even though Holstein is clearly the dominant breed in Poland, the demand for breeds with better disease resistance and fertility is on the rise. This is concretely manifested through growing interest in "colored" breeds like Simmental, Montbelliard, Polish Red, Polish Red and White, Polish Black and White, and also NRF.



© Elly Geverink

»
*Daughter after Storremma (10526), a popular NRF bull in Poland.
Photo: Elly Geverink*



» Poland - an important export market

Only uses **NRF** semen



Daughter of 4939 Rânes – with a yield of more than 7,000 kilograms and 3.74% protein in her last lactation.



“Holstein is like Formula 1. You can drive it really fast, but not very far. With NRF, your speed is not quite as fast, but you can drive and drive without any problems” is how Roman Zabecki sums up his experiences with NRF.

» What began in 2002 as a little experiment has now become standard practice. Except for some beef bull semen used for problematic cows, farmer Roman Zabecki now only uses NRF semen.

Not enough land and a full barn restricted Roman Zabecki's possibilities to expand his dairy production in Rakutowo, 150 kilometers northwest of Warsaw. He therefore wanted to increase beef production and have cows with easier calving and good health traits. Roman explains that fertility wasn't a big problem, although he wanted to improve this trait as well.

Easy calvings

The first thing that Roman noticed about NRF was their easy calvings. Even heifers had uncomplicated calv-

ings. In addition, fertility has improved quite a bit. A single insemination is often enough for the cows to become pregnant. “With NRF, I can inseminate earlier after calving,” says Roman Zabecki. “I had to wait until after the third heat with Holstein, but I can now inseminate after the second heat.” The barn on the farm is an older brick building, and having smaller cows is also an advantage for Roman.

Fewer problems

Roman's goal is a milk yield of 7000 to 8000 kilograms. He emphasizes that

problem-free cows are more important for him than the highest possible yield. As for the question of whether he's noticed a difference in slaughter weight of his cows after he began with NRF, Roman answers that he's not sure because he has only culled two crossbreeds since he first started with NRF seven years ago! He thinks that he would have had to cull at least 15 Holstein cows during that time period.

Almost no veterinary costs

Frequent veterinary visits were one of the reasons that he first



- Roman Zabecki and Malgorzata Zabecka, Rakutowo, 150 kilometers northwest of Warsaw
- 55 dairy cows
- Yield of 7,300 kilograms
- 4.61% fat – 3.46% protein
- Milk quota of 330 tons
- 64 hectares cultivated fields (of which 590 hectares are owned by them)
- 15 hectares grass, 15 hectares maize, 150 hectares with other crops, and 200 hectares pasture
- Bull calves are sold at 1-2 weeks old
- Surplus heifers are sold
- In line for a transition to a pure NRF herd



Roman Zabecki and Matgorzata Zabecka's herd has grown from nine cows in 1991 to 55 cows today, and the plan is to increase to as many as 60 cows next year. On the right in the photo is Anna Pawlicka, an employee of Konrad and an enthusiastic NRF seller in the area.



An old barn, but note the abundance of straw in the cow stalls.

THREE ABOUT NRF



Artificial insemination technician Krzysztof Ormski, who began with NRF semen 18 months ago, runs a semen company as an independent entrepreneur. Sales of NRF semen have tripled since the inception, and Braut is one of the popular bulls. Krzysztof says that when farmers learn more about NRF, they choose the best bulls and not just the cheapest. "Farmers select NRF because of health, herd life, and somatic cell count. Very few of them have barns that are suitable for the big Holstein cows. With NRF, they can earn more by selling heifers instead of having to cull their good cows," he concludes.



Ormski has two Haugset daughters in her barn. They haven't yet used very much NRF semen on this farm, but are planning a two-way cross in their Holstein herd.



Jan Rybacki has used 10032 Haugset, but no cows have yet calved. He plans on using more NRF semen to improve fertility, the main problem in his herd.

thought of switching to another breed. Crossbred cows stay healthy, and Roman says that they've hardly had any veterinary treatments in the last few years. That's something that he notices in his wallet. "Production is also much easier to plan," says Roman. "With Holstein, I didn't have enough replacement heifers because of poor fertility. Now I'm in the situation where I can sell some heifers."

From crossing to purebreds

Like most people, Roman thought of crossbreeding to begin with. Now

he's convinced that only after several generations with NRF will traits such as fertility improve enough to allow for a limited use of Holstein semen again. Roman has switched breeds once before. The Polish breeds were outmatched by Holstein at the end of the 1980s because of yield.

Optimist

Roman Zabecki is optimistic about his future as a dairy producer. He believes that there will be more stable conditions with fewer but larger producers, and it will be difficult to start up completely from scratch. His plan is

to increase his herd by five cows and keep feed costs low. The only purchased feed is a mineral/vitamin mixture and soy protein. Even though the barn is old, Roman and his wife Matgorzata think that it's not bad. They say that they would like feeding to be somewhat more mechanized, but narrow feeding alleys prevent the use of feeder wagons. There are alternative solutions, but Roman feels that they would cost more than they're worth.

