

2005 Dairy Herd Improvement Program in Arkansas

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Story in Brief

During 2005, 52 (26%) of the 202 dairy cattle herds in Arkansas were enrolled in the Dairy Herd Improvement (DHI) program. All 52 herds completed at least 4 DHI tests and averaged 9.7 tests with rolling herd averages of 17,402 lb of milk, 628 lb of fat (3.6%), and 542 lb (3.1%) of protein; mature equivalent averages were 19,179 lb of milk with 3.7% fat and 3.2% protein. This compares to 2004 averages of 17,485 lb of milk, 639 lb of fat (3.5%), and 549 lb (3.1%) of protein with 58 herds; mature equivalent averages were 18,930 lb of milk with 3.6% fat and 3.1% protein.

Quartile data of milk production for the Holstein herds with DHI records showed that income over feed costs was about \$1,000/cow greater for the highest producing quartile of herds compared to the lowest producing quartile of herds. Average income-over-feed costs (IOF\$) was \$1,377 in 2005; previous years' IOF\$ were \$1,796 in 2004 and \$1,139/cow in 2003, with the variation due primarily to varying milk and feed prices. Udder health and reproduction were enhanced in higher herds and contributed to this difference in income/cow.

The Arkansas average for milk/cow was 13,458 lb/year on all cows in 2005, which indicates that non-DHI herds averaged less than 12,000 lb/cow/year. This difference in milk/cow/year of over 5,000 lb would affect income by almost \$700/cow, or approximately \$84,000 in a 120-cow herd. Approximately 30% of the state's herds were enrolled in the DHI record-keeping program, thus opportunities exist for raising the level of milk production and profitability in the state by encouraging more producers to use DHI or similar records.

Introduction

Successful dairy producers must have accurate and reliable records to make sound management decisions. The Dairy Herd Improvement (DHI) program provides a comprehensive herd analysis and management report that includes information concerning production, reproduction, genetics, herd health, animal and feed inventory, and finances. Data obtained from DHI can be used to improve efficiency of milk production by: 1) identifying least profitable cows for culling; 2) feeding for more efficient production; 3) selecting animals with the greatest genetic potential for production as replacements; and 4) utilizing summaries of the data to make precise management decisions that improve net income.

Herds on DHI produce 4,500 to 5,000 lb more milk per year nationally than herds not on DHI. Although many factors affect production per cow, this difference in production has a significant effect on net income for the dairies. Increased income-over-feed costs (IOF\$) is associated with greater profitability for the individual cow and herd. Dairy herd summaries from DHI allow dairy producers to compare production, health, reproduction, and financial aspects with respect to other dairies, so that areas of management that need improvement can be detected.

Experimental Procedures

Dairy cattle herds on test ($n = 52$) were used to report production and management data for DHI herds. The test milking (or day) for each cow included weighing milk, taking a sample of milk to be analyzed for percentage of fat, protein, and somatic cell count (SCC), and recording of other management parameters as indicat-

ed in Table 1. Milk samples were analyzed at the Heart of America DHI Lab (Manhattan, Kan.). Records were processed at Dairy Records Management Services (DRMS), Raleigh, N.C., and analyzed by State Management DART (Direct Address to Records via Telephone) for all breeds (Table 1) and by SAS (SAS Institute, Inc., Cary, N.C.) for quartile data of Holstein herds in Table 2.

Results and Discussion

Fifty-two herds completed at least 4 DHI tests and averaged 9.7 tests per year, with a rolling herd average of 17,402 lb milk, 628 lb of (3.6%) fat, and 542 lb of (3.1%) protein. Mature equivalent averages for the herds were 19,179 lb milk containing 3.7% fat and 3.2% protein.

