Dairy Production and Management Records

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Proper management is the key to success in any enterprise, and the dairy business is no exception. Each successful producer must have records which are accurate and reliable to make sound management decisions. Records of identification and pedigree, production, feed, reproduction, health and costs help producers (1) cull the least profitable cows, (2) feed for most efficient production, (3) make precise management decisions for greatest returns and (4) select animals with the greatest genetic producing ability for herd replacements and for breeding a better herd for the future.

Methods for maintaining records vary with farms and the individuals who keep them. Good systems vary. Some include computers, while others include card files, tags, color coding and wheels. Computers are more prevalent on farms with more than 150 cows because they allow information to be summarized more easily than doing the summary by hand. But card files or similar systems can allow for relatively efficient summaries compared to a single notebook of all information in chronological order. Most importantly, records must be kept up to date. Incomplete or incorrect records can be misleading and result in less than optimal decisions.

Dairy producers benefit from production and cost information on cows in their herd as well as from efficiency and management data. Data obtained from many herds are used in herd summaries and analyses which allow the dairy producer to better determine where strong and weak points are in the herd. Although the most common type of production record used in these types of comparisons is Dairy Herd Improvement (DHI) or Dairy Herd Improvement Association (DHIA), many types of records are available.

As herds increase in size, less individual attention can be paid to one particular cow. As a result, larger herds now require more effective tools for making decisions concerning the management of the dairy. These decisions are based on information summarized by a computer, which allows the dairy producer to have management reports available for an individual cow, a group of cows or the herd. These reports then allow the quality and effectiveness of management to be improved by using information in a condensed form (Tables 1 and 2).

Table 1. Report of Reasons for Culling for Last 12 Months

	Percent[1]
Udder	1.4
Injury	7.0
Disease	4.0
Low production	7.5
Mastitis	12.0
Reproductive problems	16.5
Feet and legs	3.5
Died	20.2
Sold for dairy replacement	6.5
Other	21.5

[1]Total percent culled averages 27 to 33 percent.

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Table 2. List of Cows to Calve in Next 14 Days

Cow Name	Due Date	Lactation No.	Service Sire
132	10/7/09	2	Ramos
467	10/10/09	4	Justice
282	10/12/09	2	Mac
459	10/15/09	4	Bolton

Not all dairy herds will require computerized records, but these systems include custom management reports that can be tailored for the needs of a particular dairy farm. These management reports should cover all areas of herd management, including production, nutrition, reproduction, inventory, replacements, financial and health. Everyone manages differently, so these reports should have the ability to meet the specific needs of any dairy. Printing the reports should be easy where a single command gives the producer a complete, up-to-date report. The reports should be easily understood and could serve as a temporary or a permanent record.

Major Management Areas

Milk production records, including pounds of milk, fat percentage, protein percentage and somatic cell count, are integral parts of any dairy management record system for groups of cows and are best for individual cows. Also, feed records should be kept for each cow or group of cows and should include feed inventory records.

Reproductive records should include calving, breeding and fertility data as well as date of birth, date of all estruses or heats, breeding dates including the sire used and results of veterinary checks including pregnancy checks.

Health records should include all vaccinations, all diseases the animal has had and the somatic cell count data from the analysis of the monthly milk records. Reasons for culling animals and problems on a specific day should also be included in the records.

Financial records should total costs of production including costs of equipment, land and facilities. Records should include the price of the milk per hundredweight and allow manipulation of the data to calculate costs per hundredweight of milk.

Financial records are now being used extensively in production testing programs as well as in programs for consultants and veterinarians. These summaries of financial records can provide a comparison which indicates where herds may best make improvements as compared to similar herds across the state. Also, records now allow dairy producers to project what an individual cow may produce in the remainder of her lactation, and a financial analysis can indicate the financial results of culling her. In turn, this may indicate whether it is more profitable for the manager to cull her, keep her or cull another cow. In other cases, these records may project his cash flow for the next month, year or other period of time using reasonably valid assumptions of future prices and yields.

