Sustainability is often linked to energy saving, carbon emissions and climate change, when in fact it should combine all components of sound animal husbandry into one integrated package.

For many dairymen, the most important component of sustainability is economy, or rather, profitability. In the past, the focus was on reducing costs resulting in hidden opportunities, such as extending the productive life of the cow. The effect can be seen in Table 1.

Table 1 The effect of longevity (number of lactations completed per cow) on the cost per lactation.

<table>
<thead>
<tr>
<th>Number of lactations</th>
<th>Cost per lactation (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>1 400</td>
</tr>
<tr>
<td>3</td>
<td>1 167</td>
</tr>
<tr>
<td>3.5</td>
<td>1 000</td>
</tr>
<tr>
<td>4</td>
<td>875</td>
</tr>
<tr>
<td>4.5</td>
<td>778</td>
</tr>
</tbody>
</table>

Assumptions:
Cost of replacement heifer = R10 000 and R7 000 for large and small breeds, respectively.
- Cull value of heifer = R6 500 and R3 500 for large and small breeds, respectively.
- Real cost of replacement heifer = R3 500.

The values used here are examples and may differ from farm to farm.

Facts and figures
Another sobering figure is the amount of capital tied up per 100 cows in milk. This is R140 000 at 2.5 lactations per cow, and is reduced to R87 500 at four lactations per cow. There is also a knock-on effect in the number of heifers to be raised as replacements.

At 2.5 lactations, a 40% replacement rate means 40 heifers/year (R400 000 and R280 000 for large and small breeds, respectively). At four lactations, a 25% replacement rate means 25 heifers/year.
The focus on mineral supplementation, for improved conception, has often led to an overemphasis on mineral status and not enough on energy balance.

(R250 000 and R175 000 for large and small breeds, respectively). The difference between the 40% and 25% for large breeds is R150 000 and for small breeds R105 000 per year per 100 cows in milk.

Culling
The major reasons for culling (not in priority order) are:
• reproduction
• mastitis
• lameness.

Metabolic disorders, such as acidosis, ketosis and milk fever are often the underlying causes for problems later in life. These are, however, preventable with good nutritional management. The problem often starts in the transition period, when dry matter intake is low and the nutritional requirement high.

Reproduction
The focus on mineral supplementation, for improved conception, has often led to an overemphasis on mineral status and not enough on energy balance. Most cows lose more than one condition score within seven to 10 days.
The energy shortfall can be illustrated as follows: A cow with a body weight of 550 kg, condition score of 2.5, milk production of 50 litres, butterfat of 3.5%, milk protein at 3.1%, and eating only 22 kg of dry matter by 35 days after calving, will have an energy shortfall of approximately 60 Mj ME per day, which is equivalent to 6 kg of dairy meal. The only way for her to meet her energy needs is from body reserves (1 kg of weight loss will provide approximately 34 MJ ME), placing stress on the liver to convert body fat into glucose. Most cows, unless they are overweight, can in fact deal with such condition loss, but will only reconceive once they improve condition.

**The focus on mineral supplementation has often led to an overemphasis on mineral status and not enough on energy balance.**

Heifers introduced into the herd can be genetically superior to the cows being replaced. However, management and not genetics, is often the first limiting factor; with feed management being the biggest obstacle to increasing longevity. Producers often put unit price of feed above value for money.

Normally, older cows give between 10 and 20% more milk than first calvers. If managed correctly, first calvers will continue to improve until their third or fourth lactation.

Large herds, especially those fed total mixed rations (TMR), often have the highest culling rates. Unfortunately, high milk production is one of the greatest stresses to cows. Those peaking over 70 litres on TMR and over 50 litres on pasture are becoming more common. Especially high-production pasture cows often stay in a negative energy balance for longer, leading to more cullings owing to delayed reproduction.

The advent of sophisticated feeding systems such as Afikim and Alpro has eased the energy-shortage burden, but has exposed cows to higher levels of high-density dairy meal, increasing the risk of acidosis.

**Transition cow management**

Poor transition cow management, along with low energy densities often reduce dry matter intake to as low as 18 kg/day. This means cows may lose between 7 and 10 kg live weight per day. These cows are very seldom rebreed on time. Diet energy density is easy to address in most herds, although in high-production herds it is becoming a challenge.
Increasing dry matter intake during early lactation remains the biggest challenge. Poor choice of transition cow diet will compromise the situation. The closer the pre-partum diet (last 10 days before calving) can be to the lactating diet, the better, with starch being the most critical component. The rumen microbial population needs time to adapt. Failure to give sufficient time will lead to rumen acidosis and a subsequent reduction in feed intake, or even feed refusal, further compromising an already stressed system.

It is a credit to all concerned that we seldom see cases of clinical acidosis, but virtually all cows calving develop some form of subclinical acidosis, leading to ketosis (also often subclinical) and milk fever (often subclinical as well). Improvements in cultivar development and pasture management has seen sugar content, along with fibre digestibility, increasing. This has improved grass energy levels but at the same time increased the risk of subclinical acidosis in fresh cows.

**Mastitis**

Mastitis usually has a human cause. It appears that as herd size increases, cow environment plays a greater causative role. This may result from a lag in infrastructural upgrades relative to herd expansion. Heat stress also plays a bigger role. It is puzzling to see somatic cell counts (SCC) increasing without a comparable increase in clinical mastitis. This contradiction remains a challenge. Unfortunately, older cows often have higher counts and are often culled to reduce SCC and prevent penalisation. Good responses have, however, been attributed to increased mineral supplementation. It is vital that mineral inclusion keeps pace with increasing milk production. The focus should be on intake per cow, relative to requirement, and not merely on percentage inclusion of specific minerals.

**Lameness**

Poor infrastructure maintenance is often blamed for lameness. However, mismanagement of dietary starch content and ineffective mineral supplementation are becoming increasingly important. Fortunately, professional hoof trimmers and better nutrition have resulted in fewer cows being culled owing to lameness.

**CONCLUSION**

Keeping cows longer can improve profitability dramatically. This is within our reach. By improving transition cow management, along with correct mineral supplementation, cow health and longevity may improve, thereby increasing profitability. The future is in our hands, let’s make the most of it.

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