

A photograph of a dairy farm interior. In the foreground, a brown and white cow is looking directly at the camera from its metal stall. In the background, two men in work clothes are standing near other cows, one appears to be holding a clipboard or a small object. The barn has a high ceiling with wooden beams and large windows on the right side.

HealthyLife programme to increase longevity of dairy cows

HEALTHYLIFE
SUSTAINABLE LIFETIME PERFORMANCE

 **trouw nutrition**
a Nutreco company

Improving performance of your herd

To feed the ever-increasing world population in a sustainable way, the full production potential of each animal on a farm must be reached while taking into account animal welfare and environmental and social responsibility.

For dairy cows, this means increasing the average milk production per day of life, otherwise known as their Lifetime Daily Yield¹. The Lifetime Daily Yield can be increased by improving the following key performance indicators:^{2,3}

- Age at 1st calving
- Milk production per lactation
- Calving interval
- Number of lactations per cow

Trouw Nutrition has **two programmes** that can help to increase Lifetime Daily Yield.

The **LifeStart programme** focusses on the rearing period of calves. The LifeStart programme will reduce the Age at 1st calving. It will also prepare calves for a higher milk production and a reduction of culling rate later in life.⁴

Introducing the **HealthyLife Programme**

The HealthyLife programme focusses on the transition to lactation. It is a practical, science based programme that helps farmers increase the Lifetime Daily Yield. It will not affect the Age at 1st calving, but it will have an effect on:



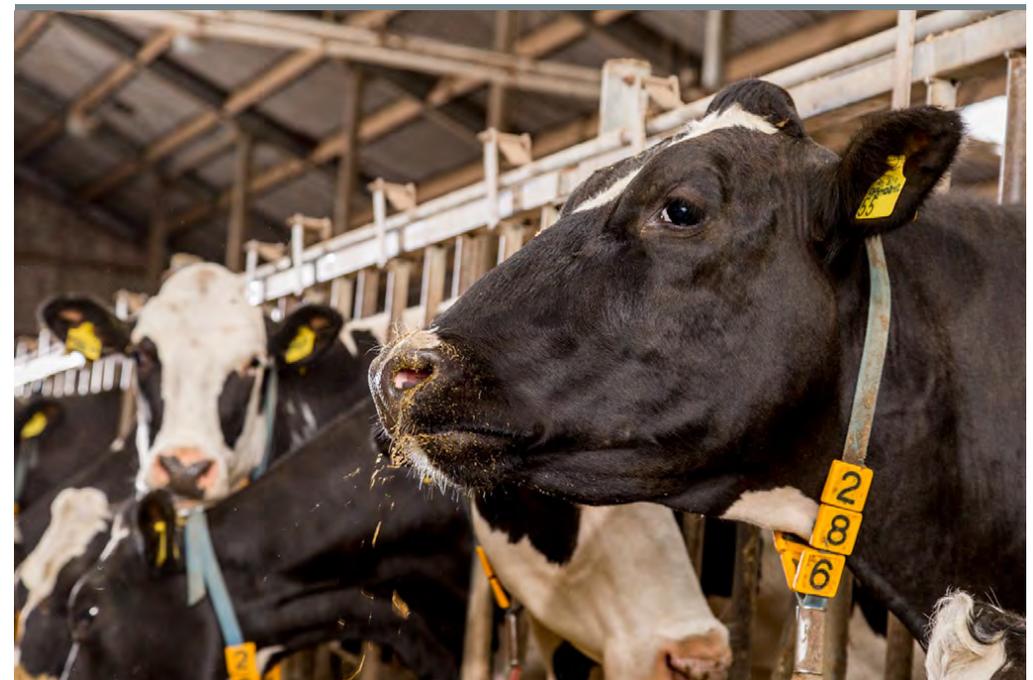
Milk production per lactation



Fertility and thus reduce the calving interval



Involuntary culling rate and thus increase the number of lactations per cow





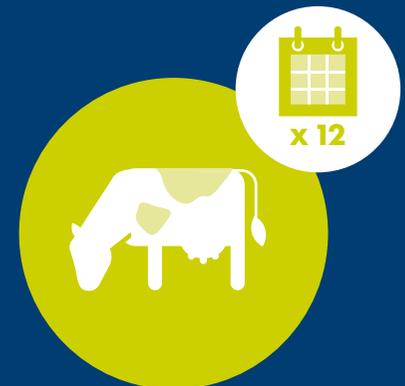
How the HealthyLife programme can help

The amount of scientific articles and information that can help farmers to manage these key performance indicators is simply overwhelming. However, HealthyLife makes it easy, by translating the latest science into simple and practical information and advice, available for use on farm.

