ABS TECHNICAL Service

NEWSLETTER **Autumn 2015**

Welcome to the Autumn Technical Service Newsletter!

As the weather grows cooler here in DeForest and the end of the harvest season is in sight, we have been reflecting on the Genus ABS values. We believe that our global technical team works to embody these values each and every day, but the value on which we will focus as this goes to print is Pioneering.

To us, Pioneering means that we are willing to put in the work and take the risk to revolutionize our industry for the benefit of our customers. Through the launch of TransitionRight™, that work and that risk have culminated to become what I believe is a breakthrough in dairy genetic improvement. The transition period is one of the most critical in the life of a dairy cow. To be able to ease the stress that goes along with transition through targeted genetics is indeed Pioneering and absolutely revolutionary. To compliment this concept, we have gathered experts in the field to share their knowledge on the science of managing transition.

In this edition, Drs. Cristian Vergara, Fernando Cavazos and Luis Alonso Ruiz of Technical Service present articles on transition period issues that they've encountered through their work in North and Latin American dairies. Dr. Yalda Zare of our Research and Development team presents a clear and valuable account of the link between genetics and transition and Drs. Julie Huzzey and Nina von Keyserlingk of Cal Poly and the University of British Columbia respectively, present their findings on the impact of feeding behavior on transition cow health.

To bring our Pioneering technology and value-added solutions to our customers, we rely on our global team. We will take a trip around the world to see the team's dedication and expertise in action. From Mexico to Brazil to Russia, Technical Service is proud to partner with our knowledgeable sales staff to turn industry-leading genetics into the next generation of healthy and productive herds.

We hope that you enjoy our most recent installment of the Technical Service Newsletter and find it informative and useful in your business. As always, many thanks for your support and please let me know if our team can be of assistance.

Regards,

Dr. Hernando Lopez
Global Technical Service Team

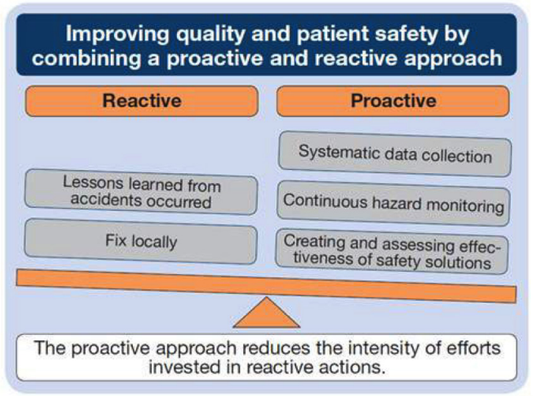
Abstechservices.com

inside:

Transition, Can We Make it Right?

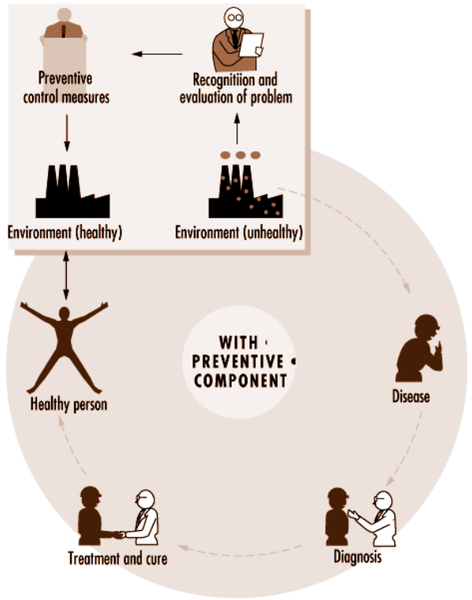
Dr. Christian Vergara
Technical Service Manager
North America

The transition period, the time referring to the two to three weeks before and after calving, is constantly present in our customers' minds, especially during the summer and early autumn. Most herds contend with different degrees of heat stress that impact a cow's health in many different ways; for instance depressing her feed intake – especially impactful for transition cows. Additionally, because of previous year heat stress and lower fertility as a result, the calvings will tend to concentrate more heavily nine months after the situation returns to normal. In other words, peak calvings may occur again in the summer, thus perpetuating the cycle. Therefore, we often see major incidences of fresh cow disease in cohorts of cows that transitioned during summer months that had lower feed intakes and struggled with overcrowded transition pens that reduced feed bunk space. Following this progression, 60 to 100 days later we struggle getting those cows pregnant; pregnancy rate declines, fertility is questioned, cows lose their body condition more markedly, have delayed cyclicity, increased lameness and so on. Does this sound familiar?