USDA genetic evaluations on Nordic

Gary W. Rogers

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Geno Global



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NRF bull Oygarden (252NR5848) has 90 daughters in the December 2010 genetic evaluation and he has the highest daughter yield deviation for milk yield and the highest daughter yield deviation for protein yield among all the NRF, SRB and FAY bulls. Photo of crossbred Norwegian Red x Holstein daughter». Photo: Elly Geverink



Data from the most recent USDA genetic evaluations (December 2010) were used to summarize performance of Nordic Red Sires with daughters in the U.S. Daughters of Norwegian Red (NRF) sires imported into the U.S.

tend to produce more milk and protein and have better fertility than Swedish Red (SRB) and Finnish Ayrshire (FAY) sires imported into the U.S. Swedish and Finnish sires tended to be slightly better for fat yield.

Nordic Red bulls in the U.S.

Thousands of doses of semen from Nordic Red sires have been imported into the U.S. over the past 10 years. Much of this semen has been used in U.S. herds that do not contribute

Daughters of Nordic Red sires (Norwegian Red, Finnish Ayrshire and Swedish Red) have performed well in crossbreeding programs in the U.S. over the past several years. Comparisons of bulls from these three populations are often distorted by marketing efforts so unbiased results are needed to help producers make the best decisions on which bulls are likely to perform best in their herds.

Red Sires in the US

to the national genetic evaluations but a significant percentage of this semen has also been used in herds that are participating in the national genetic evaluation programs. Almost all the NRF and SRB semen that has been used in the U.S. is for crossbreeding. A slightly higher proportion of the FAY semen may have been used in the U.S. Ayrshire population.

Genetic evaluations by U.S. Department of Agriculture

The U.S. Department of Agriculture is responsible for genetic evaluations in the U.S. for most traits and a substantial number of the daughters of imported Nordic Red bulls are now included in these genetic evaluations. All the official genetic evaluation details are publicly available in the U.S. so data are readily available to track and evaluate how well the daughters of bulls are doing in the U.S.

Table 1 contains the number of bulls, number of daughters and average U.S. daughter yield deviations for the Nordic Red sires with U.S. daughters in the December 2010 official U.S. genetic evaluations. Daughter yield deviations measure daughter performance compared with contemporaries or herd mates. Daughter yield deviations are adjusted for all the non-genetic factors that systematically impact performance and they are the main component of genetic evaluations. Daughter yield deviations for Nordic Red bulls are given on the Ayr-

shire scale in the U.S. These daughter yield deviations reflect actual daughter performance with no impact of pedigree or other genetic information. The bulls represented in Table 1 are, of course, bulls selected for import to the U.S. so the results tell us about the performance of daughters of the imported bulls. Danish Red sires are not included in Table 1 because only 3 Danish Red sires with 41 daughters total were included in the December 2010 U.S. genetic evaluations.

The U.S. genetic evaluations are important for understanding the merit of the selected bulls from the Nordic counties because the Nordic bulls are mainly used for crossing in the U.S. and because the U.S. herds represent a level playing field where bulls can be fairly compared with little concern over preferential treatment.

Milk yield, fat yield and protein yield in the U.S.

Daughters of the NRF bulls used in the U.S. tend to have higher milk yield and protein yield than daughters of the SRB and FAY bulls used in the U.S. Daughters of SRB and FAY bulls tended to be slightly higher than NRF bulls for fat yield and fat percentage. Of course protein yield is critical in the U.S. because of its economic value but milk and fat yield should also be considered as they are involved in payment schemes for most herds in the U.S. It is interesting to note that the NRF bull Oygarden (252NR5848) has

90 daughters in the December 2010 genetic evaluation and he has the highest daughter yield deviation for milk yield and the highest daughter yield deviation for protein yield among all the NRF, SRB and FAY bulls. Oygarden is over 500 pounds higher for milk than the next closest Nordic Red bull.

Daughter pregnancy rate in the U.S.

Daughters of NRF bulls were better for daughter pregnancy rate (measure of cow fertility) compared with daughters of SRB and FAY bulls. Daughter pregnancy rate in the U.S. is impacted only by reproduction in lactating cows (no virgin heifer data are included) and it reflects the timing of insemination as well as conception rate of the cows. Higher numbers are desirable for daughter pregnancy rate as this reflects increased speed and efficiency at getting pregnant.

The top 5 Nordic Red bulls for daughter pregnancy rate were all NRF bulls and 7 out of the top 10 bulls for daughter pregnancy rate were NRF bulls

Table 1. Number of bulls, mean number of daughters per bull, total number of daughters per bull and average U.S. daughter yield deviations (in pounds for milk, protein and fat production) by country of origin for Nordic Red bulls with daughters in December 2010 U.S. genetic evaluations.

Country of origin	Number of bulls	Average daughters per bull	Total number daughters	Average U.S. daughter yield deviations for U.S. traits						
				Milk yield	Protein yield	Protein percentage	Fat yield	Fat percentage	Somatic cell score	Daughter pregnancy rate
Finland	11	55	609	1459	55	0.04	65	0.05	-0.24	-0.1
Norway	13	45	583	1653	59	0.03	52	-0.05	0.00	2.7
Sweden	22	324	7136	1588	58	0.04	72	0.06	-0.02	1.6