

- ✓ Less demanding, strong, calm cow
- ✓ Favorable fat/protein ratio
- ✓ Nicely muscled cows and calves
- ✓ “No frills” cow

# MRY



## History in a nutshell

Meuse-Rhine-Yssel cattle (abbreviated as MRY) originates from two regions in The Netherlands; partly from the province Overijssel (along the river Yssel) and partly from the east of the province Noord-Brabant (along the rivers Meuse and Rhine). MRY cattle have been registered at NRS (currently known as CRV) since 1874, and in 1905 the MRY were recognized as a breed and the MRY herd book was started. In those days, MRY was one of the three most common breeds in The Netherlands, besides Dutch Friesian and Groningen White Headed cows. Up to the '60's and '70's, MRY represented 25% of the Dutch dairy cows (more than 500,000 cows). Since then, the number of purebred MRY decreased rapidly, with a strong decrease since 1999. In 2004, approximately 14,000 cows with at least 87.5% (7/8) MRY-blood were registered. In 2008 the number increased slightly up to 15,000 cows.

## Breeding

Breeding MRY-cows originates from two regions in The Netherlands; the first region is along the river Yssel: the West-Achterhoek, Salland, Twente and in south-west of the province Drenthe (currently represented by the breed organization called MRY-East). The second region is in the east of the province Noord-Brabant and is currently represented by the breed organization called MRY-South. In the northern part of The Netherlands the animals were not colored as dark as in the south. The preferred bull 'Prins' (born in 1941) from the region along the Yssel and his offspring played a major role in this. The color of the coats became less and less important because economical aspects were more important for farmers. But still, a select group of farmers are still focused on the color.

## Description of the breed

MRY is a red and white dual purpose breed. The cows are relatively good in coping with changing conditions and are easy to manage for farmers. Their fertility is good and they calve easy. The claws of the cows are strong and the rump angle of the cows is good. The cows are strongly muscled and they have a high protein content in the milk, with a favorable fat/protein ratio. In general, the cows are strong, calm, robust, muscled with thick thighs and strong legs.

MRJ PRINS 7055 pref. II  
geboren 1941.  
2.0 – 130 – 54 B 79.9.  
Verhoogde het vetgehalte van 3.51% tot 3.52%.  
Dochters: 2.6 – 3994 kg – 354 dagen;  
6 – 5127 kg – 338 dagen.  
(Eerste melkhoeveelheid zonder oorslogscorrectie).



"From: 100 jaar Koninklijke Vereniging het Nederlandsche Rundvee-stamboek 1874-1974"

The strengths of a MRY-cow are her longevity, few problems with claws, good fertility, low veterinarian costs, and high profit when the cows are slaughtered, compared to the typical Holstein-Friesian dairy cows. Economic comparisons consistently show that costs of milk production with MRY cattle are relatively low. Economic figures indicate that currently farmers with MRY-cows earn 1 to 2 cents more per kg milk than farmers with Holstein-Friesians.

## Red Holstein

In the '80's, the breeding program of the MRY-cattle was not so successful and not many good bulls were offered for Artificial Inseminations. MRY produced less milk than the Red Holstein cows (Table 2), but provided as dual purpose cows still a good income from selling young calves and slaughtering bulls and cows.

At that time, MRY farmers started crossbreeding with Red Holstein bulls from Canada: red dairy cattle with the same milk yield as the black Holsteins. Most farmers were convinced that scaling-up, increasing milk production and controlling costs of labor could be achieved best with Holstein-cows. That's why the Red Holstein was used frequently in those days. Next to milk production, the conformation of the udder improved considerably as well. In 1994 the red dairy cattle in The Netherlands carried mostly Red Holstein-genes and the MRY-breed had to fight for their own identity and against the risk of lack of genetic diversity. Table 1 shows the number of pure MRY-cows ( $\geq 87.5\%$  MRY) between 1975 and 2008.

**Table 1.** The number of purebred MRY-cows in The Netherlands between 1975 and 2008.

Year	Number of cows ( $\geq 87.5\%$ MRY)
1975	>500,000
1999	31,036
2002	18,339
2004	14,124
2008	15,000

The introduction of the European milk quota system in 1984 imposed a limit to the milk production per farm. On many farms an additional kg of milk did not increase the profit anymore. However, protein and meat production were not limited, and MRY became more competitive again. As a typical dual purpose breed, MRY are suitable for producing both milk and meat; the calves grow faster and the cows are stronger muscled when slaughtered. Besides, the protein content in the milk of MRY-cows is higher than of Holstein-cows, and their fat/protein ratio is favorable as well.



