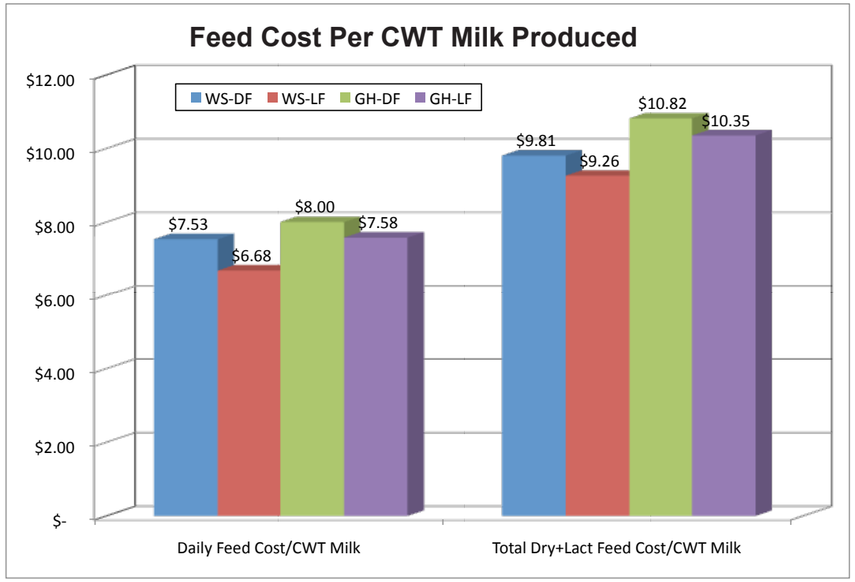
Improved milk efficiency also resulted in economic advantage in postpartum and total feed cost/ CWT milk produced for LF-supplemented cows, as shown in the graph below.




## Conclusions

- Forage price and availability, nutritional strategy, and dry matter intake, will influence prepartum diet cost.
- QLF Dry Cow Optimizer may increase prepartum diet feed costs.
- Total Feed costs during the pre- and postpartum periods for LF cows were lower than dry feed-supplemented cows, saving $17-$44/cow, from day -41 to +56.
- Regardless of milk component pricing (moderate, high, or low), LF cows had greater lactation IOFC than DF cows due to improved milk efficiency.
- Lactation feed cost/CWT milk produced was lower for LF-supplemented cows. Total transition period feed cost (dry + early lactation)/ CWT milk produced was reduced approximately $0.50 by LF supplementation.
- QLF Custom Dry Cow Optimizer supplementation during the pre- and postpartum periods resulted in greater profitability compared to dry feed in this study.

**Reference:**

Litherland, N. B., D. N. L. da Silva, W. P. Hansen, L. Davis, S. Emanuele, and H. Blalock. 2013. Effects of prepartum controlled-energy wheat straw and grass hay diets supplemented with starch or sugar on periparturient dairy cow performance and lipid metabolism. J. Dairy Sci. 96:3050-3063 & J. Dairy Sci. 96:4078.


# EVALUATION OF DRY COW OPTIMIZER PRODUCT IN MODERATE ENERGY DRY COW DIETS: ECONOMICS

## 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. 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 crossbred 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 | Postpartum |
|---|---|---|
| 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 (LF) |
| 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. TB-4346 provides information on colostrum production.

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Daily feed costs pre-and postpartum were calculated using published dry matter intake and fourth quarter 2013 feed prices (Fourth Quarter 2013 was a time of moderately high feed prices). In this evaluation, the following delivered prices were used:

| Item | $/ton |
|---|---|
| Wheat Straw | 80 |
| Corn Silage | 45 |
| Alfalfa Hay | 250 |
| Ground Corn | 180 |
| Soybean Meal | 475 |
| Corn-based Dry Mix | 383 |
| Lactation Protein Mix | 568 |
| Custom Dry Cow Optimizer | 418 |

Milk component value was calculated using yearly average $/lb for milk fat and protein using 3 different scenarios: moderate component prices (2013), high component prices (2014), and low component prices

| | Butterfat, $/lb | Protein, $/lb |
|---|---|---|
| 2013 Average | 1.66 | 3.30 |
| 2014 Averge | 2.38 | 3.79 |
| 2009 Average | 1.26 | 2.21 |

## Results

Dry period feed costs are impacted by diet composition, forage type, and dry matter intake. Dry matter intake was not statistically different between treatments. LF diets had approximately $7/ton higher diet cost/ ton as-mixed, as shown in the table below. Across treatments, cows averaged 41 days on prepartum diets, so 41 days was used for prepartum feed cost calculations.

