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# Dutch horse breeds, what makes them special?

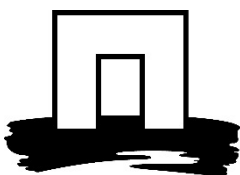
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## Abstract

This report focussed on four Dutch horse breeds, the Groninger horse, Gelder horse, Friesian horse and Dutch draught horse. To help decrease the loss of genetic diversity the unique traits of these horse breeds were sought through literature study and interviews with both owners and experts. The unique trait these four breeds have in common is their calm character. The Groninger and Gelder horses are suitable for all types of sport, and the Friesian and Dutch draught horse are known for their unique appearance. This relatively easy character makes all of these horses very suitable for recreation riders. There seems to be no special role for these four breeds in ecological agriculture, although there are options to incorporate horses in nature areas or to make pastures more eco-friendly. The role of the studbooks are important in helping preserve these breeds, as well as incentives to encourage owners to start breeding.

## Introduction

Conservation of biodiversity is a key element for a continuously and sustainably growing planet. When species go extinct genetic variation will get lost and ecosystems must adapt to fill the empty space. This lost genetic diversity cannot be recovered even though it could hold information that we might be able to use in the future for, for example, medical purposes or advancement in agriculture (FAO, 2004; Ministry of Agriculture, Nature Management and Fisheries, 2002). However, loss of genetic diversity is not restricted to extinction only. Genetic erosion is the decrease in genetic variation within species. This is often seen within small, isolated, populations and it can also endanger these populations to the point of extinction (Ministry of Agriculture, Nature Management and Fisheries, 2002; Woodruff, 2001). Livestock species generally consist of breeds that can be considered as separate populations.

When a population or breed is both limited in numbers and isolated there is a strong likelihood of high inbreeding rates since there are less individuals to choose from during the mating period. These inbreeding rates do not only increase the probability of bringing undesirable mutations and diseases to a high frequency, they also further diminish the genetic gene pool. This leads to a vicious circle in which the genetic diversity will continue to reduce until either there is an external source of new genetic material or the population, or breed, goes extinct (Townsend, Begon, & Harper, 2009). It is therefore desirable to stop the loss of biodiversity and genetic variation before it gets that far.

All over the world there are already multiple initiatives to reduce the loss of biodiversity. For instance, reducing the loss of biodiversity is part of the 17 Sustainable Development Goals, or SDG's, that the UN has created to improve peace and prosperity for both the planet and the people [UN site]. In two of these goals, life on land and life below water, reduction of biodiversity loss is a key part. The EU too recognizes the importance of biodiversity and there is a plan in motion to reduce the loss of this biodiversity by 2030 ('Biodiversity Strategy - Environment - European Commission', 2020). These plans are often focussed on wildlife preservation, but genetic variation also gets lost by genetic erosion within agricultural species. The Food and Agricultural Organisation states that by far the greatest cause of this genetic erosion is the failure to appreciate the value of locally adapted breeds (FAO, 2004). Local agricultural breeds have made way for imported breeds that are considered to be more productive, even though local breeds are often more adapted to the local environment and climate. Over the years these breeds have been bred specifically to thrive in these ecosystems, which can also make them suitable for sustainable or circular agriculture. By continuing to breed with imported animals the population of a local breed will decrease and consequently genetic diversity disappears as well. For example, traits that help an animal to survive in harsh conditions might disappear completely, while in the event of drastic climate change these traits could again be needed for breeding purposes (FAO, 2004).

The demand for animal products is increasing as a cause of the rapidly growing world population and this results in the need for high-input high-output breeds in agriculture (Oldenbroek, 2007). This intensification leads to the increased breeding of agricultural breeds that are specialized in high-input high-output to fulfil this demand for animal products. However in doing so these breeds are threatening to replace the locally adapted breeds that are not specialized in high production, but may hold other valuable traits (Oldenbroek, 2007). Because of the shift to more productive animals in favour of the traditional breeds at least 28% of farm animal breeds have become extinct, rare or endangered during the 20<sup>th</sup> century alone (Joost et al., 2016). This loss in biodiversity could be reduced by involving local breeds in circular or nature-inclusive agriculture, for which their adaptations to the local environment might make them very suitable. Local breeds could be used on farms either instead of high-input high-output breeds or alongside those breeds to help make the system more circular. There is also an option to implement these breeds in local ecosystems such as

nature reserves, or to make the systems that currently make use of local breeds more eco-friendly instead.

Horses are animals that are not specifically bred for a high output of animal products, yet also here this same change can be seen. Humans have interacted and worked with horses for over thousands of years, but in that time the role of the horse in society has changed (Bailey & Brooks, 2013). The change of role required the horses to evolve with it, new functions were needed and breeds were specialised according to the work they needed to do. Military horses needed to be fast and intimidating, horses that were put to work on farms needed to be strong, and nowadays sport horses need to be fast and agile (Centrum voor genetische bronnen Nederland, De Weerd, & Oldenbroek, 2010). This has created large contrasts between different horse breeds and led to a vast variety of biodiversity within the species. However with the disappearance of certain roles this biodiversity threatens to get lost. Draft horses for example have been made redundant by mechanisation and these animals are now often bred to focus more on suppleness instead of strength, therefore losing their qualities as strong work horses (Centrum voor genetische bronnen Nederland, De Weerd, & Oldenbroek, 2010). If these breeds disappear completely the genes associated with these qualities will be lost as well, therefore it is key to prevent this from happening before this genetic diversity disappears completely.

