

Feed Efficiency: The indicator for profitability

Feed efficiency is one of the most important indicators in dairy production. And though many farmers will agree with this assessment, in practice it is often the case that they don't actually know what their feed efficiency is. In this, dairy farmers can take an example from their colleagues in swine, poultry and beef production. We spoke with experts from the feed industry to take a detailed look at the topic of feed efficiency.

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We will start with a short check:

- What is your current milk price?
- How many kilograms of dry matter does your herd consume on average per day?
- How many kilograms of energy corrected milk is produced per kilogram of dry matter intake?
- What is the cost of one kilogram of dry matter in your ration?
- How high is the average feed cost per cow and day?
- How high is the Income over Feed Cost (IOFC) per cow and day?
- What proportion of milk revenue do you need to cover the feed costs?
- How high are the feed costs per kilogram of energy corrected milk?

Hand on your heart – how many of these questions were you able to answer spontaneously? If you had an answer to all these questions: congratulations, very well done! If you don't immediately know the answer to some of these questions, that doesn't affect the excellent work you do on a daily basis. Nonetheless, the winter months are a time where it is worthwhile calculating these figures for your herd. This helps better understand the current situation and identify potential adjustments that would have a positive financial impact.

IMPORTANCE

Feed costs are typically the largest expense in dairy production and are therefore partly responsible for the farm's financial success. The more milk produced per kilogram of dry matter

intake, the lower the feed costs will be per kilogram of milk. To enable a better comparison, it is sensible to calculate fat- and protein-corrected milk. As such, this article will use corrected milk yields. In practice, feed efficiency is usually between 1.3 and 1.7kg milk per kg dry matter. For farms that only have one feed group, an optimal goal would be to have a feed efficiency >1.5. For farms with multiple groups, the high-producing group should achieve >1.7 (heifers >1.6) and the later stage cows should be >1.2. The fresh group should be <1.5 during the first three weeks after calving, as they would otherwise lose too much body condition and be at higher risk of metabolic diseases. If the average of the herd is <1.3, we recommend having a closer look at the topic with your feed advisor as it will be having a significant impact on profitability. For the evaluation of feed efficiency, factors like days in milk, herd age, pasture access, and climate should be considered. In Table 1 we present the influence of feed efficiency on profitability. With a given milk production of 35kg and increasing efficiency, less feed is required. This lowers feed costs per cow per day and increases Income over Feed Costs (IOFC). In this example, the IOFC per cow per year is 3,558.75€ with a feed efficiency of 1.4, while it rises to 3,828.85€ with a feed efficiency of 1.6. The difference amounts to 270.10€ per cow per year, which works out to over 27,000€ for a herd of 100 cows – just through improved feed efficiency. There are different approaches to improve the feed efficiency of a herd. One important factor is genetics, which is why by now almost all countries have a breeding value for feed efficiency or feed saved. With these breeding values, animals can be identified

that need less feed for the same production level as they will have lower maintenance requirements or better feed conversion. Nonetheless, in the long term it is primarily feed and herd management that affect the actual feed efficiency.

MONITORING

The German company AHRHOFF GmbH relies on many years of experience in this area and is today active in South Africa and Hungary, among other places. Since 1996 the company has been producing high quality mineral and special supplements and puts a lot of value on intensive customer support: 'At the start of the working relationship the focus is to sensitize the clients to gather data on dry matter intake in order to develop a feel for how much their herd is consuming, so that we can successfully implement changes,' explains Rainer Kossmann, feed advisor at AHRHOFF. Many clients now gather feed intake, feed remainders and dry matter digitally through special software solutions. 'Our goal is to achieve optimal feed intake so that cows efficiently convert the feed, and that is only possible through good rumen function,' Kossmann expands. For stable rumen function, physically effective fibre and the creation of a fibre mat in the rumen are decisive. 'Monitoring during forage harvest has become an important pillar of our advisory work over the years. With the shaker box, the chop length and the particle partitioning is exam-



How high are the average feed costs per cow and day?

ined; for one, to avoid sorting of the ration and two, to prevent short chop lengths. These lead to high passage rates, whereby efficiency is lost,' Kossmann continues. For ration formulation, AHRHOFF offers mineral supplements with live yeasts and further supplements that promote health and production. Here again, monitoring plays an outsized role: the shaker box and the manure sieve are used to verify whether the ration, formulated using CNCPS analysis, actually makes it to the rumen and is efficiently digested.

FEED QUALITY

Globally, forages are a key priority for Lallemand Animal Nutrition. Lallemand provides comprehensive guidance to farmers, from the field to the silo to ensure the best quality silage is made. This includes best harvesting guidelines, achieving optimal dry matter, proper packing practices, and effective covering advice. To make good silage even better, Lallemand developed the MAGNIVA product range. This covers silage additives based on the *L. buchneri* and *L. hilgardii* bacterial strains. 'Through the combination of the two strains, the ensiling process is accelerated. This allows farmers to feed their silage

sooner,' underlines Luis Queiros, Global Manager for forage additives at Lallemand. In cooperation with over 30 different researchers and universities around the world, feed trials were conducted which revealed that silages made with Magniva silage additives improved feed efficiency for both dairy and beef cows. 'At the beginning we focused on developing products that primarily concentrated on reducing dry matter losses during the ensiling and feed-out process. The lower the losses, the more feed could be used for the animals, which in turn improved land use efficiency,' says Queiros. Now the development is focused on the digestibility of starch and fibre and on the control of mycotoxins and other harmful organisms. 'We are carrying out a variety of metagenomic research programmes aimed at suppressing unwanted bacteria, yeast and moulds. In this way, we can protect the rumen flora and further increase feed digestibility,' explains Queiros.

REDUCE STRESS

'Milk yield is the absence of stress' – this famous quote from Dr. Gordie Jones is a favourite of Jürg Hoffmann of Hofmann Nutrition AG. Through

improvements to cow comfort, cooling during heat or smooth transitions during changes in feeding, stress can be reduced though never fully avoided. When stress occurs, the microbiome in the rumen and the gut changes, and the gut wall barrier becomes leaky – the well-known "leaky gut syndrome." In this event, bacteria and toxins are able to enter the bloodstream, which activates the immune system. 'Different researchers estimate that about 2kg of glucose per 24h is required when the immune system is activated through "leaky gut." If one considers that the metabolism for the production of one litre of milk requires about 70g of glucose, it becomes clear how big the energy cost and milk loss from stress is. Feed intake is primarily used to compensate for stress factors and not to generate production, which leads to a decrease in feed efficiency,' says Hofmann. With the Concept Dairy Pro, developed by Hofmann Nutrition, which is based on a specific combination of high-quality micronutrients, act in a targeted way to reduce the consequences of stress and improve feed efficiency. ●

Table 1 - Influence of feed efficiency on profitability

Kg FECM	Efficiency	Kg DM intake	€ per kg DM	Feed cost per day	IOFC per cow and day (milk price of 0.45€)	IOFC per cow and year
35	1,4	25	0,24€	6,00€	9,75€	3.558,75€
35	1,5	23,3	0,24€	5,59€	10,16€	3.708,40€
35	1,6	21,9	0,24€	5,26€	10,49€	3.828,85€