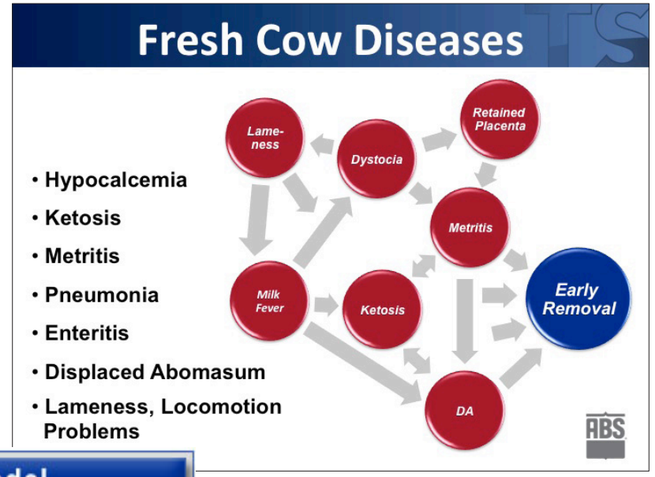
For years we reacted to those issues with improved synchronization protocols, high fertility bulls, technician's refresher courses, among other technical approaches. But now we, as a company, can work on the prevention side, putting our customers ahead of this cycle to become part of the solution with our own proprietary genetics.

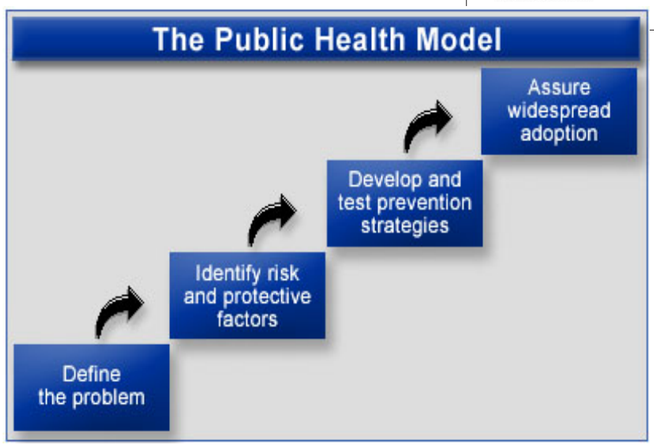
Decades ago, scientists concluded that reactionary management is less effective than preventive management in relation to herd health and also has a higher return over the course of the investment. The preventive approach that applies to almost every area of population health or preventive medicine requires strict monitoring. In general, to monitor a process requires data collection, data analysis to detect areas of opportunity, implementation of preventive and reactive protocols (working on the previously detected opportunities) and the continual monitoring of results in search of new opportunities. There is a parallel between human public health and bovine herd health. The examples to the right illustrate how public health contends with



occupational diseases. As a result, public policy regulates processes to reduce risk that otherwise would impact the productivity of society.

In broad terms, the public health policy maker model should apply to herd health and specifically to transition related health issues for similar reasons that drive public health policy. We need to manage risk and establish standard operating procedures (SOPs) that will prevent fresh cow health problems. The transition period of a dairy cow makes her very vulnerable for a number of reasons (hormonal changes, stress, management changes, etc.). As a result, her immune system and energy balance is compromised. The associated health disorders will equally apply to the whole productive herd as the transition period is common to all cows entering in milk production. If the period is not favorable, it causes significant economic loss when transition fails. These losses can be explained by lower milk production (peak), higher veterinary costs, lower fertility and decreased longevity. Similarly to the public health model, focus on policies for high risk cow populations in a herd is a must. These solutions can alleviate almost 75% of the total disease a cow may have in her life.