*“When the MRY-cow was like the current MRY-cow when the first Holstein-sires were introduced, we would not have needed the Holstein-genes”*

### Breed conservation

In 1994 the breed organization MRY-East was founded to promote the interests of the MRY cattle. The aim of this breed organization was to select more MRY-bulls to ensure that the breed would have a better and broader base. A separate breed organization MRY-South was founded in 1992. This breed organization focused more on efficient production of milk.

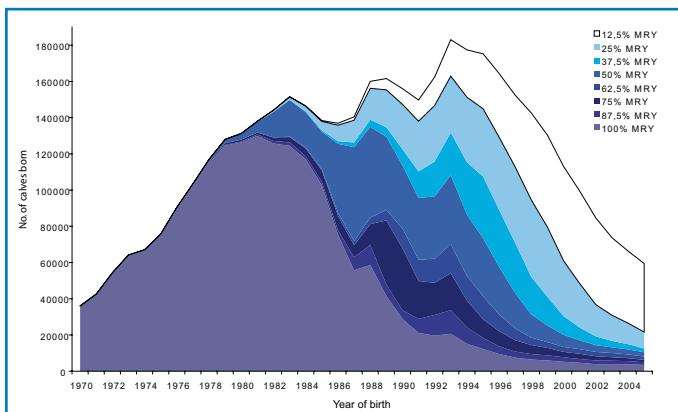
*“Counselors only look at kg milk per cow, not at net income per cow”*

Both breed organizations promote the breed by emphasizing its strong point, among which its ability to be used efficiently in low-input farms. Both breed organizations also participate in developing the breeding program for MRY together with CRV. The breed-

ing goal of this dual purpose breed used to be focused more on milk yield than it is nowadays. Currently the weight of milk yield in the index is 35%, whereas the functional traits durability and health have a weight of 25% as well as conformation. Muscling has a weight of 15%.

### Breed demographics

In order to analyze trends in numbers of purebred and cross-bred MRY over the years, a demographic analysis was performed including all calves born between 1970 and 2005. The population was split in eight classes, depending on the percentage of MRY genes in each calf that was born (1/8 to 8/8). Figure 1 shows the number of calves born per year per class. A strong decrease is seen in the number of purebred (i.e. 100% or 87.5%) MRY-calves born per year since 1980. In 2005 only 3454 purebred MRY-calves were registered and more than 50,000 calves with less than 50% MRY-genes.



**Figure 1.** Total number of registered MRY calves born within each year with 1/8 to 8/8 MRY-genes, between 1970 and 2005.



**Table 2.** Number of cows and the average milk production and lactation length of several breeds in The Netherlands in 1977 and 2007.

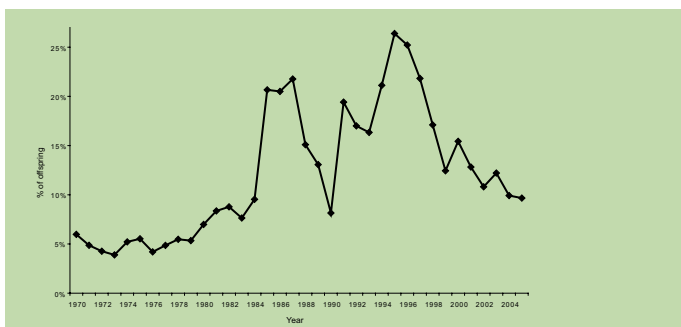
	No. of cows (1977)	Kg milk (1977)	Days in lactation (1977)	No. of cows (2007)	Kg milk (2007)	Mean fat% (2007)	Mean protein% (2007)	Days in lactation (2007)
MRY	345,338	5106	309	7,006	6743	4.45	3.63	332
Red Holstein				78,837	8694	4.55	3.57	344
HF Black				541,629	9705	4.34	3.48	356
White Headed	21,272	4930	307	588	6166	4.38	3.57	315
Dutch Friesian	926,956	5234	309	1,029	6910	4.52	3.56	340
Friesian Red	3,834	4859	302					

## Cold sire system

The breeding structure of MRY is the so called 'cold sire system'. Yearly, approximately 10 sires (with a maximum of 12.5% Holstein-genes) are tested as young bulls. When 20,000 doses of semen of each young bull are frozen, the bull is culled. When daughters of the young bulls are tested and the estimated breeding values of the bulls are good enough, a young bull will be assigned as a proven bull. The doses that are stored frozen are sufficient for 1-1.5 years. Currently, discussions started to freeze more doses per bull, because of increasing demand for crossbreeding and export.

