

Transition Cow Nutrition and Feeding Management for Disease Prevention

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KEYWORDS

- Transition period • Metabolic disease • Dry cow • Periparturient disease
- Ration formulation • Metabolizable protein

KEY POINTS

- No single nutritional program or management scheme provides consistent outcome performance for transition cows.
- Management of late lactation cows should focus on controlling variation in body condition score.
- Feeding higher amounts of metabolizable protein in the dry diets may help to ensure adequate intake in the face of variable dry matter intake within a group.
- Metabolic adaptations of maternal metabolism are essential to maintain nutrient availability in support of fetal development and lactation.
- Use of 1-group or 2-group dry cow feeding system depends on dry period length, with a 1-group system for shorter dry periods.
- Separate grouping of springing heifers throughout the transition period is desirable.

INTRODUCTION

The last issue of *Veterinary Clinics* dedicated to dairy nutrition was published more than 22 years ago.¹ In that issue, the dry cow was identified as the key to fresh cow performance, and current dry cow management approaches were described as “management by neglect.”² By the end of the decade, Drackley³ published a seminal article describing “the final frontier” as the need to understand transition cow biology in improving dairy cow productivity. Over the last 2 decades, much intensive research

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has been completed in addressing transition cows relative to nutrient requirements, physiologic adaptations, and metabolic associations with periparturient disease; yet, dairy farms continue to be plagued by high prevalence of costly fresh cow disorders adversely affecting productivity and reproductive performance (Table 1). This may be a pessimistic view of the state of affairs, because over this same period, milk production continued to rapidly increase, and diagnostic method sensitivity increased as well as recognition of subclinical disease syndromes; all resulting in post-partum disease events maintaining stable or slightly increasing prevalence rates. Most in the dairy industry believe that there are tremendous opportunities to improve transition cow health and reproductive performance without compromising milk production, yet the solution is not clearly evident.

In this article, a historical perspective is provided on transition cow nutrition and management research and its impact on current practices. Underpinning principles of metabolic adaptations necessary to successfully navigate the transition from pregnancy to lactation are described, with particular emphasis on the role of amino acids. Our objectives are to provide practical guidance, based on available research and field experience, in defining nutritional requirements for the pregnant cow relative to proper feeding management strategies and second, integrate other factors that may deter herd transition performance to ensure that a greater percentage of cows successfully complete this critical adaptation period. The transition period has typically been defined as the 3-week to 4-week period surrounding calving. For the purposes of this article, the entirety of the dry period and the last few weeks of lactation are included as part of the discussion of feeding and managing the transition cow for disease prevention.

PERSPECTIVES ON DRY COW FEEDING AND MANAGEMENT

In the current transition cow system, a range of feeding programs and grouping strategies are observed, with no one approach consistently resulting in the desired outcome (ie, cows are successful in metabolically adapting to lactation with minimal to no disease events, reduced involuntary culls, and having efficient productive and reproductive performance). To direct future management and feeding practices in an effort to minimize adverse health events, a historical perspective is needed to

Table 1
Compiled periparturient disease incidence rates and estimated costs from various published studies

Disease	Median Incidence Risk (%)	Range of Incidence Risk (%)	Estimated Cost (\$/case)
Hypocalcemia	6.5	0.3–22	335
Subclinical hypocalcemia	22	8–54	125
Retained fetal membranes	8.6	1.3–39.2	285
Metritis	10.1	2–37	359
Subclinical metritis	53	37–74	???
Ketosis	4.8	1.3–18.3	145
Subclinical ketosis	43	26–55	67
Lameness	7.0	1.8–30	302–400
Clinical mastitis	14.2	1.7–54.6	185–205
Subclinical mastitis	30	15–60	???

Data from Refs.^{4–11}

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