Rolling herd averages for 41 DHI herds on supervised tests with 6 tests are shown in Table 1. Income dollars from milk minus feed costs for the milking cows or IOF\$ averaged \$1,377/cow for 2005 for all herds; Holstein herds averaged \$1,571 (Table 2). The IOF\$ for Holstein herds was \$1,796/cow for 2004, \$1,139/cow in 2003, and \$1,044/cow in 2002. The variation in IOF\$ is due primarily to varying milk prices but also to fluctuations in feed costs. Milk prices were slightly higher in 2005 compared to the very low prices in 2002 and 2003 but slightly lower than the record high prices in 2004. Brown Swiss herds averaged \$1,325/cow/year for income minus feed costs; however, only 2 herds were included in the Brown Swiss summary for 2005. One Jersey herd was included. Twelve herds had various crossbreeds which averaged \$978/cow for IOF\$. Few non-Holstein herds had DHI records in Arkansas, but other states have shown similar trends in IOF\$ with greater numbers of herds. In the United States, 93 to 94% of the cows on test are Holsteins or crossbreeds with Holstein influence, 3% of cows on

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test are Jerseys, and less than 1% of cows are Brown Swiss.

The DHI averages for some of the most economically important production traits of Holstein herds with 10 tests are presented in Table 2 by quartile of milk production for 2004 and 2005. The quartile data for the Holstein herds illustrate the relationship of higher milk production to greater IOF\$. The top quartile of Holstein herds for milk production showed that IOF\$ was \$1,206/cow greater compared to the lowest producing quartile of herds. Herds in the high quartile had higher peak milk levels, lower somatic cell counts, less days open, greater percentage of cows in milk, and lower calving intervals than herds in the low quartile.

For quartile data, 24 Holstein herds were official herds with 10 tests during the year, compared to 27 herds in 2004 and 23 in 2003. The total percentage of herds (n = 52) on DHIA was 26%, which was similar to the percentage of total farms in 2004. Additionally, 2 dairy cattle herds used the PC DART on-farm computer program for production testing, and were not included in the 52 herds currently processed through DRMS. Only 26% of the 220 herds in 2004 were involved in the DHI program. If the cows from herds using PC DART are combined with the cows in the 52 DHIA, then over 31% of the state's 24,000 cows were on test. This number is higher than the goal (set for many years) of 30% of the cows in Arkansas that was exceeded only in 2003.

Herds on DHI averaged 17,402 lb milk/cow/year compared to the Arkansas average of 13,458 lb/milk/year (Arkansas Agricultural Statistics Service, Little Rock). Omitting DHI herds from the state average indicates that the non-DHI herds averaged less than 12,000 lb milk/year, equating to a difference in milk production of over 5,000 lb milk/cow/year between DHI and non-DHI herds which would affect income by almost \$700/cow/year or \$84,000 per year in a 120-cow herd.

Implications

The DHI program affords dairy producers an opportunity to maintain records of milk production on individual cows and other management practices. Herds utilizing DHI records averaged 17,402 lb milk/cow/year versus less than 12,000 lb/cow for herds not on DHI test, indicating much more profitable herds on DHI. Producers are strongly encouraged to enroll in the DHI testing program.

Table 1. 2005 Arkansas DHIA average for all breeds.