In summary, following the simple scheme presented above:

1 We must define the problem

Several herds fail at this very basic point because of poor record keeping and diagnosis skills. As a Technical Service team, we can help your customers set herd management software to record health related information and we can assist in the analysis of that information, finding incidences, rates of diseases and providing benchmarks. Technical Service consultants have veterinary backgrounds, allowing us to train employees on disease definition and diagnoses based on the farm resources. It is well documented that up to 50% of the fresh cows will suffer from one or more health disorder during this period, and as a result, up to 10% of those will leave the herd in the first two months after calving. Because fresh cow diseases are multifactorial and have interconnected risk factors, individual incidence rate and diagnosis will vary from farm to farm.

2 Identification of protective risk factors

Herd epidemiologists and research veterinarians have been running extensive research on developing a list of cow level transition risk factors that will increase the susceptibility of developing fresh cow diseases. In other words, predicting which cows are at higher risk of developing health issues. Well-known metabolic predictors are blood laboratory tests, which are great, but expensive tools to use around calving. Researchers have also included in their list factors that are free of cost and available to each producer. An obvious one is age; the older the cow, the higher the risk of developing a transition problem. Nevertheless, fresh lactating heifers are a weird exception to this rule, as calving abnormalities increase the risk of transition problems.

Transition, Can We Make it Right? (continued)

In research conducted by Dr. Gary Oetzel (UW-Madison) and I on New York and Wisconsin dairies during the summer of 2009, we found fourth or greater lactation cows were twice as likely to need treatment in the fresh pen and/or to be removed within the first month after calving. Similarly, moderately lame or lame (locomotion score three or greater) cows in the close up pen increased their risk of treatment and/or early removal by more than two times. However, the risk was highest when associated with calving abnormalities. Cows that had twins, death on arrival (DOA) or dystocia increased their risk by three times and up to eight times if they concurrently have had a longer than average previous lactation (over 14 months).

The only factor that showed predictability on first lactation heifers among available demographic data was calving problems (listed above). Further, Cornell University using the same data, found a higher risk of ketosis in cows that had male calves, perhaps related to bigger calf size, difficult calving and/or DOA.

The data below from dairies with whom the U.S. ABS Technical Service team works shows calving abnormality risk factors. This is a great opportunity to compare performance from your key customers to see if it merits a Technical Service visit to evaluate those numbers and the management of the transition period. Often training can solve most of the problems in addition to the use of sorted semen. The rates listed here are only reference numbers and are not intended to represent ideal situations. The intention is to summarize the sample population mean, providing a good indication of what dairies are achieving to easily detect outliers among our customers. Herds that have higher incidence rates (%) than the table below indicate that those herds have a higher risk of developing fresh cow diseases.

Fortunately, our team can identify some of the risk factors and recommend related preventive management. We can include feed bunk space limitations, locomotion issues, heat abatement and feed sorting issues, amongst others.

Finally, the ABS Research & Development team has identified protective factors among our genetics that will revolutionize the preventive approach veterinarians have been using to date.

Incidence of Calving Risk Factors by Lactation Group from U.S. TS Dairies (%)
July 2012 - 2013

Lactation Group	# Calving	% Twins	% Females	% DOA*
1	109,026	1	54	9
2	83,264	3	47	4
3 or +	108,399	5	47	5
TOTAL	**300,689**	**3**	**49**	**6**

*DOA rate was calculated from the FRESH event calf information stored in DC305© software

3 Develop and test preventive strategies

As mentioned previously, our technical group has the expertise to detect risk factors and recommend strategies. However, we prefer to work in coordination with herd veterinarians implementing SOPs and special training for employees to perform the SOPs properly. Caution is advised when testing preventive strategies because individual fresh cow disease occurs on a relatively low scale. A huge amount of observation is required to statistically detect changes in parameters, and that is why we use and trust Real World Data™ for those observations. On the farm level, DC305 uses a 68% confidence interval to monitor clinical (not statistical) differences in response to management. Additionally, often specific and costly tests are required to accurately assess changes, a good example is ketosis which is mostly manifested in the subclinical condition, and therefore expensive and difficult to find on-farm. Blood tests are required to accurately evaluate the incidence variations.

