



# Newsletter

AMERICAN ASSOCIATION OF BOVINE PRACTITIONERS

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## THE PRESIDENT'S MESSAGE

### A Beef Veterinarian Looks at Dairy

The last time I visited a dairy was during my last year as a faculty advisor for the AABP student chapter at North Carolina State University in 2000. Dr. Barrett Slenning and I were the faculty advisers for an annual weeklong Bovine Educational Symposium, commonly called "Cowabunga". On this annual epic experience, we toured both beef and dairy operations in a different region of the U.S. Barrett is a remarkable teacher and knowledgeable dairy veterinarian. I learned some "dairy stuff" just being around him and touring some well-managed dairies.

Quite frankly, I feel that I have been remiss in not taking the time to spend a few days every few years with one of my dairy colleagues. With almost 20 years since setting foot on a dairy, it was time to make a trip and try to become more connected with the dairy business. Early in October, I took a few days to travel with AABP past president and dairy consultant Dr. Mark Thomas in upstate New York. The weather during my trip to places like Ithaca, Lowville, Pulaski and Newark was uncharacteristically picture-perfect. The autumn leaf colors, gently sloping green pastures and postcard-like barn/silo combinations were set against a crystal-clear blue sky. That's the way I want to remember upstate New York. However, the 200 inches or greater of snow that falls on this picturesque landscape each year is not something this southerner wants to experience!

It was my first time to visit Cornell University, and I was not disappointed with the "Ivy League" charm and elegance of the campus. I was impressed by the veterinary school facilities and passion for the dairy industry expressed by faculty and students. Spending a little time with Dr. Chuck Guard, a Cornell icon and legendary dairy veterinarian, was a special treat. Dr. Blake Nguyen, a 2017 AABP Emerging Leader for the AVMA Veterinary Leadership Conference and facility manager of the Cornell veterinary school dairy, gave me a nighttime tour of the dairy after we had a roundtable discussion about various topics with some students and faculty from the College of Veterinary Medicine and Animal Science. Outstanding dairy faculty within the veterinary and animal science departments, and active AABP members, Dr. Daryl Nydam, Dr. Jess McCart and Dr. Julio Giordano, were also part of

the Cornell entourage. Further hospitality was extended my way with dinner and discussions with both the Dairy Health Management System and Countryside Veterinary Clinic veterinarians in Lowville.

If you are a veterinarian who cares for cattle, you're ultimately a beef veterinarian. The Holstein is the number one beef breed in the U.S. in terms of total beef tonnage. If you work on cattle you're a dairy veterinarian. Milk



quantity, quality and various milk components are essential for raising productive, healthy beef calves. Many dairy veterinarians could benefit from a better understanding of beef quality

assurance and many beef veterinarians could learn much more about colostrum management and effects of subclinical mastitis and its impact on weaning weight. When we get out of our box and spend time with people who are doing something totally different, breakthrough-type learning and novel relationships are likely to occur.

I could have watched the rotary milking parlor at Sunnyside Dairy all day long. The cows moved in place on their own without coaxing, in a quiet environment. The black and white, gentle beasts rode the nine minutes on the dairy merry-go-round, chewing their cud in a stress-free milk extraction process and exited as uneventfully as they entered. In a system that mimics the Earth rotating seamlessly on its axis, these cows enter and exit effortlessly three times daily. Beef veterinarians need to see this! I was mesmerized, and it was almost as relaxing as watching beef cattle grazing on lush wheat pasture or spring native grass.

The amount of engineering and understanding of cow behavior that went into this rotary parlor design and the evolution of this system over the years is amazing. I observed new alley scraper designs, swinging cow brushes and many other technological advancements that serve to

enhance production efficiency, manage waste and improve cow comfort.

I want to extend a personal challenge to every AABP member to consider some cross-pollination with other cattle veterinarians. If you are beef-focused, set aside a few days to ride with a dairy veterinarian. If you are dairy-focused, take the time to visit a beef cattle veterinarian.

The results of this endeavor could be outstanding! It could range from being a source of encouragement in difficult times to observing amazing, innovative and automated facilities or equipment, some that might even have cross application in a beef or dairy environment.