As of now there is little information to be found about local Dutch breeds and the traits they have that differ from the newer, more commonly known horse breeds. Increasing this knowledge and spreading information about this to owners and horse enthusiasts might help conserve the populations of these breeds and the genetic diversity they bring. A breed can be described as a native, or local, breed when it is currently present in the country and has been bred for more than 6 generations with 40 years on top of that (Oldenbroek & Van der Waaij, 2014). There are currently four Dutch horse breeds according to Stichting Zeldzame Huisdierrassen (SZH), these are the Gelder horse, Groninger horse, Dutch Draught horse and the Friesian horse (Stichting Zeldzame Huisdierrassen, 2019).

In order to prevent these four breeds from disappearing more information is needed about these breeds. Since horses are rarely needed for agricultural purposes anymore most horse owners have bought their animals for sport or companionship (Centrum voor Genetische Bronnen Nederland et al., 2005). Encouraging those owners to buy local and rare breeds can boost the population of these breeds by making them more popular and therefore more interesting for breeding. Oftentimes owners are not looking for a certain breed with the intention of increasing the population of that breed but because of the traits they possess that are better or different from the more common breeds (Centrum voor Genetische Bronnen Nederland et al., 2005). Therefore it is important to highlight these traits, classify the value they can bring and then spread this information to make more people aware of this.

This report will focus on these specific four Dutch horse breeds and the traits that distinguish them from other breeds. To get a clear picture of the situation of these populations the following questions are asked:

- How rare are these breeds?
- Which traits do owners recognize in their horses?
- For which purposes are these traits relevant?

## Material and methods

To establish how rare the Dutch horse breeds actually are, data from the FAO was used along with the catalogue of varieties of agricultural breeds by CGN (FAO, n.d.-a; Centrum voor Genetische Bronnen Nederland, 2020). These sources and a literature search have also been used to determine if there are problems such as common genetic disorders present in the populations of the four Dutch breeds or if there has been a change in interest in these breeds over the years.

In order to get a reliable view of the qualities and unique traits of the four Dutch horse breeds owners have been interviewed and asked about their experiences with these breeds. Not only were they asked about the positive and negative qualities of these breeds but also for which purpose they think this breed is best suited and if they see a future in ecological agriculture for this breed. In total four owners have been interviewed, one for each of the breeds. These owners have been selected based on their years of experience with these breeds and the intensity with which they work with these horses; all owners have more than 10 years experience with these breeds and are actively involved in breeding. An overview of this is given in table 1.

*Table 1. An overview of the interviewed owners of the breeds and their experiences with these horses*

Owner	Interviewed about	Number of horses of this breed or type currently owned and working with	Active in	Years of experience with this breed
Sanne Merks	Groninger horse	6	Vereniging Groninger Paard, breeding	10
Ria Hekkert	Gelder horse	12	Breeding	Since childhood
Karlijn Schellings	Dutch draught horse	4	Vereniging 't Brabants span, breeding	Since childhood
Myrthe Maurice – van Eijndhoven	Friesian horse	10	Breeding, training, preparing horses for performance tests	Since teenage years

To get an objective view on the qualities of these breeds and more information about the possible future these breeds might face, experts in the field of rare breeds and/or horse breeds have been interviewed as well. These experts have been asked about the unique traits they think these breeds have and about the future perspective of rare horse breeds. The experts have also been asked whether they see a future for the horse in ecological agriculture. In total four experts have been interviewed, they were selected based on their knowledge about and experience with rare animal breeds and horse breeds in general, an overview of these experts can be found in table 2.

Table 2. An overview of the interviewed experts and their qualifications

	Worked at/with
Hinke Fiona Clossen	Vereniging Groninger paard, Stichting Zeldzame Huisdierrassen
Nonja Remijn	Stichting Zeldzame Huisdierrassen
Kathalijne Visser	Aeres, Wageningen University & Research
Marjolein Neuteboom	Stichting Zeldzame Huisdierrassen, Centrum voor Genetische Bronnen, Wageningen University & Research
Mira Schoon	Stichting Zeldzame Huisdierrassen, Centrum voor Genetische Bronnen, Wageningen University & Research

Most interviews were conducted online via videocall as the minimum safe distance that needed to be maintained because of the Corona pandemic could not always be guaranteed. The questions that were asked to owners and experts can be found respectively in appendix 1 and 2.

These findings were then combined and compared with the traits found in literature to create a clear overview of the unique traits these breeds have and for which purpose they are suitable.

## Results

The results are a combination of literature research and the results from the conducted interviews. Per breed the results found in literature are first presented after which the results from the interviews follow. Potential other purposes for these horses, such as in ecological agriculture, follow. At the end an overview of the main results of the different Dutch horse breeds is given in table 3.

### The interviewed owners

All interviewed owners have worked with these horses for more than 10 years, most of them already since childhood. Breeding or working with these horses is for none of the owners their only source of income since it is very hard to make money from working with these breeds. They are all very passionate about their horses and these breeds and this is the main reason they chose to work with these horses. All four interviewed horse owners also breed with their animals.

### Groninger horse

Groninger horses are all-round horses with a calm temperament who are eager to work (Centrum voor Genetische Bronnen Nederland et al., 2005). Although the Groninger horse might not be the best choice for the top of sport their versatility makes them very suitable horses for those who want to be able to do a lot of different activities with their horse (Swormink, 2009). This is aided by a good stamina and easy character. This easy and trustworthy character also makes them especially good for recreational riders and inexperienced riders, contrary to most horses who have been specifically bred for top sport (Swormink, 2009). Groninger horses have a heavier built than average warmblood horses, although a distinction is made between the heavier type and the lighter, more luxurious type Groninger. The heavier type is suspected to disappear in the future (Centrum voor Genetische Bronnen Nederland et al., 2005). Nowadays there are more owners and users of the Groninger horse than there are people who breed them, and if owners do breed with their Groninger horses it is often with personal goals in mind instead of the general conservation of the breed (Heikens, 2018). Because of the lack of breeders there is currently a bigger demand than there are Groninger horses available.

