



by Steve Martin

Energy levels in heifer diets



I REALLY enjoy formulating diets for growing dairy heifers. For sure, there is a difference between the general approach of formulating lactating cow rations versus those for growing heifers.

One of the main reasons is that when building diets for milk cows, space in the ration is a big factor. In nearly every case we have a limited amount of intake to work with, which makes increased concentrations of nutrients so important.

How does this change when feeding heifers? Well, it doesn't in every case. The difference in heifer diets is that intake can vary widely.

You may have a set of pregnant heifers that are voluntarily eating as much as 30 pounds of dry matter (DM) and are gaining 1.9 pounds per head per day. Another set of similar heifers may be achieving the same gain in a limited bunk-time feeding approach, but are only consuming around 25 pounds per head per day.

Since it takes basically the same number of calories to gain that 1.9 pounds at both intake levels, the concentration of energy as expressed in a unit, like net energy for gain (NEG), will be higher or lower depending upon intake by the heifers.

This brings up a significant point: Dairy animals gain weight or produce milk from **amounts** of energy, not concentrations.

The difference is that in milk cow diets where intakes are nearly always at maximum possible levels, we tend to think about energy levels in terms of megacalories (mcals) per pound of net energy for lactation (NEL). To make this point, let's put some numbers to this topic:

We all know what level of NEL would best fit a high milk cow diet.

Maybe this is a 78 NEL, whereas a later lactation animal may only have a need for 75 NEL.

I am not making specific recommendations for building milk cow diets here. What I am doing, however, is making the point that we know what it means to discuss a 75 versus a 78 NEL ration. The numbers have meaning to most dairy producers.

Do we as nutritionists and dairy producers have the same feel for what energy concentrations are meaningful for different situations in heifer diets? I would suggest that those values don't roll off the tongue like the NEL values for milk cows. But why not?

Calorie numbers, not ratio

One reason is the point I made earlier – varying levels or styles of intake management for heifers can make this value vary widely. Thus, we may need to shift to an actual number of calories supplied per day instead of the ratio of calories to amount of intake.

As an example, we may say that a breeding heifer needs 8.5 mcals of NEG per day, instead of saying 0.39 mcals per pound of intake. But either way, paying a little more attention to energy supply and NEG, and connecting numbers to it, would be good.

I guess a different way to say this is that when you get a heifer ration from the nutritionist, just like you would probably look at the NEL of a milk cow ration, take a look at the NEG of the heifer ration.

As you do this you will begin to get a sense of where those numbers need to be. For example, if you think the heifers needed to put on a little extra weight due to winter weather, but the new heifer ration actually drops in NEG, you'd better ask a question.

The ratio of mcals per pound, like the value of 0.38 in the example above, is probably a little easier to re-

member than the absolute amount of mcals. And unless you are frequently changing your bunk time approach from full to limited, your intake for each ration will likely be constant. So getting NEG values in your head should be possible.

I won't suggest numbers here to match each type of heifer. Some nutritionists and ration software may have different units, so it would be confusing. But those numbers on ration reports should be interesting and you should pay attention to them.

“Younger heifers need higher protein levels, and as they get older the percentage goes down. The same way you look at protein levels in a heifer diet needs to be applied to energy levels too.”

Higher numbers mean the diet has a higher energy level and will support more gain, as long as the protein supply is appropriately matched.

At this point I should talk quickly about protein. Protein is expressed most commonly on a percentage basis and it does communicate something meaningful to a dairy farmer. Younger heifers need higher protein levels, and as they get older the percentage goes down. This is widely understood by dairy producers.

Guess what, this is the same concept for energy. The point, though, is that the same way you look at protein levels in a heifer diet needs to be applied to energy levels too.

When I send heifer rations to clients I like to put them all on the same page, side-by-side, with the youngest heifers on the far left. As you move from column to column

across the page the animals get older. I print the nutrient content of these diets along with the ingredients so my client can see the nutrient density of energy and protein generally go down as animals get older. If there are some ups and down as you go across the page, there are likely some poorly built diets.

Now that we have a reminder about the importance of watching energy levels in heifer diets, we should discuss what factors impact those energy levels. This is pretty intuitive and in most cases, the higher a grain content of a ration the higher the energy. Higher roughage diets have lower energy levels and the lower the quality of the roughage the lower the resulting energy levels.

This is where forage analysis becomes very important when building heifer diets. The type and maturity of forage used will determine the actual energy value.

Traditionally, we have used ADF and NDF to determine the energy value of a forage. Now we have newer measures to better estimate the true digestibility, and thus the energy value, of a particular forage. The most important of these is NDF digestibility and using a forage lab to determine it will allow for better ration formulation.

Don't use book values

Other details in a good forage analysis will insure accurate feeding of energy in heifer diets. Ash content, along with silage acids, fat content and sugar levels will impact the true energy value of a forage. Taking care to not use book values for them will increase your chances for supplying the correct amount of energy.

Although growing heifer diets may be a little more flexible than milk cow diets, they are still very technical. Taking time to build them correctly by considering the needs of the heifers based on stage of life will pay off in the end.

Heifers are your future! Don't forget to do adequate forage analysis for hays, silages and roughage by-products to be sure their real energy potentials are considered when building diets for them. Failure to do so may result in heifers that are ready to calve, but are either too heavy or too thin for the upcoming transition to becoming a lactating cow.

Nothing on a dairy looks better than a pen of awesome springers that have just the right body condition, frame size and udder pressure. But this reality is only possible when the many details of heifer nutrition and management are completed at a very high level.

While many producers have a feel for which protein levels fit this process, not many have a feel for the corresponding energy levels. Being sure this isn't a shortcoming at your operation will insure that when managing heifer rations you are feeding for the bottom line. **WEST**