It's great to be a bovine veterinarian!

Dr. Glenn Rogers

#### FUTURE MEETINGS

##### American Association of Bovine Practitioners

|             |                  |                          |
|-------------|------------------|--------------------------|
| <b>2019</b> | <b>St. Louis</b> | <b>September 12 – 14</b> |
| 2020        | Louisville       | September 24 – 26        |
| 2021        | Minneapolis      | September 23 – 25        |
| 2022        | Long Beach       | September 22 – 24        |
| 2023        | Milwaukee        | September 21 – 23        |
| 2024        | Columbus         | September 12 – 14        |

##### AABP Recent Veterinary Graduate Conference

|      |          |                |
|------|----------|----------------|
| 2019 | Columbus | February 7 – 9 |
|------|----------|----------------|

##### World Association for Buiatrics

|      |               |                   |
|------|---------------|-------------------|
| 2020 | Madrid, Spain | September 13 – 18 |
|------|---------------|-------------------|

#### DISCLAIMER

The AABP does not take responsibility for information contained in or accuracy of the abstracts published in this newsletter.



#### ACTIVITIES AND ADVOCACY

The following are activities AABP leadership has been involved in for the benefit of members and the industry:

- 2019 AABP Program Committee meeting, St. Louis, Mo. – President-Elect, Vice President, Executive Vice President
- Purina Dairy Nutrition Conference, Eureka, Mo. – Executive Vice President
- U.S. Animal Health Association 122<sup>nd</sup> Annual Conference, Kansas City, Mo. – Executive Vice President
- British Cattle Veterinary Association Annual Conference, Leicestershire, England – President



#### AABP NEWS

#### Thank You

To Dr. Geof Smith and members of the Awards Committee for the American Association of Bovine Practitioners,

Thank you so much for the Boehringer Ingelheim Excellence in Preventive Dairy Medicine award presented to me in Phoenix. I have been blessed to have been surrounded by so many great people who have been part of my journey. I am truly honored and humbled to have been selected. It motivates me to work harder at what I do. I looked at the list of who have received this award in the past and I think, WOW, those are some smart people.

A special thanks to Dr. Smith for all of your efforts through my wife, my staff and my associates to get me to Phoenix and keep me there.

The American Association of Bovine Practitioners is a great organization involved in the stability of food production for the world. It is an honor to be part of it.

Thanks again,  
Dr. Ben Shelton

#### Register Now!

##### 2019 AABP Recent Veterinary Graduate Conference

The second AABP Recent Veterinary Graduate Conference targeted for those veterinarians who have graduated between 2011 and 2018 will take place Feb. 7-9, 2019, in Columbus, Ohio. Registration is open!

The theme, "Break Through to Excellence", was developed to offer newer graduates information and skills to improve their practice offerings. New to this conference will be three preconference seminars on Feb. 7 including breeding soundness exams, practice valuation and DairyComp 305. The scientific sessions on Feb. 8-9 will include general, beef and dairy sessions, featuring topics for improving skills in clinical practice and business management.

Find out more and register under the Conference tab (login required) at [www.aabp.org](http://www.aabp.org), by Jan. 16, 2019.

#### Renew Your AABP Dues for 2019!

If you haven't submitted your dues renewal for 2019, your dues have expired. Please submit your dues in order to maintain membership and all of the services that AABP provides including the monthly newsletter and access to AABP-L.

You can find information and renew online at <http://aabp.org/store/paydues.asp>.

### **Applications Sought for Manage Your Rural Practice for Success Workshop Grants**

AABP is seeking applications for the Manage Your Rural Practice for Success Workshop grants for two, three-day intensive practice analysis workshops to be held in St. Louis in the spring of 2019 and 2020. Following similar successful workshops held in 2017 and 2018, the upcoming workshops, funded from a USDA-NIFA grant, have added human resources management topics to the curriculum.

Applicant requirements include U.S. citizenship, veterinary school graduation from 2009-2018 (preference given to those who graduated five or fewer years ago), at least 10% of practice income from food animals, practicing in or adjacent to a USDA-designated Veterinary Medicine Loan Repayment Program area and more. Successful applicants will receive a \$900 stipend each year to attend the training.

