

# State and national standardized lactation averages by breed for cows calving in 2013

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Lactation yields are often standardized to provide a reasonably equitable comparison of dairy animals having different lactation characteristics (e.g., calving age, days milked, milking frequency, etc.). This annual report provides averages of standardized yield coming from herds enrolled in Dairy Herd Improvement (DHI). The averages are summarized for cows and heifers that calved during 2013 for the nation by breed with data used in calculation of national genetic evaluations.

Breed yields are different between this report and the [herd-average report](#). This report summarizes standardized lactation yield (yield adjusted to 305 days, twice daily milking, for month of calving, and to a mature-age basis). In contrast, the herd-average report is determined from actual herd yields. Herd-averages reported are not restricted to records usable for national genetic evaluations. The herd-averages are impacted by lactation length and dry period. Relative yields among breeds differ between the two reports because of large breed differences in the percentage of usable records and age-parity factors. The herd-average report may provide a more accurate comparison of actual breed productivity.

Numbers of records and national averages for milk and component yields and component percentages are in Table 8A–8F by breed for selected years. Holsteins and Jerseys had more lactations (Table 8A) in 2013 than in 2012. Holstein calvings were up 0.8%; Jersey calvings increased by 10.8%. Compared with 2012, milk yield (Table 8B) increased for Ayrshires by 0.2%, Holsteins by 1.2%, and Jerseys by 2.2%. Fat percentage (Table 8C) showed increases from 2012, rising from .02 to .06 in all breeds. Fat yield (Table 8D) in 2013 increased by 4 pounds in Brown Swiss, 5 pounds in Guernsey, 9 pounds in Ayrshires, 16 pounds in Holstein, and 25 pounds in Jerseys. Protein percentage (Table 8E) increased by .01 or .02 percentage units for the breeds. Examining milk components across the last decade clearly reveals success in increasing both fat and protein percentages. Average protein yield (Table 8F) increased by 1 pound for Ayrshires and Brown Swiss, 13 pounds for Holsteins, and 19 pounds for Jersey since 2012.

**Tables 8A–8F. Summary of National Standardized Lactation Averages for Cows With Records Used in National Genetic Evaluations**

	<b>Table 8A. Records (no.)</b>
	<b>Calving year</b>

Breed	1980	1990	2000	2005	2010	2011	2012	2013
Ayrshire	13,465	11,576	7,035	5,989	6,045	5,977	5,727	5,559
Brown Swiss	17,236	17,717	15,704	16,029	18,069	18,243	18,379	17,997
Guernsey	38,364	25,805	9,406	7,248	6,144	6,076	5,807	5,532
Holstein	1,109,758	1,720,127	1,624,058	1,650,001	2,020,821	2,103,095	2,157,122	2,175,009
Jersey	63,305	99,416	106,837	128,236	182,137	209,844	229,075	253,850

**Table 8B. Milk (lb)**

Calving year								
Breed	1980	1990	2000	2005	2010	2011	2012	2013
Ayrshire	13,144	14,799	17,389	18,303	18,275	18,295	18,440	18,478
Brown Swiss	14,172	16,250	20,300	21,405	21,857	21,996	22,214	22,130
Guernsey	11,666	13,297	16,043	17,154	17,351	17,349	17,578	17,429
Holstein	17,566	20,178	24,517	25,644	25,757	25,987	26,312	26,639
Jersey	11,437	13,407	17,038	18,087	18,565	19,004	19,359	19,793

**Table 8C. Fat (%)**

Calving year								
Breed	1980	1990	2000	2005	2010	2011	2012	2013
Ayrshire	3.88	3.85	3.86	3.82	3.85	3.84	3.85	3.90
Brown Swiss	4.06	3.98	4.01	4.00	3.97	3.97	4.02	4.06
Guernsey	4.60	4.49	4.46	4.42	4.43	4.41	4.42	4.48
Holstein	3.61	3.61	3.64	3.65	3.65	3.67	3.71	3.73
Jersey	4.84	4.73	4.60	4.62	4.69	4.70	4.75	4.77

**Table 8D. Fat (lb)**

Calving year								
Breed	1980	1990	2000	2005	2010	2011	2012	2013
Ayrshire	510	570	671	700	704	703	711	720
Brown Swiss	576	646	814	856	867	874	894	898
Guernsey	536	598	716	758	769	766	776	781
Holstein	633	729	893	936	941	955	977	993

