

Cell count variation

Peter Edmondson
Shepton Vet Group

I was recently asked by a client why was the cell count reading from his milk buyer different from that of NMR when both samples collected on the same day. He was convinced that one lab must have faulty equipment. This is an excellent question that causes a lot of confusion and so I will try and set the record straight.

Somatic cell counts are measured by electronic testing machines which can work to an accuracy of plus or minus 10%. So, a true cell count result of 200 may give reading as low as 180 or as high as 220. In reality, most of the machines work to plus or minus 5%. If you put the same sample through one of these machines 10 times, the average result will be highly accurate.

Producers should be reassured that pilot milk samples are put through the machine regularly (some as often as every 20 samples) to ensure that the testing is working correctly. So if in the unlikely event that the pilot goes from say 200 to 300, it is clear that there is an error. Testing stops until the fault has been corrected. The batch of samples tested immediately prior to the error being identified would then be retested.

Farmers are paid on cell counts using a three month geometric mean figure. This is based on 12 or 13 samples and so any machine variation would be eliminated over this number of tests. This is a very fair way of averaging out cell count and eliminates the testing variation.

Eight years ago, one of our clients was perplexed. He had two bulk tanks and the results from one tank was always more than here times that of the other. At the time his milk was collected in the middle of the night and so he had no idea what the tanker driver was doing. The tank by the door always gave the highest reading. These were the old fashioned tanks which did not agitate regularly and where the fat all rose to the top between milkings.

I wondered if the tanker driver was collecting the sample from the top of the tank before it had a chance to agitate properly. We decided to carry out a mini experiment. We collected six samples from the tank before agitation and then 30 seconds and two minutes after the agitator was turned on. The average of the six results without any agitation was 486, after 30 seconds of agitation it was 226 and after the full two minutes had fallen to 119. This shows how important it is to ensure that the bulk tank is thoroughly agitated before any sample is collected. A minimum of 2 minutes should be allowed, and this time delay is built into all milk collections.

While agitation is important, we must not overlook the fact that some tankers now have in-line samplers that draws a sample of milk from the milk pipe into the tanker during collection and theoretically gives a more representative reading.

The NMR cell count result may be a true sample, taken from the tank, or may be a weighted sample. This weighted sample is an average from all recorded cows even if their milk did not enter the bulk tank. Some milk may have been used for feeding calves, or some cows recovering from treatment and milk still discarded.

The age of the milk sample and if more than three days old may have a slightly lower cell count. With Bactoscans, the readings will increase over a period of time as bacteria can continue to multiply if the samples are not stored correctly.

There is also a very large variation in bulk tank cell count on a daily basis. This is hardly surprising when you look at NMR results for individual cows. You never have cows with the same cell count on monthly tests. There is significant variation in results and these will depend on the infection status of all four quarters, the immune response from the cow and milk yield.

We are often testing bulk tank samples daily in problem herds and the results can be very surprising. Work at the Institute of Animal Health at Compton in 2004 showed that the daily cell count of their dairy herd varied between 84 and 284 over a 28 day period. Hence the cell count payment average based on a three month period.

So, if you consider all of the above it's not surprising that the cell count results from a milk buyer or NMR will not be the same even if tested from the same days milk, and why there is such a variation in bulk tank readings on a day to day basis.