

Table 3 Impact of feed prices on cost of simulated average and high corn silage rations¹

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Ingredients	Values in "Red" can be changed		Ingredient Price		
	High Corn Silage Diet	50% CS/ 50% Haylage Diet	as fed basis	unit	DM%
	lbs Dry Matter	lbs Dry Matter			
Corn Silage ²	27.0	15.0	30	\$/ton	35%
Haylage ³	0.0	15.0	48	\$/ton	40%
Hay	5.0	0.0	175	\$/ton	85%
Dry Ground Shelled Corn ⁴	6.5	12.0	5.50	\$/bushel	
Soybean Meal 48	3.9	0.0	400	\$/ton	
Expeller SBM	2.0	3.3	430	\$/ton	
Whole Cottonseed with lint	3.0	3.0	400	\$/ton	
Soybean Hulls	3.0	2.9	150	\$/ton	
Blood Meal	0.8	0.8	800	\$/ton	
Tallow	0.3	0.5	42	\$/cwt.	
Urea	0.1	0.0	650	\$/ton	
Rumen Inert Fat	0.7	0.3	65	\$/cwt.	
Calcium Carbonate	0.7	0.5	160	\$/ton	
Min/Vit/Additives ⁵	1.3	1.1	25	\$/cwt.	
Total Dry Matter (lbs)	54.2	54.3			
	Values in "Blue" calculated				
Ration Cost (\$/cow/day)	6.02	5.68			
Ration Cost (\$/cwt. milk ⁶)	6.40	6.24			
Milk Price (\$/cwt.)		19.00			
IOFC ⁷ (\$/cow/day)	11.84	11.61			
IOFC ⁷ (\$/cwt. milk)	12.60	12.76			
Nutrients DM basis					
Crude Protein %	17	17			
RUP % of DM	6.5	6.5			
% of CP	39	39			
NEI 3x Mcal/lb	0.76	0.76			
NDF %	34	32			
Forage DM %	59	56			
NDF from Forage %	26	23			
NFC %	37	39			
Starch %	25	26			
Fat %	5.4	5.5			
NEI Allowable Milk	94	94			
MP Allowable Milk	95	91			

¹Rations formulated using The Bucky Ration Evaluator. Hay included in high corn silage ration for physically effective fiber. More rumen-inert fat included in the high corn silage ration to avoid milk fat test depression. Less expeller soybean meal needed in the high corn silage ration to balance RUP.

²Assumed 43% NDF & 30% Starch (DM basis)

³Assumed 22% CP & 40% NDF (DM basis)

⁴\$15 per ton for processing and delivery added onto the price entered

⁵The higher intake for the high corn silage ration is from sodium bicarbonate buffer.

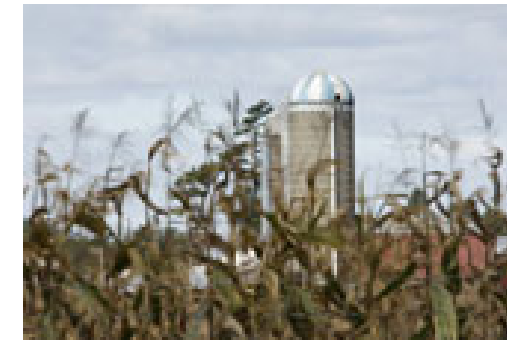
⁶Calculated using projected most limiting milk yield from net energy-lactation and metabolizable protein.

⁷Income over feed cost.



Impact of Feed Prices on Cost of Simulated Average and High Corn Silage Rations

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In 1877, August Goffart, a French farmer published a book called "The Ensilage of Maize and other Green Fodder Crops". From the title, it's apparent that both corn silage and haylage were being harvested and stored. In the US Midwest 130 years later, corn silage and haylage are still being fed to dairy cattle and there is still debate among dairy producers, nutritionists and economists as to what feeding rates are optimum.

In 2008, purchased feed prices have soared and the cost of on-farm feed production (usually forages and corn) has increased dramatically. Individual farms are questioning whether they should change feeding strategies. Deciding whether or not to feed more corn silage is one of their major questions. A difficulty in addressing this question broadly is that feed prices vary locally and on-farm.

Therefore, to help better discuss this question during a time of greatly changed feed and milk prices versus historical prices, a decision tool was developed to analyze potential opportunities for high corn silage diets fed to lactating dairy cows. The Excel spreadsheet "Impact of feed prices on cost of simulated average and high corn silage diets" can be found at <http://www.uwex.edu/ces/dairynutrition/spreadsheets.cfm>. See Table 3, a sample is given of this spreadsheet. In the spreadsheet, two diets are provided that were formulated to be nearly equal in nutrient concentrations and amount of net

energy and metabolizable protein allowable milk that they would support according to the Dairy NRC (2001) model. The high corn silage diet forage mix contains 85% corn silage, while the forage mix for the "typical" diet is comprised of 50% corn silage and 50% haylage (DM basis). Feed prices can be varied in the spreadsheet so that diet cost results are more relevant to local or on-farm price conditions.

Using the decision tool, comparisons of three different on-farm scenarios were developed as follows:

- Scenario 1 - Traditional Dairy Farm – grows all forages and corn
- Scenario 2 - Expanding or Land Limited Dairy Farm – grows all forages and purchases corn,
- Scenario 3 - Beginning or Non-Traditional Dairy Farm – purchases all forages and corn.