	Table 8D. Fat (lb)							
	Calving year							
Breed	1980	1990	2000	2005	2010	2011	2012	2013
Jersey	553	634	784	835	870	893	919	944
	Table 8E. Protein (%)							
	Calving year							
Breed	1980	1990	2000	2005	2010	2011	2012	2013
Ayrshire		3.16	3.13	3.12	3.14	3.14	3.14	3.15
Brown Swiss		3.33	3.31	3.30	3.29	3.31	3.32	3.34
Guernsey		3.30	3.31	3.27	3.26	3.27	3.27	3.29
Holstein		2.94	3.00	3.01	3.03	3.04	3.05	3.06
Jersey		3.60	3.58	3.57	3.60	3.62	3.61	3.63
	Table 8F. Protein (lb)							
	Calving year							
Breed	1980	1990	2000	2005	2010	2011	2012	2013
Ayrshire		468	545	571	573	574	580	581
Brown Swiss		541	672	707	719	729	738	739
Guernsey		439	531	561	565	567	575	573
Holstein		592	733	772	781	791	803	816
Jersey		482	610	646	669	688	699	718

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## USDA Summary of 2014 Herd Averages

### DHI Report K-3

This report had no text in the original publication. Nevertheless, a close examination will show some extremely promising trends for the Jerseys compared to all other breeds. This is reflected in the mixed herd summary as well. Herds are labeled by breed when over 85% of the

cows are from a single breed. The growth in mixed herds to a large extent is a reflection of the addition of Jersey cows to the herds of other breeds.

**Table 2. 2014 Averages of DHI cow herds by breed and test-plan category**

		Records			Milk	Fat		Protein	
Breed	Test Plan	Herds	Cow-years	Cow-years/ herd	(lb)	(%)	(lb)	(%)	(lb)
Ayrshire	All plans	68	3,903	57	14,815	3.93	582	3.21	475
Brown Swiss	All plans	162	10,944	68	18,510	4.20	777	3.44	636
Guernsey	All plans	95	4,335	46	15,533	4.65	723	3.38	524
Holstein	All plans	15,059	3,638,177	242	24,624	3.69	910	3.09	762
Jersey	All plans	938	271,849	290	17,969	4.80	863	3.65	657
Mixed	All plans	1,972	421,542	214	20,779	3.96	826	3.26	681
All breeds	All plans	18,334	4,353,277	237	23,798	3.76	898	3.13	747

**Table 2. 2013 Averages of DHI cow herds by breed and test-plan category**

		Records			Milk	Fat		Protein	
Breed	Test Plan	Herds	Cow-years	Cow-years/ herd	(lb)	(%)	(lb)	(%)	(lb)
Ayrshire	All plans	76	4,250	56	15,162	3.92	595	3.17	481
Brown Swiss	All plans	167	11,249	67	18,938	4.19	793	3.42	648
Guernsey	All plans	98	4,613	47	15,419	4.57	705	3.36	517
Holstein	All plans	15,725	3,709,885	236	24,178	3.70	897	3.08	748
Jersey	All plans	955	252,822	265	17,506	4.82	845	3.65	639
Mixed	All plans	1,963	392,400	200	20,183	3.95	800	3.24	657
All breeds	All plans	19,030	4,378,350	230	23,398	3.77	885	3.12	732

NOTE: THE ORIGINAL PUBLICATION (<https://www.cdcb.us/publish/dhi/current/reproall.html>) HAS BEEN SHORTENED FOR THIS SUMMARY.

## Reproductive status of cows in Dairy Herd Improvement programs and bred using artificial insemination (2013)

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### Background

Measures of reproductive performance are now available from most Dairy Herd Improvement (DHI) herds, whereas historically comprehensive documentation of reproductive performance was available for only days open or calving interval or from a limited number of research herds.

More selection emphasis has been placed on fertility in recent years following a steady decline in a few of the important reproductive traits. For example, days open, which is used to calculate pregnancy rate for genetic evaluations increased by 37 days for Holsteins from 1960 through 2000; around 75% of that increase in days open was attributed to genetics, a consequence of selection for higher milk yield traits.

The purpose of this 2015 annual report is to provide updates for some of the important reproductive traits. The phenotypic averages provided include both genetic and environmental differences. A few traits have shown improvement since 2003; others deteriorated for a time, but all now show some slight or considerable improvement. Considerable fluctuation across time is evident for a few of the breeds, most likely because of their limited numbers.