4 Assure widespread adoption

This is our cordial invitation for you to participate in this public health model for dairy herd health. Technical Service hopes to promote the widespread adoption of preventive management that can improve the health of transition cows among our customers. Communicate this and spread the word about our unique solution, TransitionRight™ genetics, with your customers while specifically tailoring this information to their consultant staff. Nutritionists and veterinarians will happily receive additional help in reducing the risk of fresh cow diseases through the use of genetics, and will likely be happy to receive Tech Service's help in record keeping, farm data evaluation, employee training and the update SOPs. Please, leave your comfort zone and present a preventive strategy for first service reproductive problems by bringing the transition topic to the table. The Technical Service staff will be glad to support you and your business.

Key Aspects of A Good Fresh Cow Program

Dr. Fernando Cavazos
Technical Service Manager
ABS Latin America

Luis Alonso Ruiz
Technical Service Consultant
ABS Mexico

A "Fresh Cow Program" is part of a complete Transition Period Management Program. The diagram below is intended to show the most important issues that take place during the Transition Period:

It is important to keep in mind the goals of a complete Transition Period Management Program, as summarized below by Dr. Tom Overton:

- High milk production
- Maintain or minimize loss of Body Condition Score
- Low Incidence of Metabolic Disorders
- Minimize loss of immunocompetence
- Control or decrease days to first ovulation and maintain or enhance fertility
- Low Stillborn Rate and healthy calves
- Improve profitability of the dairy farm

To achieve these goals, it is necessary to apply three different strategies to cover all factors involved.

➤ **Nutrition:**
These have a key role in facing the challenges that are outlined in the diagram below. Maximum intake of nutrients is a priority and we must ensure cows consume diets without sorting and feeding management.

➤ **Strategies to pay attention to non-nutritional factors:**
These are mainly intended to optimize Cow Comfort and minimize any type of stress that could affect cows and their feed intake and immune system. Four important non-nutritional factors to take in account are:

- o **Stocking density:** ensure that there will be always available places to eat, drink water and to lie down, avoiding social conflicts between cows.
- o **Grouping strategies and pen moves:** designed to avoid unnecessary stress for cows when they are moved to other social groups and hierarchies.
- o **Segregating cows and heifers during the transition period:** to avoid the social competition of heifers, have more homogeneous groups of animals.
- o **Heat abatement:** Avoiding heat stress during the transition period is extremely important.

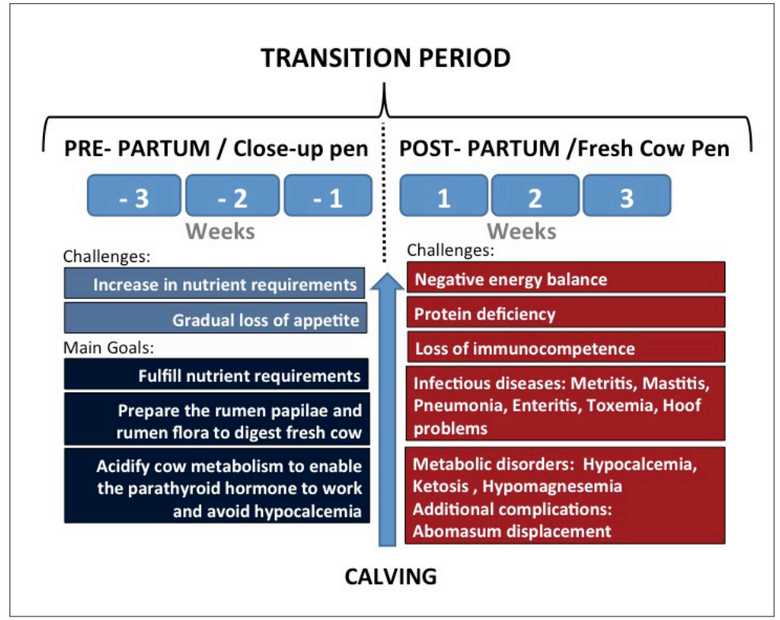
➤ **Improved on-farm monitoring systems:**
For detection of hyperketonemia and hypocalcemia with cow-side devices already available. New electronic activity monitors or accelerometers to detect sick cows and rumen activity can also be employed to strategically assist in the reaching the goals outlined earlier.