By using the HealthyLife materials, it will become easier to increase average Lifetime Daily Yield.

A HealthyLife programme will increase Lifetime Daily Yield by improving fertility, increasing production per lactation and by reducing the incidence of metabolic disease and involuntary culling rate. In contrast to popular belief, a highly productive cow is a happy cow.

HealthyLife will help those that are proud to be a farmer to get the **best out of their animals, all year round.**





Increasing Lifetime Daily Yield by managing the transition to lactation

The transition to lactation has an enormous impact on performance of dairy cows.

Problems encountered during the transition phase:



Are responsible for **75%** of metabolic disorders^{5,6}



Have a strong negative influence on farm profitability⁷



Result in early culling which can cost **€760 per cow**⁸



Reduce milk production by **3.8 to 6.8%**⁹



Targets for the HealthyLife programme

- 1.** Involuntary culling rates of **less than 5%** during the first 100 DIM¹⁰
- 2.** Involuntary culling rate in heifers of **less than 15%**^{4,10}
- 3.** Heifers producing **at least 70-73%** of the herd average during 1st lactation¹¹
- 4.** Cows reaching peak production **within 50-70 days after calving**¹²
- 5.** Cows reaching **at least 5** lactations¹³

Resilience

A cow that can adapt during the transition to lactation in such a way that there is no need for involuntary culling is a resilient cow (see figure 1).^{12,14} Highly resilient cows have the optimal age at 1st calving, have short calving intervals, calve many times and produce proportionally more milk. Every lactation completed successfully makes a cow more resilient.¹⁵

