

FEEDING

by A. F. Kertz

What really dictates how calves grow

OVER the last 10 years, it has become popular to raise the crude protein (CP) level, let's just say "protein" level, in calf starters from 16 percent on an as-fed basis all the way up to 22. Is this justified on a scientific basis? Quite simply, no it is not. Let's review what we know.

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The National Research Council (NRC) publication on Nutrient Requirements of Dairy Cattle is published about every 10 years. Its recommendations are based on published scientific data. In the 1989 version, the recommendation was for 18 percent protein on a 100 percent dry matter (DM) basis. But, remember, feed tags and feed are

manufactured and sold on an as-fed basis. So 18 percent protein, when at 88 to 90 percent dry matter as-fed basis, is a 16 percent as-fed starter.

The 2001 Dairy NRC also adhered to the same recommendation as the 1989 version. Why? Because there was no new research to suggest a change.

The major study done during the past 10 years was at Minnesota using four starters ranging from 15 to 22.4 percent protein on a 100 percent dry matter basis. Two specific comments in that publication were: "Therefore (based on a review of six other published studies plus this study), the evidence seems sufficient to indicate that the optimal amount of protein in calf starters to promote maximum growth of calves from birth to 8 to 12 weeks of age is between 16.6 and 19.5 percent of the dry matter as long as starter consumption is adequate and starter formulation meets the energy requirements" and "... current NRC recommendations of 18 percent protein in the calf starter dry matter seems to be adequate for maximum growth of young calves. Calf starters containing higher amounts of protein offer no additional advantage, even when weaning occurs as early as 4 weeks of life..." Consequently, the NRC recommendation in 2001 remained the same as it was in 1989 after review of additional research.

Why suggest more?

What is the rationale of those who promote a higher protein level in starters? Starter intake is too low to meet protein requirements at 16 percent, is one thought. If that is true, then starter intake is too low to meet energy requirements, and that will likely be the most limiting nutrient.

In essence, that is what the first Minnesota comment above said. Adequate protein without adequate energy will not result in the appropriate weight gain. The problem is low starter intake, not low protein percent.

The other rationale is that starter protein level must be as high as the milk replacer protein percent. But, remember, the milk replacer or milk bypasses the rumen and goes into the abomasum... the true stomach for monogastric digestion and absorption.

The starter goes into the rumen and is fermented before its by-products are absorbed in the rumen or pass out to the abomasum. Ironically, over the same time period as starter protein levels have been boosted, efforts have been made to back off on milk replacer levels from 22 percent to as low as 18.

There are real issues with calf starters, but most revolve around feeding factors. These include quality of the starter, feeding practices, milk replacer fat level, and water intake. Quality of the starter includes ingredients used, how well it is manufactured, how it is stored, and whether it stays fresh without mold and development of fines.

If a starter is not palatable, then calves will not eat enough. If it does not ferment well in the rumen,

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then intake also is compromised. Both need to occur and complement each other.

Poor feeding practices limit starter intake. These include putting too much starter in the container, especially when intake is low during the first week or two. If this is not managed to keep the starter fresh daily, then caking, mold, and fines will occur and limit intake.

What people do wrong . . .

A common problem is that people do not separate starters and water using a divider or use separate containers with a divider between. Calves love to dribble starter in water and water in starter. Intakes of both starter and water suffer! With some ingenuity and changes, most calf starter feeding setups can minimize this problem.

Since the 1950's, studies have shown the interaction between fat level in the milk replacer or milk and starter intake. As fat level in the milk replacer or milk climb above 12 to 15 percent, starter intake is reduced. Another extensive Minnesota study in the 1990's showed that, when fat was raised from 15.6 to 21.6 percent, starter intake not only was lower, but it dropped so much that total energy intake from both milk replacer and starter was reduced.

The higher-fat milk replacer also reduced weight gain. So what was apparently gained with putting more fat in the milk replacer was more than lost in reduced starter intake. And this effect carried over for two more weeks after weaning at 6 weeks of age. Two-thirds of these calves were raised outside in hutches, including winter.

Water is vital . . .

Water intake is most closely related to dry matter intake. In fact, calves consume about 4 pounds of water for every pound of dry matter intake. So, if water is not provided, is dirty, or accessibility is a problem, then starter and dry matter intake will be limited.


In summer, water intake is even higher . . . as much as 5 gallons a

day in a Florida study. In winter, starter intake also is limited by water availability. With greater energy requirements due to colder weather, emphasis most often is focused on raising the fat level in the milk replacer or feeding more. But there is another way.

The more starter that is consumed, the greater the benefit

from the heat of rumen fermentation of that starter. It is not incidental that, in the wild, essentially all large animals in cold climates that do not hibernate are ruminants. And we know how much better our milking herds handle the cold than heat.

Again water intake is the key. Providing warm water after twice

daily milk replacer feedings, along with one additional midday warm water feeding, is the best practical way to help this situation. That third feeding of water improves water available by 50 percent. And if calves drink only several more quarts of water, that is enough for another pound of dry matter intake of the calf starter. 

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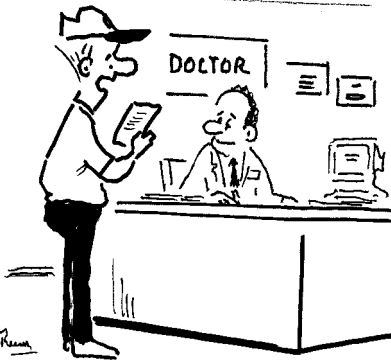
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Product Feature	ScourGuard 3 (K)/C
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Demonstrated to reduce viral (rotavirus) shedding ¹	Yes
Tissue-friendly ²	Yes
Field experience	More than 12 years

¹ Data on file, Pfizer Animal Health, study #2359H-00-00-012. ² Data on file, Pfizer Animal Health, study #2134H-00-00-075.
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