### Character traits

Sanne Merks describes the Groninger horse as a sweet and calm horse. She gives the example that even when she's handling a horse that is enthusiastic she doesn't have to worry about them trying to pull themselves free or suddenly taking off. They are not easily spooked, not quickly overworked and they have a level-headed personality. Hinke Fiona Clossen also mentions that Groninger horses have an easy character to work with and are good at listening to their owner. They are eager to work and do not give up easily. Mira Schoon describes them as calm horses as well.

### Physiology and health

Sanne Merks notices that Groninger horses are less quick to get injured than other horse breeds. This is likely because these horses are already strong and balanced from a young age, which makes them less unstable than KWPN horses and leads to less injuries during training. There is a difference between the so called "older types" and the more "luxurious types"; the luxurious type has a lighter built, better movements and more stamina than the older types. Furthermore Sanne Merks mentions that because the studbook is not closed there are very few genetic disorder and diseases in the population. Hinke Fiona Clossen also notices that the Groninger horses have a good stamina.



### **Population and problems**

The population of Groninger horses is quite small and still decreasing according to Sanne Merks. She warns that the longer this continues the less genetic variation will remain, which will be the cause of even more problems. Hinke Fiona Clossen mentions that there is more demand for Groninger horses than there is a supply currently. According to Sanne Merks it is difficult to motivate others to work with Groninger horses because there are no added economical benefits to working with this breed, it must be out of a love for these animals. She mentions that there is a lot of focus on those who breed yearly now, but people who want to try out breeding some time, or just for one time, must be involved as well. There is also a new board for the association of Groninger horse and Sanne Merks hopes that this will lead to new ideas and activities that will attract younger people to the studbook and association.

### **Unique**

The level-headed personality of the Groninger horse is seen as unique by Sanne Merks. Furthermore Sanne Merks mentions that Groninger horses are easier to work with than KWPN horses because of their character and low tendency to spook. As unique traits Hinke Fiona Clossen mentions the eagerness to work alongside the obedience they show towards their owner.

### **Purpose**

Groninger horses are very all-round, according to both Sanne Merks and Hinke Fiona Clossen; they are good at dressage, jumping and driving. It is an advantage for dressage that Groninger horses are already strong and balanced from a young age. Sanne Merks therefore mentions that it is really dependant on the horse itself what their ideal purpose is, their personality makes them good family horses but some are better suited as sport horse. She also notices that overall the older, heavier, type is more suited for recreational riding and less for dressage. Marjolein Neuteboom also mentions that their calm character makes them very suitable to bring along for activities and events.

### **Gelder horse**

Although there are different views about the future and the breeding goals of the Gelder horse, including the question if this is a breed or only a type, these horses are described by both sides as an all-round horse with an easy character (Centrum voor Genetische Bronnen Nederland et al., 2005). Even though the outward appearances have changed over the years they have kept their trustworthy character and this has become one of the unique traits of the Gelder horse (Brouwer, Van Wee, Janssen, & Schippers, 2017). The versatility of the Gelder horse is another unique trait and both this and the character of the horses have a big focus during the selection process. The movement, type and front, or posture, of these horses are being named as important traits during the selection mostly to keep the characteristic exterior of the Gelder horse (Koninklijk Warmbloed Paardensstamboek Nederland, 2008). Because the Gelder horses are strong, friendly horses they are a good fit for inexperienced riders and for trail rides (Brouwer, Van Wee, Janssen, & Schippers, 2017). Aside from inexperienced riders their easy character also makes them suitable for those who do not wish to ride every day. The versatility of these horses is very useful for those who would like to jump, do dressage, or drive with their horses from time to time (Brouwer, Van Wee, Janssen, & Schippers, 2017).

### **Character traits**

Gelder horses have a calm and cool character according to Ria Hekkert and Hinke Fiona Clossen. Hinke Fiona Clossen notices that Gelder horses have a similar character to Groninger horses but have on average a more cheerful disposition. Despite having a calm and easy character Ria Hekkert

states that Gelder horses are not lazy or slow but eager to work. Ria Hekkert describes the easy character of the Gelder horses by stating that they are able to be lead to the pasture by a child and all riders are able to ride them without problem.

### **Physiology and health**

Both Hinke Fiona Cnossen and Marjolein Neuteboom mention that Gelder horses are lighter than Groninger horses. Hinke Fiona Cnossen adds that because of this some Gelder horses can have swifter movements than Groninger horses. The quality of the hind legs and their front is important as well, Ria Hekkert mentions. Furthermore she notices that some who look for a Gelder horse used to look for, or have experience with, Friesian horses but are now looking for a horse with more power and stamina. On average Ria Hekkert notices that Gelder horses are less good at cantering if they are not being helped by their riders. Their step and trot are powerful however. Ria Hekkert also notices that the Gelder horse seems to have a high fertility even at an older age. Overall she states that Gelder horses do not need any excessive or demanding care and that they are not quick to get injured or ill.

### **Population and problems**

Ria Hekkert mentions that a number of Gelder stallions have been tested positive for the genetic disease Warmblood Fragile Foal Syndrome (WFFS). The only way to prevent this from spreading is to stop breeding with these stallions in combination with mares who have been tested positive. Apart from that she notes that a close eye must be kept on the inbreeding rates in the population of Gelder horses. Ria Hekkert states that these rates are likely this high because lots of breeders are breeding with the same popular studs within a small population, and to deviate from these studs is a risk not everyone is willing or able to take. To improve the inbreeding rate in the population Ria Hekkert notes that it is important to keep an open mind about breeding with studs from other KWPN breeding directions such as dressage-, jumping- or harness horses. Apart from this Ria Hekkert also mentions that there are different ideas about the future of the Gelder horse. Ria Hekkert believes that no breed has ever been lost because of chances to its type, but that this can occur if the breed does not adapt to the changing economical situation and thus the demand. But there are also those who want to stay close to the traditional picture and old bloodlines. Which way the studbook will go is partially dependant on the vision of the new inspector. Ria Hekkert notices that because Gelder horses are very all-round and can be used for many purposes third parties are quick to call a (lesser) dressage- and/or harness horse Gelder for the benefit of the current demand on the market. This will lead to more so called Gelder horses but can drastically change the unique and specific aspects of the Gelder horse. Ria Hekkert also notes that there are very few stud farmers at this moment.

