

Feature: Selection and Reproduction

Profitable dairy farming starts with genetics

The Netherlands – a leading world economy in genetic production and marketing

The Netherlands is one of the most advanced European countries in the area of dairy cows farming. It is one of the biggest exporters of heifers and semen worldwide. Dutch dairy milk cows are well known for their quality all over the world. Dutch sires' semen is sold in more than 80 countries. Heifers are exported in Europe, Northern Africa and the Near East. Different Dutch sires occupy the top positions of world ratings! Another impressive example: every year 2 million doses of semen and 50, 000 heifers are exported from the Netherlands to more than 60 countries. This means that about 1 million calves are of Dutch pedigree. There is no better advertisement or proof of quality. Therefore, by no means is it accidental that last summer Holland was the host of a big specialized expo, which included visits of dairy farms. Agro journalists from Europe were among the participants. And, of course, the AgroCompass team was among the invited by *Veepro Holland* – the information centre for Dutch dairy cows that supports the export of dairy cows, semen and embryos. *Veepro Holland* works in cooperation with the Product Board for Livestock and Meat (PVV), the Dutch Association for Export of Cattle, Semen and Embryos (NV ExportNet) and the Cooperative Cattle Improvement Association (CRV). *Veepro Holland* works closely with the Ministry of Agriculture, nature and Food Quality (LNV), The Animal Health Service (GD), the Dutch Association for Livestock Trade (NBHV), the Cattle Committee of the Farmers Union (LTO) and the Association of Exportstables for Breeding Animals (VEF). All these organisations are represented in the Board of Veepro Holland by an advisory membership.

The best achievements of Dutch breeding could be seen at this expo. Held every two years, it is visited by guests from all-over the world, as it is one of the three most important world expos. Among the traditionally presented companies is CRV, an international enterprise that develops, produces and sells genetic products. This is a cooperative where 37 000 of the members are Dutch and Flemish farmers. The headquarters are in the Netherlands, and its subsidiaries are in Belgium, Luxembourg, Germany, the Czech Republic, Spain, Brazil and New Zealand.

CRV breeding programmes include animals of different breeds like Black-and-white, Red-and- white, Jersey, etc. During the selection process, the company focuses on animal productivity, animal health and durability.

High productivity dairy farming

is based on several fundamental markers or paths, leading to farm profit. First come udder health and the fertility of the dairy cows. Poor udder health and low fertility result in high vet costs, premature culling and loss of milk. Longevity is another important marker for the financial performance of the herd. High longevity means a low culling rate, high milk production, reduced rearing costs and low vet costs.

Production determines the herd's income. It is of utmost importance that the sires are selected out of the most productive cow families in the world. They breed cows with an enormous will to produce lots of milk with high components.

Conformation traits that are relevant for increased longevity are also very important. Beautiful cows that are durable cows and therefore profitable cows. A beautiful and durable cow gives the breeder financial rewards and personal satisfaction. How can you ensure and combine all these markers? By using proved and reliable sires, whose daughters are economical and durable cows. This is the way to high productivity in dairy farming.

CRV uses 10 Profit Pointers to indicate the specific economic strength of a bull. These Profit Pointers can be used as a tool in sire selection. These are: Kg Milk, % Fat, % Protein, Longevity, Calving Ease, Udder, Feet & Legs, Conformation, Udder Health and Fertility.

What is longevity?

Longevity measures the productive life of a dairy cow, which is the difference in day between her first calving and her final milk recording. The breeding value for longevity (LGV) is based on direct information – the actual lifespan of a sire's daughters and on indirect information, such as pedigree information and predictor traits.

CRV research shows that low longevity means more culling due to:

Costs per cow per year

- Mastitis € 50.00
- Fertility problems € 25.00
- Feet & Legs problems € 23.00
- Other problems (such as calving ease) € 27.00

Longevity is presented as:

- average = 0 days LGV
- + 0 days LGV are bulls with high longevity
- – 0 days LGV are bulls with a longevity below average

Economic value of longevity

Higher longevity

fewer involuntary culls

100 days LGV higher



number of productive days of daughters increases by 50 days

Longevity in practice

The influence of longevity on a farm's profit is significant. We can see just how significant it is by looking at the following example. We compare two dairy farms with different culling rates.

Farmer A

Farmer A milks a 100-cow herd with a calving interval of 13 months. The culled cows have an average lactation length of 6.5 months. The culling rate is 40% and longevity is low. The dairy herd produces an average of 7,351kg of milk per cow per year. To keep the herd at the same size, 112 cows have to start a lactation every year. The milk production is not optimal because the cows have short lactations. A lot of heifers are being brought into the herd to maintain herd size. This means rearing more young stock, more work and increased costs.

Farmer John

Farmer John also milks a 100-cow herd with a calving interval of 13 months. On his farm the culling rate is 30%. The cows have an average lactation length of 10.5 months. Farmer John's cows produce for four months longer. The average production is 8,399kg of milk per cow per year – 1,048kg of milk per cow per year more than Farmer A.

The profit?

