UF IFAS UNIVERSITY of FLORIDA
Department of Animal Sciences

Dairy Update

Quarterly Newsletter **Vol. 18 No. 2** **Spring 2018**

Dairy Extension Agenda

- The 2018 UF/UGA **Corn Silage and Forage Field Day** will be in Citra, FL on **May 24**. The program starts at 8 AM and concludes with field demonstrations after lunch. Registration and brochure with info at http://bit.ly/CornSilageAndForageFieldDay More information: José E.P. Santos, Phone: 352-392-1958 Ext. 251, jepsantos@ufl.edu
- The 54th **Florida Dairy Production Conference** is being planned for **September 26**, 2018. Program and registration: http://bit.ly/2018FLDPC More information: Francisco Peñagaricano, fpenagaricano@ufl.edu
- **Dairy Cattle Genomics and Fertility Workshop**, **December 5**, 2018. Okeechobee Extension Office, Okeechobee, FL. 10:00 am -2:30 pm. Genomic testing, beef semen, culling: what makes sense? Program details follow later. More information: Colleen Larson, cclarson@ufl.edu, or Albert De Vries, devries@ufl.edu

Chris DeCubellis New State Specialized Extension Agent for 4-H Youth Dairy/Animal Science

IFAS Extension announced that Chris DeCubellis is the new State Specialized Extension Agent for 4-H Youth Dairy/Animal Science. Chris began this new role on April 13th. Chris has an Animal Science degree, runs his own farm, has worked with Dairy/livestock judging teams in multiple counties for almost 20 years, and is passionate about youth development. He possesses a strong understanding of the 4-H and FFA Dairy and livestock programs. You can reach Chris at cdecube@ufl.edu or call (352) 846-4444.

UF Dairy Students Participated in the 2018 North American Intercollegiate Dairy Challenge in California

Albert De Vries

Seven UF students with an interest in dairy science participated in the 2018 North American Intercollegiate Dairy Challenge (NAIDC), which was held in and around Visalia, CA, on April 12-14.

The NAIDC was established in 2002 as a management contest for college students to incorporate all phases of a specific dairy business. Today, Dairy Challenge strives to incorporate a higher-learning atmosphere with practical application to help prepare students for careers in the dairy industry. Thousands of students have enhanced their dairy management, communication and business skills through Dairy Challenge, in turn generating highly qualified graduates to lead and further improve the dairy industry.

In addition to the contest where a team of 4 students from each university compete against teams from other universities, the NAIDC also includes an Academy where beginning students work with Academy advisors to experience first-hand how to evaluate and consult on a dairy farm.

The 2018 two-day contest had 35 teams from 34 universities and 1 aggregate team with students from different universities. The 35 teams were divided in 4 divisions, which each division evaluating a different dairy farm. Approximately 240 students participated in the 2018 event, in addition to coaches and numerous volunteers.

Students Megan Pearce and Gabriela Lopez participated in the Dairy Challenge Academy; Gloria Rodriquez, Huridises Torrealba, Brittney Davidson, and J. B. Tarnate were on the UF team, and Michelle Taepakdee was on the aggregate team.

The UF team earned a Recognition for Participation but did not win its division of 9 schools. These 9 schools evaluated Double J Dairy in Visalia, CA, and made recommendations to a panel of dairy professionals.

The day before the NAIDC contest and Academy started, all students, coaches and volunteers were invited to Maddox Dairy in Riverdale, CA. Maddox Dairy is well known for its genetics and innovation.

The NAIDC has had a major impact on how dairy science is taught around the country and in Canada since 2002. At UF, we try to incorporate dairy farm evaluation and business decision making in our dairy courses. In addition to the regular courses, the students that went to the 2018 event received extra training by graduate students Courtney McCourt and Michael Schmitt.

The NAIDC national event will be coming to the Southeast in 2019 when the Southern Regional Dairy Challenge committee will host the event in Tifton, GA. The Southern Regional Dairy Challenge committee also organizes a regional Dairy Challenge each fall for schools in the Southeast. The University of Tennessee will host the fall 2018 event and UF dairy students hope to participate.

The NAIDC can only exist through generous financial donations from sponsors, and the generous donations of time from many volunteers. Thank you all.

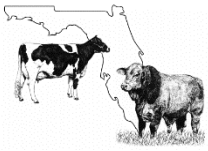
For more information about Dairy Challenge, contact Albert De Vries, devries@ufl.edu or 352 392 5594 ext 227.