### **Unique**

Ria Hekkert, Hinke Fiona Cnossen and Marjolein Neuteboom all mention that one of the unique points of the Gelder horse is that they are very all-round. Furthermore Ria Hekkert states that the character and attitude of these horses alongside their good step and trot are unique characteristics as well.

### **Purpose**

Gelder horses are very all-round and therefore suited for many purposes according to Ria Hekkert. Dressage and driving are both good sides, but the character and movements of the Gelder horse makes them very suitable as family horse, show horse, and as a sport horse for those who wish to pursue that side. Ria Hekkert states that Gelder horses should be able to ride M-Z dressage with a normal or mediocre rider. She notes that they are not bred specifically to reach the Grand Prix, but

that the main focus is to have a pleasant horse to work with even for riders without any special training.

### Friesian horse

The Friesian horse is known for their black colour, long manes, proud disposition and their upward movements (Centrum voor Genetische Bronnen Nederland et al., 2010). Over the last decennia breeding of the Friesian horse has shifted its focus from working horse in agriculture to sport, especially dressage (Koninklijk Friesch Paarden-Stamboek, n.d.). To achieve this changes in the build of the horse had to be realised to accommodate smoother movements, but the general appearance of the Friesian horse has remained the same over the years. The Friesian horse is eager to work and has a friendly character, which makes it a pleasant horse to work with (Vereniging Eigen Paard, n.d.). They are suitable for dressage, driving and as show horse. However there are some clinical problems that seem to have a higher incidence in Friesian horses than in other breeds, such as dwarfism, hydrocephalus and several immune-mediated disorders, soft-tissue disorders and orthopaedic disorders (Boerma, Back & van Oldruitenborgh-Oosterbaan, 2012). Most of these problems are highly suspected to either occur because of the small gene pool or the current type and build of the Friesian horse (Boerma, Back & van Oldruitenborgh-Oosterbaan, 2012). A report from 2011 states that the inbreeding rates are still high but the measures that were taken to reduce these rates seemed to have slowed down the increase (Ducro, 2011).

### Character traits

Myrthe Maurice-van Eijndhoven states that Friesian horses are very friendly and people-oriented horses. They seem not very sensible in work but can still be ridden with a so called "soft hand". They have a pleasant and good-natured character. However, she also mentions that this pleasant character needs to be handled with care as these horses do not often show their feelings and thoughts very clearly, which can make it difficult to read them. With proper training Friesian horses do reach this desired character on an earlier age compared to most other breeds. Mira Schoon also mentions the kind and calm character of Friesian horses.

### Physiology and health

On average Myrthe Maurice-van Eijndhoven notices that Friesian horses are less supple in their bodies and that they seem to have less stamina compared to other horses. They are, however, better able to handle the cold than average riding horses and they are strong. Hinke Fiona Cnossen mentions that because the population is relatively small in terms of different bloodlines there are quite a few genetic disorders. Because these disorders are often recessive traits they are as of yet only visible on DNA level, which makes them difficult to completely spot and therefore avoid. Hydrocephalus and dwarf growth are two genetic disorders that are mentioned by Marjolein Neuteboom and Hinke Fiona Cnossen to be a risk in Friesian horses. Myrthe Maurice-van Eijndhoven mentions these are well-known concerns that need to be taken into account when choosing a stallion to breed with. A retained placenta after foaling is also a common problem in Friesian horses that is mentioned by all three. Furthermore Myrthe Maurice-van Eijndhoven states that it seems that the foals of Friesian horses have a lower resistance against worm infections, she notices such infections are more likely to become fatal for them as it is for foals of other breeds. Hinke Fiona Cnossen mentions that on average Friesian horses have a lower life span than Groninger and Gelder horses and that they get old at a younger age. As a possible explanation for this, apart from the relatively small population, she mentions that she has noticed the breeding goals of Friesian horses are currently focussed on sport and appearance and that the desired appearance might clash with

the overall health of these horses.

### **Population and problems**

Myrthe Maurice-van Eijndhoven states that the inbreeding rates must always be watched closely in order to prevent genetic diseases, but that based on the in situ numbers of animals in the population these can now be seen as reasonably under control. Mira Schoon sees that the Friesian horses are popular in countries outside of the Netherlands as well, and she and Marjolein Neuteboom agree that there are no stimulating measures needed for the population of Friesian horses. H.F Cnossen notices that the market for and interest in Friesian horses is stabilizing; good horses are easy to sell but the market for the average or below average horses is saturated. To be able to maintain these positive trends Myrthe Maurice-van Eijndhoven emphasizes the importance of the studbook, if there is a rift due to different opinions then this will lead to two separate populations that are both too small. As long as the studbook keeps doing as well as it is doing now she foresees no problems.

### **Unique**

The appearance of the Friesian horses is described as their most important unique trait by Myrthe Maurice-van Eijndhoven, Hinke Fiona Cnossen and Mira Schoon. Myrthe Maurice-van Eijndhoven calls their beauty their absolute selling point. Apart from the exterior she also mentions their friendliness as unique point. Mira Schoon also adds that although they have a calm character Friesian horses also have a cheerful disposition that is unique.