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**TABLE 1. 2013<sup>1</sup> REPRODUCTIVE TRAIT AVERAGES and standard errors by breed.**

Trait	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
Breedings per conception	2.0 ± 0.02	2.4 ± 0.02	2.5 ± 0.04	2.5 ± 0.00	2.2 ± 0.00
Days from calving to first breeding	91 ± 0.7	88 ± 0.4	90 ± 0.7	78 ± 0.0	74 ± 0.1
Days from calving to last breeding	126 ± 1.3	142 ± 1.1	142 ± 1.9	126 ± 0.1	110 ± 0.2
Days from first to last breeding	44 ± 1.1	66 ± 0.9	64 ± 1.7	58 ± 0.1	45 ± 0.2
Conception rate for first breedings	0.40 ± .008	0.30 ± .005	0.28 ± .009	0.33 ± .000	0.42 ± .001
Conception rate for all breedings	0.38 ± .006	0.27 ± .003	0.27 ± .005	0.31 ± .000	0.37 ± .001
Calving interval	418 ± 1.8	430 ± 1.3	433 ± 2.4	404 ± 0.1	390 ± 0.2

<sup>1</sup>Cows first bred in 2013 for all traits except calving interval; for calving interval, cows with first calving for the interval in 2012.

- The fewest **breedings per conception** was 1.9 for Milking Shorthorns (not shown); the highest number was 2.5 for Guernseys and Holsteins.
- **Days from calving to first breeding** averaged 74 for Jerseys and 78 for Holsteins; the other breed averages ranged from 84 to 91 days.
- **Days from calving to last breeding** were fewest for Jerseys (110) and highest for Brown Swiss and Guernseys (142).
- **Days from first to last breeding**, the breeding interval, were fewest for Milking Shorthorn (39) and highest for Guernseys (64) and Brown Swiss (66); Ayrshires and Jerseys averaged 44 and 45 and Holsteins averaged 58 days.
- **Conception rate for first breedings** was highest (42%) for Jerseys and lowest (28%) for Guernseys; Holsteins averaged 33%.
- Breeds had similar results for **conception rate for all breedings** as for first breedings, although slightly lower.
- **Calving interval** (days) was shortest for Jerseys (390) and longest for Guernseys (433) and Brown Swiss (430); Holsteins averaged 404.

**TABLE 2. Average numbers of BREEDINGS PER CONCEPTION by breed and year of first breeding.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ayrshire	2.1	2.0	2.1	2.1	2.0	1.9	2.0	2.0	2.0	2.0	2.0
Brown Swiss	2.5	2.4	2.5	2.6	2.6	2.5	2.4	2.5	2.4	2.4	2.4
Guernsey	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.5
Holstein	2.4	2.5	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Jersey	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.2

- Breedings per conception (or number of services/conception) increased by 0.2 after 2003 for Holsteins followed by a decrease of 0.1 in 2007. The Brown Swiss and Jersey breeds, after early increases, also have shown decreases of 0.1 or 0.2 services/conception since 2007.

**TABLE 3. Average DAYS FROM CALVING TO FIRST BREEDING by breed and breeding year.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ayrshire	98	96	94	94	94	93	92	94	95	95	91
Brown Swiss	98	93	93	92	92	92	90	89	89	87	88
Guernsey	99	94	91	89	94	95	88	90	92	93	90
Holstein	90	88	87	86	85	83	81	81	79	78	78

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Jersey	87	86	86	84	83	78	76	77	76	75	74

- Days from calving to first breeding declined by 7 to 13 days for all breeds since 2003.
  - Norman et al. (2009) indicated that much of the recent decline has resulted from the adoption of heat synchronization and timed AI.
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**TABLE 4. Average DAYS FROM CALVING TO LAST BREEDING by breed and year of first breeding.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ayrshire	143	134	134	132	134	131	132	133	135	134	126
Brown Swiss	161	150	157	160	155	152	146	147	145	141	142
Guernsey	157	148	153	150	152	149	147	145	144	145	142
Holstein	147	143	146	145	141	136	133	132	130	127	126
Jersey	130	129	132	130	126	121	116	115	113	110	110

- Days from calving to last breeding declined from 6 to 31 days for all breeds over the last 10 years.
- The Holstein average was 147 days in 2003 but had decreased to 126 days by 2013. The Jersey average declined from 130 to 110 days across the same 10 years.

**TABLE 5. Average DAYS FROM FIRST TO LAST BREEDING by breed and year of first breeding.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ayrshire	54	47	50	49	48	42	48	51	48	48	44
Brown Swiss	78	72	79	81	78	73	69	73	69	67	66
Guernsey	77	72	76	75	76	71	73	71	65	64	64
Holstein	67	67	71	70	67	63	62	62	61	59	58
Jersey	53	53	57	57	54	51	48	47	46	43	45

- Breeding intervals are lower in 2013 by 8 to 21 days than in 2003 for all breeds except Milking Shorthorn which increased by 9 days.
- Breeding intervals increased somewhat for Brown Swiss, Holsteins and Jerseys through 2005 or 2006, before declining.

