

TRANSITION COW MANAGEMENT



BASICS

OVERVIEW

- The transition period is defined as the last 3 weeks of gestation until 3 weeks postpartum. However some authors may include the period from dry off until at least 30 days after parturition.
- The purpose of the dry period is to allow for the involution of the mammary gland and its repopulation with new secretory cells, which allows for a more productive subsequent lactation.
- The challenges encountered during the transition period are due to significant metabolic challenges associated with the growth and expulsion of the fetus, followed by the rapid rise in milk production after parturition.
- These metabolic challenges are associated with immune dysfunction that increases the risk for infectious disease.
- Most disorders (infectious and noninfectious) occur or have risk factors during this time period. Therefore, it is important to understand the dynamics of the transition period to formulate appropriate management strategies.

INCIDENCE/PREVALENCE

- N/A

GEOGRAPHIC DISTRIBUTION

- Worldwide distribution

- **SYSTEMS AFFECTED**

- Digestive, mammary, musculoskeletal, and reproductive

PATHOPHYSIOLOGY

- During the last month of gestation, the fetus grows exponentially, and consumes a tremendous amount of glucose, amino acids, minerals, and other nutrients from the dam.
- Colostrogenesis and lactogenesis also require large amounts of energy, protein, and minerals.
- Voluntary feed intake declines as parturition approaches, and can be reduced by 20-40% during the week prior to calving.

- The resulting negative energy, protein, and mineral balances are partly mitigated by changes in physiology, but may be overwhelmed and result in hyperlipidemia, hyperketonemia, liver dysfunction, hypocalcemia, and immune dysfunction.
- Altered feeding behavior and changes in diet predispose transition cattle to ruminal acidosis, displaced abomasum, indigestion, and laminitic foot disease.
- Immune dysfunction as a result of altered homeostasis increases the risk for retained fetal membranes, metritis, mastitis, and pneumonia.
- The metabolic and infectious diseases that occur during this period have significant impacts on lactation milk yield, reproductive success, and the risk of removal from the herd, and thus on the economic viability of the dairy herd.

HISTORICAL FINDINGS

- N/A

CLIENT EDUCATION

- Education of both dairy managers and hands-on employees should be frequent and convey the importance of preventive care and early recognition of problems.

SIGNALMENT

- Parturient and postpartum dairy cattle

PHYSICAL EXAM FINDINGS

- N/A

GENETICS

- N/A

CAUSES AND RISK FACTORS

- N/A



DIAGNOSIS

DIFFERENTIAL DIAGNOSIS

N/A

CBC/BIOCHEMISTRY/URINALYSIS

Serum Ca, Mg, P, non-esterified fatty acids (NEFA), β -hydroxybutyrate (BHBA), glucose, insulin, liver enzymes, and urea nitrogen.

OTHER LABORATORY TESTS

N/A

IMAGING

N/A

OTHER DIAGNOSTIC PROCEDURES

PATHOLOGIC FINDINGS



TREATMENT

THERAPEUTIC APPROACH

Cattle that succumb to infectious or metabolic disease during the transition period should be treated promptly and appropriately (see below)

SURGICAL CONSIDERATIONS AND TECHNIQUES

N/A

MEDICATIONS

DRUGS OF CHOICE

CONTRAINDICATION

Appropriate milk and meat withdrawal times must be followed

PRECAUTIONS

POSSIBLE INTERACTIONS

FOLLOWUP

EXPECTED COURSE AND PROGNOSIS

POSSIBLE COMPLICATIONS

CLIENT EDUCATION

Education of both dairy managers and hands-on employees should be frequent and convey the importance of preventive care and early recognition of problems.

PATIENT CARE

PREVENTION



MISCELLANEOUS

ASSOCIATED CONDITIONS

N/A

AGE-RELATED FACTORS

N/A

ZOONOTIC POTENTIAL

N/A

PREGNANCY

Cows developing transition disorders may experience delayed cyclicity and reduced fertility.

RUMINANT SPECIES AFFECTED

Dairy cattle

BIOSECURITY

N/A

PRODUCTION MANAGEMENT

Housing

- Housing for transition cows should consider their special requirements, with adequate access to clean lying areas, water, and feed, as well as non-slip walking surfaces.
- Facilities should be available to properly manage dystocia and examination of cows by personnel.
- Heat stress on dry cows has been shown to have negative consequences on milk production in the subsequent lactation, calf health and immunity, as well as milk production of cows born to heat stressed dams. Heat stress abatement strategies for dry cows should mirror those of the lactating groups.

Grouping

- Grouping decisions should consider the behavior and needs of the animals, as well as the ability to accurately and consistently provide feed and management attention.
- The number of pen moves should be minimized to reduce the disruption of the social hierarchy. Animals are best moved in larger groups in weekly cohorts, rather than as individuals on a daily basis.
- Nulliparous and parous cows are best grouped separately, especially when stocking density is high, because of the social stress to the more timid younger animals.
- Stocking density should be managed to mitigate negative social interactions and optimize feed and water intake. At least 30 inches of feed bunk access and 4 inches of water trough access per cow are recommended.
- Cows should spend at least 14 days in the close up group, to allow for adaptation to the diet and social acclimatization before the most severe drop in DMI.

