

Impact of Management Changes

Worksheet for Dairy Herd Managers


Revised from original Aug 2008 (original by Jerry Steuernagel, Extension Animal Scientist)

Making management changes can either increase the income from milk or reduce the cost of milk production. The impact values in the following table were developed using typical levels of management and prices. Use the worksheet to rank the relative merit of making various management changes.

Directions: Choose a reasonable change for your herd.

Multiply the units of change x value per cow x number of cows in the herd.

A	Improve Udder Health from ____ units by ____ units Decreasing herd average linear SCC one unit will result in a gain of \$85.64 per cow per year.	Herd \$ _____
B	Reduce Age at First Calving from ____ month by ____ month Reducing average age at first calving by one month reduces rearing cost by \$25 per cow per year.	Herd \$ _____
Not on Herd Sum	Increase Size at First Calving from _____ lb by ____ lb Increasing average body weight at first calving by one pound will increase herd production \$0.22 per cow per year.	Herd \$ _____
C	Reduce the Culling Rate from _____% by _____% Reducing the culling rate by one percent will reduce the replacement Overhead by \$8 per cow per year.	Herd \$ _____
D	Reduce the Average Days in Milk from ____ days by ____ days Reducing the herd average days in milk by one day will increase herd production \$8.69 per cow per year.	Herd \$ _____
E	Improve Sire Identification from _____% by _____% Improving identification of herd sires by one percent will increase herd production by \$.80 per cow per year.	Herd \$ _____
F	Improve Sire Selection from \$_____ by \$_____ Improving sire selection one unit of PTA\$ or NM\$ will increase herd production by \$1 per cow per year.	Herd \$ _____
G	Increase Peak Milk from _____ lb by _____ lb Increasing peak milk one pound will increase herd production by \$37.80 per cow per year.	Herd \$ _____


 Use 1st column on the left to locate the correct value to use from the Herd Summary. Letter A from this worksheet corresponds to a section on the sample herd summary labeled A.

Impact of Management Changes

Many research studies have analyzed the impact of making management changes in the dairy herd. These studies typically look at the simple impact of making a single change. For example, increasing the peak level of production will result in increased total lactation production and more income. However, it may cost more for feed to achieve the higher production. The worksheet was compiled to show the relative impact of making management changes in your herd. It is not valid to add up all the impacts. Use the worksheet to rank the relative merit of making various management changes.

To simplify the calculations in the worksheet, the following constants were chosen as basic herd assumptions. The worksheet can be tailored by choosing new constants and recalculating the formulas below.

- 20,000 lb Rolling Herd Average
- 40% animal turnover rate
- 37% first calf heifers
- \$14 per cwt milk price
- \$0.0015 premium per lb milk for reducing SCC
- \$1500 animal replacement cost
- \$700 animal cull value

Udder Health –

- ◆ The goal should be to keep reducing linear somatic cell count to less than 1.0.
- ◆ Production loss due to clinical and subclinical mastitis each time the linear cell count is increased by one linear unit is 200 lb in first lactation animals and 400 lb in older animals per lactation (Dabdoub, S.A.M. and G.E. Shook, JDS, 1984).

$$(200 \times .37 + 400 \times .63) \times \$14 = \$45.64$$

- ◆ The average loss from a clinical flare-up is \$77 per case as a combination of \$12 in medication, \$60 in discarded and decreased milk yield, \$2 in veterinary costs, and \$3 in labor (K. Hoblet et al., NMC Proc., 1991). This loss is reduced to \$50 because it was partially accounted for under the above item. We also know that clinical cases increase 20% per unit increase in linear score (Dabdoub, S.A.M. and G.E. Shook, ADSA, 1984).

$$.20 \text{ cases} \times \$50 = \$10$$

- ◆ Economic opportunity from milk quality premium is applied to the total milk sold.

$$20,000 \times \$0.0015 = \$30$$

Heifer Growth –

- ◆ The goal is to have properly grown heifers ready to milk when they enter the milking herd at less than 24 months of age.
- ◆ If a replacement is worth \$1500 and it takes 24 months to grow the animal, then the cost averages \$62 per month. If the replacement rate is 40%, then the cost per cow per year is \$25.

$$(\$1500 / 24) \times .40 = \$25$$

- ◆ Larger heifers are known to produce more milk during the first lactation. The biggest increase is about 4.25 lb milk per lb body weight increase up to 1200 lb (J.F. Keown, DHMgt, Aug 86).

$$(4.25 \times \$14) \times .37 = \$22$$

Culling Rates –

- ◆ The goal should be to keep the need to cull animals as low as possible. Normal minimums can be less than 33%.
- ◆ If the cost to raise a replacement animal is \$1500 and a cull animal is worth \$700, it costs \$800 each time an animal is replaced.

