Ideas for improving peak milk production

R. Tom Bass for *Progressive Dairyman*

Why is peak milk important?

Increased milk yield. The vast majority of dairies generate the vast majority of their incomes through milk sales. The correlation between peak milk yield and actual 305-day milk production is highly positive. Each additional pound of peak milk should translate into an additional 200-280 lbs of milk in mature cows and 300+ lbs in first-calf heifers across the entire lactation. Conservatively, each one-pound increase in herd average peak milk production should generate at least 20,000 lbs more milk per 100 cows per year.

Improved feed efficiency. This measure relates closely to improved income over feed costs (IOFC). Higher-producing cows typically have higher feed efficiencies, as each incremental increase in feed intake further dilutes maintenance feed requirements (and costs) and is more efficiently allocated to increased milk production. Dr. Mike Hutjens reports that each 0.1 unit improvement in feed efficiency typically improves IOFC by 25-35 cents per cow per day. That equates with an income increase of $9,125 to $12,775 per 100 cows per year.

Related nutritional considerations

A primary objective for both transition and early-lactation cows is to maximize dry matter intake. Feed intake is influenced by a variety of factors in dairy cattle, and the predominant physiologic limitations vary with stage of production. Based on research and a theory developed by Dr. Mike Allen and colleagues (the Hepatic Oxidation Theory, or HOT), transition and fresh cow intakes are primarily limited by elevated blood NEFA (non-esterified fatty acid) and/or blood/liver propionate levels, as they influence an increased rate of ATP production by the liver. These considerations become less significant limiters of intake as the cow progresses through early lactation toward peak milk production. During this period, physical rumen fill (ruminal distension) is the primary limitation to additional dry matter intake.

> "High and peak lactation rations should be more highly/rapidly fermentable and less filling (lower levels of physically effective NDF), but not to the extent where rumen health is jeopardized."

From a ration formulation standpoint, this means targeting lower ration starch content and/or slower-versus-faster starch fermentability for fresh cows, as well as other strategies that will minimize rapid increases or fluctuations in propionate production. High and peak lactation rations should be more highly/rapidly fermentable and less filling (lower levels of physically effective NDF), but not to the extent where rumen health is jeopardized. Excellent-quality, highly digestible forages, including BMR corn silage, should be prioritized for cows at this stage of lactation. A couple of studies have also shown improved milk production in early lactation in association with feeding BMR corn silage during the transition period.

Another ration strategy associated with improved fresh cow performance, as manifested by a decrease in metabolic disease incidence, is the feeding of dry cow diets with low energy densities. Research by Dr. Jim Drackley and colleagues, among others, has demonstrated that over-consumption of energy during the dry period (the far-off dry period in particular) makes cows "behave metabolically" like fat cows during the transition period (lower dry matter intakes, greater risk of ketosis). While there is some variation in the ease and consistency with which these diets are successfully implemented on-farm, the practical application generally agrees with the research when done correctly.

Related management factors

Better transitions lead to higher peaks. Cow management considerations through the transition period (three weeks either side of calving) are arguably the most critical in this regard. Several recent studies by Dr. Ken Nordlund and colleagues have demonstrated

Continued on page 48

R. Tom Bass
Technical Services and Nutritional Support
Renaissance Nutrition Inc.
Tom@rennut.com