### **Purpose**

Friesian horses are a bit less all-round than the Groninger and Gelder horses since they are not good at jumping, according to Marjolein Neuteboom. Both Myrthe Maurice-van Eijndhoven and Hinke Fiona Cnossen also state that jumping is not something Friesian horses will ever be good at. Hinke Fiona Cnossen does see a future in dressage for these horses, since this something they have gotten results in in the past. Myrthe Maurice-van Eijndhoven also sees that the more hot-headed Friesian horses are suitable for sports such as dressage and that there is a focus on Subtop level, which is the highest national level of dressage in the Netherlands. She mentions that the average Friesian horse has to be good at a recreational sports level and that they should be able to ride Z dressage. Myrthe Maurice-van Eijndhoven thinks these horses are best suited as a good companion, to ride sports at recreational level with, or to show off their beauty in the pasture and on the streets.

### **Dutch draught horse**

The Dutch draught horse is a horse that has been bred for their strength. Nowadays that strength is not needed to work in the fields anymore and a shift in focus can be seen towards better movements (de Weerd, Oldenbroek, & Trikwerda, 2010). The movements of the Dutch draught horse are not supple enough to be able to ride dressage at a high level, and their canter is not often used (Peerlings, Weerden, Hoof, van der Weerden, & van Hoof, 2007; Centrum voor Genetische Bronnen Nederland et al., 2005). The character of these horses is described as sweet and calm, and it is this combined with their size and appearance that make the Dutch draught horse a unique horse. Their typical appearance that has not changed much in 129 years and their trustworthy character also makes them very suitable for attending folkloristic events in The Netherlands (Peerlings, Weerden, Hoof, van der Weerden, & van Hoof, 2007). Aside from this they are also seen more and more as recreational horse and are also one of the most important horse breeds for forest work (Centrum voor Genetische Bronnen Nederland et al., 2005; Juta, 1963, p. 428).

### **Character traits**

The Dutch draught horse is described as a very calm and level-headed horse by Marjolein Neuteboom and Mira Schoon. Possibly the most calm of these four breeds. The obedience of these draught horses is very important because they are on average very large and heavy horses. Karlijn Schellings also states that they are very calm horses, but adds that although this is true for the vast majority of these horses there are also sometimes individuals who have a hotter temper.

### **Physiology and health**

Karlijn Schellings notes that Dutch draught horses are very strong and well able to handle both wind and cold temperatures. The strength of this breed is also mentioned by Marjolein Neuteboom and Mira Schoon. Because of their heavy built Dutch draught horses have a lower life span than other breeds. Hinke Fiona Cnossen suggests that their life span might be even lower than that of Friesian horses. On top of this there are also some genetic diseases in the population according to Karlijn Schellings, Marjolein Neuteboom and Hinke Fiona Cnossen. Karlijn Schellings mentions Chronic Progressive Lymphedema and states this can only be prevented by not breeding with horses with this genetic disease. H.F Cnossen and Karlijn Schellings also mention mudfever, although Karlijn Schellings states that this is preventable by proper cleaning. Low fertility is also mentioned as a problem by Hinke Fiona Cnossen.

### **Population and problems**

The current population of Dutch draught horses is very small according to Karlijn Schellings. Although more attention has been paid to the inbreeding rates these are still quite high. She states that the population of draught horses in Belgium faces the same problems, because of this it will be necessary to start breeding with other cold blood breeds to increase the numbers in the population. Karlijn Schellings also mentions that not everyone agrees with the studbook anymore because they are holding on to old traditions and breeding standards. If the studbook was to renew itself she predicts more people will join again, which could be beneficial for the population of the Dutch draught horse. Mira Schoon also mentions the high inbreeding rates and that there are few available studs and people who breed with these horses.

### **Unique**

Their strength and appearance are seen as unique points by Karlijn Schellings, Marjolein Neuteboom, Mira Schoon and H.F Cnossen. According to all four the strength of the Dutch draught horse is what sets them apart from other breeds that are known for being good at driving, such as the Haflinger.

### **Purpose**

Karlijn Schellings mentions recreative riding, trail rides both under the saddle and with carriage and demonstrations as suitable fields and activities for this breed. Working on the land with these horses would be better for nature since in comparison with machines there is less destruction of the ground or forest, but it also takes longer and is more expensive. Their unique appearance is what makes them especially suited for demonstrations and events in regards to Dutch folklore according to both Karlijn Schellings and Hinke Fiona Cnossen. Marjolein Neuteboom adds that this can be a small source of income but most likely not nearly enough to make a profit out of. The strength and built of the Dutch draught horse might be a limiting factor in riding these horses under the saddle according to Hinke Fiona Cnossen. Mira Schoon also notices that there is as of yet little demand for Dutch draught horses for recreational riders.

## Other possible purposes

Using horses like the Dutch draught horse in agriculture could make this more ecological or circular since, unlike machines, they can convert grass into power. Karlijn Schellings and Marjolein Neuteboom add that using draught horses instead of machinery is better for the ground and the forest. They also agree however that this is difficult to make feasible since working with horses requires more time and is more expensive, which makes it economically not preferable. Hinke Fiona Cnossen adds that working with horses requires farmers to have the skills and expertise necessary to handle and work with horses, which is something not a lot of farmers have nowadays.

