

Higher NTM leads to less methane

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The breeding goal is based on NTM, and breeding for NTM increases the economic profit per cow. Across breeds, the profit of 1 NTM unit is 9 Euro per cow per year. The extra profit is based on higher production and lower cost based on more functional cows. The good news is that a higher NTM also gives less methane, so breeding for higher NTM also gives a more climate friendly cow.

SimHerd can give the answer

By using the simulation program SimHerd, it is possible to account for the changes that will happen in a herd when NTM is increased. For this article, two scenarios were investigated, where the differences of 10 NTM units were calculated. The first scenario was the standard, with no use of sexed semen and beef semen, while the other scenario was intensive use of sexed semen and beef semen. Both scenarios were calculated for the three breeds Holstein, RDC and Jersey. The herd data were the phenotypic values across NAV countries from November 2023.

As expected, an increase of 10 NTM units gave higher production, better fertility, less treatments and lower replacement level for both scenarios and for all breeds.

Increased level of NTM reduces methane

When NTM is increased by 10 units in a herd that only uses conventional dairy semen, the amount of methane per kilo produced fat + protein is reduced for all breeds. RDC has the biggest reduction in methane with 1.7 percent while the reduction for Jersey is 1.0 percent and 0.9 percent for Holstein. All three breeds increase the production level by 20 to 23 kg fat + protein, and the replacement rate is reduced 3.3 to 4.3 percent because of better fertility, healthier cows and 4-5 extra heifers for sale. The higher production requires a higher feed intake, and for RDC the increased intake in kg dry matter is lower than for the two other breeds.

Standard No sexed semen and beef semen	RDC		Jersey		Holstein	
	0 NTM	+10 NTM	0 NTM	+10 NTM	0 NTM	+10 NTM
Kg fat + protein	803	826	802	822	873	896
Replacement %	35.7	32.4	31.3	27.4	33.3	29.0
Sold heifers	8	12	10	14	9	14
% reduction in methane		1.7		1.0		0.9

Table 1. Effects of +10 NTM in the standard scenario, with no use of sexed semen, for all the breeds Holstein, RDC and Jersey. The % reduction in methane is based on gram methane per kg produced fat + protein.

Intensive use of specialized semen gives higher methane reduction

Surprisingly, intensive use of sexed semen and beef semen gives a higher methane reduction when NTM is increased by 10 index units. For the scenario with 0 in NTM, sexed semen is used on all the heifers and 35 % of the cows the first two inseminations. Beef semen is used on the remaining 65 % of the cows. For the scenario with +10 in NTM the use of sexed semen on cows is reduced to 25 % and beef semen is increased to 75 %. This is due to the reduced replacement rate caused by better fertility and health. The changed use

of beef semen gives around 10 beef calves extra per year, with 45-47 beef calves in the scenario with 0 in NTM and 55-58 beef calves produced per year in the scenario with +10 in NTM.

For all three breeds, the production increases by 7 to 14 kg fat + protein and the replacement decreases with 5.6 to 5.7 percent with +10 NTM. The lower increase in production compared to no use of sexed semen is caused by less calving's that give fewer cows in early lactation and more cows in late lactation because of a better longevity. The lower replacement rate and use of beef semen means that the amount of replacement heifers drops with 15-20 heifers per 100 cows.

When NTM increases by 10 units, RDC has a decrease in g methane per kg fat + protein by 4.6 percent while it is 2.5 percent for Jersey and 2.2 percent for Holstein. This means that the reduction in g methane per kg fat + protein when NTM increases by 10 units is 2.5 to 2.75 times higher when sexed semen and beef semen are used intensively. The amount of reduction in methane when NTM increases is therefore also dependent on the breeding strategy used in the herd. The reason for the breed difference is again a lower increase in feed intake for RDC compared to the two other breeds.

Use of sexed semen and beef semen	RDC		Jersey		Holstein	
	0 NTM	+10 NTM	0 NTM	+10 NTM	0 NTM	+10 NTM
Kg fat + protein	799	813	809	817	877	884
Replacement %	35.8	30.2	31.2	25.5	32.9	27.3
Replacement heifers	105	85	85	70	89	74
% reduction in methane		4.6		2.5		2.2

Table 2. Effect of +10 NTM in the scenario, with intensive use of sexed semen and beef semen, for Holstein, RDC and Jersey. The % reduction in methane is based on gram methane per kg produced fat + protein.

Use NTM to get more climate friendly cows

If you select bulls by NTM – regardless of breed - you will get more profitable cows and at the same time reduce the methane emission per kg produced fat and protein. If you combine it with intensive use of sexed semen and beef semen you will get an even bigger reduction of methane emission.