Table 3. DairyMetrics for Holstein Herds in Arkansas, May 2008

Trait	Number of Herds	Average	Std. Dev.	Minimum	Maximum
General					
Number of Cows – All Lactation	21	145.9	98.6	40	376
Number of Cows – 1st Lactation	21	51.2	47.9	2	161
Number of Cows – 2nd Lactation	21	38.4	27.4	9	115
Number of Cows – 3rd Lactation	21	56.2	28.9	19	112
Number of Cows – Year Change, %	21	1.4	14.8	-27	27
In Milk on Test Day, %	21	89.9	5.9	78	100
Days in Milk	21	196.8	21.1	168	255
Age of 1st Lactation Cows, m	21	27.8	2.7	23	34
Cows Left Herd – All Lactation, %	21	35	15	17	74
Cows Left Herd – 1st Lactation, %	21	27.2	29.4	2	108
Cows Left Herd – 2nd Lactation, %	21	22.2	22.6	1	81
Cows Left Herd – 3rd Lactation, %	21	33.4	18.3	5	78
Cows Died – All Lactation, %	21	7.4	4.4	3	18
Cows Died – 1st Lactation, %	21	4.4	4.2	0	14
Cows Died – 2nd Lactation, %	21	5.5	4.6	0	17
Cows Died – 3rd Lactation, %	21	12.4	9.7	2	37
Cows Left Herd for Reproduction – All Lactation, %	21	5.1	4.9	0	18
Cows Left Herd for Reproduction – 1st Lactation, %	21	4	5	0	16
Cows Left Herd for Reproduction – 2nd Lactation, %	21	4.8	5.4	0	17
Cows Left Herd for Reproduction – 3rd Lactation, %	21	6.2	6.7	0	26
Daily Value Produced – Milk Cows, $	21	11.7	2.3	7.8	16.6
Daily Feed Costs – Milk Cows, $	16	4.8	1.2	2.5	7.3
Daily Feed Costs/Cwt Milk, $	16	8	2.1	5.3	12.3
Daily Income Minus Feed Costs – Milk Cows, $	16	7	1.9	3.7	11.5
Milk Blend Price, $	21	19.6	2.4	17.5	26