The above mentioned strategies are part of a proactive protocol where prevention is paramount. Even when all of those strategies are implemented correctly, some health problems in the fresh cow period will still arise that cause us to take some reactive measures to detect problems quickly and apply adequate treatment. That is one of the objectives of fresh cow programs.

Important components of a good fresh cow program:

1. Measures to increase feed intake: Because negative energy balance is the pivotal problem of fresh cows, every effort to increase feed intake is critical. These measures should include nutritional strategies (high quality and digestible forage, enough effective fiber, good palatability rations, adequate particle size to avoid sorting, feeding management, etc.); but also all those non-nutritional measures to ensure that every cow has good opportunity to access the feed bunk (and waterers) without struggling against cows higher in the hierarchy. Heat stress can affect feed intake significantly and should be avoided as much as possible using heat stress abatement measures.

2. Measures to minimize any source of stress for the cows. Stress can exacerbate the loss of immuno-competence which is the other important challenge in fresh cows. Overcrowded pens are the most common source of stress for fresh cows, so it is crucial to have adequate stocking density trying to keep the pen at 85% of capacity to assure enough feed bunk and waterer space and also enough space to lie-down and rest. This issue becomes more critical if there is no opportunity to segregate primiparous from multiparous cows, which would be the ideal situation.



3. Establish the importance of two key topics with the personnel in charge of fresh cow management:

- The key clinical signs that they are going to look for in each type of health problem and the criteria that will determine certain type of diagnosis in cows that don´t have a healthy appearance.
- The treatment protocols to follow for each diagnosis or health disorder. Also agree on the additional supportive care to provide in certain cases (rehydration, for example).

4. Determine the best schedule to perform the daily fresh cow management and physical examination, taking in to account milking times and feed delivery to the feed bunks. This is important to avoid excessive lock-up time and to be able to appreciate appetite and attitude of cows, and also udders fill.

5. Establish the program for visual inspection and sorting of cows that need a physical examination to decide if they require special attention or treatment.

The final goal of such a program is that a very high percentage of the fresh cows can be moved to a high production pen two weeks after calving so they can receive a ration with enough energy density as soon as possible to solve the negative energy balance and obtain a high peak of milk.

The program should allow dairy personnel to detect, at a very early stage, the most important and common health problems and treat them quickly. Employees in charge of the program, should do the following:

I. **Detect which cows do not have a healthy appearance and require a complete physical examination. This step will be based on three important sources of information: visual Inspection of cows, milk production information and body temperature.**

II. **Perform a complete physical examination of those cows sorted in the first step.**

III. **Based on the physical exam, try to arrive to a diagnosis, taking in to account the key clinical signs agreed upon for each case or disease.**

Key Aspects of A Good Fresh Cow Program (continued)