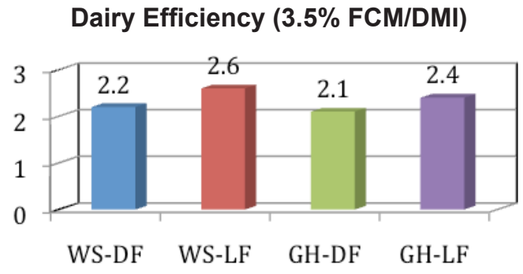
| | WS-DF | WS-LF | GH-DF | GH-LF |
|---|---|---|---|---|
| Prepartum DMI, lb/d | 29.5 | 29.8 | 32.6 | 30 |
| Prepartum Feed Cost, $/day | 2.88 | 3.16 | 3.29 | 3.28 |
| 41-d Prepartum Feed Cost, $ | 118.15 | 129.46 | 134.89 | 134.31 |
| Prepartum Diet Cost/ton As-Mixed, $ | 107.06 | 114.22 | 110.21 | 117.49 |

LF cows had lower dry matter intake postpartum, resulting in reduced daily feed costs. Postpartum and total feed costs were lower for LF-supplemented cows, as shown in the table below.

| | WS-DF | WS-LF | GH-DF | GH-LF |
|---|---|---|---|---|
| Postpartum DMI, lb/d | 47 | 39 | 46 | 42.6 |
| Postpartum Feed Cost, $/day | 6.99 | 6.00 | 6.85 | 6.55 |
| 56-d Postpartum Feed Cost, $ | 391.67 | 335.90 | 383.33 | 366.90 |
| Total Feed Cost, $ | 509.82 | 465.36 | 518.23 | 501.21 |

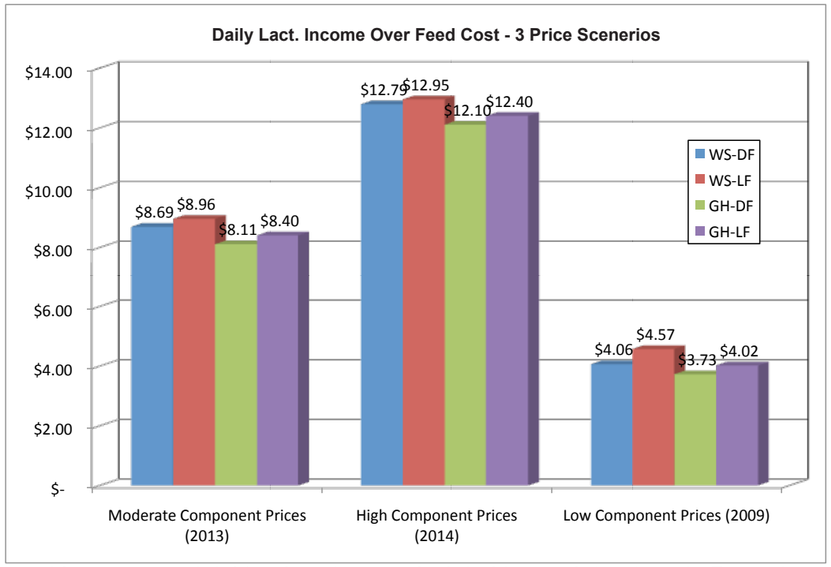
LF cows had similar milk and component production to DF cows, resulting in similar milk component income. Pounds of milk, FCM, and components was not statistically different between treatments.

| | WS-DF | WS-LF | GH-DF | GH-LF |
|---|---|---|---|---|
| Milk, lb/d | 92.8 | 89.7 | 85.6 | 86.4 |
| 3.5% FCM, lb/d | 101.7 | 98.8 | 97.5 | 97.7 |
| Milk Fat lb/d | 3.75 | 3.75 | 3.75 | 3.75 |
| Milk Protein, lb/d | 2.87 | 2.65 | 2.65 | 2.65 |
| Fat & Protein Income, $/d (moderate) | 15.68 | 14.95 | 14.95 | 14.95 |
| Fat & Protein Income, $/d (high) | 19.79 | 18.95 | 18.95 | 18.95 |
| Fat & Protein Income, $/d (low) | 11.06 | 10.57 | 10.57 | 10.57 |




LF-supplementation significantly (*P* <0.01) improved milk efficiency, as shown at left.

Milk and component production was similar between DF and LF cows. Improved milk efficiency for LF resulted in greater lactation IOFC for LF cows. IOFC for LF cows ranged from $0.16 - $0.51/cow greater than DF. Even in a low milk component price scenario (2009), LF cows achieved economic advantage compared to DF: $0.29 and $0.51 for cows receiving grass hay or wheat straw during the dry period, respectively.




Total component income over total feed cost was calculated for each treatment. Prepartum and postpartum feed costs (d-41 through 56 DIM) and milk and component production were evaluated in a moderate, low, and high component price scenario. Across scenarios, LF provided an advantage of $3.71/cow to $17.18/cow compared to DF. In the high component price scenario, WS-LF had a slight disadvantage ($2.34) due to greater feed cost during the dry period, and slightly less milk protein income magnified by a high milk protein price. The value increased colostrum quality for LF cows, reported in TB-4346 was not included in the economic analyses.