Trait	Number of Herds	Average	Std. Dev.	Minimum	Maximum
Production					
Rolling Milk, lb	21	16,617.3	4,409.6	10,076	24,079
Rolling Milk – Year Change, lb	21	-790.1	1,091.6	-2,402.5	1,418
Rolling Fat, lb	21	586.7	147.5	379	878
Rolling Protein, lb	21	513.7	134.2	292	739
Daily Milk 1-40 D – 1st Lactation, lb	17	52.6	9.6	31	70
Daily Milk 1-40 D – 2nd Lactation, lb	16	77.4	18.8	39	104
Daily Milk 1-40 D – 3rd+ Lactation, lb	14	75.1	19	45	103
Daily Milk – Milk Cows, lb	21	60.4	10.7	45.3	77.8
Daily Milk – All Cows, lb	21	54.5	11.6	39.3	77.8
Daily Fat, %	21	3.4	0.3	3.1	3.9
Daily Protein, %	21	3.1	0.1	2.9	3.4
Summit Milk – 1st Lactation, lb	21	56.8	12.8	34	80
Summit Milk – 2nd Lactation, lb	21	71.2	16	41	94
Summit Milk – 3rd+ Lactation, lb	21	77.2	16.7	52	106
Peak Milk – 1st Lactation, lb	20	60.8	14.4	33	86
Peak Milk – 2nd Lactation, lb	21	74.9	16.7	42	103
Peak Milk – 3rd+ Lactation, lb	21	79.8	17.8	51	108
Proj 305 Day ME Milk, lb	21	19,109.8	4,009.1	12,578	25,664
Standardized 150 Day Milk, lb	21	64.1	11.1	46.1	80.6
Fat:Prot 1-40 D – 1st Lactation	17	1.1	0.1	0.8	1.2
Fat:Prot 1-40 D – 2nd Lactation	16	1.1	0.2	0.8	1.7
Fat:Prot 1-40 D – 3rd+ Lactation	14	1.2	0.2	0.8	1.4
Fat:Prot 41-100 D – 1st Lactation	18	1.1	0.2	0.7	1.3
Fat:Prot 41-100 D – 2nd Lactation	19	1.1	0.1	0.8	1.4
Fat:Prot 41-100 D – 3rd+ Lactation	21	1.2	0.2	0.9	1.6
Fat:Prot 100-199 D – 1st Lactation	16	1.1	0.1	1	1.2
Fat:Prot 100-199 D – 2nd Lactation	21	1.1	0.2	0.7	1.5
Fat:Prot 100-199 D – 3rd+ Lactation	21	1.1	0.1	0.8	1.3
Fat:Prot 200-305 D – 1st Lactation	20	1.1	0.1	0.9	1.4
Fat:Prot 200-305 D – 2nd Lactation	21	1.1	0.1	0.9	1.3
Fat:Prot 200-305 D – 3rd+ Lactation	20	1.1	0.1	1	1.3
Fat % 1-40 D – 1st Lactation	17	3.4	0.3	2.9	3.9
Fat % 1-40 D – 2nd Lactation	16	3.4	0.6	2.4	4.4
Fat % 1-40 D – 3rd+ Lactation	14	3.7	0.8	2.6	5
Fat % 41-100 D – 1st Lactation	18	3.1	0.5	2.1	3.9
Fat % 41-100 D – 2nd Lactation	19	3.1	0.4	2.5	4
Fat % 41-100 D – 3rd+ Lactation	21	3.3	0.4	2.6	4.2
Fat % 100-199 D – 1st Lactation	16	3.4	0.2	3.1	3.8
Fat % 100-199 D – 2nd Lactation	21	3.4	0.5	2.3	4.6
Fat % 100-199 D – 3rd+ Lactation	21	3.3	0.5	2.3	4
Fat % 200-305 D – 1st Lactation	20	3.7	0.4	3	4.7
Fat % 200-305 D – 2nd Lactation	21	3.5	0.4	2.7	4.1
Fat % 200-305 D – 3rd+ Lactation	20	3.5	0.3	2.9	3.9
Udder Health					
Somatic Cell Count (X1000) Actual	21	353.4	95.4	188	538
Somatic Cell Score	21	3.4	0.5	2.2	4.3
Somatic Cell Score for 1st Lactation Cows	21	2.9	0.6	1.6	4.1
Somatic Cell Score for 2nd Lactation Cows	21	3.3	0.6	2.3	4.5
Somatic Cell Score for 3rd+ Lactation Cows	21	3.7	0.5	2.4	4.8
Somatic Cell Score for Cows in Milk 41-99 Days	21	2.8	0.9	1.3	4.4
Somatic Cell Score for Cows in Milk 100-199 D	21	3.1	0.6	1.9	4.2
Somatic Cell Score for Cows in Milk 200-305 D	21	3.6	0.6	2	4.8
Somatic Cell Score for Cows in Milk 306+ D	21	3.9	0.6	2.8	5.2
Cows (Somatic Cell Score of 0-3), %	21	55.8	10.1	35	78
Cows (< 41D with Somatic Cell Score > 4), %	20	38.7	24.9	0	100
1st Lactation (Somatic Cell Score of 0-3), %	21	66	14.9	40	100
2nd Lactation (Somatic Cell Score of 0-3), %	21	57.2	16.1	13	81
3rd Lactation (Somatic Cell Score of 0-3), %	21	49.6	12.3	26	74
Cows Culled for Mastitis, %	21	3.1	3.3	0	9
Value Produced Lost From Somatic Cell Count, %	21	3.1	1.6	0	6

