Factors Affecting Income Over Feed Cost by County on Northeast Texas Dairies

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ABSTRACT

Using Dairy Herd Improvement Association (DHIA) records on Northeast Texas farms, this study develops a predictive model of Income Over Feed cost (IOFC) for the region as a whole and for individual counties. Emphasis is placed on factors under a manager's regular control, as opposed to long run structural changes or investments. The findings present quantitative estimates of the influence of various factors on IOFC; e.g. each hour between milkings from a.m. to p.m. tended to reduce IOFC per cow by $0.47 to $0.51 per day, whereas the pounds of concentrate fed, Holstein breed and month of March raised IOFC by $0.38, $4.16 and $0.95 per day, respectively.

INTRODUCTION

In addition to monitoring and considering the latest technological developments and capital investments available to Texas dairies, dairymen need to manage their current assets as efficiently as possible. Though much concern in agriculture has lately focused on aspects of making a transition to the long run (Richardson 1984; Schwart 1985), a need remains to help managers make better short run decisions; otherwise, adoption of expensive technologies and sophisticated management practices may not be possible.

The Dairy Herd Improvement Association (DHIA) record keeping system was developed to create a data base on individual farms to enhance productivity (Voelker 1981). A key short run variable related to profitability is Income Over Feed Cost (IOFC) (Shumway et al. 1982). this study develops a predictive model of IOFC for the Northeast Texas region as a whole and for selected individual counties. Emphasis is placed on factors under a manager's regular control, versus long run structural changes or investments. With the goal of aiding short run decision making, the study presents quantitative estimates of the influence of various factors on daily IOFC.

Though Texas dairies produce only about 2.8% of total U.S. milk (ERS 1985), Texas ranks ninth among the states in quantity produced (Knutson et al. 1981). Whereas approximately

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Little comprehensive work has been done on predicting dairy IOFC. Several linear programming models have been developed to maximize IOFC using nutrient and price data for various feed ration formulations, but with only a few cow and herd specifications (Bath and Bennett 1980; Bath et al. 1972; Dean et al. 1969; Jones et al. 1980; Reyes et al. 1981). Dairy profit functions have been developed, but their meaning and purpose, i.e. to include fixed expenses and enhance genetic evaluation, are different from predicting IOFC (Andrus and McGilliard 1975; Balaine et al. 1981; Blaine et al. 1981; Norman et al. 1981; Pearson and Miller 1981; Tigges et al. 1984). Two studies have conducted simple correlation, but not multiple regression, analysis on IOFC (Grisley 1985; Williams 1985).

Several studies have estimated the impact on IOFC of a few of the factors examined in this analysis. Increasing herd life from 2.8 to 3.3 lactations was found to increase annual income by $30/cow (Congelton and King 1984). Each additional day open from 40 to 140 reduced daily IOFC by $0.71 and $1.18 for first and later lactation cows, respectively (Olds et al. 1979). Three studies indicated that extending the calving interval for high-producing cows from 13-15 months did not decrease IOFC (Reyes et al. 1980; Reyes et al. 1981; Shumway et al. 1982), but two other studies found a negative impact of approximately $7/cow/year for every three days beyond thirteen months (Gibson 1984; Holman et al. 1984). Bakker et al. (1980) argued that assessment of sire profitability requires information beyond the impact on first lactation, an aspect examined in this study.

DATA

The variables of interest are reported monthly to the farmer on the DHI-202 Herd Summary Form. Table 1 defines the two dependent and 146 independent variables and presents a corresponding acronym for each one for the purposes of this report.

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Funded in part by the Office of Graduate Studies and Research, East Texas State University and the Houston Livestock Show and rodeo.