IV. Start the treatment protocol also agreed upon previously for each case.

V. Complete the treatment and evaluate the results in due time.

VI. Keep good records of all events and treatments.

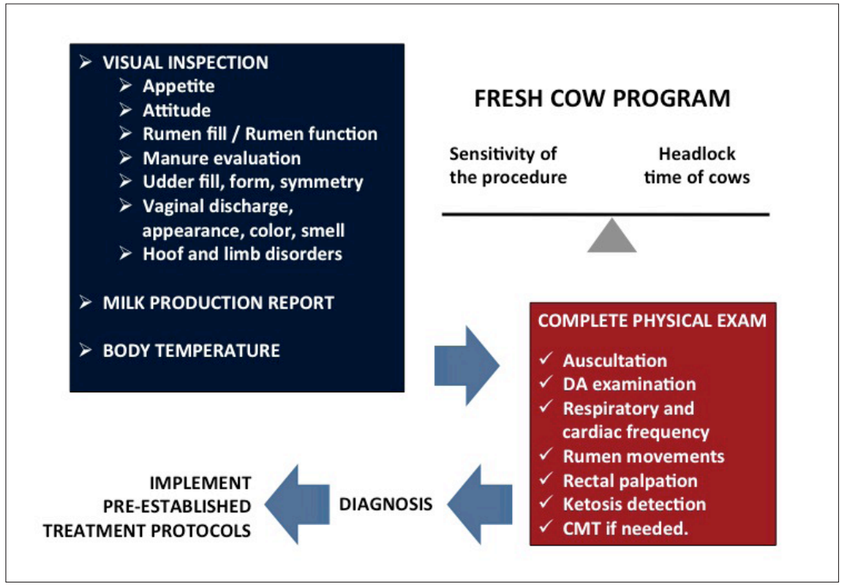
It is highly recommended that the inspection be performed first from the front, walking in front of the face of cows to appreciate the attitude and appetite of cows and also see any other signs of discomfort or illness. Once all cows have been observed from the front, then the inspection is initiated from the rear.

It is important to keep in mind that cows must not be in the headlocks for more than 45 minutes, if possible, to avoid excessive on concrete time. The goal should be to keep a balance between enough sensitivity of the program to detect health issues and the headlock time of cows. The diagram to the right provides more details on the process.

6. It is useful to have a good marking system of cows and adequate record keeping of all the events and treatments.

The marking system will allow the personnel in charge of the fresh cows to know the type of calving (degree of difficulty) and the number of days the cow has been in the fresh pen. The type of colors will indicate if the cow has been all right or if she has had some problem and the number of days under treatment.

It is very important also to record all the events of postpartum diseases to be able to evaluate if the incidence of such type of problems is normal or is higher than the level desired.



Around the World

Mexico

Dr. Miguel Rosano presenting dairy management training in San Carlos, Mexico.

Idaho

Joe Bennett and Andrew Gale of Genus ABS in the UK at the RMS Training Center in Twin Falls, Idaho.

Vietnam

Dr. Diego Vallejo training our clients TH Milk in Vietnam.

Russia

Phil Salkeld is leading reproductive training in Yekaterinburg, Russia, located in the Ural mountains.

Brazil

ABS Pecplan team & Paul Trapp at the 2015 Agroleite Dairy Fair in Brazil.

Feeding Behavior and Management Impacts Transition Cow Health

Dr. Julie M. Huzzey
California Polytechnic University

Dr. Marina (Nina) von Keyserlingk
University of British Columbia

Summary of 2015 California Animal Nutrition Conference Proceedings

Maintaining healthy cows through transition continues to be a challenge for many producers. Recent research has focused on identifying **1) ways to improve the early detection of cows at risk for becoming sick and, 2) management practices that increase this risk.** Much of this work has focused on feeding behavior and management known to affect feeding behavior. Decreased intake is frequently observed in sick animals and this response was, for a long time, believed to be simply the result of the debilitating effects of the illness. In fact, sick individuals may be highly motivated to decrease feeding time and increase resting time in order to conserve energy to enhance the immune system.

Researchers in the Animal Welfare Program, at the University of British Columbia have devoted much of their work over the past decade to exploring how feeding behavior relates to common transition cow disorders including metritis, mastitis, subclinical ketosis and hypocalcemia and also lameness. For many of these disorders dry matter intake (DMI) and feeding time is often lower during the period of illness but research has also shown behavior changes well before clinical signs of disease appear. For example, DMI and feeding time have been reported to be lower 1 to 2 weeks before calving in cows that later develop metritis and subclinical ketosis.

Intake has also been reported to decline beginning 5 days before clinical signs of mastitis.

Lameness has not typically been considered a transition cow disease, however hoof lesions, take months to become visible and the period around calving may be where lesions first begin to develop. In one study, cows with lesions during mid-lactation, were observed to have a faster feeding rate during the 2-week period before calving. Increased feeding rate is linked to competition at the feed bunk; this can increase a cows' risk for injury. A high rate of intake is also associated with feed sorting for small particles; this may increase cows' risk for ruminal acidosis and laminitis.