## Breeding structure

The number of MRY AI bulls available for breeding is limited. This increases the risk that one single bull has a large number of offspring in a certain year. In 1995, 26% of all purebred calves were offspring of one proven bull. Figure 2 shows that already in the mid '80s, only a few sires accounted for a large proportion of the offspring per year. The top bulls accounted for maximally 5% of calves born in the '70s, but in the '80s and '90s this could peak up to 25%. This means that at least 25% of all calves born are half-sibs. By introducing the 'cold sire system' this risk was decreased, since in this system only a certain amount of doses per sire are available.



**Figure 2.** Percentage of offspring of the most popular bull per year as a percentage of all MRY-calves born in that year.

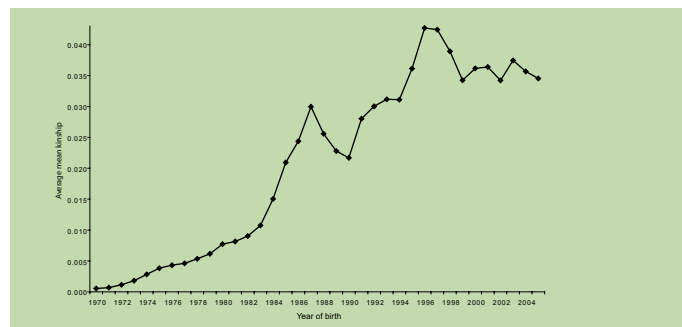
## Genetic analyses

Most present sires are offspring of one of the six following bulls or bull-lines:

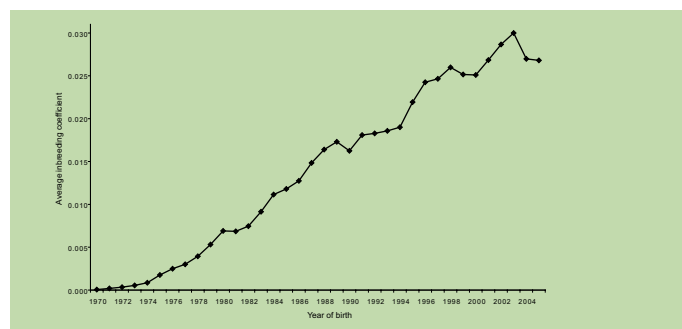
- Prins 2
- Lieske's Gustaaf-Berend
- Miena's Mars
- Daan-Roel
- Lutein-Louis
- Lieske's Gustaaf-Julius

Therefore, most MRY-bulls are strongly related to each other. Among the cows, the kinship is high as well, because some sires had many offspring. The mean kinship of the MRY-population increased up to the end of the '90s. This is also shown in Figure 3. Since the introduction of the 'cold sire system' the average mean kinship stabilized.

The danger of a high average mean kinship is the risk for inbreeding. Inbreeding can cause unfavorable effects such as inbreeding depression, health problems or occurrence of genetic disorders. Therefore, it is important to keep the genetic diversity and to maintain certain genes/characteristics within the population. Between 1960 and 2008, semen of 420 MRY-sires has been stored in the Dutch Gene bank of CGN. This will also help to preserve certain genes for the next generations.



**Figure 3.** The average mean kinship of the purebred MRY population born within each year from 1970 and 2005.



**Figure 4.** Average inbreeding coefficient of purebred MRY animals born within each year between 1970 and 2005.

Figure 4 shows that the inbreeding coefficient has increased in the purebred MRY population over last decades, up to 3% in 2003. An animal is inbred when both its parents are related to each other. To restrict inbreeding, it is important to limit an increase in the average mean kinship of a breed. In general, an increase of the inbreeding coefficient of 0.5% per generation is seen as acceptable. Based on the figures between 1980 and 2005 (Figure 4), the increase of the inbreeding coefficient is calculated to be 0.08% per year, which amounts to 0.45% per generation assuming a generation interval of 5.5 years.



*“MRY-cows are modern and easy to manage,  
without a lot of hoo-ha”*

### Herd and breed comparison

An important question in the EURECA-project is why some regional cattle breeds still have large numbers of breeding animals, while other breeds decrease rapidly? What considerations may farmers have to choose specifically for MRY-cows, or to continue with another breed (mostly Holstein-Friesian)? What are the strengths and weaknesses of this breed? We have looked at why some MRY farmers continue to use the breed, whereas others stop using MRY and continue farming with another breed.