Find a detailed description of the program, as well as an application, at [http://aabp.org/next\\_gen/](http://aabp.org/next_gen/). **Applications are due by December 15, 2018 (5:00 p.m. EST).**

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#### **Dr. Elizabeth Homerosky Named AABP-AVMA Emerging Leader**

Dr. Elizabeth Homerosky, Airdrie, Alberta, has been selected as the AABP-AVMA Emerging Leader, and will represent AABP at the AVMA Veterinary Leadership Conference (VLC) in Chicago, Ill., in January.

The Veterinary Leadership Conference is for veterinarians at every career stage who are interested in deepening their engagement with AVMA and other veterinary organizations. The VLC equips veterinary professionals at all career stages to take on new challenges and leadership roles that benefit both the individual attendee and the veterinary profession.

The 2019 emerging leader must have graduated between 2009 and 2018 and is selected by the AABP Student Activities & Membership Committee.

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#### **2018 AABP Recent Veterinary Graduate Conference Proceedings Available!**

AABP members can now view the proceedings from the inaugural 2018 AABP Recent Veterinary Graduate Conference which was held in February, 2018, in St. Louis, Mo.

Log on to [www.aabp.org](http://www.aabp.org) and under the Publications tab, select the Recent Graduate proceedings. Then, click on 2018 and you can view the table of contents which will link you to proceedings papers.

AABP members can also receive free CE credit by viewing presentations from the Recent Graduate conference on the Beef Cattle Institute website. Simply click on the BCI logo on the left hand side of the AABP home page to access that and other AABP conference presentations.



### **DEADLINE REMINDERS**

#### **Call for 2019 AABP Annual Conference Preconference Seminar Proposals**

The AABP program committee is calling for preconference seminar proposals for the 2019 52<sup>nd</sup> AABP Annual Conference to be held Sept. 12-14 in St. Louis, Mo. The preconference seminars will take place Sunday, Sept. 8 through Wednesday, Sept. 11. Preconference seminars provide in-depth instruction on a subject and most are limited to 30 attendees. Each year, old favorites as well as new seminars on beef, dairy and practice management subjects, are offered.

Priority will be given to proposals which include:

- 1) Seminar concepts recommended by standing AABP committees;
- 2) Seminars receiving good attendance and reviews in 2017 and 2018;
- 3) Seminar content revision and upgrades, particularly with rotation of speakers in repeat seminars;
- 4) Originality tempered with reality in new proposals to be considered.

Find proposal details and more information in the purple link on the AABP homepage at [www.aabp.org](http://www.aabp.org), or directly at <http://aabp.org/meeting/preconference.asp>. Online documents include a budget calculator, seminar description and faculty contact information, all of which must be downloaded, completed and emailed by **Dec. 31, 2018**, to Dr. Carie Telgen ([carietelgen@gmail.com](mailto:carietelgen@gmail.com)) and Dr. Fred Gingrich ([fred@aabp.org](mailto:fred@aabp.org)). Contact Drs. Telgen or Gingrich with questions.

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#### **Call for 2019 AABP Foundation Research Proposals**

The AABP Foundation announces two grants supporting clinical research in cattle. Each grant will be for up to \$25,000. Proposals may address beef, dairy or both, and an effort will be made to award one beef and one dairy grant. More than two projects may be funded, but the total amount awarded will be \$50,000. Proposals should be aimed at providing practical solutions that cattle veterinarians can utilize in beef or dairy production environments.

Each proposal should include a title and description of the proposed study, experimental protocol, a budget and a list of the investigators with biographical sketches.

Salary replacement for faculty members, post-docs or graduate students, indirect costs, or scientific equipment will not be supported. At least one of the investigators must be an AABP member. Projects likely to be funded by corporate or industry sponsors are not likely to be prioritized. In judging between proposals of similar merit, preference will be given to proposals from researchers who

are starting their careers or from private practitioners, and proposals for which AABP Foundation funds can serve as seed money to attract other grants.

For more details and a proposal template, visit [http://foundation.aabp.org/research\\_proposal/default.asp](http://foundation.aabp.org/research_proposal/default.asp).

