

# DAIRY PIPELINE

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## Are we using the right criteria to select for fertility?

—Connor Owens, M.S. Student with Dr. Rebecca Cockrum; [rcockrum@vt.edu](mailto:rcockrum@vt.edu)

“...incorporation of additional traits such as follicular fluid composition and milk progesterone could provide a greater rate of genetic change in overall herd fertility.”

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When compared to a cow with good reproductive performance, one with poor reproductive performance (low conception rate, high incidence of reproductive disease, increased rate of embryonic death, etc.) will cost an additional \$271 per year. It is no surprise that reproductive issues are one of the main reasons for culling cows, comprising of 24.8% total culls in the United States. Thankfully, producers have been able to use new management tools, such as ovulation synchronization, and genetic traits to improve fertility since 2000. These include traits within the Net Merit index (daughter pregnancy rate, cow conception rate, and heifer conception rate) as well as additional information that is easy to collect (calving interval, days open, number of inseminations, and time between 1<sup>st</sup> service and conception). However, the traits not included in the Net Merit index may be too intertwined with response to reproductive management rather than true biological fertility, decreasing the amount of change a producer can see with each generation. What other traits could be used in genetic selection that have a closer relationship to fertility but are easy for the average producer to collect information on?

The cow's ovary may be the place to start. Before ovulation, the ova, or egg cells, develop in follicles on the ovary to prepare for ovulation, moving from an early primordial follicle towards a larger tertiary or dominant follicle filled with fluid. It could be possible that the fluid in this follicle could have a role in the quality of the ova. One study from the University College Dublin compared the follicular fluid from the dominant follicles of Holstein heifers to those of Holstein cows, where heifers typically have higher conception rates than cows. They found that the composition of follicular fluid varied drastically between heifers and cows, demonstrating that the follicular fluid could impact fertil-

ity. While follicular fluid is difficult to collect, they also found similar differences in follicular fluid composition between cows with high or low values for fertility traits, which indicates that U.S. dairy producers may have already been indirectly selecting for “good” follicular fluid composition.

Another possible trait that could be heritable, easier to collect information on than follicular fluid, and closely related to fertility is the interval between calving and ovarian activity. After a cow calves, they will experience a period of time called anestrus, where the follicles on the ovary do not develop and ovulate and the ovary is essentially inactive for 30 – 40 days. After this time, ovulation occurs, and a corpus luteum forms on the ovary and secretes a hormone called progesterone, which interacts with the uterus to maintain pregnancy. Progesterone is usually thought to just be circulating in the blood, but it can also be found in the milk, changing in concentration alongside resumption of ovarian activity after anestrus. Therefore, monitoring progesterone levels in milk as a proxy for ovarian activity could prove to be a useful trait in selection for fertility.

In the past, collecting this information would require sampling cows everyday and those samples would have to be sent off the farm to a lab to be analyzed, losing precious time. Thankfully, in recent years, in-line systems such as the Delaval Herd Navigator have been developed to analyze milk progesterone levels at each milking. This allows for the collection of information for not only the producer to make decisions related to reproduction, but also for the use in determining milk progesterone's capabilities as a genetic tool. Using this information, geneticists have determined that the heritability of interval to ovarian activity to be 0.12, higher than previously established fertility traits. This does still come at an initial cost to implement the analysis system, but it could provide the information necessary to



## Upcoming Events

See [VTDairy](#) for details.

### January 9, 2019

Udder Health Workshop,  
Cub Run Dairy

### January 9, 2019

VA Dairy Princess Pageant  
Natural Bridge, VA

### January 18, 2019

VA Holstein Youth Retreat  
TBD, VA

### February 5, 2019

No-till Conference  
Rockingham County  
Fairgrounds

### February 9, 2019

State 4-H Dairy Bowl Contest  
Broadway High School

### February 13-14, 2019

Virginia State Feed  
Association & VT Dairy  
Nutrition 'Cow College'  
Hotel Roanoke