**TABLE 6. Average CONCEPTION RATES FOR FIRST BREEDINGS by breed and breeding year.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ayrshire	0.35	0.38	0.37	0.36	0.37	0.39	0.38	0.36	0.37	0.37	0.40
Brown Swiss	0.29	0.28	0.27	0.27	0.28	0.27	0.29	0.29	0.29	0.30	0.30
Guernsey	0.28	0.28	0.27	0.26	0.27	0.26	0.25	0.27	0.28	0.29	0.28



Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Holstein	0.32	0.33	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.33	0.33
Jersey	0.40	0.41	0.40	0.39	0.39	0.39	0.40	0.41	0.41	0.43	0.42

- Holstein conception rates for first breedings were lowest (31%) in 2005 and 2006; the averages were highest (33%) in 2004, 2012, and 2013. Jersey conception rates were lowest at 39% in 2006 through 2008, and increased to 43% in 2012.
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**TABLE 7. Average CONCEPTION RATES FOR ALL BREEDINGS by breed and year of first breeding.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ayrshire	0.34	0.36	0.35	0.35	0.36	0.39	0.37	0.36	0.36	0.36	0.38
Brown Swiss	0.26	0.26	0.25	0.24	0.25	0.26	0.27	0.27	0.27	0.27	0.27
Guernsey	0.26	0.26	0.25	0.25	0.26	0.24	0.24	0.25	0.26	0.27	0.27
Holstein	0.30	0.31	0.29	0.29	0.30	0.30	0.31	0.30	0.30	0.31	0.31
Jersey	0.37	0.37	0.35	0.35	0.35	0.35	0.36	0.37	0.37	0.38	0.37

- The conception rates for all breedings were lowest for most breeds from 2005 to 2009.
- The conception rates for all breedings in 2013 were lower (1 to 5%) than those from first breedings in all breeds.

**TABLE 8. Average CALVING INTERVALS (days) by breed and year of first calving for the interval.**

Breed	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Ayrshire	420	421	420	421	416	418	413	418	421	418
Brown Swiss	436	443	444	451	449	448	440	433	434	430
Guernsey	434	437	440	438	440	441	435	432	436	433
Holstein	425	422	423	423	418	417	412	409	408	404
Jersey	411	412	411	411	402	400	396	393	392	390

- The long-term deterioration in calving interval described by Nieuwhof et al. (1989) and Hare et al. (2006) often continued into 2005 or 2006 but since has been reversed.
  - Holstein calving intervals averaged 425 days in 2003 but has improved to 404 days in 2012.
  - Jersey calving intervals improved from 412 days in 2004 to 390 days in 2012.
  - Brown Swiss calving intervals improved from 451 days in 2007 to 430 days in 2012.
- The positive economic impact from these reduced calving intervals cannot be overemphasized, as it reflects a valuable measure of the overall reproductive picture.
- Continued improvement of this trait is especially important to herds engaged in seasonal calving.

**TABLE 9. Numbers of RECORDS (2003–12): D) HOLSTEIN and E) JERSEY) used to calculate reproductive statistics by breed, trait, and year.**

- Information in Tables 1 through 8 was based on the numbers of records in Tables 9A through 9G. Only Table 9D and 9E are shown here, for Holsteins and Jerseys
- The number of reproduction records available through DHIA has more than doubled from 2003 to 2013 revealing that more dairy producers are taking advantage of this management option.
- Over 90% of the reproductive data each year came from the Holstein breed.
- Jersey reproductive records increased from 5% in 2003 to 8% in 2013.

**D) HOLSTEIN**

Trait	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Breedings per conception	907,811	984,889	1,031,167	1,085,600	1,359,369	1,405,459	1,443,202	1,677,827	1,743,110	1,824,036	1,856,321
Days from calving to first breeding	945,598	1,019,844	1,066,405	1,120,956	1,400,584	1,450,130	1,487,793	1,728,321	1,794,201	1,880,255	1,911,390
Days from calving to last breeding	670,905	747,785	767,559	808,853	1,028,018	1,068,155	1,100,683	1,282,792	1,328,499	1,395,234	1,422,220
Days from first to last breeding	907,811	984,889	1,031,167	1,085,600	1,359,369	1,405,459	1,443,202	1,677,827	1,743,110	1,824,036	1,856,321
Conception rate for first breedings	867,702	957,182	1,005,617	1,039,134	1,275,745	1,341,924	1,392,669	1,619,853	1,696,804	1,774,686	1,813,214
Conception rate for all breedings	2,136,274	2,391,138	2,602,477	2,750,929	3,367,284	3,558,676	3,578,268	4,163,620	4,382,606	4,524,231	4,585,970
Calving interval	478,626	534,154	537,460	590,522	728,973	747,715	795,270	896,347	934,496	972,080	980,755

