Profile of DHI Management Factors of Twenty High and Low Producing Holstein Herds

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Story in Brief

The DHI records of forty Holstein herds were studied to compare the apparent importance of various management factors on herd production. The forty herds represented the twenty highest and twenty lowest producing Holstein herds based on the rolling herd average milk production for the testing year May 1, 1976 to April 30, 1977. Data from the September 1977 Herd Ranking and Summary was utilized for the breeding and genetic information. The twenty high producing herds averaged 18189 lb of milk, 662 lb of fat, while the twenty low producing herds averaged 10257 lb of milk, 366 lb of fat. Both high and low groups differ considerably from the state average of 14308 lb milk, 512 lb fat for all Oklahoma Holsteins in DHI.

The genetic difference between the two groups according to identified sires PD is +289 lb. In the high herds, 76 percent of sires were identified and had a predicted difference for milk (PDM) of +231 lb. In the low herds only 7 percent of the sires were identified and these had a PDM of −58 lb. This low percentage of identified sires and low sire average was apparently due to low herd owners using home raised bulls extensively. Low producing herds culled 15 percent annually while high herds culled 33 percent annually. The top producing herds were apparently fed a higher grain to forage ratio ration than the low group. The high producing herds averaged 1517 lb more concentrates per year than the low herds. Forage feeding averaged 2.2 lb/cwt body weight for high producers compared to 2.5 lb/cwt for the low group. High producing herds had 86 percent days in milk compared to 77 percent days in milk for low producers.

Introduction

Dairymen continue to ask, "What is the difference between the high producing herd and mine?" Factors listed on the various summaries available

through the DHI Record Program provide reliable information to answer this question. USDA research (1968) listed pounds of grain fed, percent days in milk and milk price as the primary factors effecting income over feed cost from a dairy herd.

A periodic study of DHI record factors of Oklahoma herds will aid in preparing extension lessons. The objective of this study was to develop apparent profiles of high and low producing herds using all factors available in DHI records. These profiles would be useful in extension education programs in assisting dairymen in achieving more efficient management.

Materials and Methods

Official DHI and DHIR Holstein herds in Oklahoma were ranked by pounds of milk listed on the Rolling Herd Average (RHA) for testing year May 1, 1976 to April 30, 1977. The top twenty herds and low twenty herds having larger than twenty-five cow herd size were selected for this study. The September 1977 Herd Ranking and Summary (HR&S) for the same herds were used for calving interval and genetic data. Herd average data on a per cow basis was then weighted for herd size to obtain a true weighted average for approximately 1600 cows of each group.

All factors that routinely appear on the dairymen's monthly DHI Herd Summary and those of the HR&S which measure intervals and genetic values were summarized for this study and are listed in Table 1.

Results and Discussion

Table 1 lists the average of twenty-two DHI management factors weighted for herd size, of the twenty high and low producing Holstein herds. Weighted averages and the range are listed for each factor. There was very little difference in herd size between the two groups. The high producing herds averaged 83 cows ranging from 35 to 231 cows. The low producing herds averaged 89 cows and ranged from 39 to 236 cows. Body weight was in favor of the high producing group by 120 lb. Examination of individual herd reports revealed that the big difference in body weight was due to the size of first lactation cows.

The primary differences between the high and low producing herds were found by analyzing the breeding program factors. The breeding program is divided into two parts, reproductive efficiency and genetic quality of sires used. In both areas there were wide differences between the two groups. Sire average PD and Percent DIM are highly useful indicators of a herds breeding program. The weighted average of sire's PD for high producers was +231 lb milk and +4 lb fat while low producers had −58 lb milk, and −12 lb fat. The low twenty herds had only 7 percent of the sires identified compared to 76 percent for the high herds. The small number of identified sires in the low

Table 1. DHI management factors for high and low Holstein herds

Management factors from sample day report	High 20 Holstein Herds		Low 20 Holstein Herds	
	Weighted Average	Range	Weighted Average	Range
Herd Size	83	35 to 231	89	39 to 236
Body weight	1310	1110 to 1370	1190	1000 to 1290
RHA milk	18189	17357 to 22328	10257	8614 to 10964
RHA fat	662	594 to 770	366	321 to 430
% Days in milk	86	81 to 93	77	66 to 88
Lbs. concentrate	6243	5400 to 8100	4726	2200 to 6000
Lbs. silage	8867	0 to 14400	5897	0 to 14600
Lbs. hay	4561	0 to 10000	4400	0 to 11200
Pasture days	180	0 to 288	195	0 to 365
Forage feeding rate	2.2	1.7 to 2.7	2.5	1.8 to 3.3
Value of product	$1684	$1457 to $1966	$972	$837 to $1001
Concentrate cost	$401	$219 to $530	$283	$199 to $353
Feed cost	$732	$607 to $941	$550	$429 to $652
Inc/feed cost	$952	$758 to $1352	$421	$236 to $535
Feed cost/cwt milk	$4.23	$2.69 to $5.23	$5.38	$5.02 to 6.92
Factors from Herd Ranking & Summary				
Calving interval	392	368 to 447	387	362 to 457
Lactation length	335	301 to 392	299	272 to 370
Dry period	57	45 to 76	88	65 to 112
% cows with sire ID	76%	0 to 100%	7%	0 to 100%
Sire avg. P.D. milk	+231	−737 to +1113	−58	−2644 to +330
Sire avg. P.D. fat	+4	−29 to +40	−12	−91 to +11
% culling rate	23%	4% to 33%	15%	5% to 27%
Progress in EPA milk	+182	−110 to +474	+59	−116 to +227

