

Let the Cows Score the Milking Protocols

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Proper preparation of udders and teats before milking improves milk quality by 1) ensuring good hygiene, 2) detecting cows with clinical mastitis, and 3) harvesting milk efficiently. This last point, efficiency of milking, is measured by dairy producers by various means, for example, cows milked per hour, milk produced per hour, cows milked or milked produced per labor hour, etc. Productivity of a dairy operation increases when milking is done as efficiently as possible, as long as we don't sacrifice milk quality and harvest. Additionally, cow health improves when the time standing in holding pens and parlors, or having units attached, decreases. Given the effort spent on most dairies to ensure proper milking protocols, how do we know if they are being done correctly? Let the cows answer this question, they know best!

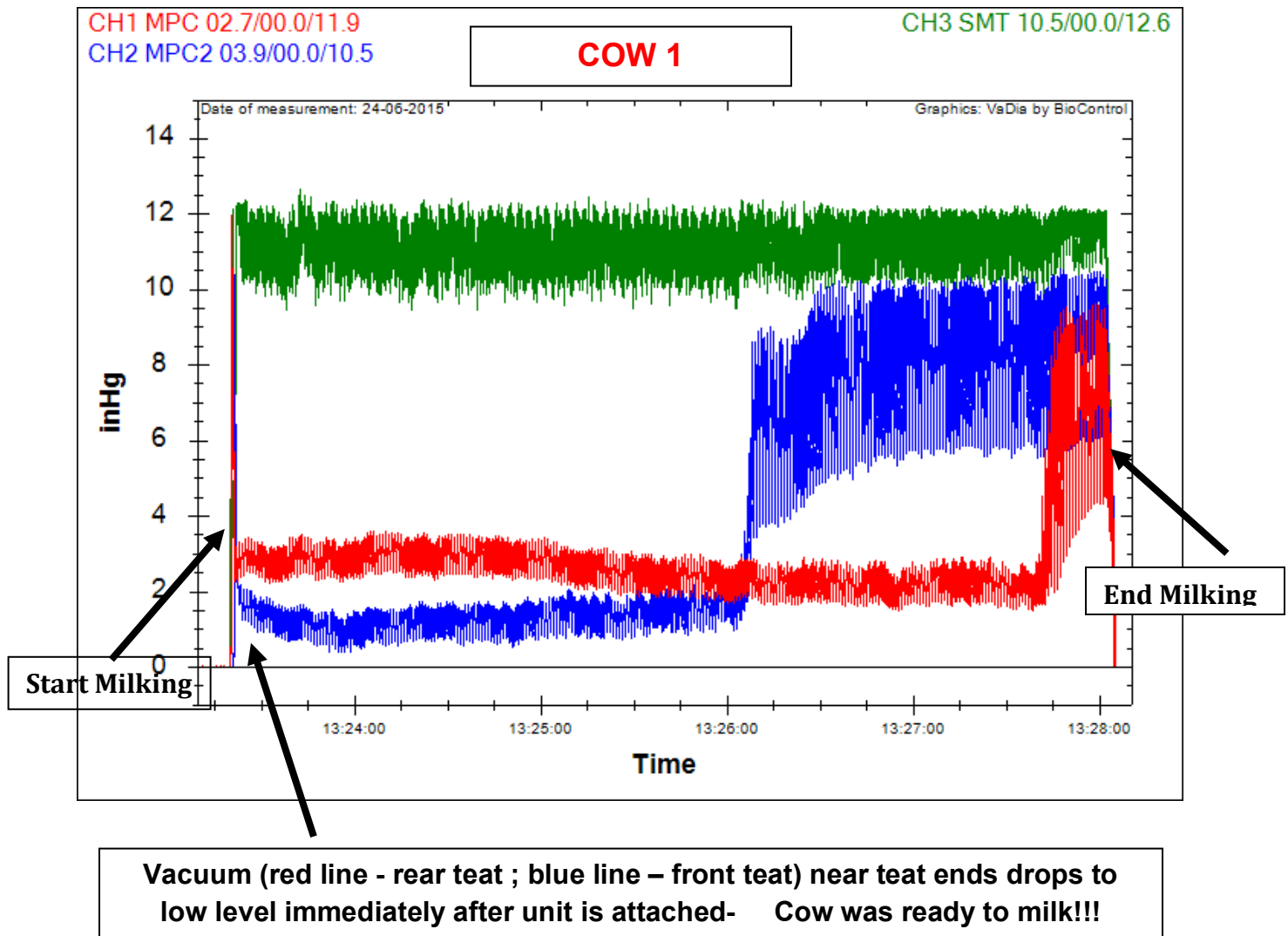
VaDia units (Vacuum Diagnostic) digitally record vacuum at the teat end (inside the liner) and cluster, letting the cows tell us if they're ready to milk, or if they're milked too long (overmilked). VaDia units don't measure milk flow directly, but a simple way to interpret VaDia results relative to milk flow is:

High Milk Flow = Low vacuum in the liner
Low Milk Flow = High vacuum in the liner.