The University of Florida participants at the 2018 North American Intercollegiate Dairy Challenge in Visalia, CA. From left: Michael Schmitt (coach), Megan Pearce, Michelle Taepakdee, Gloria Rodriquez, Gabriela Lopez, Huridises Torrealba, Brittney Davidson, J. B. Tarnate, and Albert De Vries (coach).

Brittney, J.B., Gloria, and Huridesis evaluated Double J Dairy in Visalia, CA, for the NAIDC event. Double J Dairy milks 4400 cows and has 4700 head of young stock.

Maddox Dairy in Riverdale, CA, hosted all students, coaches and volunteers on the day before the NAIDC event. Nine people from UF participated; they are in the middle of this photo.

Proceedings 2018 Florida Ruminant Nutrition Symposium Now Online



The proceedings of the 29th Florida Nutrition Symposium are now online at http://dairy.ifas.ufl.edu/rns. The Symposium was held in Gainesville, FL, on February 5-7, 2018, and attracted over 250 attendees, mostly from the allied dairy and beef feed industries. More information about the Ruminant Nutrition Symposium: José E.P. Santos, Phone: 352-392-1958 Ext. 251, jepsantos@ufl.edu

Three new EDIS Dairy Publications Available

EDIS is the Electronic Data Information Source of UF/IFAS Extension, a collection of information on topics relevant to the Extension mission of UF/IFAS. It is the comprehensive, single-source repository of all current UF/IFAS numbered peer-reviewed Extension publications. EDIS publications are typically written by IFAS Extension specialists and/or Extension agents. EDIS topics for dairy can be found at http://edis.ifas.ufl.edu/topic_dairy. Three new EDIS publications on dairy topics were published earlier this year:

Basic Concepts of Dairy Sire Selection

"Sire selection is one of the most important decisions that a dairy producer makes. It represents a great opportunity to improve the profitability of the dairy production enterprise. This new 3-page fact sheet reviews some key concepts that should be considered in order to make proper selection decisions and discusses alternative methods for selecting sires based on multiple traits. Written by Francisco Peñagaricano, and published by the UF/IFAS Department of Animal Sciences, January 2018." http://edis.ifas.ufl.edu/an337

Economic Value of Genetic Merit of Dairy Semen

"Attempts to calculate the economic value of semen have been made since at least the 1970s. This new 3-page fact sheet reviews these calculations, adds a few other considerations, and offers estimates of the worth of the genetics of dairy semen. A spreadsheet is available. Written by Albert De Vries, and published by the UF/IFAS Department of Animal Sciences, January 2018." http://edis.ifas.ufl.edu/an338

Effective Use of Genomics in Commercial Dairy Farms

"Genomic selection refers to selection decisions based on genomic-estimated breeding values. These genomic breeding values are calculated using genetic markers across the entire genome. This technology has revolutionized dairy cattle breeding globally. This new 4-page fact sheet discusses the effects of genomics on dairy sire selection. Written by Francisco Peñagaricano, and published by the UF/IFAS Department of Animal Sciences, February 2018." http://edis.ifas.ufl.edu/an340

1600 Visitors at the 2018 Family Day at the Dairy Farm

Albert De Vries

The UF/IFAS Dairy Unit held its fifth Open House for the general public on Saturday March 31, 2018. The Open House is advertised as Family Day at the Dairy Farm and attracted 1600 visitors, tying the record set in 2017. The event was again organized by Department of Animal Sciences, the staff of the UF Dairy Unit, and Florida Dairy Farmers Inc.

First held in 2013, Family Day at the Dairy Farm was designed to be educational and fun for children and adults alike. Visitors could watch cows being milked, tour barn facilities, pet calves, make butter and learn how UF/IFAS dairy research and Extension help dairy farmers produce better milk at lower cost, while keeping their herds comfortable, happy and healthy, and protecting the environment.

New in 2018 were stations by the Florida Department of Agriculture and Consumer Services, Alachua County 4-H, and stations on milk safety. Sponsor Campus Credit Union also set up a booth were visitors could make buttons.

Family Day at the Dairy Farm is a fun Extension event to organize because the public is so appreciative. An enthusiastic visitor wrote on Facebook: *"The event you organized on Saturday was AMAZING. My 2.5 year old son, husband, and I drove from Fleming Island (Jax) and were pleasantly surprised immediately upon pulling into the parking lot. The cows next to the parking were right there greeting us before loading onto the hayride that lit up my sons face. And then the day just went on and on to more and more excitement. A real mooing cow. A peeing cow. Cows with messy noses while they eat. It was all so enlightening, especially compared to the books this city kid reads about the creatures. Pair the cows with the highly knowledgeable people at each station and it was an educational and enjoyable day for all. You organized a splendid event that will definitely be on our to-do list next year. THANK YOU for your efforts. They are appreciated."*

It took 70 volunteers to make the day a success. Volunteers helped with jobs like parking cars, registrations, giving directions, taking surveys, cleaning up trash, and answering questions from the public.