$$(\$1500 - \$700) / 100 = \$8$$

Reproduction –

- ◆ Shorter calving intervals result in higher herd production milk because cows spend less time producing during the tail end of the lactation curve.
- ◆ Milk sales due to herd milking late and lower in the lactation curve is 0.17 lb per extended day per cow (Western Regional Ext Pub 0067).

$$(.17 \times 365) \times \$14 = \$8.69$$

Genetics –

- ◆ The goal is to maintain identification records and select high merit sires to improve herd genetics.
- ◆ Improving sire identification can result in improved lactation production by about \$80 per percent improvement (Cassel, 1990).

$$(\$80 / 100) = \$0.80$$

- ◆ Improve service sire selection to improve herd genetic level in the future. Improved sire selection of PTAS\$ or NM\$ by one unit will increase herd production by \$1.00 per cow per year.

$$\$1.00 = \$1.00$$

Feeding –

- ◆ The goal is to use nutrition management to increase peak milk production and to reduce feed costs.
- ◆ A comparison of current Minnesota DHIA herds indicates that the Rolling Herd Average increased 270 lb for each increased pound of overall peak.

$$270 \times \$14 = \$37.80$$

DHI Herdcode 41990010	Test Type & Description 31 DHI -AP	Breed HO	Sample Date 9/02/09	Process Date 9/03/09
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Days 28	Test Interval		FRep	PString
	8/06	9/02/09	66EH	HERD

SAMPLE HERD

Herd Summary



Dry Period Summary			
Avg Days	Cows by Days Dry		
	< 40	40 - 70	> 70
69	1	87	43
	1%	66%	33%

BASED ON 131 COWS

Peak and Persistency									
305 ME		Prod Index	Lact	Cows	DIM	Peak		MLM	
Milk	\$ Value					DIM	Milk	Current	C-L
22,725	3,127	95	1	80	175	85	73	67	- .9
25,636	3,444	105	2	62	173	79	99	81	-3.9
25,134	3,328	101	3+	69	155	82	107 G	82	-2.3
24,355	3,283	100	All	211	168	82	92	76	-2.1

PEAK RATIO (1ST/OTHERS) IS 0.71

Daily Milk	
DHI	13130
Sold	12877
Shipped	102%
Value	\$2075
\$ / cwt	15.80

Current SCC Evaluation							
Number Cows	SCC LS	% Infected	Lact	% Cows by Linear Score			
				0,1	2,3	4,5,6	7,8,9
71	1.6	7	1	57	32	10	1
50	1.8	14	2	50	30	20	
62	2.0	15	3+	51	24	23	2
183	1.8	11	All	53	29	17	1

MONTHLY SCC \$ LOSS 0

Management Level Milk								
Annual Summary				Current Test				
Days In Milk			All Cows	Lact	All Cows	Days In Milk		
< 100	1-200	> 200				< 100	1-200	> 200
66	69	77	72	1	68	65	67	70
78	80	86	82	2	81	76	77	87
77	82	92	85	3+	83	75	81	88
73	76	84	79	All	77	71	75	80

BASED ON 14 TESTS

Yearly SCC Summary			
Lact	% Infected by DIM		
	< 30	30-220	> 220
1	25	8	14
2	21	5	16
3+	17	9	20
All	21	7	16

BASED ON 2471 SAMPLES

Changes in SCC Status			
Fresh vs Last Dry Off		Current vs Last Test	
Cures	Chronics	Cures	Chronics
12%	4%	3%	3%
Negatives	New Infections	Negatives	New Infections
78%	6%	85%	9%

BASED ON 116 COWS

BASED ON 183 COWS

Production Averages																				
Rolling Herd			Test Day				Date	Quantity						Quality						
Milk	Fat	Protein	All Cows	% in Milk	Milk	% Shipped		Milk Cows	Fresh Cows	DIM	Milk	MLM	% Fat	% Protein	Raw SCC	SCC LS	Number Infections	Fresh Infections	New Infections Number	New Infections %
23,705	959	714	211	87	63	102	9/02/09	184	15	168	72	77	4.1	3.0	88	1.8	21	3	16	9
23,743	956	715	213	87	66	106	8/05/09	185	23	162	76	79	4.1	3.0	91	1.9	14	4	10	5
23,743	953	714	213	85	65	106	7/08/09	181	20	167	77	80	3.9	3.0	98	2.0	18	2	14	8
23,736	952	714	205	87	64	104	6/10/09	178	6	171	74	77	3.8	2.9	64	1.7	11	2	6	3
23,738	951	714	204	88	67	108	5/26/09	180	15	165	76	78	3.9	2.9	78	1.7	14	3	8	4
23,764	949	714	206	88	66	103	4/28/09	181	15	160	75	77	3.9	3.0	82	1.7	16	2	6	3
23,812	949	714	210	86	66	104	3/31/09	181	16	150	77	77	4.0	3.0	112	2.0	23	4	13	7
23,863	948	713	208	87	67	105	3/03/09	181	25	143	78	79	4.1	3.1	92	2.0	20	5	12	7
23,880	947	712	209	84	67	108	2/03/09	176	17	147	81	83	4.1	3.0	86	2.1	22	6	14	8
23,862	944	712	207	84	63	106	1/06/09	174	21	141	75	78	4.2	3.0	145	2.0	21	2	14	8
23,878	943	712	204	85	62	102	12/09/08	173	22	148	73	76	4.1	3.1	132	2.2	23	5	17	10
23,766	938	708	200	84	66	114	11/11/08	168	11	155 D	79	82	3.9	3.0	147	1.8	15	2	4	2
23,590	928	702	202	85	64	110	10/14/08	172	19	147	75	77	4.4	3.0	169	2.4 A	30	8	17	10
365 DAY AVERAGE >			207	86	65	106	AVG	178	17	156	76	78	4.0	3.0	106	1.9	19	4	12	7