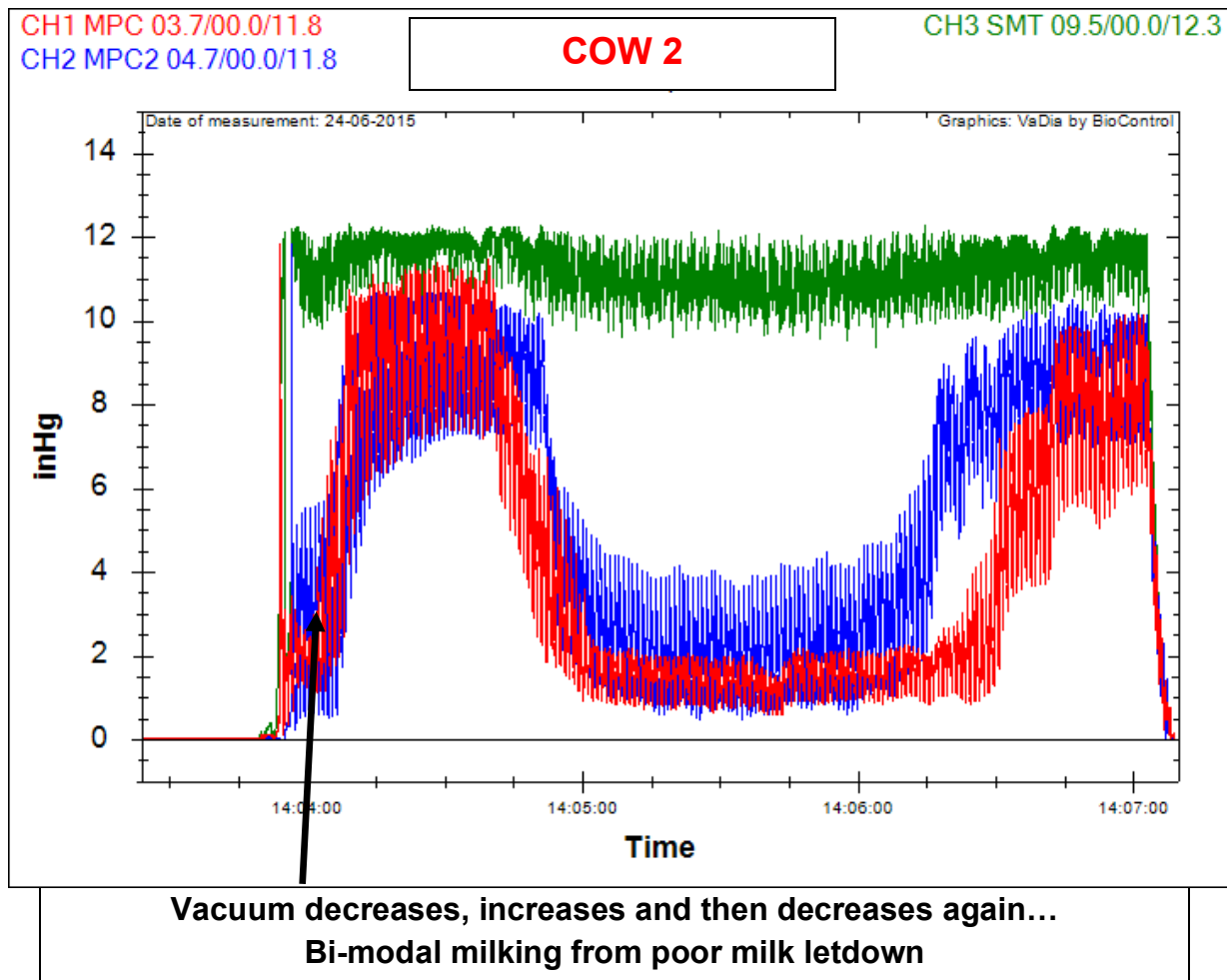
VaDia units can measure vacuum levels at four different places on the cluster simultaneously. In the picture below, two tubes were placed in the mouthpiece of a front and rear liner (near the teat ends: **red arrows**). Additional tubes were placed near the cluster and in a short pulsation tube. Vacuum was then measured during milking for four cows.