herds was due to the use of home raised sires. A survey (Stout, 1976) of all Oklahoma members of AMPI indicated that the lower producing herds were using over 75 percent natural service and purchased more than 50 percent of herd replacements. These data indicate that owners of low producing herds do not consistently use artifical insemination and/or as high genetic caliber sires as do owners of high producing herds.

The range of sires average Predicted Difference (PD) is interesting. The low herd with the high sire PD was also the herd with 100 percent of sires identified but was low in many of the other management factors. The herd with −2644 sire PD was a herd with a considerable number of daughters of one home bred sire. The other sires represented in the cow herd were not identified. The herd in the high group with the −737 lb average sire PD was a small group of purchased highly selected mature cows, the oldest average age of any of the forty herds. The high herd with the high sire average PD of +1113 was also a small group of individually selected cows.

Reproductive efficiency may best be measured by Percent DIM. Percent DIM is the combined function of calving interval, lactation length and length of dry period. A 305 day lactation, 60 day dry period and 365 day calving interval would equate to 83 percent DIM. National statistics (USDA, 1968) indicate that as Percent DIM moves up or down from 83 percent, the rolling herd average changes by 140 lb of milk for each one percent change. When calving intervals are long or when lactations average shorter than normal, the Percent DIM will usually be less than 83 percent. It is recommended that the Percent DIM on the rolling herd average by 84-87 percent. The higher Percent DIM is desired due to two year olds entering the herd without dry days and older cows being sold during lactation. The high producing herds averaged 86 percent DIM compared to 77 percent DIM for the low producing herds, a difference of 9 percent. Calving interval was 392 days for high herds compared to 387 days for the low herds. However, the high herds milked 335 days and dry only 57 days compared to 229 days lactation and 88 days dry for the low group.

Feed data listed in DHI records is an estimation with few dairymen as concerned about accuracy as we would like. Also each farm's feeding program is different based on their forage availability. Considering the information available and average composition for protein and energy, the high producing herds are apparently receiving a much higher level of nutrition. Pounds of milk returned per pound of grain fed is in favor of high producers 2.9 to 2.1. The rate of forage feeding of 2.2 and 2.5 lb/cwt body weight for the high and low groups respectively, indicate that a higher grain to forage ratio is characteristic in high producing herds. High producing herds received over 1500 lb more concentrates per cow than low producing herds. The percentage of total protein and energy requirements for body maintenance and milk production apparently supplied by feeds listed would favor the high producing group. The top twenty herds were fed at approximately 102 percent of calculated needs of both protein and energy, whereas the low producers were fed at approximately 86 percent of protein needs and 108 percent of energy requirements.

The difficulty of comparing feed cost is knowing whether all dairymen use the same basis for determining the value of home grown forages and home mixed grain rations. We suggest that the regular purchasing price be recorded for home grown feeds used. We would have to realize that some fallacy in reported value for these feeds would be in the summaries for both the high and low producing groups; however, the weighted average of $952 compared to $421 income over feed cost respectively for high and low groups clearly indicates that the higher production is profitable.

Excellent management is required to maintain high milk production. Attention must be given to sire selection to continually improve the genetic base of herd replacements. Then the feeding and reproductive efficiency must combine to provide the proper environment for the genetic superior animals to express themselves. DHI management factors of the top twenty Holstein herds

indicate that those herd owners are providing excellent management. The extra $521 income over feed cost would also suggest that owners of high producing herds were compensated for their efforts.

Literature Cited

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Chemical Preservation of Alfalfa Hay for Lactating Dairy Cows

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Story in Brief

At times it is extremely difficult to harvest alfalfa hay with the high quality desired for high producing dairy cows. In this trial, use of a chemical hay preservative was evaluated as a management technique for minimizing problems encountered in harvesting high quality hay.

Alfalfa hay from a common field was baled as follows: a) dry, at 19 percent moisture, b) wet, at 29 percent moisture, and c) wet, at 28 percent moisture with addition of chemical preservative. The product consisting of 70 percent propionic acid and 30 percent formalin was applied at the rate of 1.0 percent of hay baled.

Heating and molding during storage were prevented by the preservative. *In vitro* digestibility of dry matter in dry baled and treated hay was higher than in hay baled wet with no preservative. In a feeding trial with lactating Holstein cows, treated hay supported milk production equal to that by cows fed dry baled hay. Digestibility of total ration components was similar for dry baled hay and hay treated with chemical preservative. Thus, the commercial hay preservative used in this trial was effective in maintaining hay quality under the conditions described.