Twenty percent of the granted funds will be withheld until the results are presented at an AABP annual conference and evidence of submission to a peer-reviewed publication is received.

Proposals must be received by **5:00 pm (EST), December 10, 2018**. Proposals must be submitted online at [http://foundation.aabp.org/research\\_proposal/default.asp](http://foundation.aabp.org/research_proposal/default.asp).

Email Dr. Virginia Fajt ([vfajt@cvm.tamu.edu](mailto:vfajt@cvm.tamu.edu)) or Dr. Fred Gingrich ([fred@aabp.org](mailto:fred@aabp.org)) if you have questions.

View previous AABP Foundation grant recipients at [http://foundation.aabp.org/research\\_proposal/Funded\\_Proposals.asp](http://foundation.aabp.org/research_proposal/Funded_Proposals.asp).



## AABP COMMITTEE REPORTS

### Accounts Receivable

In a recent discussion of management issues, there were increased concerns within the industry about accounts receivable (AR).

Every bovine practice has its own philosophy and protocols regarding accounts receivable. In many practices addressing AR is left until the next rainy day that just never seems to occur. Since nobody wants to be viewed as the bad guy, that fact turns the entire process into a downward spiral of poor cash flow, ancient AR, and practice owner despair.

We, as a profession, tend to want to please everyone except ourselves. Left unaddressed, the issue of AR can lead to a reduction in our paycheck, a lack of pride in our performance and emotional frustration. This chain of events makes AR a serious issue in many bovine practices. Most practice owners don't even know how much money is being tied up in AR and for how long. That has to change.

There are five basic steps to addressing the issue.

#### Step 1: Assess the Problem

The first step to returning some sanity to AR is to determine your accounts receivable turnover. This ratio shows whether your practice is effectively collecting payments on its AR. A low turnover indicates collection problems and possibly bad debts. Calculating accounts receivable turnover ratio can be the first step. By doing this, the practice owner will have a metric to quantify how bad the situation is and will have a tool to use in the future to measure progress.

To see how this plays out, we can look at Dr. Content's situation. Dr. Content has never charged a service charge, has no written policy on AR, and does not offer discounts for early payment. In addition, he bills at the end of each month and charges the same fees to good payers as well as delinquent accounts. Dr. Content views this money as a hidden reserve that he will eventually receive. Dr. Content

has a practice that grossed \$900,000 in 2017. At the beginning of 2017 he had accounts receivable of \$80,000. Many of Dr. Content's clients are dairymen, and 2017 was not kind to the dairy industry. By the end of 2017, his accounts receivable had climbed to \$150,000.

To calculate accounts receivable turnover ratio, calculate the average AR by adding the AR at the beginning of the year and at the end, divide by two to get the average, then divide that into the total sales. In this case, the calculations are as follows:  $AR\ ratio = \$900,000 / ((\$80,000 + \$150,000) / 2) = 7.83$ . To determine the average number of days it takes you to collect money, simply divide 365 by the ratio of 7.83 and you will see that Dr Content takes nearly 47 days to collect money. This can be discouraging if you have vendors who require payment in 10 days or even 30 days after services are performed or drugs delivered.

Another tool you should have is an "accounts receivable aging report". This report is commonly produced at the end of each month, and shows the amount of money that is due from the last month's services, and the amount that is 30, 60, 90 days and above overdue. This tool will allow you to focus efforts and develop policies directed at each group of aging. In addition, it is a metric by which to measure progress.

#### Step 2: Change your Attitude

After you calculate the average time to collect on accounts, you may need to change your mindset and become assertive. You did not go to school to be a banker. Not charging for services and products insinuates that your products and services are not of as much value as other vendors who do. If you do not charge adequately for your services and collect in a timely manner, eventually you will not be able to continue to provide services at the present quality, will not be able to pay new associates a respectable wage, and you may even get depressed about the situation and look for a different means to earn a living. You are doing yourself, your staff and your clients a favor by demanding prompt and adequate payment for services and products.