### *“Calm cows, strong breed”*

For the EURECA-project 25 MRY-farmers, 23 White Headed-farmers and 22 Deep Red Cattle-farmers have been interviewed (Table 3). On average, the interviewed MRY-farmers have 56 cows on 39 ha, of which 31 ha is owned. The White Headed-farmers have on average fewer cows (39), but more land (50 ha, of which 39 ha is owned). The Deep Red-farmers only have a few cows (16) on 34 ha, of which 19 ha is owned. The majority (88%) of the interviewed MRY-farmers obtain 75 to 100% of their income from the farm. For the White Headed and Deep Red the percentage income from the farm are 83 and 23%, respectively. Most Deep Red-farmers obtain a substantial part of their income from other sources than their farm.

The average age of the interviewed MRY-farmers is 52 years, with a range between 41 and 63 years. 88% has a Bachelor-degree or lower. The average age of White Headed and Deep Red-farmers is comparable, 50 and 51 years, respectively. The percentage farmers with a Master-degree is higher for the White Headed and Deep Red-farmers, than for MRY-farmers.

All three breeds are dual purpose breeds. MRY and White Headed are mainly used on dairy farms and Deep Red cattle is

kept mostly as suckling cows or as free roaming cows in nature reserves. The most optimal production system for MRY is the low-input system with a high proportion of silage, or a system where the cows are grazing constantly.

Both the MRY and the White Headed are known for their good fertility, durability, strong legs (with good claws) and high protein content in the milk. All three breeds are quiet and strongly muscled. The cows are less demanding compared to high productive breeds.



### Farmers' opinion on MRY-breed

For 59% of all interviewed MRY-farmers the income out of milk and/or meat is the most important reason to keep MRY-cows. Specific characteristics of the breed, like (1) high protein content of the milk, (2) strong muscled and (3) the durability of the cow are the second most important reason for 54% of the interviewed farmers. Third reason for 43% of the farmers is the nature of the cow; the cows are calm and friendly and easy to manage.

When comparing the MRY with the Holstein-Friesian, the interviewed farmers state that the milk production of MRY is low, but the fertility, durability, robustness, health and personality of the cows are scored better than that of HF. The profitability of the MRY-cow, compared to the Holstein, is seen as a major plus for 87% of the farmers.

**Table 3.** Overview of herd and farmer characteristics per breed

	No. of herds	No. of cows	No. of ha (ownership)	Contribution to family income	Age (years)	% BSc-degree or lower
MRY	25	56	39 (31)	88%	52	88
White Headed	23	39	50 (39)	83%	50	67
Deep Red	22	16	34 (19)	23%	51	72

## Eureca

The EURECA-project (*Towards (self)sustainability of EUropean REgional CATTLE breeds*) started on May 1st, 2007. Partners from 10 European countries participate in the project (for more information, see: <http://www.regionalcattlebreeds.eu/>). The purpose of this project is to learn from each other in Europe to develop better strategies to preserve the regional cattle breeds.

In total 15 cattle breeds from 10 different countries are being analyzed in detail; for The Netherlands we have chosen the MRY, the Groningen White Headed and the Deep Red cattle breeds.

### Farmers' opinion on their farm

50% of the interviewed farmers do not expect that their herds will grow in the next 5 years. The other half expects to grow, by approximately 33%.

The manure legislation and rescinding the milk quota system are possible threats for keeping the MRY-breed in the near future. Also, the low interest of young farmers to continue farming can be a threat. Opportunities for the MRY-breed are its strong characteristics; durability, fertility, muscularity and protein yield.

### Farmers' opinion on preservation

According to the interviewed farmers, the specific breed characteristics are the most important reason for preservation of the MRY-breed. Those characteristics are: fat/protein ratio, durability, muscularity, health, fertility, personality, strong legs and calving easy.

The majority of interviewed farmers (75%) indicate that in order to continue using MRY on their farms it is important to increase the milk production per cow per lactation. More than 50% of the interviewed farmers said they are not interested in developing other activities on the farm, like selling products related to breed or region, caring farms etc. The main reason for this lack of interest is that above all, the interviewed farmers consider themselves as a dairy farmer.

*“Holstein-farmers think you can only be a farmer with at least 10,000 kg of milk”*

Generally, the farmers expect support from breeding organizations in testing more young bulls and in offering a broader variety of proven bulls. In general, the interviewed farmers would like to see a better promotion of the breed, and they consider this to be a task for the national herd book (CRV). They don't expect any support from consumers and from the local and national authorities. Scientifically, they would like to see more research on genetic aspects of traits and a demonstration of the qualities of the MRY-breed. Last, but not least, free roaming MRY-cows in nature reserves is an opportunity for the breed.

### SWOT

Using the information obtained in the interviews, a SWOT-analysis is performed to point out the strengths, weaknesses, opportunities and threats.