Table 1. Variables Examined in Economic Model of Income Over Feed Costs (IOFC)

Dependent:		
Y1. $IOFCACTD	=	Mean daily IOFC per cow, all cows (milking and dry)
Y2. $IOFCACAA	=	Rolling annual average IOFC per cow, all cows (milking and dry)
Independent:		
		Test Day Data
1. #COWSNTLHDTA	=	Total # of cows in herd
2. #COWSNMKTD	=	# of cows in milk
3. %COWSNMKTD	=	% of cows in milk
4. PDSMKACTD	=	Lbs. of milk per cow per day, all cows

Table 1., cont.

5. PDSFATACTD	=	Lbs. of butterfat per cow per day, all cows
6. %FATACTD	=	% of butterfat per cow per day, all cows
7. PDSPTNACTD	=	Lbs. of protein per cow per day, all cows
8. %PTNACTD	=	% of protein per cow per day, all cows
9. PDSMKMCTD	=	Lbs. of milk per cow per day, milking cows
10. PDSSLGACTD	=	Lbs. of silage consumed per cow per day
11. SLGENGVALTD	=	Net energy value of the silage
12. PDSOTSCLACTD	=	Lbs. of other succulents consumed per cow per day
13. OTSCLENGVAL	=	Net energy value of other succulents
14. PDSDRYFRGACTD	=	Lbs. of dry forage consumed per cow per day
15. DRYFRGENGVALTD	=	Net energy value of the dry forage
16. PDSOTFDSACTD	=	Lbs. of other feeds consumed per cow per day
17. OTFDSENGVALTD	=	Net energy value of the other feeds
18. PTRQUALRAT	=	Pasture quality rating
19. PDSCNTACTD	=	Lbs. of concentrates consumed per cow per day
20. CNTENGVALTD	=	Net energy value of the concentrates
21. CNTCSTPCTD	=	Cost of concentrates per cow per day
22. TFDCSTPCTD	=	Total feed costs per cow per day
23. FDCSTPCWTMK	=	Feed costs per cwt. of milk produced
24. #COWSBRHDTD	=	# of cows in breeding herd
25. #BDSOP>1OOBRDH	=	Mean # of breedings for cows open > 100 days, breeding herd
26. %BDSSVDBRHD	=	% of possible breedings that were serviced, breeding herd
27. DYSFSTBDGBRHD	=	Mean # of days to first breeding, breeding herd
28. #OP<6OBRHDNDP	=	# of cows in breeding herd currently open < days, not diagnosed pregnant
29. %OP<6OBRHDNDP	=	% of cows in breeding herd currently open < 60 days, not diagnosed pregnant
30. #OP60-1OOBRHDNDP	=	# of cows in breeding herd currently open 60-100 days, not diagnosed pregnant
31. %OP60-1OOBRHDNDP	=	% of cows in breeding herd currently open 60-100 days, not diagnosed pregnant
32. #OP101-14OBRHDNDP	=	# of cows in breeding herd currently open 101-140 days, not diagnosed pregnant
33. %OP101-14OBRHDNDP	=	% of cows in breeding herd currently open 101-140 days, not diagnosed pregnant
34. OP>14OBRHDNDP	=	# of cows in breeding herd currenty open > 140 days, not diagnosed pregnant