- Cows may be calmly moved to a separate maternity pen to calve. However, moving cows may slow the progress of parturition and increase the risk of dystocia or stillbirth. Moving cows too early (more than 12 hours before calving) may cause a greater drop in feed intake and also have negative consequences.
- Separate fresh cow groups allow for better attention to nutrient needs and closer monitoring of health and disease. Cows are typically moved out of the fresh group around 2-4 weeks after calving, when disease incidence drops.

Feeding management

- Management of the feeding program is as important as nutrient composition of transition rations. Care should be taken to provide consistency in the formulation, mixing, and timing of feed delivery.
- Transition cows should have access to a balanced ration at all times. Optimizing intakes in groups of transition cows requires feeding to at least 5-10% refusals.

Ration formulation

- There are several nutritional philosophies used by dairy nutritionists for transition cows that meet NRC guidelines. The best strategy depends on the strengths and weakness of an individual farm. The guidelines below apply to all strategies.

Far-off

- Rations for far-off dry cows should support cow maintenance and fetal growth. Overfeeding energy during this period may exacerbate the drop in DMI prepartum, body fat mobilization and insulin resistance. Underfeeding during this time may also cause metabolic challenges.

Close-up

- Rations for close-up dry cows should support cow maintenance, fetal growth, and colostrogenesis, and consider the effect of dropping DMI.
- Calcium balance can be managed with manipulation the DCAD in the close-up diet with selection of low potassium forages and the addition of anionic salts.

Fresh cows

- Rations for fresh cows should be highly palatable to maximize nutrient intake to support the rapid increase in milk production.

Monitoring

- In herds using a negative DCAD in the close-up group, weekly monitoring of urine pH is highly recommended to monitor the level of acidification and the sortability of the ration. Properly acidified cows will have a urine pH between 5.5 and 6.5, with little variation within the group.

- Cows should be monitored frequently for signs of parturition, and assistance should be provided if progress is not made every 30 minutes.
- Individual fresh cows should be monitored at least daily for attitude, appetite, udder fill, and vaginal discharge. More thorough evaluations can be used, including rectal temperature, uterine palpation per rectum, manure evaluation, and thoracic and abdominal auscultation, as long as this does not result in prolonged forced standing time (more than one hour per day).
- Pen level feed intakes should be monitored to evaluate group level health trends over time.

Disease treatment

- Herd managers should work with their veterinarian to develop treatment protocols for common metabolic and infectious disease during the transition period.
- Treatments should follow label directions, or extra-label use must follow AMDUCA guidelines within the context of a valid VCPR.

SYNONYMS

Transition period, periparturient period

ABBREVIATIONS

AMDUCA = animal medicinal drug use clarification act

BHBA = β -hydroxybutyrate

DCAD = dietary cation anion difference

DMI = dry matter intake

VCPR = veterinary client patient relationship

SEE ALSO

Calving-related disorders

Displacement of abomasum

Dystocia

Hypocalcemia

Ketosis

Metritis

Periparturient paresis

Retained fetal membranes

Udder edema

INTERNET RESOURCES

TheDairylandInitiative.vetmed.wisc.edu

<http://www.extension.umn.edu/agriculture/dairy/transition-cows/>

Transitioncow.net

Suggested Reading

Cook, N.B., Nordlund, K.V., 2004. Behavioral needs of the transition cow and considerations for special needs facility design. *The Veterinary clinics of North America* 20, 495-520.

Drackley, J.K., 1999. Biology of Dairy Cows During the Transition Period: the Final Frontier. *J. Dairy Sci.* 82, 2259-2273

Grummer, R.R., Mashek, D.G., Hayirli, A., 2004. Dry matter intake and energy balance in the transition period. *The Veterinary clinics of North America* 20, 447-470.

Guterbock, W.M., 2004. Diagnosis and treatment programs for fresh cows. *The Veterinary clinics of North America* 20, 605-626, vii.

Martin-Tereso, J., Martens, H., 2014. Calcium and Magnesium Physiology and Nutrition in Relation to the Prevention of Milk Fever and Tetany (Dietary Management of Macrominerals in Preventing Disease). *The Veterinary clinics of North America* 30, 643-670.

National Research Council. 2001. Nutrient requirements of dairy cattle. 7th ed. Washington, DC: National Academy Press.

Nordlund, K.V., Cook, N.B., 2004. Using herd records to monitor transition cow survival, productivity, and health. *The Veterinary clinics of North America* 20, 627-649.

Sheldon, I.M., 2004. The postpartum uterus. *The Veterinary clinics of North America* 20, 569-591.

Van Saun, R.J., Sniffen, C.J., 2014. Transition Cow Nutrition and Feeding Management for Disease Prevention. *The Veterinary clinics of North America* 30, 689-719.

Author Emmanuel Rollin

Consulting Editor Ahmed Tibary

Acknowledgment: The author and Book Editors acknowledge the prior contribution of Pedro Melendez and Marcia I. Endres