Trait	Number of Herds	Average	Std. Dev.	Minimum	Maximum
Reproduction					
Pregnancy Rate – Current, %	18	18.1	7.8	6	34
Days Open – Proj Min – Total Herd	21	180.1	37.8	134	280
Proj Calving Interval, m	21	15.1	1.2	13.6	18.4
Actual Calving Interval, m	21	14.6	1.2	12.6	17.5
Cows Calving – Current Test, %	21	6.6	3.8	0	14
Births 4+ Calving Diff – 1st Lactation, %	14	5.1	6.3	0	21
Days Open – Proj Min – 1st Lactation	21	200.6	67.1	117	409
Days Open – Proj Min – 2nd Lactation	21	177	51.6	98	329
Days Open – Proj Min – 3rd+ Lactation	21	173.8	38.6	118	249
Voluntary Waiting Period (VWP)	21	50.5	7.7	40	60
Days to 1st Service – (% herd < VWP)	16	11.6	11	1	38
Days to 1st Service – (% VWP to 100D)	19	55.5	21.5	23	92
Days to 1st Service – (% herd > 100D)	19	34.8	18.4	4	71
Days to 1st Service – Total Herd	19	102.1	23.2	71	160
Days to 1st Service (% herd < 100D) – 1st Lactation	18	60.7	24.1	16	96
Days to 1st Service (% herd < 100D) – 2nd Lactation	19	64.1	22.6	22	94
Days to 1st Service (% herd < 100D) – 3rd+ Lactation	19	67.7	14.7	48	96
Con Rate for Past 12M – 1st Service	21	45.3	24.1	0	95
Con Rate for Past 12M – 2nd Service	21	46.5	23.8	0	100
Con Rate for Past 12M – 3rd+ Service	21	49	27.3	0	100
Service per Pregnancy – All Lactation	19	2.8	1	1.3	4.8
Service per Pregnancy – 1st Lactation	19	3	1.2	1.4	6.1
Service per Pregnancy – 2nd Lactation	19	2.7	1.1	1.1	5
Service per Pregnancy – 3rd+ Lactation	19	2.9	1.2	1.3	5.9
Heats Observed for Year, %	19	27.9	15.5	2	53
Heats Observed – Last Test, %	18	30.4	20.1	1	63
Abortions in Past Year, no.	21	0.1	0.4	0	2
Calvings in Past Year, no.	21	140.1	89.9	39	357
Dry Less Than 40 Days, %	19	13.9	8.2	3	28
Dry More Than 70 Days, %	21	38.3	14.5	9	55
Genetics					
%ile Rank of Proven AI Bulls	21	40.7	27.1	0	77
%ile Rank of Young AI Bulls	21	28.5	33.6	0	88
Herd Bred to Proven AI Bulls, %	17	57.5	30	0.6	100
Herd Bred to Young AI Bulls, %	21	9.7	13.2	0	36
Herd Bred to Non-AI Bulls, %	21	34.3	37.1	0	100
Net Merit $ for 1st Lactation Cows	16	110	94	10	381
Net Merit $ for All Cows	18	57.6	50.7	-38	137
Net Merit $ for Heifer	18	74.8	72.2	-64	208
Heifers IDd by Sire, %	19	59.7	33.2	0	100
Cows IDd by Sire, %	21	57.7	40	0	100
Replacement/Rate (# heifer/# cows) * 100	21	81.3	46.1	0	167
Replacement/Rate (# heifer 0-12 Mo/# cows) * 100	21	33.7	17.9	0	63
Replacement/Rate (# heifer 13+ Mo/# cows) * 100	21	47.2	32.2	0	135

Herd Summaries and Comparisons

The dairy producer should choose a software program that best suits his/her needs. The program should provide analyses of milk production, feed, reproduction, health and financial data and allow for comparisons among individual cows within the herd, groups of cows within the herd (Table 3) and a comparison to other herds in the region and across the country. The data should allow dairy producers to determine how they compare to other dairy producers so they can determine the strong and weak points of their operation. This comparison allows dairy producers to determine the areas they can most improve in their herd management.