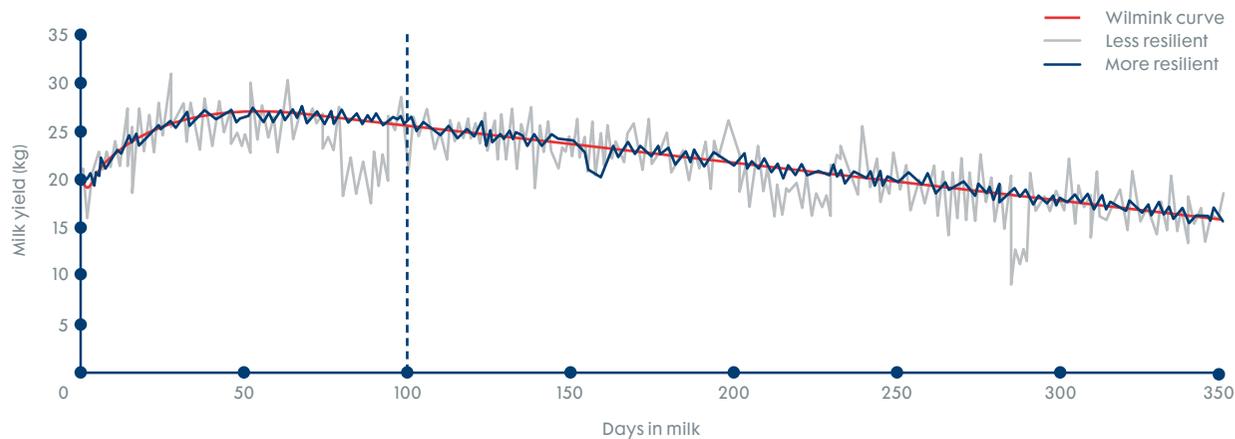
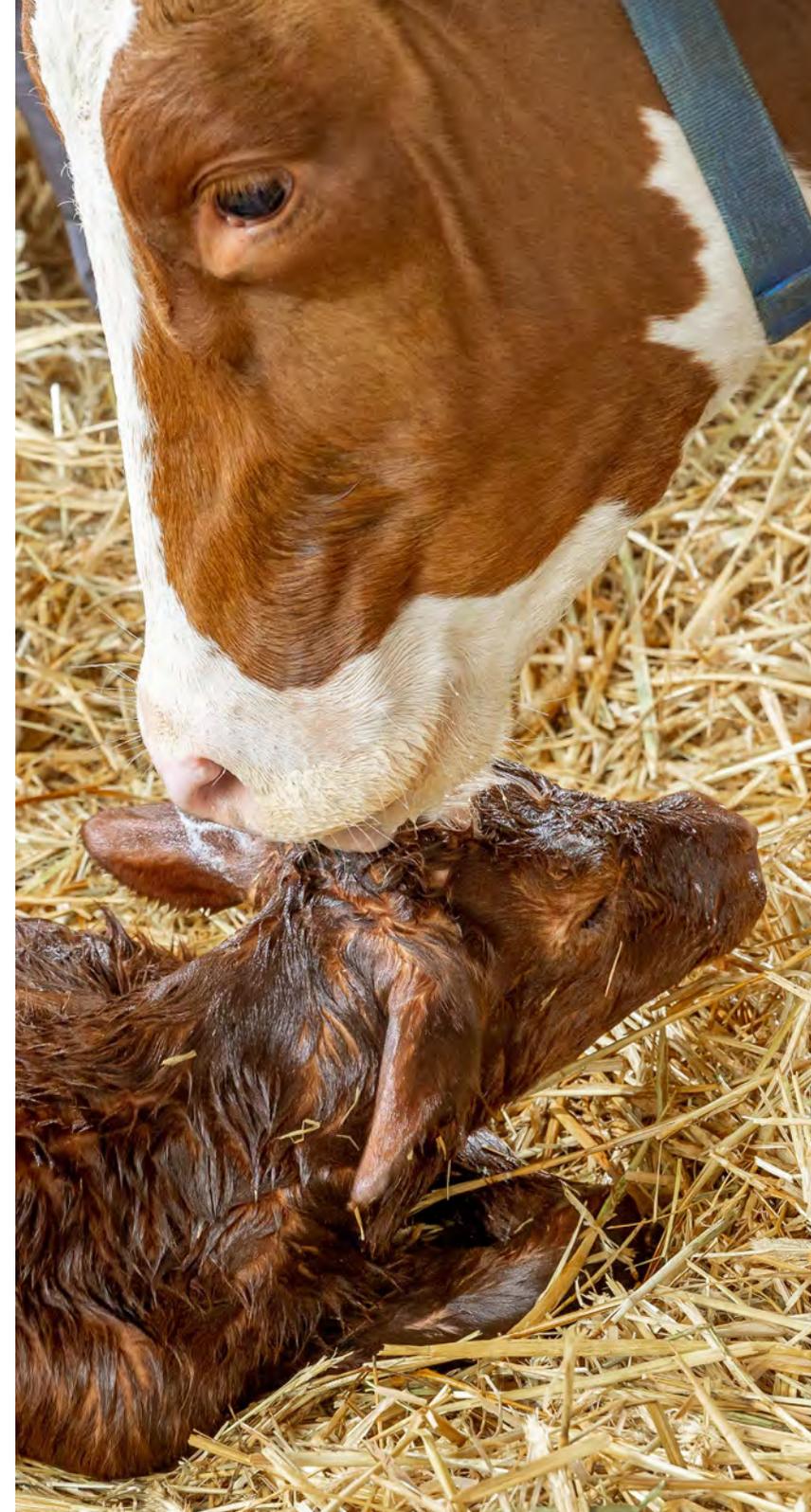


Figure 1, Adapted from Berghof et al²

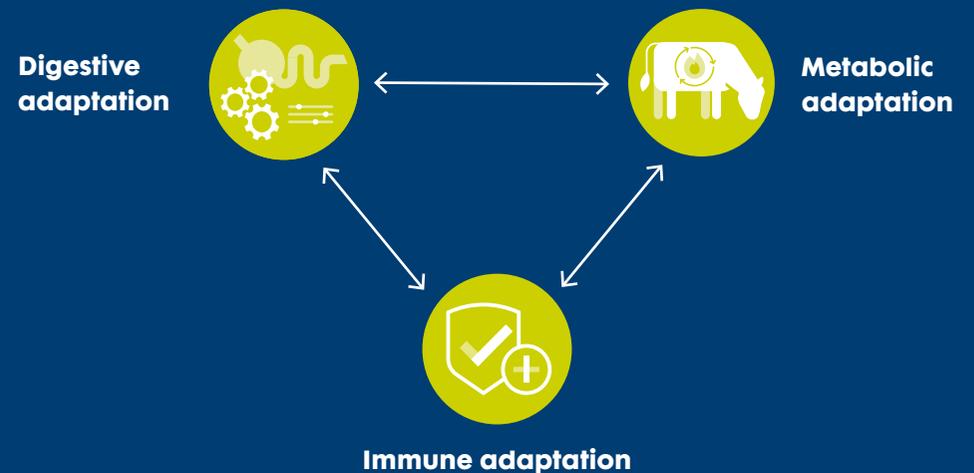
Figure 1, Wilmink curve which shows that resilient cows have less day-to-day variation in milk production and a slower decline because they are better able to cope with the metabolic changes during the transition. As a result, they reach peak production at **50-70 days**.