**E) JERSEY**

Trait	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Breedings per conception	47,956	48,459	51,386	53,772	88,801	95,172	104,346	128,709	148,096	157,368	167,754
Days from calving to first breeding	50,246	50,567	53,453	55,797	91,979	98,432	107,398	132,683	152,782	163,275	173,019

<b>Trait</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Days from calving to last breeding	37,825	38,818	41,361	42,390	70,681	76,629	85,688	107,233	122,431	129,197	137,293
Days from first to last breeding	47,956	48,459	51,386	53,772	88,801	95,172	104,346	128,709	148,096	157,368	167,754
Conception rate for first breedings	45,065	46,828	49,661	51,735	80,983	89,887	99,002	120,426	138,559	145,316	153,057
Conception rate for all breedings	100,565	105,306	114,692	122,086	194,888	221,574	235,438	283,046	324,961	338,760	363,445
Calving interval	26,678	28,315	29,239	30,831	49,323	53,385	58,402	76,310	81,580	87,290	88,812

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## **Reasons that cows in Dairy Herd Improvement programs exit the milking herd (2014)**

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**TABLE 1.** Percentages of cows (ALL BREEDS and CROSSBREDS) completing lactations.

**TABLE 2.** Percentages of cows (ALL BREEDS and CROSSBREDS) leaving the herd except for dairy purposes.

**TABLE 7.** Percentages of HOLSTEIN cows leaving the herd except for dairy purposes.

**TABLE 8.** Percentages of JERSEY cows leaving the herd except for dairy purposes.

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For decades, dairy producers have designated reasons why cows leave the milking herds through Dairy Herd Improvement Association (DHIA) recordings. Information given when cows complete lactations or are removed from the herds place the animals into 4 destination codes (DC): remained in herd, sold for dairy, sold for slaughter/salvage, or died. Those removed from the herd are given more descriptive codes, i.e., termination codes (TC). The TC system has added codes across time and in addition choices offered to producers vary slightly between Dairy Records Processing Centers (DRPC). All DRPCs include TCs on each lactation record before forwarding to the national dairy database. The frequencies of the codes are provided annually to summarize reasons for voluntary and involuntary culling as they have considerable economic impact on producers. Rate and reason for culling also provide beneficial information for economic studies on dairy management.

Currently there are 2 TC choices for cows that remain in the herd when their lactation ends, and 10 choices (TC codes) for cows that leave the herd. For cows that stayed in the herd, the TC indicates whether their lactations ended as planned (TC=0) or ended unexpectedly as a result of an abortion (TC=8). For those cows “sold for slaughter or salvage”, 8 more TC choices provide more detailed information about why they left the herd.

Historical studies of survival of U.S. dairy cattle have been reported by Hare et al. (2006). Those studies grouped cows by calving year and tracked them until they left the herd. That method provided comprehensive information, but unfortunately the results are quite dated due to having to wait until all animals in the original group leave the herd. The alternative approach used here provided more current information by summarizing reasons cows left the herds last year. This report is based on lactations with completion dates between January 1 and December 31, 2014. Results using this method are impacted considerably by annual fluctuations in milk and feed prices.

Selected summaries are provided by parity and breed (including crossbreds). Crossbreds were categorized into 2 groups depending on the extent of heterosis: those with heterosis of >90% (CB90) and those with heterosis of 50 to 90% (CB50). The CB90 group was primarily first-generation crosses between 2 breeds (F1s) or offspring of a third-breed sire and an F1-crossbred dam of 2 other breeds; the CB50 group (not shown) was

predominately backcross offspring from an F1 dam and a sire from 1 of the F1 parent breeds. The CB60 were deleted from the table for brevity.

Table 1 shows the frequency of codes by breed disregarding parity. The percentage of cows that completed their lactations and stayed in the herd averaged 64.3% across all groups. Purebreds ranged from 62.2 to 66.8%; Jerseys were highest, Holsteins were at 63.8%. Crossbreds were higher than the purebreds with 69.4% of CB50s and 69.1% of CB90s remaining in the herds for an additional lactation. All purebred and crossbred groups had 0.3 or 0.5% of lactations ended by an abortion.