Cow 1 was ready to milk; the vacuum near the teat ends (red and blue lines) dropped quickly (less than 15 seconds after the unit is attached) and remained low until each teat was finished milking.



What about **Cow 2**? Teat end and cluster vacuum (green line) decreased, but then increased to near maximum levels, and finally decreased again. This cow was not ready to milk, milk flow was low for more than a minute after the milking unit was attached, signifying delayed milk letdown. This increases milking time, and may reduce her milk output as well as increase the risk of mastitis.

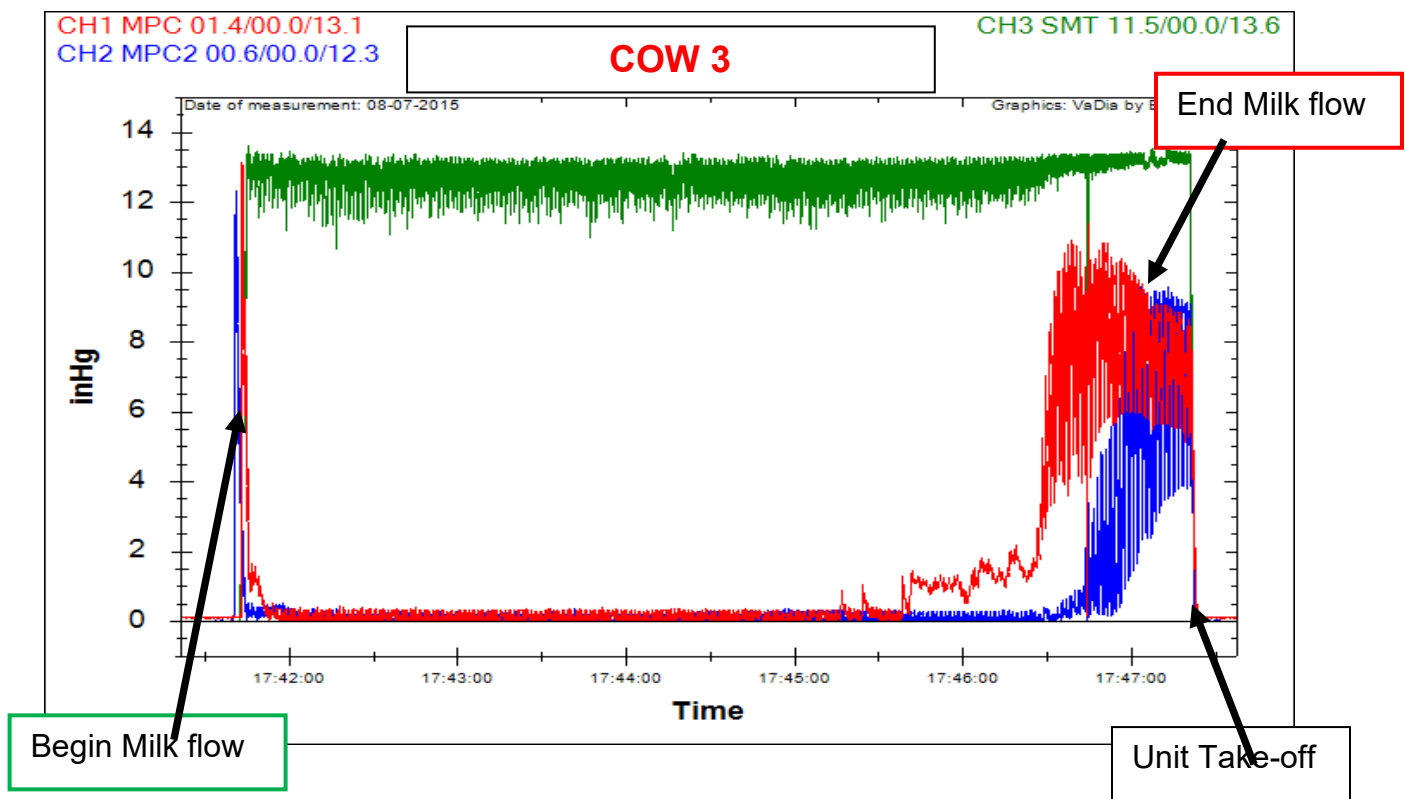


What about overmilking cows? The actual time that milking units are attached to cows will depend on milking frequency, milk production, udder preparation, teat condition, and udder conformation. However, a reasonable goal should be:

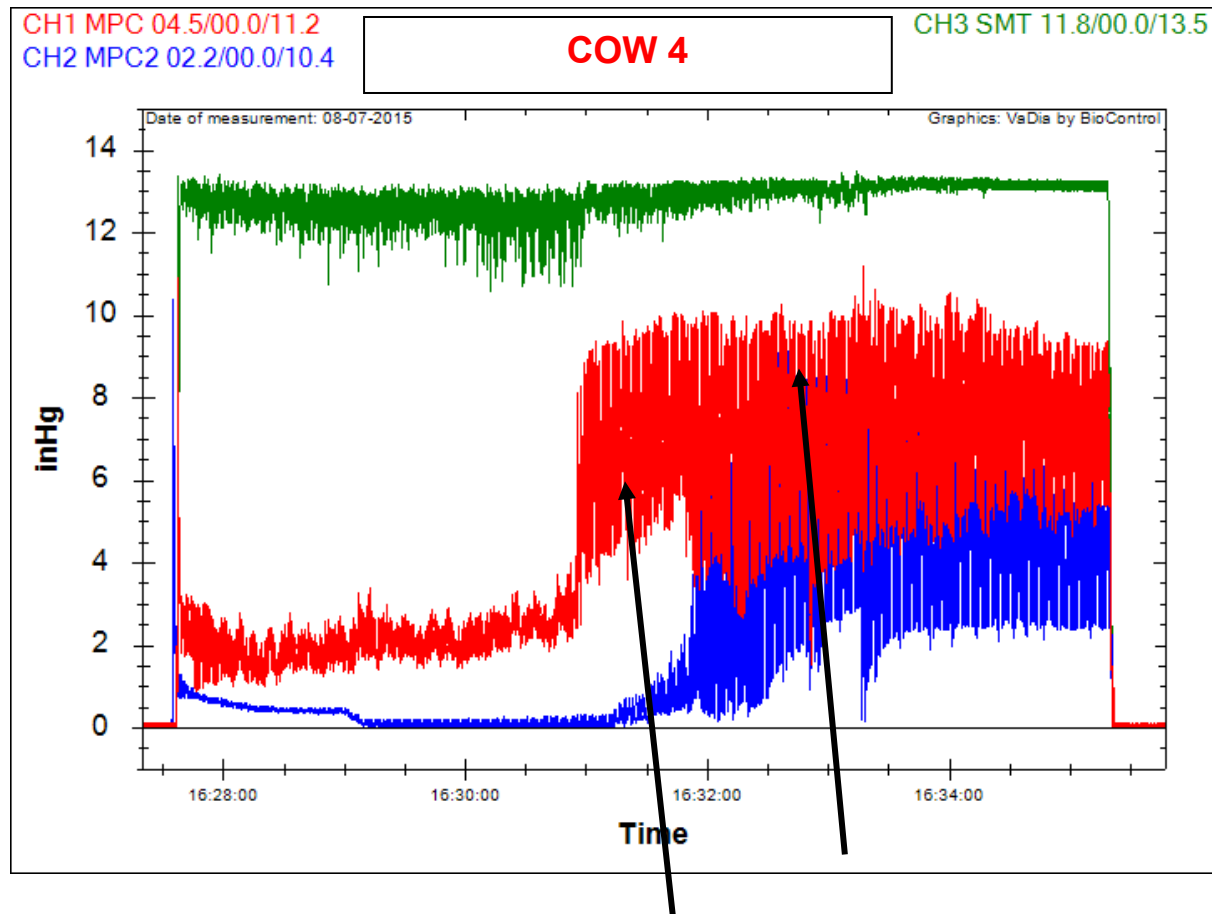
Milking three times/ day = maximum of 5 to 6 minutes per cow

Milking twice/ day = maximum of 6 to 7 minutes per cow

Once again, two examples of VaDia recordings are shown below. **Cow 3** was ready to milk; the vacuum near the teat ends (red and blue lines) decreased and stayed low until the cow was done milking. Also, as the vacuum increased and milking was complete, the units came off and milking ended within 30 seconds...this cow was NOT overmilked.



Cow 4 had good milk letdown, both front and back quarters finished milking in four minutes, but then the units stayed on for an additional three minutes.



**Vacuum (red and blue lines) increase when milking is finished for each teat but unit stays on with high vacuum and no milk.
Cow 4 was OVERMILKED!!!**

VaDia recordings tell us which cows are “ready to milk” after udder preparation and which cows were overmilked. Preliminary data from 63 herds in Michigan (figures below) suggests that in the top 25% of herds, less than 90% of cows have bi-modal milking or are overmilked.

How would the cows in your herd score their milking experience?