The collection of raw data should also allow dairy producers to compute management reports which will provide herd summaries such as those listed in Tables 2 and 4. These allow dairy producers to manage their herds more efficiently so they can spend less time with their records and manage only animals needing attention on a particular day.

Table 4. List of Cows Not Confirmed Pregnant Greater Than 50 Days Open

Cow Name	Fresh Date	Days to 1st Bred	Date Bred	Days Open	Times Bred
Dixie	12/28/08	90	5/24/09	280	5
1607	12/29/08	109	4/17/09	279	1
32	1/20/09	74	9/29/09	257	6
29	3/01/09	102	8/11/09	217	3
Brandy	4/01/09	56	9/28/09	186	4
Benny	4/21/09	51	8/16/09	166	3
Blackie	6/29/09	56	11/10/09	97	3
Jo	7/05/09	86	11/21/09	91	3
Rhoda	7/26/09	57	11/14/09	70	2
Nita	8/15/09			50	

Records also should provide dairy producers with sufficient financial and management information so they can determine which cows are the least profitable and if they should be culled from the herd or if it would be more profitable to maintain them in the herd at one particular time (Table 5).

Individual Animal Records

By storing lifetime health information on each animal in the herd, immediate access to health history is available. For example, all health activities and treatments of an individual animal should be available on a management report if needed. Also, it is important to be able to retrieve a management report listing all animals which have had a particular disease (i.e., acute mastitis) or a management practice (i.e., dehorning) so producers can see if a particular disease or condition exists in their herds.

Interfacing With Automatic Data Retrieval Systems

Dairy records, especially in larger herds, are best suited for interface with computer-linked data retrieval systems so the dairy manager does not have to spend large amounts of time following each individual cow or group of cows. Data on the computer should be easily transmitted to a mainframe computer or used with a personal computer on the farm. The producer may use information from the management summaries to determine if animals are producing milk efficiently.

The computer software purchased by the dairy producer should consolidate various kinds of information into a single report quickly and accurately. These reports should be compared to other reports on a weekly, monthly or yearly basis. Examples of these reports are shown in Table 5.

A critical part of any successful computer system is ongoing service and support. In selecting a dairy management record-keeping system, a producer should select a system that has professionals who

Table 5. Effects of Herd Traits on Income-Over-Feed Costs in Arkansas Holstein Herds

Trait for Herds	Trait Average	RHA[1] Milk (lb)	Daily IOF[2] ($)	Calving Interval (mo)	% Cows Left Herd	SCC[3]/1000
Holstein	---	17,568	5.33	14.3	33	445
NonHolstein	---	15,501	4.53	15.7	36	530
Herds with < 15 month calving interval	14.9	18.930	5.13	13.4	38	391
Herds with > 15 month calving interval	16.2	16,595	5.49	14.7	30	487
Herds < 16,000 lb RHA milk	13,579	13,579	4.85	14.4	31	618
Herds > 16,000 lb RHA milk	19,961	19,961	5.62	14.4	35	366
Herds < 44% conception rate	29	18,561	5.86	14.4	36	449
Herds > 44% conception rate	61	15,922	4.86	14.3	28	438
Herds < $5 IOF	4.31	17,195	4.31	14.4	37	474
Herds > $5 IOF	6.08	17,469	6.08	14.4	28	397
Herds < 300,000 SCC	225	20,909	5.66	14.2	35	225
Herds > 300,000 SCC	549	16,192	5.15	14.4	33	549
Herds < $49 net merit for cows	2	16,756	5.24	14.2	33	426
Herds > $49 net merit for cows	77	19,310	5.57	14.8	34	420
Herds < 39% heats reported	20	16,666	5.19	14.3	31	443
Herds > 39% heats reported	47	19,506	5.51	14.5	36	409
Herds < 3.5% fat test	3.2	17,140	5.54	14.7	27	505
Herds > 3.5% fat test	3.8	17,930	5.16	14.0	39	398
Herds < 49 replacements/100 cows	10	15,982	5.14	13.8	32	463
Herds > 49 replacements/100 cows	93	18,244	5.53	14.5	33	414