The 3 core physiological adaptations

The HealthyLife programme will help cows to deal with the **3 core physiological adaptations** that occur during transition:



There is a strong connection between these 3 adaptations, one is not independent from the other. A holistic approach to these 3 key adaptations will increase Lifetime Daily Yield because it will:

- Minimise systemic inflammation and immune activation, which will lead to an increase in milk production.^{16,17,18,19,20}

- Reduce the impact of metabolic diseases.^{5, 21, 22, 23}
- Improve functional longevity by reducing the involuntary culling rate early in lactation.^{24, 25, 26, 27}

By dealing with possible consequences of the poor immune, digestive and metabolic adaptations, the HealthyLife programme will thus create a resilient cow.

The importance of hindgut health

During the transition to lactation, the amount of fast fermentable carbohydrates in the ration goes up. It is a well-known fact that this can cause sub-acute rumen acidosis (SARA). More recent evidence suggests that there is an equally strong impact on the fermentation processes within the hindgut¹⁹.

Signs that are typically attributed to SARA, like for example loose and frothy faeces, are actually **signs of hindgut acidosis**²⁸ (see figure 2).

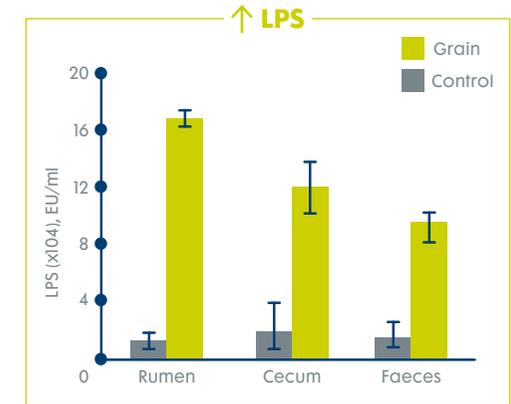
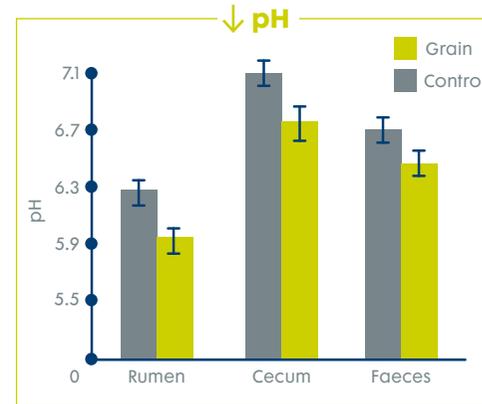
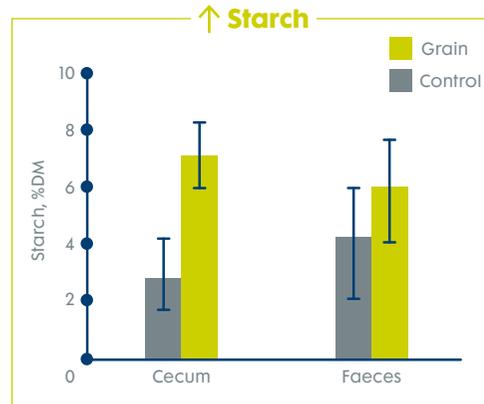


Figure 2, pH and production of LPS in rumen, caecum and faeces of cows fed high amounts of grain compared to control cows. Increasing the level of starch decreased pH and increased LPS both in the rumen and the hindgut.²⁸

Compared to the rumen, the hindgut has less defence mechanisms against acidosis.^{19, 29, 30} Mucosal damage as a result of acidosis leads to “leaky gut”, resulting in systemic inflammation. This systemic inflammation uses a lot of energy and nutrients which the cow can’t use for milk production. Supporting hindgut health reduces the risk of leaky gut and thus represents an opportunity to further improve overall health and performance.