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SAMPLE HERD

Consultant Summary



Herd Genetic Profile										
Service Sires				Group	Animal PTA			Sire PTA		
Num Brd	% AI	NM\$	% Rank		Num	NM\$	% Rank	% AI	NM\$	% Rank
				Calves	129	+227	56	95	+357	62
79	100	+368	64	Yearlings	83	+203	50	87	+347	60
61	100	+417	72	Lact 1	49	+222	64	78	+421	69
49	100	+421	74	Lact 2	45	+147	50	60	+239	52
55	100	+395	69	Lact 3+	48	+144	48	86	+223	36
165	100	+411	72	Cows	142	+172	54	75	+300	53

F

Inventory					
% Herd		Age	Num	% Identified	
				Sire	Dam
	Calves	0-06	130	100	100
	Yearlings	1-06	90	100	100
	Youngstock	0-11	220	100	100
38	Lact 1	2-01	80	100	100
29	Lact 2	3-01	62	100	100
33	Lact 3+	4-07	69	100	100
	Cows	3-02	211	100	100

E

Cows Entering and Leaving Herd												
Number Entered	Number Left	Lact	Reason for Leaving								% Turnover	
			Dairy	Low Milk	Repro	Sick	Mast	Ft/Legs	Died	Other		
91	24	1			10			5		4	5	12
	24	2	1		10			5	1	3	4	12
	28	3+		2	4	1	8	5	3	5	14	14
91	76	All	1	2	24	1	18	6	10	14	37	37
		Left Herd	1%	3%	32%	1%	24%	8%	13%	18%		

ANNUAL TURNOVER RATE IS **37%** C

Monthly Herd Turnover													
	History						Test	Planning					
	MAR	APR	MAY	JUN	JUL	AUG		SEP	OCT	NOV	DEC	JAN	FEB
Total Cows	210	204	205	212	216	211	211	223	224	226	225	227	226
Cows Milking	183	182	176	185	191	186	211	190	190	195	201	194	193
Heifers Calving	8	4	5	11	8	5		9	7	8	5	7	5
Cows Calving	12	10	11	10	16	12	1	16	19	19	9	16	16
Cows Dried-off	11	12	11	12	19	9		18	10	16	17	16	24
Cows Dry	27	22	29	27	25	25		33	34	31	24	33	33
Cows Left	6	10	4	5	4	10		6	5	5	5	5	5

Reproduction Summary		
Breeding Herd	Cows	Heifers
Animals	185	91
Animals Served	89%	87%
Waiting Period (days or mo)	59	13
First Served (<100 days or 15 mo)	85%	*
Time to First Services (days or mo)	77	*
Services per Animal	2.1	2.0
Open Period (<150 days or 17 mo)	48%	65%
Min Calving Interval (months)	13.0	24.4
Heat Detection Index	53%	
Pregnant Animals	Cows	Heifers
Animals	121	59
Conceived at First Service	46%	42%
Services per Conception	2.2	1.9
Pregnancy Rate	21%	
Open Period (days or mo)	123	15
Calving Interval (months)	13.3	24.4
CI - Standard Deviation (months)		

MANAGEMENT CALVING INTERVAL = 13.3 MOS.

* AVAILABLE SOON

BIRTH SUMMARY

DAM'S LACT NUM.	OFFSPRING BORN									
	MALES		FEMALES		CALVING DIFFICULTY SCORE					
	ALIVE	DEAD	ALIVE	DEAD	1	2	3	4&5	% 4+5	
1	42	2	43	3	53	17	16	3	3	
2+	81	2	75	1	130	11	7	3	2	
TOTAL	123	4	118	4	183	28	23	6	3	