Part of the attitude change involves achieving buy-in from partners, associates and support staff. Staff must realize that reducing AR supports practice growth, maintenance of quality care and is essential for the career growth of all members of the staff. They can't be allowed to permit their favorite clients to violate collection policy.

#### Step 3: Create a Protocol

Once you see the problem, you need to start changing your mindset and that of your team members. It's time to be assertive. Remember that when you bill clients, you're loaning them money. Are you a bank? Were you taught in school how to be a banker? I doubt it! I know it's easier to say, "I'll bill you," than face up to your fear of confronting a client about money. But you offer high-quality medical care, excellent products and outstanding client service. You're also the owner of a small business who needs to improve cash flow. So, establish a policy that will insure payment.



For a practice such as Dr. Content's with no policy, there are a number of options to consider in establishing a policy:

- Demand payment at the time of service. This may be difficult, but there are practices that have this as a policy and have almost zero AR.
- Some practices that are not 100% payment at the time service is provided insist that the client supply a credit card that can be used throughout the month, or that the client use services such as John Deere Financial. If you use the client's credit card, be sure you're taking the necessary precautions to protect those numbers from hackers and identity thieves. If clients authorize you to bill them on their credit card on file, do it the day of service or as soon as possible afterwards.
- Consider a discount (commonly 1-2%) on invoices paid at the time of the service.
- If you still have clients you are billing, consider a discount for payments received within a defined timeframe after billing. Note that many veterinary practices bill monthly while many small businesses bill weekly or even daily. The longer the time from delivery to billing, the less that service is valued.
- After looking at the aging report, determine which clients (based on age of accounts) will have to pay for all services at the time of delivery until they are current on their account.
- After looking at the aging report, determine which clients (based on age of accounts) will have services terminated and turned over to a collection service.
- For some overdue clients, you may suggest that a payment plan can be established, such as pay for all services at the time of delivery plus \$500 per month.

#### **Step 4: Communicate the Plan**

After you have developed a plan, you should share it with you staff, stating why it is important that all be on board for the financial wellbeing of the practice and for the practice's ability to continue to provide high quality services.

Clients need to be informed of the policy. This can be done through a newsletter, a separate mailing or with a statement attached to billings. In stating the policy, try to be positive, emphasizing the need that in order to meet client needs, we need to collect funds in a timely fashion.

#### **Step 5: Implement the Plan**

After you have completed the first four steps, the easy part is over. Due to the hard times the sectors of agriculture we serve are experiencing, there will be some clients who you will no longer be able to serve. This is difficult to accept, but if you are going to be in business to help them, you will not be able to serve them and pay your team if you are not paid in a timely fashion. If you are a Dr. Content, I hope you become discontent.

Submitted by the AABP  
Veterinary Practice Sustainability Committee



## **GENERAL INFORMATION**

### **AABP CAST Report**

*This report from the October Council for Agricultural Science and Technology (CAST) fall meeting in Sacramento, Calif., is provided by Dr. Gabe Middleton on behalf of AABP CAST representative Dr. Jason Nickell.*

Thank you to the AABP Board of Directors for your support of CAST in the past, present and future. AABP has been well represented in CAST leadership with past presidents Dr. Lowell Midla and Dr. Mark Armfelt. Dr. Gabe Middleton is currently serving as the CAST President and a proxy for Dr. Jason Nickell as the American Association of Bovine Practitioners representative.

As background, CAST is a nonprofit organization comprised of representatives from the corporate, nonprofit, society and university areas. The goal of CAST is to communicate sound science through issue papers and commentaries that synthesize the current scientific literature on certain topics. CAST also aims to distribute those papers to policymakers and the public via paper rollouts in Washington, D.C., from an active and engaged communications department.

Activities at the CAST fall meeting included:

#### **Tuesday, October 23**

- Tours of UC Davis food processing, winery and brewery at the Robert Mondavi Institute.
- Tour by Dr. Alison Van Eenennemann of her beef research facility utilizing genome editing to add desirable traits to cattle, such as the polled phenotype. She expressed concerns about the current FDA regulations surrounding genome editing and animals. Other countries, such as Canada, are much more open to this technology because the end product of these animals (milk, meat, eggs) is no different than animals that are not modified by the process. Her current research is utilizing genome editing to allow bulls to be "testicular surrogates." In other words, the bull's testicles are able to carry elite genetics from a different sire to pass those traits on in a commercial setting.