### February 26, 2019

Transitioning to Grazing  
Workshop

### March 12-15, 2019

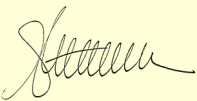
Area Dairy Conferences  
March 12—Rocky Mount  
March 13—Amelia  
March 14—Dayton  
March 15—Marion

### April 27, 2019

Little All-American

*If you are a person with a disability and require any auxiliary aids, services or other accommodations for any Extension event, please discuss your accommodation needs with the Extension staff at your local Extension office at least 1 week prior to the event.*

*For more information on Dairy Extension or to learn about current programs, visit us at VT Dairy—Home of the Dairy Extension Program on the web at: [www.vtdairy.dasc.vt.edu](http://www.vtdairy.dasc.vt.edu).*



*Christina Petersson-Wolfe, Ph.D.  
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Milk Quality &  
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prevent additional costs due to poor reproductive performance in the future.

So while previously established traits have been used to increase fertility in the U.S. dairy industry, they may be too closely related to response to management. This is not

## We can't help if you don't call!

—*Cynthia Martel, Extension Agent, Rockingham County; [cmartel@vt.edu](mailto:cmartel@vt.edu)*

Are you experiencing problems on the farm? Is milk production low, somatic cell or PI high, do you need financial guidance? Nothing is too big or too small for Virginia Cooperative Extension to tackle. How many times have you heard “there is no such thing as a stupid question”? You might tell your kids this all the time, but it also stands true for adults.

Too often lately, I am sad to say, we are usually the last ones to find out when problems are occurring on the farm—which is hard to hear. Time after time, we learn things third party and months after the fact. For example:

- “A tank of milk has been dumped at Dairy X because they have been having problems with high SCC and PI causing the milk coop to reject milk.”
- “Dairy Y has been having milk production issues for several months and they are ready to sell out, because the cows are not making enough to pay the bills.”
- “Dairy Z sold out two weeks ago because they couldn't get their quality control problems fixed and their coop dropped them.”

The list of issues and after-the-facts could be a mile long but if you do not call us, we do not know. We want to help! Following is the **most important** information you will receive this year or maybe ever.

### 1. Write these names down or put in your phone. We cover the entire STATE.

- **Cynthia Martel** – Dairy Extension Agent, located in Franklin County, VA (540-483-5161) – [cmartel@vt.edu](mailto:cmartel@vt.edu);
- **Jeremy Daubert** – Dairy Extension Agent, located in Rockingham County, VA (540-564-3080) – [jdaubert@vt.edu](mailto:jdaubert@vt.edu)

2. Requesting assistance from Virginia Cooperative Extension is FREE! We will come to your farm and consult FREE of charge.

Sometimes we also have funding to help test

necessarily a bad thing, as having cows that respond well to management is important for farm efficiency, but incorporation of additional traits such as follicular fluid composition and milk progesterone could provide a greater rate of genetic change in overall herd fertility.

items on your farm, like feed samples, FREE. We also have many contacts to help with possible cost-share or grant funding opportunities.

3. Having SCC or PI count problems? No problem! I recently spent 4 hours at a local farm, milking side-by-side with the producer, CMT paddling every cow that came through the parlor, and taking sterile milk samples on questionable cows for mastitis testing. The next day, I drove those samples to the Virginia Tech Milk Testing Lab for culturing. This was all done for FREE for the farm. NO cost! We were able to identify problem cows so the farm could cull or treat accordingly. This process can help you save money.

4. Need financial guidance? Has your financial institute suggested you have a whole farm analysis done? Virginia Tech has great faculty that are here to assist you. All you have to do is contact us and we will help set everything up. We can come out to the farm, walk the entire operation with you, ask questions, and give suggestions on improving key areas.

5. Looking for ideas and guidance on additional sources of income to help pay the bills while still dairy farming? We can help! There are plenty of Ag and non-Ag jobs that can be done on the side to help earn extra income. Please call us! Come pick our brains!

6. Interested in educational programs with VCE? They're free (or very low cost)! Get on the mailing lists to receive program flyers. We offer programs for free or little cost (usually only to cover the meal). Look for our 2019 Area Dairy Conferences March 12-15.

Remember, if you do not call us, we can't help. Do not wait until it is too late!



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