Nonja Remijn suggested that horses could also be used in grazing of wild areas or nature reserves. Marjolein Neuteboom notes that not many owners are willing to do this since horses can be quite expensive and letting them roam in nature areas can quickly lead to injuries. Mira Schoon adds that in those cases it depends on the character of the horse and the area, calm horses are more suitable since they are less likely to injure themselves because of spooking. The areas should be open and wide as well, areas with many obstacles are more dangerous. She argues that the Gelder horse might be the least suited for this out of these four breeds since they tend to spook a little bit easier than the others. Groninger and Friesian horses she thinks are suited, but she and Marjolein Neuteboom note that Friesian horses do not necessarily need any extra measures to stimulate the population growth. The Dutch draught horse might be suitable when it comes to character, but these horses might be too big and risk trampling other plants. Apart from that Mira Schoon notes that it might be a little bit intimidating for some to walk past a group of Dutch draught horses if the nature area is also designed for hiking.

Kathalijne Visser states that character and temperament can be partly found in the genes. Horses with a hot temperament are often more spooky, but this also makes them very suitable for the sport. She notices that in the decade the focus in horse breeding has shifted to sport and because of this more horses with a hotter temperament have been bred. Not all of these reach the top of sports and the horses that are left over often end up with recreational riders. However, she notices that these recreational riders do not always have the ability to handle these horses, this can create unsafe environments. Because of this Kathalijne Visser notes that there should be a line of horses with easy and calm characters to provide these recreational riders with good and pleasant horses that are safe to work with. This calm character can be found in all four of these Dutch horse breeds, making them very suitable for this purpose.

Table 3. Summary of the unique traits, suggested purposes and the risks in the populations of four different Dutch horse breeds

	<b>Unique traits</b>	<b>Purpose</b>	<b>Risks</b>
<b>Groninger horse</b>	Easy and calm character All-round	Recreational horse, sportshorse	Small population size
<b>Gelder horse</b>	Easy and calm character All-round	Recreational horse, sportshorse, familyhorse	Small population size
<b>Friesian horse</b>	Friendly character Appearance	Recreational horse, sportshorse for dressage and driving, showhorse	Higher incidence of various diseases and disorders
<b>Dutch draught horse</b>	Calm character Appearance	Recreational horse, showhorse, driving, workhorse on the land	Small population size and short average life span

## Discussion and conclusion

To determine if these four Dutch horse breeds are rare breeds first the population numbers of these breeds and other common horse breeds in the Netherlands will be compared. Then the unique traits of these breeds are discussed, along with the purpose these horses seem best suited for based on these traits. Lastly the possibilities of incorporating horses in ecological agriculture will be discussed, along with the possible role these specific four breeds can play in nature-inclusive agriculture.

### Number of individuals

In 2015 there were 450,000 horses in the Netherlands (KNHS, 2015). According to data from the FAO the five most numerous breeds within the Netherlands are the Welsh and COB pony, the KWPN riding horse, the Friesian horse, Shetland pony and the Harness horse (FAO, n.d.-a). However, despite having a smaller population the Irish Cob has more breeding mares than the Shetland pony. In table 4 an overview can be seen of the number of animals from these breeds based on the most recent complete data.

*Table 4. Maximum population size and number of breeding mares of the most numerous horse breeds in the Netherlands*

	Max. population size	Number of breeding mares
KWPN riding horse	160,000	79,584
Friesian horse	60,000	30,000
Welsh and COB pony	40,000	25,000
Shetland pony	38,000	3,007
Harness horse	16,000	8,842
Irish Cob	8,000	7,400

A horse breed can be called rare when less than 6,000 breeding mares are registered (FAO, 2013). The Friesian horse has 30,000 breeding mares in the Netherlands alone which means that this is not a rare horse breed.

The Friesian horse is shown to be a transboundary breed, meaning this breed occurs in more than one country (FAO, n.d.-b). This means the global number of breeding mares is possibly even higher. The Groninger horse, Gelder horse and the Dutch draught horse are only present in the Netherlands (FAO, n.d.-b). There is a population of draught horses in Belgium, but this population is similarly small with 437 breeding mares in 2013 (FAO, n.d.-a). In table 5 an overview can be found of the number of adult mares of these four Dutch breeds present in the Netherlands in 2017.

*Table 5. Number of adult mares in the populations of four Dutch horse breeds in the Netherlands*

	Number of adult mares
Friesian horse	30,000
Dutch draught horse	3,000
Gelder horse	1,261
Groninger horse	449

Since the Dutch draught horse, Gelder horse and Groninger horse are only shown to be present in the Netherlands we can assume that these numbers represent the entire population. All three of these horse breeds have less than 6,000 registered breeding mares which means that they can be classified as rare horse breeds. This is a concern because small populations like those of these three



horse breeds carry the risk of loss of genetic variation (Ministry of Agriculture, Nature Management and Fisheries, 2002). This can even lead to extinction of these breeds (Woodruff, 2001). Not only does this contribute to the loss of genetic diversity, but rare breeds also hold traits that could be crucial for future purposes or that play a role in education about local history (Van der Ouderaa, 1992). In order to prevent these traits from disappearing it is therefore important to try and increase the number of animals from rare breeds. The unique traits and/or purposes of the Groninger horse, Gelder horse and the Dutch draught horse could play an important role in the preservation of these populations by showing what makes them indispensable and useful in the present day.

## What makes them special?

### **Unique traits of these breeds**

The calm and down-to-earth character of the horses is an unique trait each of these four Dutch horse breeds, but still some differences that can be found between them. Whereas the Groninger horse and the Dutch draught horse are mainly described as easy and calm horses by their owners, the Friesian horse shows a proud disposition on top of that and the Gelder horse is also described as being more cheerful. The Friesian horse seems the only one out of these breeds who requires more care in regards to their character, but they too are described as more friendly than most other breeds. In the past all four of these breeds have been bred to work on the land or in front of a carriage (Centrum voor genetische bronnen Nederland, De Weerd, & Oldenbroek, 2010). This type of work requires horses to be obedient and not spooky, since this could be dangerous while driving or slow down the work when working in the field. It is possible that this past is the reason all four of these breeds have a high tendency to show easy and calm characters.