Prices for home grown forages (\$30/ton for 35% DM corn silage and \$48/ton for 40% DM haylage) and corn (\$3.20/bu) were based on the estimated cost of production figures for 2008 (adapted from the 2008 Crop Enterprise Budgets from the Center for Dairy Profitability at <http://cdp.wisc.edu/crop%20enterprise.htm>). The price of purchased corn was the approximate current cash price of corn of \$5.50/bushel in July 2008. Purchased corn silage (\$45/ton of 35% DM corn silage) and purchased haylage (\$68/ton of 40% DM haylage) prices were based on estimated July 2008 market rates for these forages. Prices for other ingredients reflect July 2008 market conditions and were held constant across all scenarios. The prices used for the three scenarios are outlined in Tables 1 and 2. The price of milk used across the three scenarios was \$19.00/cwt.

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Table 1 Diets and Commodity Prices for Three Scenarios

Ingredients	High Corn Silage Diet	50% CS/ 50% Haylage Diet	Ingredient Price		DM %
	lbs Dry Matter	lbs Dry Matter	as fed basis	unit	
Corn Silage	27.0	15.0	variable	\$/ton	35%
Haylage	0.0	15.0	variable	\$/ton	40%
Hay	5.0	0.0	175	\$/ton	85%
Dry Ground Shelled Corn	6.5	12.0	variable	\$/bushel	
Soybean Meal 48	3.9	0.0	400	\$/ton	
Expeller SBM	2.0	3.3	430	\$/ton	
Whole Cottonseed with lint	3.0	3.0	400	\$/ton	
Soybean Hulls	3.0	2.9	150	\$/ton	
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Tallow	0.3	0.5	42	\$/cwt.	
Urea	0.1	0.0	650	\$/ton	
Rumen Inert Fat	0.7	0.3	65	\$/cwt.	
Calcium Carbonate	0.7	0.5	160	\$/ton	
Min/Vit/Additives	1.3	1.1	25	\$/cwt.	
Total Dry Matter (lbs)	54.2	54.3			

Table 2 Comparisons of Three Different On-Farm Scenarios

Feed Prices	Scenario 1 ^a Forages on Farm Gr. Corn On Farm		Scenario 2 ^b Forages On Farm Gr. Corn Off Farm		Scenario 3 ^c Forages Off Farm Gr. Corn Off Farm	
	Corn Silage	\$30/ton		\$30/ton		\$45/ton
Haylage	\$48/ton		\$48/ton		\$68/ton	
Ground Corn	\$115/ton		\$210/ton		\$210/ton	
Other Ingredients	same		same		same	
Economic Comparisons	High CS Diet	Average Diet	High CS Diet	Average Diet	High CS Diet	Average Diet
Ration Cost (\$/cow/day)	\$5.72	\$5.13	\$6.02	\$5.68	\$6.60	\$6.38
Ration Cost (\$/cwt. milk)	\$6.08	\$5.63	\$6.40	\$6.24	\$7.02	\$7.01
IOFC (\$/cow/day) ^d	\$12.14	\$12.16	\$11.84	\$11.61	\$11.26	\$10.91
IOFC (\$/cwt. milk) ^d	\$12.92	\$13.37	\$12.60	\$12.76	\$11.98	\$11.99

^aScenario 1 is a more traditional dairy

^bScenario 2 is a dairy that is expanding / has limited acreage

^cScenario 3 is likely a larger/beginning dairy

^dIncome over Feed Cost - Milk Price used is \$19.00/cwt.



Using these price assumptions, we conclude the following from Table 2:

- a) At the current time, with the current markets, forages and corn grown on farm reduce feed costs per cow per day and per cwt of milk. As the amount of feed purchased off farm increases, the income over feed cost (IOFC) drops accordingly.
- b) For all three scenarios, the high corn silage diet is the highest cost per cow per day. There are a number of reasons within the current market for why this occurs:
 - i. protein supplement prices are much higher than historical highs and high corn silage diets require more supplemental protein,
 - ii. input costs for corn silage are higher than historical highs with production costs, expenses to grow corn silage, having risen significantly,
 - iii. opportunity prices for corn silage are high and related to high grain prices, and
 - iv. Dry hay prices (included only in the high corn silage diet) are up sharply in 2008.
- c) The income over feed cost (IOFC) per cwt. of milk favors the “typical” corn silage and haylage diet. However, the IOFC per cow per day favors the high

corn silage diet in Scenario 2 and 3 (where feeds are being purchased off farm). This difference is due to the fact that the high corn silage diet in this scenario supports slightly more milk production (94 lbs Allowable Milk vs 91 lbs Allowable Milk).

d) Scenario 2 and 3 show that IOFC (both per cow per day and per cwt of milk) for both diets are relatively close. A 2 lb/cow change in milk production would cover the difference. If supplement costs were to drop more (with other prices remaining stable), the high corn silage diet in Scenario 2 and 3 would be favored. If supplement prices were to increase, the “typical” diet in Scenario 2 and 3 would be favored.

These scenarios are taken as a snapshot in time and market conditions may change the outcome of the proposed scenarios. For individual farms, the cost of feed production, the price of purchased feeds and (or) the price of milk will vary. This decision tool (“Impact of feed prices on cost of simulated average and high corn silage diets” found at <http://www.uwex.edu/ces/dairynutrition/spreadsheets.cfm>) can easily be applied to local and on-farm price conditions for these simulated diets.