**TABLE 1. Percentages of cows (ALL BREEDS and CROSSBREDS) completing lactations by reason for termination and breed (2014).**

Destination code	Termination code	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey	CB90	All
Stayed in herd	Lactation ended normally (0)	65.6	64.6	62.2	63.8	66.8	69.1	64.3
	Lactation ended with abortion (8)	0.3	0.4	0.4	0.3	0.3	0.4	0.3
Sold for dairy (2)		7.9	5.1	5.7	3.1	6.7	2.3	3.4
Sold for slaughter	Locomotion problems (1)	1.1	1.8	1.2	1.6	0.4	1.1	1.4
	Low production (3)	3.6	4.3	2.4	6.4	5.5	6.7	6.3
	Reproduction problems (4)	5.7	6.7	6.0	5.0	3.2	3.7	4.8
	Unspecified reasons (5)	8.7	9.3	11.7	10.1	8.2	8.0	9.8
	Mastitis or high SCS (7)	2.2	2.7	2.7	4.2	3.3	3.9	4.1
	Undesirable conformation (A)		0.0	0.0	0.0	0.0	0.0	0.0
	Bad behavior (B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Died (6)		4.7	5.1	7.5	5.6	5.5	4.8	5.5
<b>Records (no.)</b>		<b>8,478</b>	<b>21,757</b>	<b>6,788</b>	<b>3,264,525</b>	<b>317,344</b>	<b>114,336</b>	<b>3,846,568</b>
<b>Herds (no.)</b>		<b>865</b>	<b>1,932</b>	<b>546</b>	<b>16,272</b>	<b>3,958</b>	<b>6,026</b>	<b>39,591</b>

<sup>1</sup>Breed is determined from individual cow records, and cow's breed is used to determine the breed for herd counts. For example, a Holstein herd with a few Jersey cows would be included in the herd count for both Holsteins and Jerseys. The total number of herds across all breeds is much higher than the actual number of herds in Dairy Herd Improvement programs.

Because of breed differences in the percentage of cows remaining in the herd, percentage sold for other reasons was often reversed. Across all groups, the cows coded as sold for dairy was 3.4%; percentage of Holsteins and Ayrshires were the extremes for purebreds at 3.1% and 7.9%,

respectively. Percentages of crossbreds sold for dairy (2.3 and 3.1%) was low. For all groups, unspecified reasons, low production, reproduction problems, and mastitis/high somatic cell score (SCS) accounted for 9.8, 6.3, 4.8, and 4.1%. Crossbreds were intermediate to Holsteins and Jerseys in percentage reported culled for reproduction, mastitis/high SCS, or locomotion. Percentages of crossbreds sold for low production was similar to the average percentage of all purebreds. The percentage of Holsteins and Jerseys that died was similar (5.6% and 5.5%). The lowest percentage of animals coded died was for Milking Shorthorn (4.0%).

Table 2 shows the percentages derived from only animals that left the herd excluding those sold for dairy purposes. This gives a clearer picture of the relative importance of the various reasons for exiting. Unfortunately, for 30.6% of all cows leaving the herd, the reason was unspecified (26.7 to 37.1%), the highest in every group. Low production or reproductive problems (depending on breed) were generally the next most frequent codes assigned for cows exiting the herd (7.7 to 23.9%). Low production was the second most frequent reason in Holsteins and crossbreds, while reproduction problems was second for Ayrshires and Brown Swiss. Death was the second most frequent reason for Guernseys (23.9%) and Jerseys (21.2%). Death and mastitis/high SCS were also important causes for departures (14.5 to 23.9% and 8.4 to 13.9%, respectively).

**TABLE 2. Percentages of cows leaving the herd except for dairy purposes by reason for termination and breed (2014).**

Termination code	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey	CB90	All
Locomotion problems (1)	4.4	5.9	3.7	4.8	1.6	3.7	4.5
Low production (3)	13.7	14.3	7.7	19.4	20.9	23.9	19.6
Reproduction problems (4)	21.8	22.4	19.1	15.3	12.1	13.0	15.1
Unspecified reasons (5)	33.3	31.2	37.1	30.6	31.6	28.4	30.6
Mastitis or high SCS (7)	8.5	8.9	8.4	12.9	12.6	13.9	12.9
Undesirable conformation (A)		0.0	0.0	0.0	0.0	0.0	0.0
Bad behavior (B)	0.2	0.1	0.1	0.1	0.0	0.0	0.1
Died (6)	18.1	17.1	23.9	17.0	21.2	17.0	17.3
<b>Records (no.)</b>	<b>2,221</b>	<b>6,516</b>	<b>2,145</b>	<b>1,073,187</b>	<b>82,874</b>	<b>32,274</b>	<b>1,231,342</b>
<b>Herds (no.)</b>	<b>533</b>	<b>1,205</b>	<b>356</b>	<b>15,685</b>	<b>2,818</b>	<b>3,949</b>	<b>30,580</b>