#### Strengths-Weaknesses

One of the strengths of the MRY-breed is its profitability, as MRY-cows realize a higher net income per 100 kg milk than Holstein-Friesians. Also, the functional traits are relatively strong for MRY-cows. For example, the cows have a good fertility, few health problems, a calm and quiet nature, favorable fat/protein ratio in the milk and they are efficient in low-input systems. Therefore, the MRY-breed is increasingly used for crossbreeding with other breeds, especially by dairy farmers who are not aiming for the last 1000 kg of milk per cow extra, but for an easy to manage cow that is not vulnerable to the changing conditions.



CRV continuously works on a good breeding program for MRY, with a clear breeding goal and a population that is large enough. Especially now that there is an exchange of bulls with the German Doppelnutzung Rotbunt population, the total population is large enough to test more young bulls.

The reality that you need more MRY-cows than Holstein-cows to fill the milk quota, is seen as a weakness of the breed. Also, there are only a few farmers left that breed purebred MRY cows, and the number of MRY-farmers that do not participate in milk recording and/or scoring of conformation traits is increasing. The main reason for this is that the farmers have the feeling that the MRY-cows are underrated for traits like stature, feet



*“The MRY-cow has changed over the years, she is bigger and produces a favorable fat/protein ratio”*

and legs, fore udder attachment and muscularity, as MRY-cows are scored according to a Holstein-standard. As a consequence, less recordings are registered, and less information about the MRY-breed becomes available, which is a drawback for the breeding program.

Making use of the regional and cultural or historical value of the breed is difficult, because, for laymen, MRY hardly differs from the Red Holstein. Promoting the breed through breed specific products is very minimal because most MRY-farmers do not consider this as their core business.

The most important weakness is the decrease in genetic diversity within the population. Because a limited number of sires fathered a large proportion of the offspring in the past, many cows in the current MRY population are related to each other.

### Opportunities-Threats

Most opportunities for the breed arise from the new interest in the breed by the current generation of young farmers. They do not expect an additional 1000 kg of milk, but aim for durability and efficiency of the cows. And that's why the MRY-cow becomes more popular again. MRY is currently frequently used to crossbreed with other breeds to improve the functional traits, like fertility, claws, legs, protein content etc, of the other (Holstein) breed.

There is still a big opportunity in promoting the breed and its characteristics. This can possibly be done by (1) developing

regional concepts in which the MRY plays a major role, by (2) combining farming with tourism or nature conservation, or by (3) developing a website with information of the breed. Promoting the breed has to be initiated by the farmers themselves, otherwise there is no way this can succeed.

Another opportunity is to exchange genetic material and develop a joint breeding program with Germany. This will ensure an increased population to test up to 18-20 young bulls yearly, and a broader offer of proven MRY bulls to farmers.

Possible threats for the MRY-cattle are (1) rescinding the milk quota, (2) the manure legislation, and (3) the tendency towards more intensive farming with a more efficient milk production. However, when you talk to MRY-farmers, the farmers are convinced that the MRY-breed will survive. Up to now, they have always found a solution for changing situations. They are sure they will do so again.

The MRY-cow still carries the image of 'old fashioned and conservative', even though it can be considered as a modern cow nowadays. The difference with Red Holstein is minimal for laymen. Unfortunately, the new generation of young farmers is not familiar with the MRY-breed and focuses therefore mainly on the Holstein-Friesians. This also holds for local and regional authorities. The best way to provide proof to the contrary is promoting the breed. Make sure the breed information can be found easily, via a website, and show the strong characteristics of the MRY-breed.





## Conclusions and recommendations

The MRY-cow has many qualities. The strong characteristics of the MRY are the high protein yield, good fertility, strong muscularity and her durability. The cows produce both milk and meat. However, there has been a decline in the number of purebred MRY-cows because of the focus on kg of milk per cow of many dairy farmers. In the last few years, a slight increase in the number of registered MRY-cows and inseminations is recorded because strong functional traits are becoming more important again for dairy farmers.

The population size and the genetic diversity present in the population still remains a point of special concern. With the recent collaboration and exchange with Germany, the population increases and more young bulls can be tested and a broader variety of proven bulls can be offered.

Increasing awareness and knowledge of the characteristics of the MRY breed will result in a wider use of semen. Breed promotion by MRY farmers and breed interest groups will therefore continue to be important.

*“In fact, all farmers should farm with MRY-cows”*

## Colophon

This breed assessment is compiled by Yvette de Haas, with help of Rita Hoving-Bolink, Myrthe Maurice-van Eijndhoven, Debbie Bohte-Wilhelmus, Henk Sulkers and Sipke-Joost Hiemstra. More information about the EURECA-project can be found on the website: [www.regionalcattlebreeds.eu](http://www.regionalcattlebreeds.eu).

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