The event could also not be organized without the help of our sponsors:

Thank you Sponsors!

2018 Family Day at the Dairy Farm

Diamond sponsors:
Florida Dairy Farmers
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UF/IFAS

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Campus Credit Union
Helena Chemical Company
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Southeast Milk, Inc.
Sumner Ag Services, Inc.
Suwannee Valley Feeds

Farm Credit of Florida

Michael Holloway Consulting Engineer

Computa Tune
Automotive repair center

https://www.facebook.com/FamilyDayattheDairyFarm

2018 Family Day at the Dairy Farm

More pictures available at
https://www.facebook.com/FamilyDayattheDairyFarm/photos

One More lactation?

Albert De Vries

In February 2018, I traveled to the National Cattle Congress in Herning, Denmark, to give a presentation on the economics of longevity in dairy cows. Denmark has a modern dairy industry with about 575,000 dairy cows. Holsteins are the predominant dairy breed. There are also sizable populations of Jerseys, Danish Red, and crossbreds.

The national annual dairy cow cull rate in Denmark is close to 40%, which means that after first calving cows stay on average 1/40% = 2.5 years in the herd before culling. This is short of three lactations. For economic, welfare and environmental reasons, the Danes are wondering if this short productive life ought to be extended, and if so, how to do it. In Denmark there is a national project called 'The road towards the 6th lactation – greater value by increased longevity of cows'. Part of this project is exploring the economics of culling and replacement. Notice that a productive life of 6 lactations is the equivalent of a 15% annual cow cull rate when we assume 13 months per lactation. They have a ways to go.

The annual cow cull rate in the US is similar to the one in Denmark. Figure 1 shows the distribution of annual cow cull rates in herds that participate in DHI. The average cow cull rate in the figure is approximately 38%. A 38% cow cull rate is equivalent to 2.6 years productive life (2 years and 8 months).

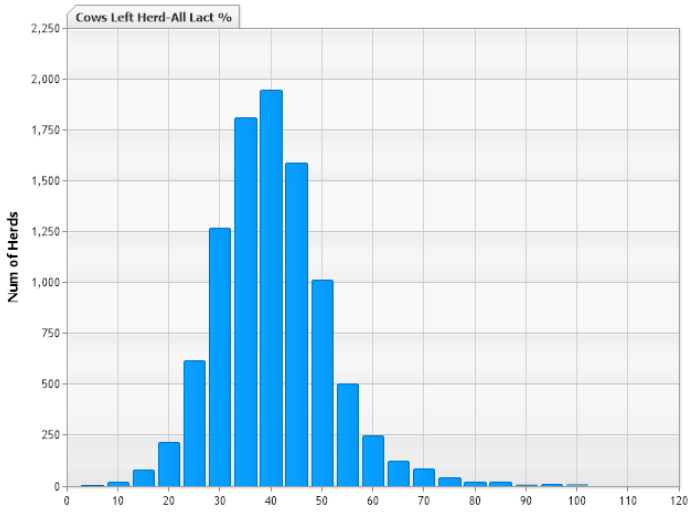

Figure 1. Distribution of annual cow cull rates of 9158 herds with > 50 cows that participate in DHIA. The average is 38%. (Source: www.drms.org,; Feb. 19, 2018)

Lower cull rates mean that fewer heifers need to be raised while maintaining herd size. Table 1 shows the number of heifers in inventory needed for a 100-cow herd. A 10% loss rate for growing heifers is assumed. The number increases with greater cull rates and higher age at first calving. For example, when annual cow cull rate is 40% and age at first calving is 24 months, the inventory would be 89 heifers for the 100-cow herd.

Table 1. Heifer inventory as a result of annual cow cull rate and age at first calving for a 100-cow herd. A 10% loss rate for growing heifers is assumed.

Age at first calving (months)	Annual cow cull rate (%)				
	25%	30%	35%	40%	45%
20	46	56	65	74	83
22	51	61	71	81	92
24	56	67	78	89	100
26	60	72	84	96	108
28	65	78	91	104	117

Part of the economic reasoning for high cull rates is that heifers are genetically improved over the cows in the herd. There is an opportunity cost from keeping average, old cows in the herd too long. Opportunity cost is defined as the loss of potential gain from other alternatives (bringing in the genetically better heifer) when one alternative (keeping the old cow) is chosen.