<sup>1</sup>Breed is determined from individual cow records, and cow's breed is used to determine the breed for herd counts. For example, a Holstein herd with a few Jersey cows would be included in the herd count for both Holsteins and Jerseys. The total number of herds across all breeds is much higher than the actual number of herds in Dairy Herd Improvement programs.

More detailed information by parity is in Table 3 for Holsteins and Table 4 for Jerseys. Clear differences across parity are evident for all groupings as each were less likely to complete the lactations as they aged. Although 73.5% of Holsteins remained in the herd when lactation 1 ended,

those percentages dropped to 66.6, 58.1, 50.4, 44.5, and 38.8 as lactations 2 through  $\geq 6$  ended. Likewise, Jerseys remaining was 71.7, 71.7, 66.0, 58.6, 53.1, and 46.5%. Other purebreds and crossbreds declined as well across lactations, from 71.9 to 48.2% and from 77.4 to 45.3%, respectively.

The probability that lactations were terminated by abortion was low (0.2 to 0.5%) for all lactation and breed groups. The frequency of recorded abortions has declined from 0.7% in 2007 and 2008 (Norman et al., 2009) to 0.3 and 0.4% in 2014. Percentage sold for dairy purposes generally decreased as lactation number increased as younger cows are preferred due to their longer expected life.

Because of the declining percentage staying in the herd and sold for dairy across parities, one would expect those leaving the herd for other reasons to increase. The trends across parity are clear and consistent for Holsteins. Holstein cows sold for mastitis/high SCS increased from 2.0 to 8.6%, for locomotion issues from 0.8 to 3.7%, for low production from 5.3 to 9.0%, and for reproductive problems from 4.1 to 6.4%. The largest increase was for those sold with reason unspecified, from 6.7 to 19.3%. The percentage of Holstein that died increased from 3.2% during lactation 1 to 11.5% during lactations  $\geq 6$ . The percentage of cows of the other breeds that left for these five reasons increased across parities as well.

**TABLE 3. Percentages of HOLSTEIN cows completing lactations by reason for termination and parity (2014).**

Destination code	Termination code	Parity 1	Parity 2	Parity 3	Parity 4	Parity 5	Parity 6+	All parities
Stayed in herd	Lactation ended normally (0)	73.5	66.6	58.1	50.4	44.5	38.8	63.8
	Lactation ended with abortion (8)	0.3	0.3	0.3	0.2	0.2	0.2	0.3
Sold for dairy (2)		4.2	2.7	2.2	2.3	2.3	2.5	3.1
Sold for slaughter	Locomotion problems (1)	0.8	1.2	2.0	2.8	3.4	3.7	1.6
	Low production (3)	5.3	6.4	6.8	7.4	8.0	9.0	6.4
	Reproduction problems (4)	4.1	5.3	5.6	5.8	5.9	6.4	5.0
	Unspecified reasons (5)	6.7	8.8	12.1	15.0	17.1	19.3	10.1
	Mastitis or high SCS (7)	2.0	3.8	5.8	7.1	8.0	8.6	4.2
	Undesirable conformation (A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Bad behavior (B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Died (6)		3.2	4.7	7.0	9.0	10.5	11.5	5.6
<b>Records (no.)</b>		<b>1,168,161</b>	<b>885,647</b>	<b>589,997</b>	<b>340,278</b>	<b>166,035</b>	<b>114,407</b>	<b>3,264,525</b>