There is a connection between the personality and temperament of horses and their aptitude in sport (Hausberger et al., 2004). Horses who have a hotter temperament are more likely to be suitable for sports, for example dressage. Because the focus in breeding within these four populations has always included keeping their signature friendly or calm character these horses have kept this trait despite the fact that the focus within horse breeding in general has been moving towards the sport. This sets them apart from other breeds in which the focus on getting results in the top sport are often prioritized over character traits. Although they have not been bred to reach the top of the world in sports these breeds are still very suitable for various sports. The combination of their easy character and the possibilities of riding dressage, driving, or jumping with them makes them unique and versatile horses. This is also something owners recognize in their horses.

Lastly, the appearances of both the Friesian horse and the Dutch draught horse are unique and important traits of these breeds. The strong ties the Dutch draught horse has to Dutch history gives them an important role in retelling of this history through folkloristic events, while the Friesian horse is seen as an elegant and majestic horse. The signature appearance of the Friesian horse is possibly part of the reason why the Friesian horse has the biggest population out of these four breeds within the Netherlands, and why they are also well known outside the country. Recognition of horses by their appearance can be a good first step for one to want to get to know more about the breed, and might be an incentive for some to buy a horse of that breed.

### **Purpose of these breeds based on these traits**

There is an increasing focus on achieving high results in sport within horse breeding. Since a higher emotional reactivity, or a more spooky temperament, has been linked to horses who have shown an aptitude in sports such as dressage more horses will get a hotter temperament due to this shift in

focus. This will be to the disadvantage of recreational riders who don't want a horse with a hot temperament but do want to dabble in the sport every now and then, because there will be less horses suitable for them on the market. The Groninger and Gelder horses are especially suited to fill this potential gap in the market. Their calm character makes them easy horses for riders who have not had any special training and their eagerness to work combined with their ability to ride competitions in each branch of the sport makes them very suitable for recreational riders to still have fun in the sport, if so desired. It is of importance that there are enough horses on the market who have a calm character and that it is avoided that more and more hot tempered horses end up with beginning or recreational riders. This in order to ensure that the horses end up with owners who can give them the exercise or level of riding they need and to try and prevent the accidents that are likely to occur when riders are unable to properly handle their horse's temperament.

The Friesian horse is also well suited for recreational riders, but since they are not likely to become good at jumping they are mostly suited for those who want to focus on dressage, driving, or going on trail rides. Thanks to their remarkable appearance they are very well suited as show horse and this can also be an advantage while driving or riding outside. The appearance of the horses can be a source of pride for owners, and like the Friesian horse the Dutch draught horse also benefits from this. The Dutch draught horse is less in demand among recreational riders, likely because they are less suited for sport and riding under the saddle, even though they are very well suited as companion and for driving. Their calm character makes them very useful for attending events as well, since these often provide a new or scary environment for horses. Because their appearance and built have not changed much over many years the Dutch draught horse is still very well suited for working on the land.

Despite being able to make an assumption about the best fitting function or purpose of horses based on the qualities and traits of their breed this will always remain partly dependant on the individual horses themselves. Each horse has a different personality and different stronger and weaker points after all. It is entirely possible that some horses from a breed that is known for their easy character have a hotter temperament and a stronger or weaker affinity for sport. Similarly, a horse bred specifically for sport can have a calm character and make for a very safe and trustworthy horse for beginners. This is because the character of a horse is only partly determined by genetics. Genetics seems to have an influence on the reaction a horse may have to new and unknown objects, while environment circumstances seem to have an influence on the learning ability of the horse (Hausberger et al., 2004). Housing conditions and feeding strategies too might influence horse behaviour, as well as human interaction with the horse (Hausberger et al., 2007; Hausberger et al., 2004). It is therefore important that despite the general impression of a certain breed the purpose they can serve or the owners they are best suited with is still determined based on the individual.

### **Future of these breeds**

For the growth of the populations of these breeds it is not only important how many people are willing to buy horses from a certain breed but also how many breeders there are. The market for the Friesian horses is stabilizing, but for the Groninger horses there is currently more demand than supply and owners of both the Gelder horse and the Dutch draught horse have signalled that there are very few studs or stud farmers to be found. Instead of only spreading information about the qualities of these breeds to the general public it is therefore likely to be more helpful when this is combined with encouraging owners to start breeding with their horses. There should be a bigger focus on owners who wish to try it out sometime but do not necessarily have the intention to

continue breeding on a regular basis, since they are now not being involved as much as those who breed yearly.

It is difficult to predict the future for these breeds since a lot can change within a relatively short timespan, but the role of the studbooks in holding the population together cannot be underestimated. Unity among the owners of the horses within a breed is important to facilitate the trade of information and could make it easier for owners to find a stud or mare to breed their horses with. When there are disagreements about how the studbook is handling things it can cause a rift that divides the population. A studbook that is functioning well with enthusiastic breeders can convince more people to join.

### Horses in ecological agriculture

The use of horses such as the Dutch draught horse in agriculture is energy neutral and better for the soil compared to the use of machinery. There are multiple examples of farmers who still work with these horses and benefit from the advantages, such as the reduced strain on the ground and plants when using horses for dragging tree trunks out of the forest (Remijn, 2016). However, working with horses requires farmers to learn an extra set of skills and it is less time-efficient than working with machinery in agriculture. These factors make it very difficult to replace machinery with horses since it is simply not economically profitable. It is very likely that there will not be more than a handful of farmers who work with horses in agriculture since those who choose to do so need to be passionate about it. However, horses can be included in sustainable systems in different ways, either by implementing them in nature areas or by making the environments they are currently in more nature friendly.