This genetic improvement has been accelerated since the wide use of genomic testing to find bulls. Genetic progress on many traits has more than doubled compared to 15 years ago. Figure 2 shows the trend in PTA for Net Merit. Lately, the PTA for Net Merit increases by about $80 per year. This means that the estimated breeding value (EBV; 2 * PTA) changes by $160 per year. Because Net Merit expresses the difference in profit in a lifetime of about 3 years, the annual genetic opportunity cost of a one year older animal is $53.33 per year. This greater rate of genetic improvement indeed implies that productive life should decrease and thus cow cull rate should increase.

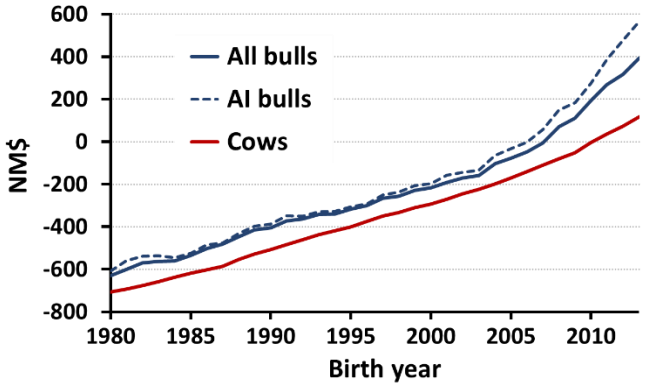

Figure 2. Trend in PTA of Net Merit for Holsteins from 1980 to 2014. Genetic progress has doubled lately, which increases the genetic opportunity cost.

Genetic progress is also evident in the trait productive life. The genetic trait productive life measures the ability of cows to stay in the herd compared to the breed base average. Figure 3 shows how the EBV for productive life has been increasing for more than 50 years. However, phenotypic productive life (how long cows actually stay in the herd) has not increased. This is a result of the availability of continuously improving heifers. The bar to stay in the herd is continuously being raised.

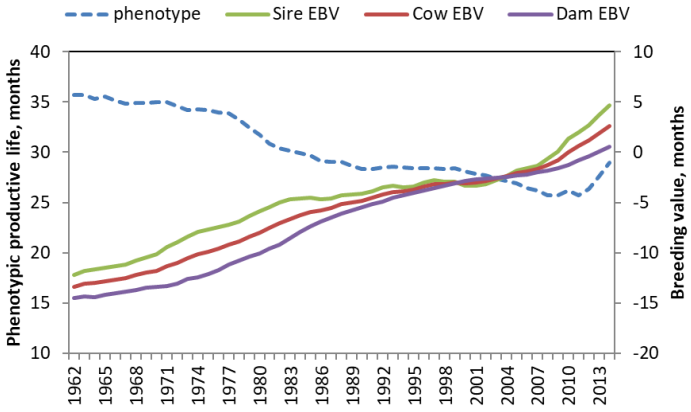

*Figure 3. Phenotypes and estimated breeding values (EBV = 2 * PTA) of productive life (longevity) for Holsteins in the US. Although the EBV for productive life have increased, the phenotypic trend has not increased.*

On the other hand, a lower cull rate would mean less cattle depreciation. If it takes $1600 to obtain a calving heifer, and the cull price is $900, then deprecation for this animal is $700. When cull rate is 40%, the annual depreciation cost per cow in the herd is ($1600-$900)*40% = $280. When cull rate is 30%, this annual depreciation decreases to $210 per cow.

Another benefit of a lower cull rate (longer productive life, more lactations) is that the herd has more mature cows. Mature cows produce more milk and are typically more profitable than first and second lactation cows. A simple but reasonable assumption is that, compared to a first lactation cow, a second lactation cow is $300 more profitable per year, and a mature cow is $600 more profitable, given the same genetics. One could say that cows in the first lactation have a $600 "lack of maturity" cost. A very young herd will have a large lack of maturity cost. An old herd will have few cows in the first and second lactations, and thus a low lack of maturity cost.

We now have three competing forces that drive the optimal cull rate: genetic opportunity cost drives towards greater cull rates (fewer lactations), while herd replacement cost and lack of maturity cost drive towards lower cull rates (more lactations). We can add these three costs together to get a total cost for a certain average number of lactations.