**TABLE 4. Percentages of JERSEY cows completing lactations by reason for termination and parity (2014).**



Destination code	Termination code	Parity 1	Parity 2	Parity 3	Parity 4	Parity 5	Parity 6+	All parities
Stayed in herd	Lactation ended normally (0)	71.7	71.7	66.0	58.6	53.1	46.5	66.8
	Lactation ended with abortion (8)	0.4	0.3	0.2	0.2	0.3	0.2	0.3
Sold for dairy (2)		10.9	5.8	3.6	3.4	3.2	3.5	6.7
Sold for slaughter	Locomotion problems (1)	0.2	0.3	0.5	0.7	0.8	1.3	0.4
	Low production (3)	4.6	5.4	5.7	6.3	7.3	7.5	5.5
	Reproduction problems (4)	2.5	3.1	3.6	3.8	3.9	4.7	3.2
	Unspecified reasons (5)	4.8	6.7	9.4	12.4	15.0	18.8	8.2
	Mastitis or high SCS (7)	1.7	2.5	4.1	5.5	6.5	6.7	3.3
	Undesirable conformation (A)	0.0	0.0	0.0	0.0	0.0		0.0
	Bad behavior (B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Died (6)		3.2	4.2	6.9	9.0	10.0	10.9	5.5
<b>Records (no.)</b>		<b>114,522</b>	<b>78,525</b>	<b>54,321</b>	<b>33,467</b>	<b>19,408</b>	<b>17,101</b>	<b>317,344</b>

Tables 7–8 show the percentages of Holstein and Jersey cows, respectively, assigned to the various termination codes by lactation number for all animals that left the herd except for those sold for dairy purposes. Within all 3 purebred groups and parities, “sold for unspecified reasons” accounted for the highest percentage of exiting (28.4 to 37.8%). This could represent all reasons not designated, or simply indicate no reason was given; most likely more of the latter. Died (14.7 to 23.8%) and sold for low production (12.7 to 26.8%) were the next most common code assigned in all breeds, usually followed by sold for reproduction (9.0 to 19.6%). Mastitis/high SCS (8.9 to 15.2%) was the next most frequent reasons for leaving. Two codes added to the TC list recently were assigned infrequently, sold for locomotion (1.1 to 6.5%) and for udder problems (0.0 or 0.1%). Perhaps there were no comparable codes within some of the DRPCs that translated into these.

**TABLE 7. Percentages of HOLSTEIN cows leaving the herd except for dairy purposes by reason for termination and parity (2014).**

Termination code	Parity 1	Parity 2	Parity 3	Parity 4	Parity 5	Parity 6+	All parities
Locomotion problems (1)	3.4	4.1	5.0	6.0	6.5	6.3	4.8
Low production (3)	24.2	21.2	17.4	15.7	15.0	15.4	19.4
Reproduction problems (4)	18.4	17.6	14.1	12.4	11.2	10.9	15.3
Unspecified reasons (5)	30.3	29.0	30.7	31.8	32.3	33.0	30.6
Mastitis or high SCS (7)	8.9	12.5	14.8	15.0	15.2	14.8	12.9
Undesirable conformation (A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Termination code	Parity 1	Parity 2	Parity 3	Parity 4	Parity 5	Parity 6+	All parities
Bad behavior (B)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Died (6)	14.7	15.6	17.8	19.1	19.7	19.7	17.0
<b>Records (no.)</b>	<b>256,989</b>	<b>268,653</b>	<b>232,201</b>	<b>160,316</b>	<b>88,003</b>	<b>67,025</b>	<b>1,073,187</b>

**TABLE 8. Percentages of JERSEY cows leaving the herd except for dairy purposes by reason for termination and parity (2014).**

Termination code	Parity 1	Parity 2	Parity 3	Parity 4	Parity 5	Parity 6+	All parities
Locomotion problems (1)	1.1	1.2	1.5	2.0	1.9	2.6	1.6
Low production (3)	26.8	24.4	18.9	16.7	16.7	15.0	20.9
Reproduction problems (4)	14.7	14.0	11.9	10.1	9.0	9.4	12.1
Unspecified reasons (5)	28.4	30.1	31.2	32.8	34.5	37.8	31.6
Mastitis or high SCS (7)	10.0	11.4	13.7	14.6	14.9	13.4	12.6
Undesirable conformation (A)	0.0	0.0	0.0	0.0	0.0		0.0
Bad behavior (B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Died (6)	19.0	18.9	22.7	23.8	23.0	21.8	21.2
<b>Records (no.)</b>	<b>19,463</b>	<b>17,401</b>	<b>16,390</b>	<b>12,656</b>	<b>8,438</b>	<b>8,526</b>	<b>82,874</b>

## References

- Hare, E, H.D. Norman, and J.R. Wright. 2006. Survival rates and productive life of dairy cattle in the United States. *Journal of Dairy Science* 89:3713–3720.
- Norman, H.D., J.R. Wright, and J.E. Lombard. 2009. Reasons that cows in Dairy Herd Improvement Programs exit the herd. AIPL Research Report CULL1 (9-09).