35. %OP>14OBRHDNDP	=	% of cows in breeding herd currently open > 140 days, not diagosed pregnant
36. #OP<6OBRHDTED	=	# of cows in breeding herd currently open < 60 days, too early to diagnose
37. %OP<6OBRHDTED	=	% of cows in breeding herd currently open < 60 days, too early to diagnose
38. #OP60-1OOBRHDTED	=	# of cows in breeding herd currently open 60-100 days, too early to diagnose
39. %OP60-1OOBRHDTED	=	% of cows in breeding herd currently open 60-100 days, too early to diagnose
40 #OP101-140BRHDTED	=	# of cows in breeding herd currently open 101-140 days, too early to diagnose
41. %OP101-14OBRHDTED	=	% of cows in breeding herd currently open 101-140 days, too early to diagnose
42. #OP>14OBRHDTED	=	# of cows in breeding herd currently open > 140 days too early to diagnose
43. %OP>14OBRHDTED	=	% of cows in breeding herd currently open > 140 days, too early to diagnose
44. #BRD>3BRHD	=	# of cows in breeding herd bred > 3 times
45. %BRD>3BRHD	=	% of cows in breeding herd bred > 3 times
46. #OP50-8OTLHDFSTBDG	=	# of cows in total herd open 50-80 days at first breeding
47. %OP50-8OTLHDFSTBDG	=	% of cows in total herd open 50-80 days at first breeding
48. #OP81-1OOTLHDFSTBDG	=	# of cows in total herd open 81-100 days at first breeding
49. %OP81-1OOTLHDFSTBDG	=	% of cows in total herd open 81-100 days at first breeding
50. #OP>1OOTLHDFSTBDG	=	# of cows in total herd open > 100 days at first breeding
51. %OP>1OOTLHDFSTBDG	=	% of cows in total herd open > 100 days at first breeding
52. %PBLMCOWSNTLHD	=	% problem cows in total herd
53. DYSOPLSTCLVDT	=	Mean # of days open per cow since last calving date
54. #PGNTTLHD	=	# of cows in total herd currently pregnant
55. #COWSCDPTLHD	=	# of cows in total herd with complete dry periods
56. #DYSDRYCDP	=	Mean # of days per cow in 55
57. DRY<4OCDP	=	# of cows in 55 dry < 40 days
58. #DRY40-7OCDP	=	# of cows in 55 dry 40-70 days
59. #DRY > 70CDP	=	# of cows in 55 dry > 70 days
60. #SVCSRS	=	# of service sires currently used
61. $PDSVCSRS	=	Mean $PD of current service sires
62. #FSTCLFHFRTLHD	=	# of first calf heifers, total herd
63. #>1LCTNTLHD	=	# of cows in second and later lactation, total herd
64. AVGAGEMOSTLHD	=	Mean age of cows, in months, total herd
65. #MKG>305	=	# of cows currently milking > 305 days
66. %MKG>305MKHD	=	% of milking herd currently milking > 305 days
67. AVGWGTPDSTLHD	=	Mean body weight of cows, total herd
68. #HRSBTWNMKGSAM-PM	=	# of hours between milkings, a.m. to p.m.