Improving hindgut health by managing digestive adaptation

A first important step is to deal with challenges where they occur. Improving hindgut health can prevent many of the problems related to poor digestive adaptation³⁰.

Improve hindgut health by using our technical brochure on managing hindgut health.

Next to attacking the problem of leaky gut at the source, the negative consequences should be managed.



Managing negative energy balance through managing metabolic and digestive adaptation

Cows are always in negative energy balance during the period immediately after calving. Poor metabolic and digestive adaptation can make this worse, resulting in metabolic stress, with the following consequences:

- Poor fertility
- Low milk production
- Impaired immune function
- Reduction of protein levels in milk
- An increased risk to develop sub-clinical or clinical ketosis

Use our technical brochure "Managing the negative energy balance in cows" and our BCS poster to reduce the impact of negative energy balance and metabolic stress.



Reducing sub-clinical hypocalcaemia by managing metabolic and immune adaptation

During the period immediately after calving, blood calcium levels decline. In combination with poor metabolic and immune adaptation, this results in

- A high incidence of milk fever
- Low milk production
- An increase in the incidence of mastitis
- An increased incidence of retained placenta and infections of the reproductive tract, resulting in poor fertility

Many of these problems can be avoided by managing the calving process properly. Reduce the risk of sub-clinical hypocalcaemia by using our Technical brochure "Managing the calving process to start a successful lactation" and find practical tips about managing the blood calcium levels of your cows in the period around calving in our Technical brochure "Hypocalcaemia, the hidden threat for dairy farmers".



Increasing production of milk fat by managing metabolic and digestive adaptation

Poor digestive and metabolic adaptation results in poor rumen fermentation and problems with hindgut health, leading to decrease of milk fat production. This directly affects farm income.

Increase the yield of milk fat of your cows by using our Technical brochure **"Increasing the production of milk fat"**.



Connecting the dots by managing fertility in a systematic way

Managing the aforementioned challenges that cows are facing in the transition period will have a strong positive impact on fertility and will result in a reduction of involuntary culling.

A further improvement can be reached by monitoring some key performance indicators related to fertility in a systematic way and translating this into specific actions. More information on managing fertility of your herd can be found in our Technical brochure **"Managing fertility on farm"**



Peer Claassen from Beuningen, the Netherlands



Number of dairy cows:

135

Age at first calving:

24 months

Annual production:

10,370 kg, with 4.50% fat and 3.90% protein

Lifetime production:

50,000 kg of milk per cow

Average daily yield:

34 litres per cow

The farm has been on this location since 1989 and in 2011 we built a new barn with milking robots. We are working according to the "Planet Proof" standards for sustainability from our milk processor Friesland Campina.

Sustainable dairy production for our farm means balance in everything we do, resulting in healthy cows and healthy land. Sustainable farming now brings more profit, due to the benefits that come in addition to the Planet Proof premium. Ultimately, our aim is to ensure this farm still exists for the next decades.

Our lifetime production has now increased to 50,000 kg per cow. This is due to our cows being in balance and do not have health issues. Issues such as culling because of mastitis or lameness hardly exist and as a result our culling rate is very low. Because of this, the number of heifers could be reduced from 45 to 25.

Our main reason for culling is fertility. We aim at a calving interval just below 400 days, however we do not worry if a cow takes more time before it gets pregnant, as long as persistence of milk production is good.

Our cows aim to have 5 to 5.5 lactations before they are being culled. To achieve this number, a smooth transition to

lactation is crucial. This means housing of the dry cows and heifers should be comfortable and pregnant heifers should be introduced to the group early. Heifers are moved to a stress free calving line with a straw bed 2 weeks before calving, cows a little bit later. All animals stay on the straw bed for at least 1 week after calving.

Next to that, housing and nutrition of the lactating cows is crucial.

Using cubicles with deep bedding, along with good feed is crucial to keep cows healthy. Alongside this, the farm has also invested in new silos to ensure silage quality is optimal.

Ultimately I am a happy farmer because I can make my own choices. For me, these choices are about balance, ensuring the cows have an easy life and ensuring the farm can earn an income at the same time.



HealthyLife for healthy performance

Following the HealthyLife programme will help increase Lifetime Daily Yield by improving fertility, increasing milk yield per lactation and by reducing involuntary culling, leading to an increase of the number of lactations per cow.

Not only will this will improve financial performance of the farm, it will also result in sustainable milk production, now and in the future.



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