

TECHNICAL BULLETIN

DAIRY



EVALUATION OF DRY COW OPTIMIZER PRODUCT IN MODERATE-ENERGY DRY COW DIETS: COLOSTRUM PRODUCTION

Introduction

Field experience has shown that using a molasses-based liquid supplement to replace dry supplements in moderate-energy dry cow diets improves palatability, fiber digestion, and dry matter intake, while reducing ration separation. Several field reports have also noted improvements in colostrum production when feeding QLF Dry Cow Optimizer. A Custom QLF Dry Cow Optimizer was utilized in a university trial to evaluate the effects of forage source and supplement type on cow performance, metabolism, and colostrum production in a research setting. Custom QLF Dry Cow Optimizer is a molasses-based liquid feed which delivers sugar, protein (urea), calcium, trace minerals, and vitamins into a dry cow TMR.

Materials & Methods

Sixty multiparous Holstein and Holstein-cross cows, balanced by 305ME and parity, were used in a 2 × 2 factorial design prepartum (forage: wheat straw vs. grass hay and supplemental CHO source: corn vs. molasses-based liquid feed) for a combination of four prepartum treatments and two postpartum treatments:

# Cows	Prepartum beginning d-42	Postpartum through d 56
15	Wheat Straw TMR + Corn-Based Dry Feed (WSDF)	Lactation TMR + Corn Based Dry Feed (DF)
15	Wheat Straw TMR + Dry Cow Optimizer (WSLF)	Lactation TMR + Dry Cow Optimizer
15	Grass Hay TMR + Corn-Based Dry Feed (GHDF)	Lactation TMR + Corn Based Dry Feed (DF)
15	Grass Hay TMR + Dry Cow Optimizer (GHLF)	Lactation TMR + Dry Cow Optimizer (LF)

Wheat Straw or grass hay was fed at 30% of prepartum DM; all diets were formulated using CPM Dairy 3.0.8. Prepartum diets were formulated to meet nutrient needs of a 1433 lb cow at 280 days in gestation. Dry period dietary treatments started at 42 d prepartum. After calving, cows were fed one of two diets (formulated to support 88 lb/day of 3.5% FCM) through 56 days postpartum,. A Custom QLF Dry Cow Optimizer was fed for the entire experimental period targeting 3 lb/day as-fed intake in formulated diets.

The corn-based supplement and Custom Dry Cow Optimizer were designed to vary only in carbohydrate (starch vs. sugar) and used similar macro and micro-nutrient ingredients and supplemental levels to provide a finished diet with equal mineral and vitamin composition. Please see TB-4345 for complete diet composition and production results of this trial.

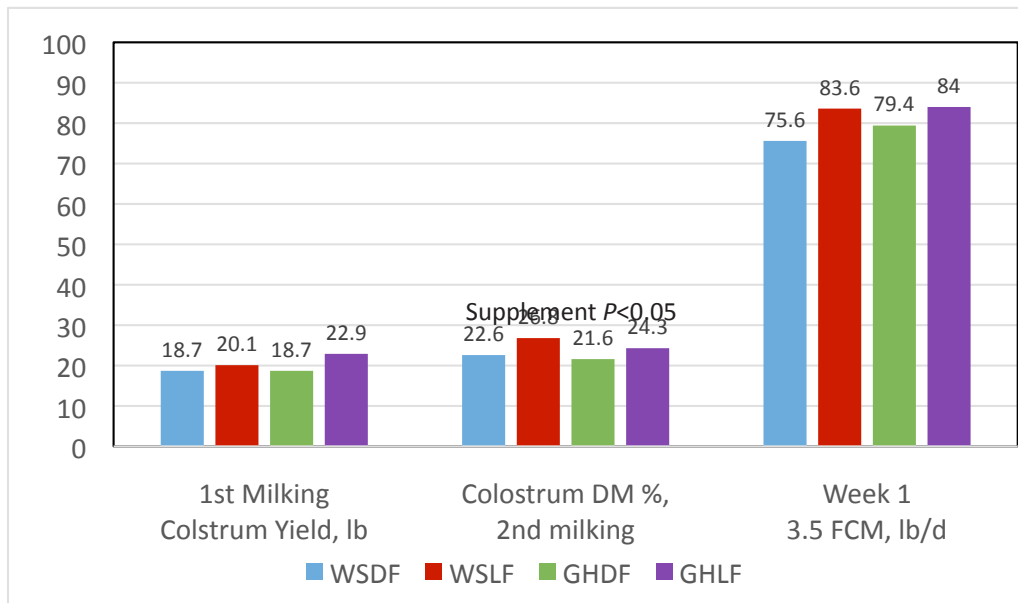
Results

Pearson correlation coefficients were used to evaluate associations between colostrum yield and periparturient diet, metabolic and production parameters.

Prepartum dry matter intake was not different between treatments, averaging 30.5 lb/day. LF cows consumed approximately 0.7 lb/day supplemental sugar. Prepartum sugar intake tended ($P=0.07$) to be positively correlated with colostrum production.

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In this study, cows receiving LF had greater prepartum serum NEFA compared to DF cows ($P < 0.01$). LF cows also tended to have higher postpartum liver triglyceride ($P = 0.09$). Prepartum serum NEFA and postpartum liver triglyceride values for LF cows are considered typical for cows transitioning normally into lactation. Both prepartum serum NEFA (d-7), and postpartum liver triglyceride (d +7, +14, +28) had significant positive correlations to colostrum production ($P < 0.05$). Based on these correlations, it appears that LF cows were nutritionally and metabolically prepared to produce greater amounts of colostrum.



- Although not statistically different, cows receiving LF had numerically greater amounts of 1st milking colostrum yield and Week 1 FCM.
- LF cows had higher dry matter 2nd milking colostrum

Colostrum Mineral Yields	Diets				SEM	P-Value	
	WSDF	WSLF	GHDF	GHLF		F	S
Calcium, g	21.4	26.3	25.5	28.5	3.7	0.38	0.27
Potassium,	13.1	16.7	14.6	18.5	2.3	0.47	0.09
Zinc, mg	193.5	256.8	225.3	249.8	38.1	0.73	0.23
Copper, mg	2.9	4.7	3.2	4.6	0.7	0.81	<0.05
Iron, mg	25.4	37.5	25.3	48.0	9.8	0.58	0.07

Additional lbs of colostrum and higher dry matter provides greater nourishment for newborn calves and helps reduce expenses for purchased colostrum. Colostrum from LF cows tended to yield ($P < 0.09$) greater amounts of potassium, copper, and iron. Providing greater amounts of micronutrients to newborn calves through colostrum may have positive implications for metabolism and health.

Conclusions

- Feeding Custom Dry Cow Optimizer to provide supplemental sugar, protein, minerals, and vitamins during the dry period may increase yield and quality of colostrum produced.
- Cows with greater prepartum NEFA may have greater metabolic preparedness for lactation, therefore producing greater amounts of colostrum. Increased colostrum yield and quality did not have a negative effect on early lactation milk production or efficiency in this study.
- Colostrum production begins 45 days prepartum, can be variable between cows, and is influenced by a variety of factors. Improving colostrum yield and quality has positive implications for calf health.

Reference: Litherland, N. B., L. Davis, S. Emanuele, and H. Blalock. Effects of prepartum supplementation of starch or sugar to dairy cows fed TMR with thirty percent wheat straw or grass hay on colostrum yield and composition. J. Dairy Sci. 94(E-Suppl. 1): 455 (Abstr.)