You can calculate the difference in milk income based on the price in your country. If we put it at € 0.30 per kg of milk, then farmer John earns no less than $€ 0.30 \times 1,048\text{kg of milk} = € 314.40$ per cow per year more than his colleague. This is more than € 30,000 for the whole herd!

And there's even more profit! Farmer John has also the advantage of lower heifer rearing costs. He raises 12 fewer heifers every year. Raising a heifer costs about € 1,100. Therefore he saves another € 13,200 thanks to the higher longevity of his herd. And that profit also returns every year.

Effect of breeding on longevity

We now know that a high culling rate is financially damaging. With a good breeding strategy, aiming for longevity, the culling rate can be reduced. Take a look at the example below.

The average score for Longevity (LGV) is 0 days. Every 100 days LGV above 0 increases the longevity of the bull's daughters by 50 days.

What is the effect in practice?

Let's take a look at Farmer John's herd: 100 dairy cows, 8,399kg milk per year, average productive life 1,220 days (from first calving to culling). The farmer uses bulls with +300 days LGV. The effect after one cow generation: an increase in the productive life from 1,220 to 1,370 days and a decrease of the culling rate from 30% to 27%. This is the effect of using bulls with high indexes for LGV for just a year.

Farmer John:

"You must see longevity in combination with lifetime yield.

The bull of my choice must possess a minimum score of 100 for longevity. That's the kind of bull that sires cows that get back in calf more easily, have less chance of getting mastitis, have a sound

udder and good feet & legs. These bulls give the most profitable cows. Some of them produce more than 100,000kg of milk. We've had 13 of them. Two of them produced more than 10,000kg fat and protein. And in both categories there are more to come.”

Health and Fertility

Farmer John wants to enjoy dairying. He aims to farm in a profitable and trouble-free way, which will save him time and money and leave him more satisfied with his work. To achieve these goals, it is important that his cows have optimal health and fertility. Among others, breeding is a factor that can improve health and fertility of the herd. Let's take a look at the herd of Farmer John and go through the possibilities for improving farm profit by using breeding values for fertility and udder health.

Fertility

Fertility problems have a negative effect on farm profit. Improving herd fertility will result in:

- higher milk revenue
- lower insemination costs
- lower labour costs
- lower veterinary costs
- less premature culling

The easier a cow gets in calf, the better. It means less labour, less costs and more satisfaction on your farm. Semen supplied by CRV is continuously screened on quality and fertility and meets the highest EU quality standard to offer you guaranteed quality. On the female side, fertility can be improved by changes in feeding and management. Breeding for better fertility is also possible. In the Netherlands we have a wealth of data about fertility as a result of which all CRV sires have proofs for the fertility of their daughters (daughter fertility), which is a very good tool to improve fertility in the herd.

Daughter fertility is calculated from:

- non-return rate, 56 days after first insemination
- interval between calving and first insemination
- interval between two calvings
- condition score
- milk production

The average of the proofs for daughter fertility is 100. Using bulls with proofs of 100 or higher means that their daughters will have a better than average fertility. We calculated what this could mean for Farmer John (table 1).

Table 1: Pregnancy rate and revenue after insemination (*)

Proof daughter fertility	Calving interval (days)	Pregnancy rate	Effect on income (**)
96	404,0	47,5%	-€ 1921
100	401,9	50,0%	--
102	400,8	51,3%	+€ 969

*first service 120 days after calving, 100-cow herd, on average 50% in calf after first service.

**effect on income compared to an average proof of 100.

Higher scores for daughter fertility result in shorter calving intervals and higher pregnancy rates. As a result Farmer John has lower insemination costs and higher milk revenue. If he uses sires with a proof of 100, he earns €1,921 (see table 1) compared to using bulls with a proof of 96.

Udder Health

Mastitis is one of the most significant health problems in dairy herds. The positive effects of improving udder health are:

- less production lost
- less undeliverable milk
- lower cost of treatment
- lower labour costs
- fewer involuntary culls

Healthy udders are absolutely essential to avoid trouble with mastitis. Management and housing are the most important factors influencing udder health. But udder health can also be improved by breeding and choosing the right bulls is critical.

The average proof for udder health is 100. A higher score means healthier udders and fewer cases of mastitis. On average, a sire with a proof of 104 will have 3% less cases of mastitis in his daughters compared to a sire with a proof of 100. And a proof of 104 for cell count lowers the daughter's cell count by 10,000 cells/ml.

Let's return to Farmer John and see what difference the choice of bulls makes in saving on mastitis costs (table 2).

Table 2: Total costs of mastitis*

	Proof Udder Health 100 (average)	Proof Udder Health 104
Production loss	€ 4 170	€ 3 689
Undeliverable milk	€ 1 564	€ 1 383
Treatment costs	€1 314	€ 1 163
Total costs	€7 048	€ 6 235

Advantage compared to sire with proof of 100: € 813

**100-cow herd, average yield 8,200kg/305 days, milk price € 0.30. All calculations are based on averages and price levels in Western European countries.*

By using sires with a proof of 104 for udder health, the number of cases of mastitis on Farmer John's farm is expected to decrease. With this strategy he can add € 813 to his income.

How much will it be on your farm?