Finding ways to improve access to feed and increase time spent at the feed bunk would likely be beneficial to a cows overall health and welfare during the transition period. Dairy cattle are social animals and prefer to engage in activities such as feeding as a group rather than individually. Fresh feed is an important motivator for drawing cows to the feed bunk. Increasing the frequency of fresh feed delivery increases cows total daily feeding time, provides cows with more equal access to feed and reduces the frequency that subordinate cows are displaced from the feed bunk. Overcrowding the feed bunk also results in more aggressive interactions as cows "fight" for access to this valuable resource. To compensate multiparous cows are able to increase their feeding rate to some degree with the cows that are displaced from the feeding area most often (the subordinates) eating the fastest. Unfortunately primiparous cows are less able to alter their feeding rate.

Increased competition at the feed bunk also occurs when the quality of the diet is non-uniformly distributed across the length of the feed bunk. Total mixed rations (TMRs) should provide a balanced well mixed supply of nutrients to the cow. However, the quality of a TMR may vary between days (in relation to mixing and inputs), within days (due to sorting by cows or environmental exposure), and along the length of the feed bunk (due to improper mixing or uneven feed distribution and usage).

Competitive interactions occurred nearly 4 times more often at the feed bunk when TMR quality was non-uniformly distributed.

Moving animals into new social groups disrupts normal feeding behavior; the period around calving is marked by several group changes. Competitive aggressive interactions at the feed bunk are most frequent on the day of regrouping and remain elevated for several days after. One of the UBC studies reported a 9% decrease in intake and rumination time on the day of regrouping.

The design of the feeding area may offer dairy cattle some relief from social competition during feeding. Feed barriers that offer physical separation between the necks (i.e. headlocks) or bodies (feed stalls) of cows at the feed bunk can reduce the frequency of competitive displacements. A less aggressive feeding environment may promote longer feeding times and may also have long-term health benefits; cows protected from aggressive competition would likely be at decreased risk for injury and hoof health problems.

Take Home Messages

- Behavioral changes around parturition (decreased feeding time and DMI, subordinate behavior at the feed bunk, avoiding the bunk at peak feeding times, and increased feeding rate) identify animals that are sick or at risk for becoming ill.
- Reduced frequency of feed delivery, unexpected changes in TMR quality, overcrowding, and frequent movements of cattle between pens can negatively affect feeding behavior.

For more information on this research please contact marina.vonkeyserlingk@ubc.ca

Transition from a Research and Development Perspective

Dr. Yalda Zare,
Research Scientist
ABS Global

Transition period in dairy cattle refers to a time period starting 2-3 weeks prepartum until about a month after calving. In this time frame, important physiological, metabolical, and nutritional changes occur to prepare a dairy cow to start her productive cycle by termination of her pregnancy and initiation of a new lactation. The manner in which these changes occur and how they are managed have a great impact on lactation performance, clinical and subclinical diseases, reproductive performance and therefore profitability of producers.

Most of our understanding of this period is related to transition cow nutrition, treatment and management due to extensive research efforts in the academia or at the industry and global dairy producers, for many years, have used these prevention-reaction strategies to manage transition cow problems. Although the genetics of this period has not received as much attention, in recent years genetic studies have addressed the role of genetics in susceptibility (or resistance) of transition cow to various diseases which are the majority of the disease events that occur in the life of a cow. Typically, 75% of dairy cattle diseases occur during the first 30 days in milk and more than 50% of cows during this period are estimated to suffer from at least one subclinical disease and as a result, up to 10% of those will leave the herd in the first 2 months after calving.

