



Identifying Rumen Acidosis and Related Problems Using Fat/Protein Ratios

By Donald Niles, DVM. From the California DHIA publication 'Unlocking Herd Performance'

Dairy performance continues to improve with each passing year. Even 30,000 pound rolling herd averages are becoming more common. This normal state of dairy evolution means that most progressive dairymen are constantly dealing with a new level of production.

Their feeling is that since they are not making individual cow culling decisions based on the animal's fat, protein or somatic cell count, why pay to test for them? The answer is that they don't need it to make individual cow decisions. They need them to recognize herd problems.

As a result, we are always working on dairy evaluation tools. We need these tools to both identify the bottlenecks preventing further progress in a herd, and to identify threats to the current production level. In this article, we will talk about using **individual** cow milk component data. By analyzing the **patterns** of these components in a dairy, we can help identify conditions such as acidosis and fatty livers long before they have disastrous consequences. This article will focus on using records to identify acidosis.

A key point is that we are talking about patterns made up of **individual cow** component data. Occasionally, dairies stop testing cows for components. Their feeling is that since they are not making individual cow culling decisions based on the animal's fat, protein or somatic cell count, why pay to test for them? The answer is that they don't need it to make individual cow decisions. They need them to recognize herd problems.

Acidosis

Rumen acidosis is one of the more common problems we run into on large dairies. It can also be one of the most expensive. The causes include nutritional factors such as high starch levels or low fiber levels, feed management issues such as over-mixing or TMR

separation, and environmental concerns such as heat stress or poor group transition. Generally, acidosis needs to be present for a while on a dairy before it starts causing huge financial problems. A key benefit of monitoring milk components is the detection of acidosis before significant problems occur.

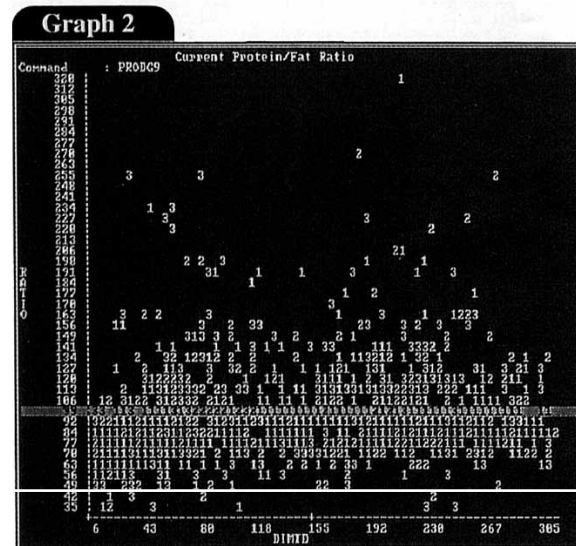
Signs of acidosis are well documented and can be vague and difficult to identify. They include reduced cud chewing, inconsistent intakes, increased off-feed cows, inconsistent manure and later, increased lameness.

is a second lactation animal, and a '3' represents third lactation or greater.

Here we have each individual cow's fat to protein ratio, on the most recent test, plotted against days in milk. The line is drawn at a ratio of 1:1. All cows above the line had a fat test that was lower than their protein test. As you can see in this example, there are relatively few cows above the line, indicating that acidosis was not likely to have been a problem in this herd on test day. Generally, I am not concerned until more than 30%-35% of cows are above the line.

On Graph 2 we can see a different situation. Here, a very substantial number of cows have fat tests that were lower than their protein tests. In this herd, some pens of cows have 50% of the cows inverted, and yet the bulk tank fat test was still 3.6%. This is a case where changes made now, can prevent expensive consequences from occurring later.

Graph 3 brings up a more alarming situation. This is a herd that had recently gone up dramatically in production (almost 20 pounds/cow in two months). Although the dairyman was delighted with his production, as you can see, there were a tremendous number of cows with a higher protein than fat test. This herd clearly needs intervention now, to prevent serious problems in the very near future.



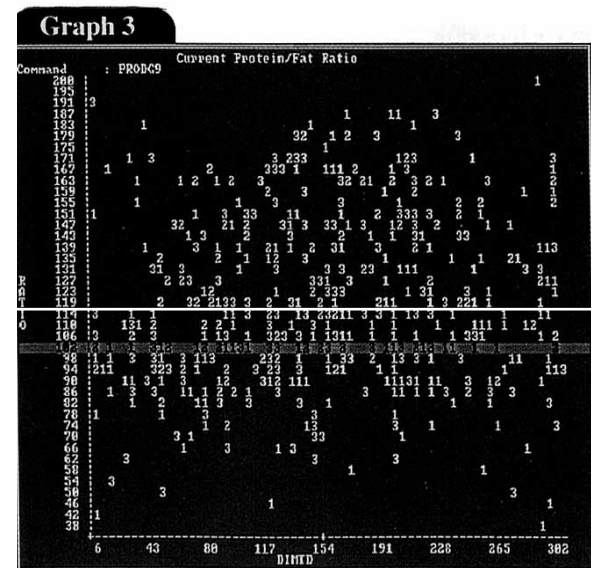
We will also often see depressed fat tests in herds with acidosis. There are problems with the **bulk tank** fat test, however, as a monitor. The herd fat test can be depressed from causes other than acidosis. Fat tests can also be depressed from high levels of dietary fat, inefficient rumen function or heat stress, to name a few.

Also, even if acidosis exists, not all cows are acidotic at the same time. Individual cows tend to cycle in and out of acidosis. Therefore, even if one-third of the cows in a herd are acidotic, with a low fat test, the other two-thirds may have a high enough fat test to keep the bulk tank 'normal'.

Fat/Protein Ratio

A fairly sensitive indicator of acidosis is an individual cow's fat/protein ratio. Acidotic cows generally have depressed fat tests and normal protein tests. Many other causes of depressed fat tests, such as feeding excessive fat, tend to cause both fat and protein to be depressed. Therefore, we look at the ratio of a cow's fat to protein. This way, we can often see signs of acidosis before the cows are affected. In other words, the more cows with a fat test that is lower than their protein test (called an 'inversion'), the more worried we are about acidosis.

This ratio can be very easily graphed as we can see on Graph 1. Each of the data points shows one or more animals. A '1' indicates a first calf heifer, a '2'



If the acidosis goes uncorrected, this dairyman could be dealing with a large number of lame and sick cows in another month or so. His impression at that time could be mistakenly be that high production caused his problems when, actually, the problems resulted from acidosis.

As you can see, monitoring fat/protein ratios for individual cows can be very effective in preventing herd breakdowns. By providing your key herd advisors, such as your nutritionist and veterinarian, with the data to monitor, they can help fine-tune your operation and avoid problems.