#### **Bringing horses into nature areas**

Nature areas are now often grazed by sheep and cattle, but the addition of horses might be beneficial for the grasslands since horses are able to eat different plants than sheep and cattle. The grazing of nature areas by horses is shown to be beneficial for both the chemical and biological properties of the soil, even more so than grazing by sheep (Futa et al., 2017). Young horses are sometimes already sent into nature areas to grow and develop with a group of other horses.

The disadvantage of this is that horses are often expensive animals and letting them roam in nature areas is not without danger. Close attention needs to be paid to both the character of the horses and the environment they are in to limit the risk of injuries. With the exception of the young horses in nature areas who are sent back to their original owners after a couple of years the horses who are released to graze in nature areas must be horses that are not being ridden often anymore, since they are not readily available to be brought back out of the area.

The calm character of these Dutch breeds makes them suitable for roaming in nature areas, but the success of this is still largely dependant on the safety and size of their environment. The size of the Dutch draught horse could potentially be a problem in areas where people can walk since a group of these horses could be intimidating to walk past, and they might be prone to trampling other plants.

#### **Making their current environment nature inclusive**

The other way of including horses into an ecological system is by making the stables and pastures currently used by horses more nature inclusive. One way of doing this would be by recycling the manure and reusing it on the pastures. There is also a possibility to make the pastures more friendly for meadow birds. Currently there are many horse pastures that have a low species richness and closely resemble cattle pastures, despite that horses can be sufficiently fed by eating herbaceous

grasses and these grasses are great for providing forage opportunities and vegetation structure for meadow birds (Wageningen University & Research, 2016). These examples show that there are still plenty of opportunities for stables and owners to make their environment more nature friendly with the help of their horses. There are currently no indications that these effects can differ based on the breed of horse or if any of these four Dutch breeds is better suited for such pastures than other breeds. There seems to be no specific role for these breeds in this option.

## Further research and limitations

Dutch breeds as described by Stichting Zeldzame Huisdierrassen were the focus of this report, but there are other breeds that can officially be called Dutch due to their presence in the Netherlands for many years, such as the Shetland pony. The Dutch heavy warmblood horse is similar to the Groninger horse breed but has not been considered in this report either. Future research could be done to include these breeds in order to get a complete overview of the qualities of all Dutch horse breeds.

Furthermore the Gelder horse has been described as a breed in this report but the opinions on whether this horse is a breed or only a certain type are divided, and the use of breed in this report does not necessarily reflect the views of all who have been interviewed.

Due to limitations in the scale of this research only one owner of every horse breed could be interviewed. To get a more reliable view more owners could be asked for their views in future research, for example through the means of a questionnaire. To prevent a solely one-sided view in this report the interviewed experts have also been asked about the traits of the horse breeds and these answers along with those of the interviewed owners have been combined with literature research.

There is limited research done to the advantages horses could bring to ecological or circular agriculture. This means not all options have been fully examined yet and it might turn out there are more or different practices that horses are very well suited for. To get a complete picture of this specific research should be done on that topic. Possible research options for this include determining if there is a difference between breeds in the effect of grazing on the land, or if certain breeds or types of horses are better suited for surviving in herds in the wild.

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## Appendix 1.

Questions asked during the interviews with the horse owners.

### **General information**

How many horses do you own?

Which breeds do these horses have?

Do you make a living by working with these horses?

How long have you worked with these horses?

Was their breed an important factor for you in deciding which horses to work with?

If yes, for which reason did you decide on this breed?

What have you found to be advantages of working with this breed?

What have you found to be disadvantages of working with this breed?

What is the economical value of working with these breeds?

Do you breed with your mares?

If yes, which traits are important to you when selecting a stallion?

Can you easily find these traits back in the breeding values of the stallions?

Do you always look for a stallion within the same breed or type or do you cross-breed?

Do you sell or donate semen from your stallions?

If yes, what is your main reason for doing so?

Which traits are important to be present in your stallions?

### **Health**

Do you make adjustments to the feed of your horses based on their breed?

If yes, for which reason are these adjustments necessary?

Are there weak points in the physiology or common illnesses that are known to occur with the breeds of your horses?

If yes, which precautions do you take to avoid these?

Are there strong points in the physiology of the breed of your horses?

Are you aware of any possible troubles within the population of your horses' breed (e.g. declining number of animals, inbreeding, etc)?

### **Behaviour and personality**

Based on your experience, are there any personality traits you can ascribe to certain breeds? For example, do you notice that most horses of a breed are very stubborn, easily spooked, or generally very calm?

Do your horses show an aptitude towards one or more disciplines in the sport?

Does this differ a lot between individual horses within the breed?

For which purpose would you think this breed of horse is best suited? For example, as sports horse, family horse or trail riding horse.

Are there questions you have missed or things you would like to add?

## Appendix 2.

Questions asked during the interviews with the experts.

### **About the breeds**

*This questions in this part have been asked four times in total, once for each of the four horse breeds.*

Which advantages are there for owning and working with this breed?

-advantages in performance

-advantages in character

-advantages in health

Which of these advantages are unique for this breed?

Which disadvantages are there for owning and working with this breed?

-disadvantages in performance

-disadvantages in character

-disadvantages in health

Which traits are currently important in the breeding values of this breed?

Is there at this moment being selected on these traits?

### **About the status of the population of these breeds**

Over the last few years have you observed a change in the interest owners and breeding stables have for these breeds?

What is the added economical value working with these breeds gives?

Which risks will owners possibly face when working with these breeds?

Which future do you currently see for these breeds?

Is there a role for horses in circular or nature-inclusive agriculture?

If yes, which traits are useful for breeds to have for this purpose?

What is needed to maintain the populations of these breeds?

Are there questions you have missed or things you would like to add?