Monthly Data

69. $BLDPRCCWTMK	=	Milk blend price per cwt.
70. %FATBLDPRCCWT	=	Blend price base % butterfat
71. %<2OOKSCCTLHD	=	% of total herd with < 200 KSCC
72. %2-400KSCCTLHD	=	% of total herd with 200-400 K SCC
73. %4-800KSCCTLHD	=	of total herd with 400-800 K SCC
74. %>800KSCCTLHD	=	% of total herd with > 800 K SCC

Table 1., cont.

Rolling Annual Average Data

75. #COWSNTLHDAA = Total # of cows in herd
76. #COWSNMKAA = # of cows in milk
77. %COWSNMKAA = % of cows in milk
78. PDSMKACAA = Lbs. of milk per cow per year, all cows
79. PDSFATACAA = Lbs. of butterfat per cow year, all cows
80. %FATACAA = %of butterfat per cow per year, all cows
81. PDSPTNACAA = Lbs. of protein per cow per year, all cows
82. %PTNACAA = %of protein per cow per year, all cows
83. PDSSLGACAA = Lbs. of silage consumed per cow per year
84. SLGENGVALAA = % energy from silage
85. PDSOTSCLACAA = Lbs. of other succulents consumed per cow per year
86. OTSCLENGVALAA = % energy from succulents
87. PDSDRYFRGACAA = Lbs. of dry forage consumed per cow per year
88. DRYFRGENGVALAA = % energy from dry forage
89. PDSOTFDSACAA = Lbs. of other feeds consumed per cow per year
90. OTFDSENGVALAA = % energy from other feeds
91. #DYSPTRPCAA = # of days per year on pasture, any cows
92. PTRENGVALAA = % energy from pasture
93. PDSCNTACAA = Lbs. of concentrates consumed per cow per year
94. CNTENGVALAA = % energy from concentrates
95. CNTCSTPCAA = Cost of consentrates per cow per year
96. TFDCSTPCAA = Total feed costs per cow per year
97. FDCSTPCWTMK = Feed costs per cwt. of milk produced
98. $AVGBLDPRCCWTMK = Mean milk blend price per cwt.
99. %AVGFATBLDPRCCWT = Mean blend price base % butterfat
100. PRJMINCLVITVLMOS = Projected minimum calving interval
101. #BDSLST12MOS = # of breedings in last 12 months
102. %SCFLBDSLST12MOS = % of successful breedings in last 12 months
103. #BDSPCNPN = # of breedings per conception
104. FSTBDGCNPNRT = First breeding conception rate
105. PRJ305DYMKMETLHD = Projected 305 day milk ME, all cows
106. PRJ305DYFATMETLHD = Projected 305 day fat ME, all cows
107. $PDSVCSRSFSTCLFHFR = Mean $ PD of current and former sires first calf heifers
108. $PDSVCSRS>1LCTN = Mean $ PD of current and former sirez, second and later lactations
109. $PDSVCSRSTLHD = Mean $ PD of current and former sires, all lactations
110. #COWSLFTHDLST12MOS = #of cows that left herd in last year
111. %COWSLFTHDLST12MOS = % of cows that left herd
112. #COWSLFTLOWPDTN = # that left due to low production
113. #COWSLFTREPROBLM = # that left due to reproductive problems
114. #COWSLFTDIS/INJ = # that left due to disease/injury
115. #COWSDIED = # that left due to death
116. #COWSLFTMSTS/UDR = # that left due to mastitis/udder problems
117. #COWSLFTFEET/LEG = # that left due to feet/leg problems
118. #DYSNMKLST12TSTSMC = Mean # days in milk, last 12 test days, milking cows
119. PDSMKLST12TSTSMC = Mean lbs. of milk per milking cow per day, last 12 test days
120. PRSTCYNDXLST12TSTS = Mean test period Persistency Index, last 12 test days
121. PDSMKLST12TSTSAC = Mean lbs. of milk per cow per day, all cows, last 12 test days
122. %FATLST12TSTSAC = Mean % of butterfat per cow per day, all cows, last 12 test days
123. %PTNLST12TSTSAC = Mean % of protein per cow per day, all cows, last 12 test days
124. %<200KSCCLST12TSTS = Mean % of herd with < 200 K SCC, last 12 test days
125. %2-400KSCCLST12TSTS = Mean % of herd with 200-400 K SCC, last 12 test days
126. %4-800KSCCLST12TSTS = Mean % of herd with 400-800 K SCC, last 12 test days
127. %>800KSCCLST12TSTS = Mean % of herd with > 800 K SCC, last 12 test days
128. AVGSCCLST12TSTS = Mean weighted average SCC, nearest 1,000, entire herd, 12 test days.

Dummy Variables (1 = true, 0 = false)

129. HOHD = Holstein herd
130. JEHD = Jersey Herd
131. GUHD = Guernsey herd
132. BSHD = Brown Swiss herd
133. AYHD = Ayrshire herd
134. MXHD = Mixed breeds herd

135. JAN = Jan. test month
136. FEB = Feb. test month
137. MCH = Mch. test month
138. APR = Apr. test month
139. MAY = May test month
140. JUN = Jun. test month
141. JUL = Jul. test month
142. AUG = Aug. test month
143. SEP = Sep. test month
144. OCT = Oct. test month
145. NOV = Nov. test month
146. DEC = Dec. test month

Data were collected through the DHIA on 126 farms in 19 counties for the two most recent years available, 1982-83. With a total of 749 monthly observations, the data are distributed by county in Table 2.

