

Study shows that genomically tested bulls retain their NVI levels when daughter proofs become available

# Genomic sires maintain their breeding values

Genomic bulls that 'disappoint' when they get a breeding value based on daughter information tend to be the focus of a lot of attention. But there are exceptions. A study has shown that, on average, genomic bulls will maintain their breeding values up to the standard.

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Exactly two years ago Dutch and Flemish cattle breeders were introduced to genomic breeding values. In August 2010, Dutch organisation Genetic Evaluation of Sires (GES), which is responsible for publishing the country's breeding values, revealed its 'hit parade' of bulls without daughters.

Since then, two years have passed and many cattle breeders have become used to using breeding values of bulls with and without daughters.

So it's time for an interim evaluation: do the genomically-tested bulls live up to their figures? Of the bulls with a genomic breeding value, 505 have also recorded a daughters' breeding value.

So, how do their daughter breeding values of August 2012 relate to their latest genomic breeding value? Commissioned by the GES, which assesses the results of the genomic bulls after every proof run, Gerben de Jong, from the Animal Evaluation Unit team at CRV, has listed all the results.

## NVI points

First of all, Mr de Jong examined how the bulls performed on average. Table 1 shows the average difference between the genomic breeding values and the daughters' breeding values.

For NVI the bulls dropped by two points on average on the transition from genomic to daughter breeding values, with an increase in the reliability of 23%. "Two NVI points is such a small difference that nobody should worry about that. It indicates that the bulls as a group turn out well. The genomic breeding values of the bulls are not underestimated or overestimated," says Mr de Jong.

That also applies to the other characteristics, such as kilogrammes of milk, longevity and the type breeding values.

Again the differences are small. Equally relevant is the matter of whether bulls that are at the top with their genomic breeding value also

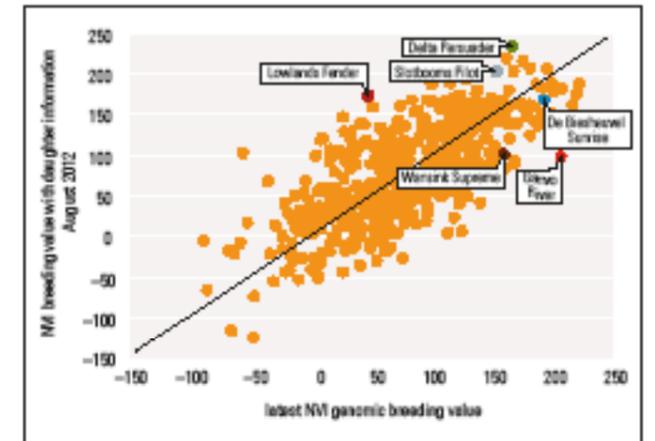


Figure 1: The breeding value, with daughter information for NVI of 505 bulls offset against the genomic breeding value

remain at the top if the daughters' breeding value is also known.

## Five groups

In order to be able to determine that, Mr de Jong plotted a graph for all bulls the daughter values of August 2012 against the latest genomic breeding value (see Figure 1). What did it show? Most points were parallel.

"That means that, on average, the bulls that score highly on the basis of genomics, also score highly on the basis of daughters' breeding values. Bulls do not do extremely badly or suddenly improve dramatically."

The fact that the majority of the bulls that scored highly for genomics also have a high daughter-breeding value can also be seen in Table 2 (on the next page). Mr de Jong divided the 505 bulls up into five groups. Of the bulls that, on the basis of genomics, ended up in group five – or the highest 20% – two thirds also ended up in class five on the basis of daughter information. Another 20% are in group four.

## Detailed study

CRV's head of breeding Sander de Roos has made a detailed study of the comparison between the genomic breeding values and the daughters' breeding values. He is pleased with the figures.

Mr de Roos refers to Figure 1. "Suppose we had decided only to test bulls with a genomic breeding value of more than 150 NVI. There are about 60 of them or the best 12%.

"Subsequently virtually all breeding bulls with daughter breeding values turned out to come



from this group, such as Pilot, Refiner, Persuader, Tobias, Ormsby and Sunrise.” Mr de Roos also looked into what would have happened if CRV had not used bulls with a genomic breeding value below 100 NVI.

“Then we would have missed Fender and Emanuelson. They now score between 160 and 170 NVI and are, therefore, second rank.”

The figures may look good, but in practice there are regular discussions about bulls that disappoint on the basis of daughter information.

Wansink Supreme is such a bull where the genomic breeding value deviates from the daughter breeding value. The latest genomic breeding value of the Classic son amounted to 156 NVI. His current daughters’ breeding value amounts to 100 NVI.

**Bull fathers**

Supreme therefore dropped by 56 NVI points. “That is a considerable difference but you can’t just say that daughters of Supreme will straight away be worthless cows,” believes Mr de Roos.

“His breeding value of 100 NVI is at the same level as the breeding value of breeding bulls that at that time were the most used, such as Olympic, Surprise and Twister.”

However, Mr de Roos does advise spreading the use of genomic bulls. “Don’t just concentrate on the one success story, but spread your bets. It’s better to have a couple of daughters from different genomic bulls.”

Genomic bulls are also becoming a success as ‘sires of sons’. At the moment 70% of the embryos that CRV produces are sired by genomically-tested bulls, according to Mr de Roos.

“The risk that the breeding values of a genomic bull will fall is somewhat greater than with a bull with a daughter breeding value.

“From Wansink Supreme, for example, we have tested a number of sons. They do score a bit lower although they are naturally not hopeless.

“With Lowlands Fender the use of a genomic bull as bull sire turned out quite well. For example, Camion van de Peul is a result of that.”

CRV does have a policy with bulls at the same genetic level of giving preference to a bull with a daughter breeding value. “We are, for example, using Persuader as a bull father and we have also used Danillo.”

First of all, according to Mr de Roos, a

characteristic	difference
NVI	-2,2
% reliability NVI	23,1
kg milk	-16
kg fat	0,7
kg protein	-0,2
longevity (days)	-16
total type score	-0,6
frame	-0,6
dairy strength	-0,5
udder	-0,4
feet and legs	-0,4
SCC	-0,2
udder health	-0,2
fertility	-0,1

Table 1: Per characteristic the difference between the latest genomic breeding value and the daughters’ breeding value, averaged over 505 bulls (source: GES)

daughter based class NVI		genomic based class NVI				
		low				high
		1	2	3	4	5
1-20%	1	55	32	12	3	0
21-40%	2	26	31	32	12	1
41-60%	3	9	18	32	26	14
60-80%	4	10	17	16	40	18
81-100%	5	1	4	9	20	67

Table 2: Distribution of 505 bulls that on the basis of genomics belong to different classes and the class to which they belong on the basis of daughters’ breeding values. The lowest 20% of bulls is in group one and the highest 20% in group five.

genomic bull is now also on the sire list of which the grandsire still has no daughters’ breeding value. This concerns the red-and-white De Vrendt Aram, a son of Blom Farm Award (sire Ramos). He scores 242 NVI.

**Reliability scores**

Mr de Roos notes that cattle breeders are sometimes afraid that the breeding values of such bulls will change a lot.

“That may be the case, but such a bull really does not score nothing as far as the NVI goes if its daughters produce the milk,” he says.

“It is highly likely that Aram, on the basis of his daughters, will ultimately end up above 200 NVI. That level will not be reached by the majority of the bulls with a daughter breeding value.”

He takes the bull Kian as an example. “Kian now scores 140 NVI with reliability of 99%. His breeding value could change a few points at the most, but you can be sure that such a bull will never reach 200 NVI.” |