[1]Rolling herd average.
[2]Income-over-feed costs (milk$ minus feed$).
[3]Somatic cell counts.

understand the computers and are willing to provide backup support to the record-keeping system. It is also important to select a system which has professionals who will train the producer to enter daily events such as calving, cows bred, diseases, etc., and allow the producer to tailor the custom reports to the specific needs of the dairy. By the end of the training session, the producer should feel confident using the records and know that trained professionals are available to assist with problems.

Use of Graphics in the Management System

Report of Conception Rates by Month in Lactating Cows Bred Artificially
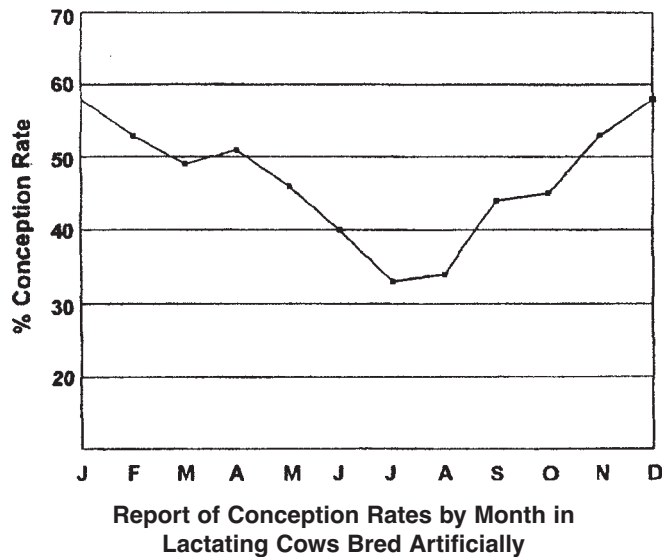
All computers can store, list and print data. However, many software programs now include graphic displays for ease in evaluating the information and to assist in decision making. You may obtain graphs of individual cows, groups of animals within the herd or the entire herd. These graphs are not essential in a record-keeping system but are sometimes much easier to understand, evaluate and use than data tables. For example, you can immediately see that in the graph above conception rates are lower in the summer months than winter months. Breeding and health information displayed graphically quickly shows if the reproductive performance of a group of cows or an individual cow is within the goals established by the dairy producer.

Graphs may also be used to indicate health problems. For example, graphing the incidence of retained placentas during the year may indicate one particular time of the year when a greater percentage of retained placentas occurs in the group or that the incidence has recently changed.

Timelines of an individual cow may show her calving date, her first heat date and her breeding dates, which may indicate if there is a problem in terms of her conceiving.

Dairy Herd Improvement Records

Dairy Herd Improvement (DHI) records provide information for producers to use in improving the production efficiency of their herds. DHI records are computerized and may be maintained on a desktop personal computer (PC), on a PC with a link to a mainframe or on a mainframe only where the information is collected in written form on the farm and mailed to a location for entry into the mainframe computer. For many dairy producers who do not have a computer, DHI records offer a similar record-keeping system without the investment of dollars in the computer system and time in learning to use it.

Several management reports may be defined by dairy producers with DHI records and used in their management program. These reports may be adapted for various parameters that the dairy producer considers important in herd management in an identical manner to those options described earlier (Tables 1-5). Reports are available for culling guides, management lists of practices to be performed at various ages or times postpartum, heifer management reports, lactation graphs and calving records, herd health records, inventory for animals, feed and semen, somatic cell information and a herd analysis package which compares either individual animals or the herd to similar animals or herds in the region.

Producers in Arkansas on the DHI program are associated with either Heart of America DHIA, Manhattan, Kansas (1-800-398-2634), or Mid-South DHIA, Springfield, Missouri (1-800-756-3442). Additional information concerning DHIA can be obtained by contacting your local county Extension agent.