Table 2. Distribution of Data by County

County	Number of Farms Observed	Number of Total Monthly Observations
Camp	5	42
Franklin	8	61
Henderson	1	7
Hopkins	73	366
Hunt	1	6
Nacogdoches	8	58
Rains	3	28
Rusk	1	5
Smith	1	10
Upshur	12	96
Wood	7	37
Van Zandt	3	21
? *	3	12
Total . . .	126	749

* Cass, Harrison, Houston, Marion, Norris, Panola, or Shelby. Unknown due to similar DHI County codes.

Sample farms ranged in size from 18 to 384 head. The highest daily herd average for milk production per milking cow was 65.9 lbs. Daily IOFC per cow ranged from — $0.08 to $6.21, with a mean of $2.70. The minimum projected calving interval was 11.8 months, with a mean of 13.7. Average days open ranged from 80 to 275, with a mean of 137. Average days dry ranged from 45 to 124, with a mean of 74. the average first breeding conception rate was 59.8%. Eighty-nine percent of the herds were Holstein, 5% were Jersey, 5% were mixed herds, 1% were Guernsey or Brown Swiss, and none were Ayrshire. The mean numbers of hours between milkings was 11.4 from a.m. to p.m. Average somatic cell count (SCC) ranged from 7,000 to 984,000 with a mean of 334,335.

METHODOLOGY

Simple correlation analysis based on Pearson's sample correlation coefficient was conducted to identify those independent variables most linearly correlated with IOFC. Stepwise regression at the 0.05 level was then conducted to search for the best set of independent variables. Multiple linear regression models were then estimated for the nineteen-county area collectively, then separately for the seven counties with twenty-eight or more monthly observations, and once for the remaining twelve counties.

FINDINGS

No theoretically or statistically satisfactory model could be found to predict the annual measure of IOFC : Y2. $IOFCACAA. This is not surprising since the majority of variables on the DHI-202 Form are monthly data. Suitable models were found for the monthly measure of IOFC : Y1. $IOFCAACTD. Table 3 presents two overall models for the nineteen-county area.

Table 3. Multiple Linear Regression Models of Y1. $IOFCACTD

Independent Variable	Beta Coefficient	T Value
(Model 1 : With the "Big 3")		
Constant	0.72	3.84[b]
3. %COWSNMKTD	0.01	3.99[b]
4. PDSMKACTD	0.04	13.23[b]
5. PDSFATACTD	0.95	13.82[b]
20. CNTENGVALTD	0.01	7.25[b]
21. CNTCSTPCTD	-0.20	-5.85[b]
23. FDCSTPCWTMK	-0.26	-24.43[b]
R^2 = 0.85	Sig. F = 0.0000	Entire Sample
(Model 2 : Without the "Big 3")		
Constant	-2.42	-6.39[b]
3. %COWSNMKTED	0.05	15.05[b]
17. OTFDSENGVALTD	-0.02	-3.40[b]
20. CNTENGVALTD	0.02	5.16[b]
21. CNTENGVALTD	-0.31	-4.73[b]
66. %MKG>305MKHD	-0.02	-5.38[b]
74. %>800KSCCTLHD	-0.01	-3.19[b]
118. #DYSNMKLST12TSTSMC	0.00	3.91[b]
128. AVGSCCLST12TSTS	-0.00	-2.92[b]
R^2 = 0.38	Sig. F = 0.0000	Entire Sample

[a]Denotes significance at 0.05 level
[b]Denotes significance at 0.01 level

Model 1 illustrates the positive effects of the percent of the herd in milk, milk and fat production, and the energy value of concentrates, plus the negative effects of concentrate costs and feed costs per cwt. of milk produced.[2]

The model's accuracy, as measured by the R^2 ratio, is 85%. However, in this Model, as well as in all preliminary estimates of the county models, the regression procedure relied on milk and fat production and feed costs per cwt. of milk produced for most of its predictive power. These three independent variables, i.e. the "Big Three," were omitted from the remainder of the analysis in order to search for less obvious determinants of IOFC.

