

TECHNICAL BULLETIN

DAIRY



ENERGY INTAKE DURING THE DRY PERIOD

A “new” approach to dry cow diets is a “Bird’s Nest” dry cow ration, which contains 6-12 lb/day of low quality forages (such as straw, corn stover, or mature grass hay). This article details University research supporting this “new” approach.

A 2006 University of Illinois research study demonstrated importance of closely monitoring energy intake during the dry period. In the trial, 74 multiparous Holstein cows received one of three dietary treatments for the far off dry period (dry off to 25 d pre-calving), and one of two dietary treatments in the close up period (-24 d to calving). Far off dry period treatments were: 1) Control diet meeting 100% of NRC NEI requirement fed ad libitum 2) higher nutrient density diet, fed ad libitum to provide 150% of calculated NEI requirement, or 3) higher nutrient density diet, fed at restricted intake to provide 80% of calculated NEI requirement. The Control diet fed ad libitum was similar to a “Bird’s Nest” diet (0.59 MCal NEI/lb DM, contained 26% wheat straw DM basis), and the higher nutrient density diet was similar to a typical close-up diet (0.72 MCal NEI/lb DM). In the close up period, cows received a diet fed ad libitum or restricted intake, to provide 150% or 80% of calculated NEI requirement, respectively. The close-up diet was similar to the higher nutrient density far-off diet, but contained anionic salts. After calving, all cows received a common lactation diet (0.8 MCal NEI/lb DM). The table below shows items measured during the first 10 DIM for each treatment:

Item	Far-Off Dry Period Treatment						P-Value F ^a C ^b	
	100 NRC		150 NRC		80 NRC			
	Ad libitum close-up	Restricted close-up	Ad libitum close-up	Restricted close-up	Ad libitum close-up	Restricted close-up		
DMI, % BW	2.47	2.45	2.18	2.14	2.47	2.53	0.07	0.98
DMI, lb/d	35.3	34.8	31.3	30.9	34.0	35.7	0.14	0.91
Milk, lb/d	66.2	64.8	58.4	56.4	58.9	57.6	0.12	0.66
Energy Balance, % of NE ^l								
Require- ment	86 ^{cd}	91 ^{cd}	78 ^c	82 ^c	90 ^d	96 ^d	0.03	0.21
NEFA, µEq/L	870	703	793	792	686	568	0.07	0.14
Liver Total Lipids, %	7.85	5.89	7.46	6.63	5.67	5.30	0.08	0.09

^aF = Far-off treatment
^bC = Close-up treatment
^{c,d} Main effect of far-off treatments with different superscripts differ (P<0.05)

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As shown, cows that consumed less energy during the far-off dry period (through diet formulation-100 NRC or restricted feeding-80 NRC) had increased dry matter intake, milk production, and energy balance during the first 10 days of lactation, compared to cattle that consumed more energy during the far-off dry period (150 NRC). In addition, cows that consumed less energy during the far-off dry period had lower non-esterified fatty acids (NEFA) and total liver lipids, indicating the cattle mobilized less body fat and accumulated less fatty tissue in the liver.

Improving post-calving dry matter intake and energy balance are advantageous to the cow. The periparturient period is a time of tremendous stress on the cow, due to the hormonal, metabolic, and physical changes that occur to begin parturition and milk production. Improving postpartum dry matter intake minimizes energy deficit as the cow consumes nutrients required to fuel the healing process, body maintenance needs, and milk production. Also, cows with higher feed intake and energy balance are better “equipped” to withstand the health challenges of early lactation, since consumed nutrients are available to help fuel immune system demands. In addition, improving feed intake and energy balance reduces the need for body tissue mobilization, which reduces risk for ketosis!! Also, remember that improving postpartum feed intake and rumen fill reduces risk of displaced abomasum, which is caused by the physiological changes associated with calving, and energy deficit.

The results above demonstrate the importance of closely monitoring energy intake during the dry period. Restricted feeding, however, is NOT advocated. Dr. Jim Drackley, University of Illinois, states: “Our solution to the potential for cows to over-consume energy is to formulate rations of relatively low energy density (0.59 to 0.63 Mcal/ NEI/lb DM) that cows can consume free choice without greatly exceeding their daily energy requirements. It is important to note that we are not proposing to limit energy intake to less than cows’ requirements but rather to feed them a bulky diet that will only meet their requirements when cows consume all they can eat” (2007) A Bird’s Nest Dry Cow Diet is the solution...

Including a liquid supplement within a Bird’s Nest Dry Cow Diet provides nutritional and physical benefits which, combined with proper feeding management, help enhance success of a Bird’s Nest Dry Cow Ration approach. Please see QLF Technical Bulletins TB 4313 and TB 4314 for details regarding the nutritional and physical benefits provided by the QLF liquid supplement within a Bird’s Nest Dry Cow diet.