#### **Wednesday, October 24**

- Presentation by Jamie Johansson and Karen Ross, Secretary of the California Department of Agriculture. She discussed how California's over 77,000 farms are still able to produce food while being held to the highest environmental and ethical standards.
- The CAST general sessions gave attendees an introduction to "Smart Farm UC Davis: Creating Sustainable Farming in the Future." Smart Farm is a holistic approach of taking small-scale care to a large-scale level. It involves gaining more detailed data on soil types, topography, water needs and other markers on how to increase productivity in an attempt to feed a

growing population. Labor scarcity is another area that was discussed and is obviously of major interest to animal agriculture. An example of how the tomato industry has reduced labor needs is that every seed is planted with a GPS location designated by the planter. There is a robotic weeding device that utilizes those GPS locations to avoid the plant and destroy the weeds. Steve Maddox from Maddox Dairy Farm and Chris Hostetler from the National Pork Board discussed sustainability and technology in the dairy and swine industries.

- The CAST Board of Representatives visited the Syngenta vegetable (mainly cucurbits) facility and learned about plant breeding and innovation and the role that genome editing could play in the future to drastically reduce the time for a trait to make it to market and the accuracy in which that process occurs.

#### Thursday, October 25

- The Board heard a sustainability roundtable featuring Dr. Amrith Gunasekara, Science Advisor to the Secretary from the Office of Environmental Farming and Innovation, Dr. Gabriele Ludwig, Director of Sustainability & Environmental Affairs for the Almond Board of California, and A.G. Kawamura, Orange County Produce, LLC (former California Secretary of Agriculture and co-chair of Solutions from the Land). The panelists described the challenges and opportunities of agriculture in a state where soil, water, climate, and labor are so diverse and regulated.
- The animal working group continued to work towards completion of several papers that may be of interest to bovine practitioners:
  - The impact of recruitment and retention of food animal veterinarians on the US food supply
  - GMO free: Impact on consumers, retailers, producers, and the environment
  - The social and economic impact of misinformation in agriculture
  - Antibiotics in animal agriculture
  - Producing food products from cultured animal tissues
- A new potential paper was proposed evaluating life cycle assessments (LCAs) and how they can be used to determine the environmental impact of different segments of agriculture. The paper will examine the potential shortfalls of LCAs and how they can be standardized to share a consistent message. There is concern about LCAs being weaponized to make animal agriculture appear less environmentally friendly relative to alternative products.



**BEEF**

Vet Micro  
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#### **Distinct Bacterial Metacommunities Inhabit the Upper and Lower Respiratory Tracts of Healthy Feedlot Cattle and Those Diagnosed with Bronchopneumonia**

E. Timsit\*, M. Workentine,  
F. Van Der Meer, T. Alexander

Specific nasopharyngeal bacterial communities can provide colonization resistance against respiratory pathogens in cattle. However, the role of bacterial communities of the lower airways in respiratory health remains largely unknown. Therefore, our objective was to compare nasopharyngeal and tracheal bacterial communities between healthy feedlot cattle and those with bronchopneumonia (BP). Deep nasal swabs and trans-tracheal aspiration samples were collected from steers with (n = 60) and without (n = 60) BP at 4 feedlots in Western Canada. After DNA extraction, 16S rRNA gene (V4) was amplified and sequenced. Alpha-diversity analysis revealed a lower bacterial diversity in the nasopharynx and trachea of steers with BP compared to healthy pen-mates. Bacterial communities present within the airways clustered into 4 distinct metacommunities that were associated with sampling locations and health status. Metacommunity 1, enriched with *Mycoplasma bovis*, *Mannheimia haemolytica* and *Pasteurella multocida*, was dominant in the nasopharynx and trachea of steers with BP. In contrast, metacommunity 3, enriched with *Mycoplasma dispar*, *Lactococcus lactis* and *Lactobacillus casei*, was mostly present in the trachea of healthy steers. Metacommunity 4, enriched with *Corynebacterium*, *Jeotgalicoccus*, *Psychrobacter* and *Planomicrobium*, was present in the nasopharynx only. Metacommunity 2, enriched with *Histophilus somni*, *Moraxella* and *L. lactis*, was present in both healthy and sick steers, but was primarily detected in one feedlot. We concluded that distinct bacterial metacommunities inhabited the nasopharynx and trachea of healthy feedlot cattle and those with BP. Because *L. lactis* and *L. casei* can inhibit *M. haemolytica* growth in vitro, their presence in healthy steers may have provided colonization resistance against bacterial respiratory pathogens.

\* Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, T2N 1N4, Canada

**Relationships of Nutritional Plane and Feed Efficiency  
with Sexual Development and Fertility Related  
Measures in Young Beef Bulls**

S. Bourgon\*, M. Diel De Amorim, T. Chenier,  
M. Sargolzaei, S. Miller, J. Martell, Y. Montanholi

Sexual development in beef bulls appears to be influenced by nutritional plane and feed efficiency. Yearling bulls fed high (GRAIN = 49) and moderate (ROUGHAGE = 109) nutritional planes, were submitted to a performance test where scrotal circumference (SC), scrotum and testis ultrasonograms and hormones were monitored throughout. Scrotal thermographs, blood cell counts and semen were evaluated at the end of the test. Residual feed intake (RFI) was the measure of feed efficiency, and bulls within each population were characterized as efficient and inefficient. During the test period, the GRAIN group had greater triiodothyronine (T3), leptin and scrotal skin thickness (SST) while having greater T3, leptin, % motile sperm, % normal sperm, scrotal temperature and values for red blood cell variables at the end of the test when compared to the ROUGHAGE group. During the test, the efficient GRAIN group had lesser testis pixel intensity while at the end of the performance test the bulls of this group had greater % normal sperm and lower testis pixel intensity compared to bulls in inefficient GRAIN group. In comparison, the efficient ROUGHAGE group had less T3, SC and SST while at the end of the test these bulls had less T3, leptin, SC, SST and scrotal temperature compared to bulls in the inefficient ROUGHAGE group. Complete blood cell variables, semen quality, scrotal biometry and thermography explained most of the variation in RFI. Results of the present study support the hypothesis that there is an antagonistic relationship between feed efficiency and sexual development in young bulls, which seems partially offset when there is a greater plane of nutrition. Thus, feed efficiency should be factored in the reproductive evaluation of sires.

\* Ontario Veterinary College, University of Guelph, Guelph, ON, N1G 2W1, Canada

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**Evolution of the Nasopharyngeal Bacterial  
Microbiota of Beef Calves from Spring Processing  
to 40 Days after Feedlot Arrival**

C. McMullen\*, K. Orsel, T. Alexander, F. Van Der Meer,  
G. Plastow, E. Timsit

The composition of the nasopharyngeal bacterial microbiota has been shown to play a role in cattle respiratory health. However, previous studies are narrow in scope regarding longitudinal observations, limiting our understanding of how respiratory bacteria evolve over time. The objective

was therefore to characterize this microbiota and its evolution over time in beef calves. A total of 120 crossbred beef-breed steer calves were enrolled in a study in southern Alberta at the time of first vaccination (spring processing), comprising three groups (40 calves/group) that originated from different ranches and were placed in different feedlots. Deep nasopharyngeal swab samples were collected from the calves at the time of spring processing, arrival at the feedlot, and a targeted 40 days after feedlot arrival. The swabs were processed for DNA extraction and the V4 region of the 16S rRNA gene was sequenced to evaluate the microbiota. The composition of the microbiota differed among groups of calves, with each group showing different relative abundances of 963 observed sequence variants. Mycoplasma was the most abundant genus and M. dispar the most abundant species across all groups. There was a distinct shift in the composition of the microbiota over time for all calf groups; however, changes in sequence variants differed by group. Variations in both microbiota composition and temporal changes of sequence variants according to calf group indicates that the respiratory microbiota of beef cattle may lack a common pattern of evolution from ranch to feedlot, and that future studies should account for potential group effects.

\* Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, T2N 1N4, Canada



DAIRY

Anim Repro Sci  
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**Comparison of Luteolysis and Timed Artificial  
Insemination Pregnancy Rates after Administration of  
PGF<sub>2α</sub> in the Muscle or the Ischiorectal Fossa in Cattle**

S. Holland\*, W. Whittier, S. Clark, S. Hafez,  
W. Swecker

Prostaglandin F<sub>2α</sub> (PGF<sub>2α</sub>) is commonly injected intramuscularly (IM) in female cattle in synchronization protocols. A novel site for administration of PGF<sub>2α</sub> that improves beef quality assurance is the ischiorectal fossa (IRF). The objective of this study was to determine whether administration of PGF<sub>2α</sub> in the IRF results in a similar physiological response to an intramuscular injection. Yearling angus-cross heifers (n = 112) were blocked by weight and randomly assigned within blocks to be injected with 5 mL PGF<sub>2α</sub> either IM in the neck or in the IRF. Blood samples taken at 0, 8, 16, 24, 36, and 48 h post-injection were analyzed for serum progesterone concentration using a radioimmunoassay. Progesterone concentration curves for each heifer were plotted to determine luteolysis. The median times to luteolysis for neck and IRF injections were 18.1 h and 20.0 h, respectively (p = 0.06). Angus cross commercial beef cows (n = 1471) at least 30 days post-partum were blocked by age and randomly assigned within blocks to be injected with 5 mL PGF<sub>2α</sub> either IM in the neck

muscle or in IRF as part of a 7-Day CO-Synch + CIDR synchronization protocol. Pregnancy diagnosis was performed via ultrasound at 60 days post insemination. Results were analyzed with Proc Glimmix (SAS). Pregnancy rates for neck and IRF injections were 52.6% and 57.2%, respectively ( $p = 0.06$ ). In summary, injection of PGF<sub>2α</sub> in the IRF for synchronization of estrus and luteolysis did not differ from IM injection. Utilizing the ischiorectal fossa as an injection site for PGF<sub>2α</sub> may serve as an alternative that more closely aligns with beef quality assurance.

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**Aggressive Attempted Escape Behavior during  
Head-lock Restraint Reduced Reproductive  
Performances in Holstein Heifers**

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The objective was to determine associations between behavior during head-lock restraint and reproductive performance in dairy heifers. Behavior of 817 Holstein heifers from four farms was evaluated at feeding (Days 0 and 7) while restrained in a self-locking stanchion. All

heifers were assigned a body condition score (BCS; 1, emaciated to 5, obese) on Day 0. Heifers were timed-inseminated on a maximum of three occasions to determine impact of behavior for first service pregnancy per AI (FS-P/AI) and cumulative P/AI (C-P/AI). Ovulation was synchronized with an Ovsynch synchronization protocol for first service and thereafter either Ovsynch and/or prostaglandin F<sub>2α</sub>-based protocols. More heifers displayed calm escape behavior ( $P < 0.05$ ) compared with mild or aggressive escape behaviors (45.2, 28.2 and 26.6%, respectively). Adjusting for BCS ( $P < 0.05$ ), FS-P/AI was greater ( $P < 0.05$ ) for calm heifers compared with aggressive escape behavior, 58.0% (214/369) vs 48.2% (105/218), with FS-P/AI of heifers with mild aggressive behavior [53.5% (123/230)] intermediate and did not differ from other means. Adjusting for BCS ( $P < 0.0001$ ), C-P/AI was greater ( $P < 0.0001$ ) for heifers with calm compared with mild or aggressive escape behaviors [84.8% (313/369), 71.3% (164/230) and 64.7% (141/218), respectively]. Serum cortisol concentrations were not different among behavior categories, but serum substance P concentrations were greater ( $P < 0.05$ ) in aggressive heifers compared with mild or calm heifers,  $97.1 \pm 4.9$ ,  $58.4 \pm 2.9$  and  $52.3 \pm 2.6$  ng/mL, respectively. In conclusion, Holstein heifers with aggressive escape behavior during head-lock restraint had significantly reduced reproductive performance.

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