Figure 4 shows the trade-offs between these three drivers by the average number of lactations (and the equivalent annual cull rate). The optimal annual cull rate is the one with the lowest total cost per cow per year. Genetic progress in Net Merit ($80 PTA Net Merit$), depreciation ($700), and lack of maturity costs ($300 and $600) assumptions are described above. It is also assumed that annual profitability of a cow after lactation 5 decreased by $50 per year to account for some effect of aging. A lactation length was assumed to be one year. The risk of culling was assumed to be the same in each lactation. For example, when cow cull rate is 33%, then 33% of cows are in the first lactation, 22% are in the second lactation, 15% are in the third lactation, etc., until 100% of the cows are accounted for. These assumptions are simple, but are likely good enough to show the relative sizes of these three drivers on the optimal number of lactations. The evaluations only considered increments in whole lactations, for example 3 vs. 4. vs. 5.

Figure 4 shows how the genetic opportunity increase with more lactations whereas the herd replacement cost decrease. The lack of maturity cost is the lowest at 4 lactations and then increases again.

Further in figure 4, we see total cost per cow per year sharply decrease until 4 lactations (25% cull rate). Total costs for an average of 4 lactations are $800, which consist of $253 lack of maturity cost, $175 herd replacement cost, and $372 genetic opportunity cost. The difference with 5 lactations (a 20% cull rate) is small.

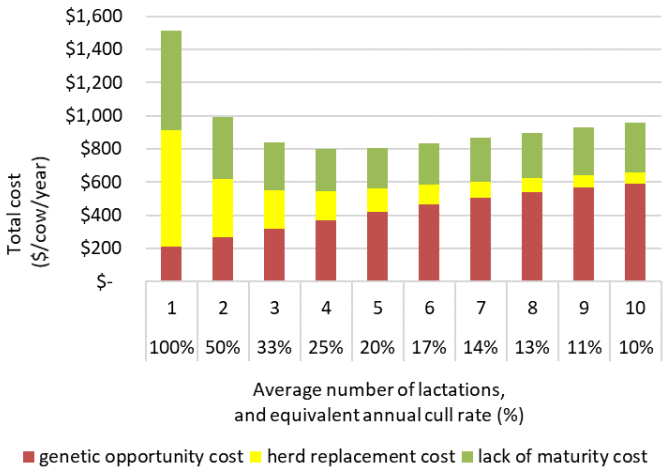

Figure 4. Three drivers of total cost of keeping a cow in the herd: genetic opportunity cost, herd replacement cost, and lack of maturity cost. The optimal number of lactations is the one where the total cost is the lowest (4 lactations).

Total cost at a 40% cull rate (2.5 lactations) is $895. This increase of $95 per cow per year, compared to the total cost at 4 lactations ($800), is due to a $69 greater lack of maturity costs, a $105 increased herd replacement cost, but also the benefit of $79 lower genetic opportunity costs.

When herd replacement costs are set at $0 (heifer and cull price are the same), the lowest total cost is at 3 lactations ($606). Total cost at 2 lactations is $645 and at 3 lactations it is $625.

The optimal number of lactations is 8 when genetic opportunity cost are excluded. Genetic opportunity cost is a real driver towards fewer lactations. At the same time, the data in figure 4 show that genetic opportunity cost does not warrant current low average number of lactations (few lactations). Let's think about how we too can add one more lactation.

For more information, contact Albert De Vries at devries@ufl.edu or (352) 392 5594 ext. 227.

Prediction of the Future Florida Mailbox Price and Future All Milk and Feed Prices: May 2018 – April 2019

Forecast of the future Florida Mailbox Price and Future All Milk and Feed Prices: May 2018 – April 2019

Month	Forecast FL mailbox price ($/cwt milk)	2014 Farm bill formulas	
		Forecast All-Milk price ($/cwt milk)	Forecast feed cost ($/cwt milk)
May-18	18.31	16.20	8.65
Jun-18	18.94	16.77	8.71
Jul-18	20.72	17.31	8.77
Aug-18	20.98	17.59	8.82
Sep-18	21.12	17.75	8.86
Oct-18	21.45	18.35	8.90
Nov-18	21.43	18.31	8.95
Dec-18	21.44	18.30	8.99
Jan-19	20.44	17.88	9.01
Feb-19	20.38	17.82	9.01
Mar-19	20.41	17.83	9.00
Apr-19	19.57	17.36	9.02

Based on futures prices of May 18, 2018.

The forecast All-Milk price and the forecast feed cost have been added to the table since the Fall 2014 issue of Dairy Update (http//dairy.ifas.ufl.edu/dairyupdate). These forecast are based on the formulas in the 2014 Farm Bill. Daily updated Florida mailbox price forecasts are at http://future.aae.wisc.edu/predicted_mailbox/?state=Florida Feed costs are at http://future.aae.wisc.edu/tab/costs.html#94.

For more information, contact Albert De Vries at devries@ufl.edu or (352) 392 5594 ext. 227.

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