Model 2, with 38% predictive power, indicates positive impacts from the percent of herd in milk and concentrate energy value, and negative impacts from the energy value of other feeds, concentrate cost, percent herd milking more than 305 days, percent of herd with more than 800,000 SCC, and the average SCC from the last twelve tests. The mean number of days in milk for milking cows from the last twelve tests has a positive, albeit very small, effect on daily IOFC.

Table 4 presents the county models of daily IOFC. The equations do not utilize any of the "Big Three" factors. With the exception of Hopkins County, the predictive power of the equations is generally high. In Camp County (Model 3), Holstein herds are relatively more lucrative and March and April are the most prosperous months in terms of daily IOFC. For each

[2]The beta coefficient reflects the change in the dependent variable associated with a **one unit change** in that independent variable, holding the values of the other independent variables fixed. The R^2 statistic measures the percent of variation in the dependent variable accounted for by the independent variables, the significance of the F statistic states the likelihood that there is no relationship between the dependent variable and **any** of the independent variables, and the significance of the T statistic states the likelihood of no relationship between the dependent variable and **that** independent variable.

hour from a.m. to p.m. between milkings, daily IOFC/cow drops by $0.47. In Franklin County (Model 4), Holstein herds tend to increase IOFC and the number of hours between milkings has a markedly negative effect. In Hopkins County (Model 5), a major dairy center, the leading predictors are the percent of herd in milk and the mean test period persistency index from the last twelve tests, the latter of which corresponds to an increase of $0.09 in daily IOFC/cow for each unit increase in the index. The cost of concentrates in Nacogdoches County (Model 6) has a pronounced negative effect. The persistency index, percent of herd in milk and concentrate energy value are correlated with enhanced IOFC.

Table 4. Multiple Linear Regression Models Of Y1. $IOFCACTD by County

Independent Variable	Beta Coefficient	T Value
(Model 3 : Camp County)		
Constant	-7.78	-2.76[b]
20. CNTENGVALTD	0.18	4.77[b]
68. #HRSBTWNMKGSAM-PM	-0.47	-3.62[b]
110. #COWSLFTHDLST12MOS	0.03	2.76[b]
128. AVGSCCLST12TSTS	-0.01	-4.77[b]
129. HOHD	4.16	5.94[b]
137. MCH	0.95	4.05[b]
138. APR	1.07	4.49[b]
R^2 = 0.71	Sig. F = 0.0000	No. of Obs. = 42
(Model 4 : Franklin County)		
Constant	3.06	4.26[b]
3. %COWSNMKTD	0.05	9.65[b]
19. PDSCNTACTD	-0.08	-8.01[b]
66. %MKG>305MKHD	-0.01	-2.97[b]
68. #HRSBTWNMKGSAM-PM	-0.51	-10.55[b]
118. #DYSNMKLST12TSTSMC	0.01	4.46[b]
129. HOHD	0.69	5.43[b]
R^2 = 0.82	Sig. F = 0.0000	No. of Obs. = 61
(Model 5 : Hopkins County)		
Constant	-12.06	-5.14[b]
3. %COWSNMKTD	0.05	10.57[b]
27. CYSFSTBDGBRHD	0.00	2.26[a]
66. %MKG>305MKHD	-0.01	-2.50[a]
67. AVGWGTPDSTLHD	0.00	2.67[b]
110. #COWSLFTHDLST12MOS	-0.00	-2.34[a]
118. #DYSNMKLST12TSTSMC	0.00	2.83[b]
120. PRSTCYNDXLST12TSTS	0.09	3.73[b]
R^2 = 0.32	Sig. F = 0.0000	No. of Obs. = 363
(Model 6 : Nacogdoches County)		
Constant	-36.46	-5.83[b]
3. %COWSNMKTD	0.08	8.03[b]
20. CNTENGVALTD	0.05	3.44[b]
21. CNTCSTPCTD	-0.87	-5.66[b]
67. AVGWGTPDSTLHD	0.00	4.00[b]
120. PRSTCYNDXLST12TSTS	0.23	5.07[b]
R^2 = 0.67	Sig. F = 0.0000	No. of Obs. = 58
(Model 7 : Rains County)		
Constant	-0.85	-1.88
19. PDSCNTACTD	0.38	8.86[b]
21. CNTCSTPCTD	-2.04	-4.64[b]
R^2 = 0.80	Sig. F = 0.0000	No. of Obs. = 28
(Model 8 : Upshur County)		
Constant	-1.57	-3.25[b]
3. %COWSNMKTD	0.05	11.96[b]
53. #DYSOPLSTCLVDT	0.00	2.57[a]
128. AVGSCCLST12TSTS	-0.00	-0.42
R^2 = 0.67	Sig. F = 0.0000	No. of Obs. = 96
(Model 9 : Wood County)		
Constant	-10.56	-4.92[b]
3. %COWSNMKTD	0.08	4.29[b]
20. CNTENGVALTD	0.02	4.97[b]
118. #DYSNMKLST12TSTSMC	0.03	3.49[b]
128. AVGSCCLST12TSTS	0.00	3.65[b]
R^2 = 0.78	Sig. F = 0.0000	No. of Obs. = 37
(Model 10 : All Other Sample Counties)		
Constant	-0.59	-1.00
3. %COWSNMKTD	0.05	6.25[b]
53. #DYSOPLSTCLVDT	0.01	2.04[a]
66. %MKG>305MKHD	-0.04	-3.55[b]
128. AVGSCCLST12TSTS	-0.00	-3.91[b]
142. AUG	-0.48	-2.73[b]
R^2 = 0.60	Sig. F = 0.0000	No. of Obs. 61

