Milk components and profit

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Often under utilised and less often understood, key production indicators are a relatively new management discipline in today's high tech dairy industry.

These indicators act as a barometer of a farm's nutritional programme and cow comfort provisions, helping dairymen operate more efficiently and profitably.

Energy corrected milk (ECM), which best represents the overall performance of a dairy cow, is a compilation of indicators. It collates milk quantity, butterfat and milk protein into one useable number.

ECM = (milk lb x 0.327) + (butterfat lb x 12.95) + (protein lb. x 7.2).

Evaluating and comparing each component provides a basis for management decisions.

Milk urea nitrogen (MUN) is a good barometer of dietary protein utilisation and helps reduce dietary protein costs. High trends of MUN (>16mg/dl) usually indicate excessive feeding of protein or underfeeding of carbohydrates, which both cut into profit.

Somatic cell count (SCC) is also a very important indicator, but requires more attention than can be addressed in this article.

Much of the milk produced in the USA for fluid consumption is marketed based on component pricing.

Formerly, many dairymen relied on milk check receipts and bulk tank measuring sticks to track production and components, while others depended upon monthly dairy cooperative testing programmes, such as, DHI in North America or similar recording systems in countries with ICAR (International committee for animal recording) member organisations. Today, on farm metering, for example with the Lacticheck from Page and Pedersen International Ltd, USA, gives farmers greater control.

Besides checking for measurement errors at the processing plant, on farm testing:

- Demonstrates how each cow responds to management.
- Monitors cow string performance.
- Checks milk lactose, a barometer of dietary carbohydrate utilisation.

Milk component and production monitoring of cows in the first week after freshening is a useful tool to determine the effectiveness of the close up, dry cow programme – the 21 day period immediately prior to calving.

A milk component analysis that reveals abnormally high butterfat and normal milk protein indicates excessive mobilisation of body fat, suppressed appetite or, perhaps, fatty liver disease.

Holsteins with a first butterfat test after calving of >5.0% suggests subclinical ketosis. Cows that test >6.0% conditioned dry cows or fresh cow management.

An overly conditioned dry cow freshens with fatty liver degeneration or develops liver disease because of excessive mobilisation of fat stores.

Her appetite decreases as more NEFAs mobilise, leading to a downward spiral of ketones, displaced abomasa, or, in severe cases, paralysis.

Close up dry cows

The transition dry cow ration is often incriminated when fresh cows perform poorly for the first 30 days after calving.

Dry cow rations containing >0.65 megCal/lb. NEL (1.43megCal/kg.) have been shown to negatively affect the appetite of the fresh cow.

This may lead to a cascade of detrimental metabolic events. Close up dry cows in crowded conditions or with severe heat stress will likely demonstrate a similarly poor appetite.

Low first butterfat (<3.2%) and milk protein (<2.9%) tests after freshening can indicate other problems, such as poor body condition at calving.

Since cows go into a negative energy balance after calving, they do not have fat reserves for butterfat synthesis. In this case, changing the close up dry cow ration will not likely solve the issue.

Body condition must be evaluated prior to dry off in the previous lactation.

Low body scores in late lactation dictate that changes in the nutritional programme be made then.

The dietary cation-anion difference (DCAD) prior to calving is a critical component to monitor in the transition diet of late-term pregnant cows.

A well formulated close up DCAD ration will reduce the incidence of milk fever and retained placenta, shorten the time to first oestrus in fresh cows, improve conception rate and raise milk production 7-10%.

Fresh cow management

Fresh cows perform best when they get the '3 Cs' – compassionate cow care.

Here is a summary of practices that benefit the cow and maximise milk components:

- Provide each cow immediately after calving with 15 gallons (60 litres) of warm water containing a palatable electrolyte cocktail. Large volume fluid replacement not only rehydrates the cow but provides 'fill' in the abdomen, physically impeding displaced abomasum.
- Monitor dry matter intake (DMI). Feeding 1kg of high quality alfalfa (lucerne) or other equivalent, palatable, fine stemmed forage, twice daily prior to a total mix ration (TMR) is an excellent method for stimulating rumen function while enabling the caregiver to observe a cow's appetite.
- Check temperature and evaluate further with a physical examination.
- Observe cows' demeanour, appetite and brightness of eyes for signs of illness. When illness is suspected, evaluate a cow's abdomen, chest, faeces, udder and reproductive tract.

Lactating cows

Cows that consume excessive amounts of grain in proportion to forages risk rumen acidosis. When the TMR is too dry or poorly blended, cows sort the ration to choose only the grain concentrate. Rumen acidosis is also caused by heat stress and a lack of cow comfort. In such situations cows chew cud less, cutting production of bicarbonate rich saliva.

Cows experiencing rumen acidosis often have a suppressed butterfat test – usually inverted with milk protein, but, not always.

In the case of sub-acute rumen acidosis (SARA), rumen acidosis often affects health but has little effect on butterfat.

Increasing profit

Milk components can be increased in two ways:

- Increase milk production. The greater the volume of milk, the more pounds (or kilograms) of butterfat and protein.
- Manipulate diet. Optimum levels of forage processed for the appropriate particle length can maximise butterfat. Rations can also be formulated with specific ratios of amino acids to increase milk protein (for example, 3:1 lysine to methionine).

A low butterfat test

This is probably more troubling to nutritionists and dairymen than any other production issue.

Once rumen acidosis is ruled out, many experts are perplexed. Biohydrogenation appears to be a major factor that is not yet well understood.

Experts know that feeding dietary fat at >5% will suppress fat production. Some claim that feeding monensin also contributes. However, if fat suppression is more than 0.1%, factors other than monensin should be evaluated.

Conclusions

On farm monitoring of milk components is a useful tool to increase profitability. Technology exists to measure the results of improving management and dairy husbandry through nutrition and cow comfort and care, especially at freshening. ■

References are available from the author on request.