

Eluding the Preset Length of Dry Period to Smoothen Transition and Lactation Curve

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Rec date: June 02, 2015; Acc date: June 04, 2015; Pub date: June 08, 2015

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Abstract

This article analyzes a pragmatic viewpoint to avoid presetting the length of dry period to smoothen transition and lactation curve in commercial dairy cows. Many cows still continue to considerably lactate even after 7 months of gestation. Drying such cows suddenly off imposes intolerable harsh pressures to dairy cows and their adaptive physiology. Preknown dry period length (e.g., 60 days) for the entire herd is not compelling and high-producing cows must be allowed to realize lower production at drying even if dry period has to be shortened to much less than 60 days.

Keywords: Lactation curve; Drying; Metabolic disease; Sustainability

Science for Practice: A Global Analysis

Introduction and logic

Transition from gestation through lactation represents an entire shift in cow endocrinology and metabolism. This shift in metabolic properties describes a gap in cow's metabolic responses to the environment [1]. The gap is related to different nature of production (pregnancy and parturition vs. lactation) and different amount and quality of nutrient requirements [2,3]. The larger the gap, the more dramatic the shift, and thus the more challenging transition and the higher risks from metabolic disorders and depressed reproduction. Thus, management must be modified in ways to minimize (extent) or at the very least to shorten (duration) cow's metabolic gaps from late pregnancy through early and peak lactation. This article innovatively generates a global conceptual on-farm standard to prescribe individual cow dry period length for commercial herds to improve longevity, reproduction, economics, and environmental quality. Despite some earlier research studying how shortening or omitting dry period may affect production, reproduction and health [4-8], conclusive data for guideline and on-farm recommendations development will yet to be obtained. There also is a lack of profound and pragmatic sciencefounded knowledge and insight on individualizing dry period properties in dairy cows.

Innovation and Discussion

The main philosophy of this article is constructed based on an onfarm theory that necessitates linking gestation into lactation highly delicately and within an adequately short time period, such that cow metabolism is not shocked multiple times and severely at each time (e.g., at drying-off, parturition, diet alterations, sudden milking after a prolonged mammary silence). Fundamentally, drying still-much-milkproducing cows suddenly is a too-serious challenge to be tolerated without adverse metabolic and health side effects. In addition, silencing cow's production metabolism during lengthy dry periods alters animal endocrinology towards more tissue deposition that will interfere with healthy postpartum metabolism and lactation. This will also contribute to delayed crave for feed and postponed dry matter intake peak. These are other serious problems that increase chances of metabolic disorders and jeopardised immunity [1,5]. On paper, a minimum of 60 days dry period may appear an essential resting and recovery time for the gastrointestinal tract, splanchnic tissues, and mammary glands to regain functioning fluency and high efficiency before the next challenging lactation begins [3]. However, in reality and practice, shutting down the cow's milk production and processing factory abruptly and then imposing a silent and passive metabolic state to the cow will significantly increase risks of unfavourable metabolic responses at parturition and more severely during early lactation [1,2]. Reproduction is also presumed to be improved by eluding the preset length of dry period for high-merit cows substantiating which required more research [7]. Even assuming that milking of cows in late pregnancy may somehow reduce the next lactation production, a relatively lower peak means smoothened lactation curve that could ultimately improve cow reproduction and health. In a nutshell, having cows with, for instance, a peak milk production of 40-45 kg for 3-4 lactations is considered more economical, healthy and environmentally-friendly than raising cows with a peak production of 50 kg staying in herd for only 2 lactations.

To simplify, individual cows must be dry-managed according to their lactation and metabolic properties. Producing 10-20 kg of milk is not low enough to be appropriate for drying a cow off, let alone more milk. Cows must not enter dry cow group until unless milk production drops considerably low. Shorter than 60 days dry periods for stillmilk-yielding cows could significantly help their metabolism transition through late pregnancy and early lactation less stressfully and more manageably. Research is required to further develop innovative updated minimum dry period lengths if at all needed for cows that continue to produce much milk in late gestation.

Implications

Avoiding the preset unnecessary dry period durations (e.g., 60 days) is a preparation for a less challenging transition from late pregnancy through early and peak lactation. Many cows continue to produce much milk in late pregnancy, the impulsive drying of which imposes

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multiple intolerable challenges to cow's metabolic haemostasis. Cows should enter dry group based on their own individual lactation and metabolic properties should a dry period be really needed at all.

Acknowledgments

Thanks to the Ministry of Science Research and Technology, National Elite Foundation and University of Zanjan for supporting the author's global initiative programs of optimizing science edification in the third millennium.

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