[a] Denotes significance at 0.05 level.

[b] Denotes significance at 0.01 level.

In Rains County (Model 7), 80% of the variation in IOFC is associated with changes in the quantity used and cost of concentrates, positively and negatively, respectively. Both of the coefficients are significantly different from zero at the 0.01 level. The most powerful predictor in Upshur County (Model 8) is percent of herd in milk. The number of days open since last calving date and the mean SCC from the last twelve tests have marginally positive and negative impacts, respectively. In Wood county (Model 9), the percent of herd in milk, concentrate energy value and mean number of days in milk from the last twelve tests have important positive effects. Lastly, the key positive factor in the remaining twelve sample counties (Model 10) is percent of herd in milk, while the percent of cows in the milking herd currently milking over 305 days and the month of August have notably negative effects on daily IOFC/cow.

It may be of interest to note that the age of the herd, first breeding conception rate and the percent of possible breedings that were actually serviced are some typically key factors that did not enter any of the models. Neither did the size of the herd, implying that a positive flow of IOFC can be achieved at any farm size, as measured by herd size.

CONCLUSIONS

It is possible to anticipate the direction and magnitude of change in IOFC from changes in many of the feeding, breeding, genetic, health and management factors reported on the monthly DHI-202 Herd Summary Form. This applied study developed models capable of predicting IOFC on Northeast Texas dairies. For the nineteen-county region, the following factors contributed positively to IOFC: percent of herd in milk, concentrate energy value, Holstein breed, the months of March and April, mean test period persistency index, and mean number of days in milk. Important negative factors were: concentrate costs, percent of energy from other feeds, percent of herd milking over 305 days, percent of herd with more than 800,000 SCC, mean SCC from the last twelve tests, the number of hours from a.m. to p.m. between milkings, and the month of August. The beta coefficients, which reflect the change in IOFC from a one unit change in that particular factor, presented in Tables 3 and 4 are offered in the hope of helping producers improve short run financial returns during this period of uncertainty and transition.

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