Diseases occurring during the transition period include dystocia, metabolic disorders such as milk fever and ketosis, retained placenta, metritis, displaced abomasums, mastitis, and lameness which are all correlated and interconnected. Many years of efficient selection based on productivity and the genetic antagonism between milk production and transition health problems such as mastitis has only increased the frequency of these diseases over time. Table 1 shows the incidence rates of three major transition cow disorders in Holstein. *See Table 1.*

The challenge in genetic studies of these diseases is that adequate, accurate and consistent on-farm health records are needed to be able to accurately estimate heritability, genetic correlations between traits and breeding values. Lack of direct measures (clinical symptoms) on these diseases has led to the use of indicator traits with somatic cell count (SCC) being the most well-known example as a measure of subclinical mastitis and an indicator for clinical mastitis. Moreover, recently milk beta-hydroxybutyrate (BHBA) has been suggested as an indicator of clinical ketosis. Although the indicator traits provide some information about the disease of interest, they are not perfect predictors and do not preclude the need for direct measures and genetic correlation of <60% between SCS and mastitis and about 48% between BHBA and ketosis confirms that. The second challenge in the genetic studies of transition cow diseases is the complex and multi-factorial nature of these diseases such that they are under the influence of many genes with small effects as well as the environment which makes deciphering the genetic basis of them more difficult.

Traditional heritability of these diseases is generally low to moderate ranging from 0.05 to 0.18 based on first lactation alone or all lactations. On the other hand, studies show that significant genetic differences exist between dairy sires in their daughters' susceptibility to common transition health disorders. As an example, 25% of the daughters of a low PTA bull for metritis displayed clinical metritis. Therefore, it is possible to reduce the incidence of these diseases over time with genetic selection. Considering the cost of these diseases (from a minimum of $200 per case of mastitis to $350 per case of metritis per lactation), and the time and energy that producers have to spend to manage cows in transition period, genetic selection provides an effective solution.

To that end, ABS Global has produced TransitionRight™ index as a selection tool that specifically targets the transition period by developing proprietary genetic evaluations for the three major transition period disorders including Mastitis, Metritis and Ketosis using on-farm collected health data powered by Real World Data platform. The 5-star TransitionRight™ bulls are expected to have 7 fewer cases of mastitis, 6 fewer cases of metritis and 4 fewer cases of ketosis out of every 100 daughters compared to 1-star bulls. Economically, the difference between a 5-star and a 1-star sire translates to $200 difference per cow per lactation in preventive costs, reduced productivity or herd loss from transition cow problems.

In conclusion, genetic selection allows us to break the prevention-reaction battle of transition period and manage the transition period in a more sustainable way. The Holstein breed has shown that we can correct the erosion of female fertility through genetic selection of a low heritability trait like DPR (heritability of 0.04) and so transition cow disorders are not an exception. Using available genetic tools such as TransitionRight™, we can utilize the high genetic variability among dairy sires in the performance of their daughters around transition period and save producers a lot of time, energy and most importantly money in dealing with transition period cows.

Table 1- Incidence rates of major transition cow disorders in Holstein cattle

Disease at 60 DIM	Typical Incidence Rate	High Incidence Rate
Subclinical Ketosis (BHBA≥1.2 mmol/l) **Clinical Ketosis** (BHBA≥3.0 mmol/l)	<15% 3%	>25% >8%
Retained Placenta and Metritis	<8%-10	>10%-15%
Mastitis	<10% of new infections or <10% cows with a linear score of SCC>4 at 1st test	≥12% of new infections or ≥14% of cows at 1st test with a linear score of SCC>4 at 1st test

Adapted from https://ahdc.vet.cornell.edu/Sects/NYSCHAP/factsheets.cfm

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A genetic solution to help your herd
TransitionRight™

Break the cycle of prevention and reaction. Use the power of genetics to help address transition cow health.

Transition health disorders cost you serious time, money and productivity. ABS's TransitionRight offers you a genetic solution to proactively help prevent transition health problems in your herd, by making your cows more genetically predisposed to reduce disorders such as Mastitis, Metritis and Ketosis. ABS is the first company to offer a genetic solution to help prevent these disorders.

TransitionRight Economics

The economic impact of sire genetics on cow transition health is significant for any size dairy operation. By choosing a 5-Star sire, your operation is projected to save approximately $100 in preventive or reactive costs per cow per lactation over a breed-average 3-Star sire.

Star Ranking	Sire Ranking	Expected Economic Impact Per Lactation
★★★★★	Top 10%	$100 savings
★★★★	20%	$50 savings
★★★	Average 40%	$0
★★	20%	-$50 cost
★	Bottom 10%	-$100 cost

View our short 3-minute video at
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