Item	n	Mean	SD	Minimum	Maximum
Rolling herd average, milk (lb)	41	16,614	3,678	10,917	24,711
Services per pregnancy, pregnant cows	41	1.8	0.8	0	3.3
Services per pregnancy, all	41	2.8	1.8	0	8.8
Projected calving interval	41	15.6	1.2	12.0	21.0
Number of cow years	41	129.8	111.16	2.4	579.3
Rolling herd average, fat (lb)	41	590	130	316	906
Peak milk (lb)-1 st lactation	40	62.1	12.0	43.0	96.0
Peak milk (lb)-2 nd lactation	40	74.8	14.3	49.0	107.0
Peak milk (lb)-avg	40	73.2	12.1	51.0	103.0
Average days dry	41	81.7	32.2	51.0	189.0
All lactations -% cows SCC ¹ 0-3	40	50	16	0	76
1st lactation 305-2x-ME milk (lb)	40	18,563	3,627	13,313	27,179
1st lactation 305-2x-ME fat (lb)	40	648	138	381	971
2nd lactation 305-2x-ME milk (lb)	40	18,868	4,021	11,909	27,280
2nd lactation 305-2x-ME fat (lb)	40	656	132	422	1,012
All lactation 305-2x-ME milk (lb)	41	18,633	3,635	13,402	27,352
All lactation 305-2x-ME fat (lb)	41	647	128	403	967
1st lactation -% cows SCC 0-3	39	61	17	30	100
Days to 1st service, current	41	92	56	0	210
Rolling herd average, protein (lb)	41	518	106	335	762
IOF \$ ²	34	1,377	482	355	2,820
Peak milk -3 rd lactation (lb)	39	82.5	13.7	54.0	109.0
3+ Lactation 305-2x-ME milk (lb)	40	18,503	3,617	13,244	27,559
3+ Lactations 305-2x-ME fat (lb)	40	647	124	410	956
2nd Lactation- % cows SCC 0-3	39	50	19	14	86
Days to 1st service, total	41	95	45	0	188
Days open	41	195	55	84	358
% Successful first service	41	42	24	0	100
% Successful total	41	42	23	0	100
% Herd bred to proven sires	41	42	36	0	100
% Herd bred to AI young sires	41	7	11	0	40
% Herd bred to other sires	41	38	37	0	100
1st Lactation- AIPL PTAS ³ -cows	33	-2	73	-216	107
2nd Lactation- AIPL PTAS-cows	33	-27	87	-308	130
3+ Lactations- AIPL PTAS-cows	34	-73	102	-431	68
All lactations- AIPL PTAS-cows	37	-51	98	-431	74
1st Lactation- AIPL PTAS-sires	34	121	79	-72	309
2nd Lactation- AIPL PTAS-sires	34	81	115	-317	349
3+ Lactations- AIPL PTAS-sires	32	-10	122	-432	124
All lactations- AIPL PTAS-sires	37	52	92	-199	192
1st Lactation 305-2x-ME protein(lb)	41	553	132	0	803
2nd Lactation 305-2x-ME protein (lb)	41	559	139	0	788
3+ Lactations 305-2x-ME protein (lb)	41	553	131	0	819
All lactation 305-2x-ME protein (lb)	41	568	100	405	804
Average test day milk (lb-milking cows)	41	55	10	40	77
Average standardized 150-d milk (lb)	41	60	11	41	83
3+ Lactations - % cows SCC 0-3	39	40	18	0	100
Average days in milk	41	193	26	109	254
Average % cows in milk	41	84	6	71	93
SCC average	40	466	308	154	1875
Average % heats observed	36	29	14	5	55

¹Somatic cell count

²IOF\$ = income over feed costs; income from milk minus feed costs

³Animal Improvement Programs Laboratory --predicted transmitting ability for dollars

Table 2. 2005 Arkansas DHI averages for official Holstein herds.

Production traits	Quartile 1		Quartile 2		Quartile 3		Quartile 4	
	2004	2005	2004	2005	2004	2005	2004	2005
Rolling herd average, milk (lb)	23,307	23,229	19,824	18,999	16,633	16,303	14,152	14,316
Peak milk-1 st lactation (lb)	78.7	79.7	62.5	68.9	58.2	62.0	57.0	56.9
Peak milk-2 nd lactation (lb)	96.3	93.7	73.0	84.4	71.5	774	65.5	69.7
Peak milk-3 rd lactation (lb)	102.7	105.0	85.2	91.4	77.0	81.5	70.7	75.7
Peak milk-average (lb)	83.0	90.2	70.7	81.4	67.0	72.8	63.5	70.3
IOFS¹/year	2,384	2,250	2,037	1,609	1,483	1,380	1,279	1,044
SCC ² average	283	272	329	410	498	576	431	500
Days to 1 st service	75.5	88.2	110.2	99.1	111.5	116.0	94.5	75.1
Days open	144.0	166.7	178.0	183.4	158.7	194.3	200.7	189.3
Average % in milk	-	89.3	-	86.4	-	85.8	-	82.4
Projected calving interval (mo)	13.9	14.7	15.1	15.2	14.4	15.6	15.8	15.4

¹Income from milk minus feed costs

²Somatic cell count