

# OUR INDUSTRY TODAY

## Phenotypic Trends in Herdlife of Dairy Cows in the United States

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### ABSTRACT

Herdlife through eighth parity of dairy cows in the United States was studied with lactation records from 87,756 Ayrshires, 108,733 Brown Swiss, 331,497 Guernseys, 294,195 Holsteins (sample of every 15th herd), and 421,911 Jerseys that first calved after 1965. Only cows not sold for dairy purposes and from herds that provided an opportunity for subsequent calving were included. Average survival rates were about 78% to second, 57% to third, 40% to fourth, 27% to fifth, 17% to sixth, 10% to seventh, and 5% to eighth parities. Survival rates were higher for registered cows than for grades for all parities and breeds. Average number of parities was 3.3 for Ayrshires, 3.4 for Brown Swiss, 3.1 for Jerseys; average productive herdlife was 37.7, 39.4, 34.6, 38.4, and 39.4 mo. Distribution of parities within herds was similar for all breeds: 31% first lactations, 23% second, 17% third, 12% fourth, 8% fifth, 5% sixth, 3% seventh, and 1% eighth. Jerseys had upward trends for survival rate and herdlife over time; other breeds generally had downward trends. Because data from only the first eight parities

were included, average number of parities and average herdlife were underestimated slightly.

### INTRODUCTION

Since 1975, milk yield of US dairy cattle has increased rapidly (19). Part of this increase can be attributed to genetic improvement of yield ability. However, some individuals are concerned that too much emphasis on yield in selection of sires threatens genetic ability for longevity. Decreased average herdlife has been associated with increased yield in several populations (1, 11, 12) despite positive correlations between yield and various measures of longevity (3, 7, 8, 13, 14, 15, 16, 18, 24, 26, 27). This positive relationship apparently is for individual cows rather than for the population as a whole.

Concerns over longevity and its economic impact have resulted in many estimates for genetic parameters of longevity measures (4). Heritabilities for stayability were low (generally below .10) and ranged from .01 to .19 (3, 4, 12, 15, 16, 24, 27). Positive correlations with milk yield (.18 to 1.01) were found (3, 4, 7, 8, 13, 14, 15, 16, 18, 24, 27). Correlations with type traits varied for different traits (3, 4, 7, 8, 13, 18, 23).

Low heritability of stayability indicates a large environmental influence on this trait, but little is known about factors that affect it. Survival rates of US cattle seldom have been reported except for dated studies (1, 5, 12). Differences in stayability have been found between breeds (1, 12), between registered and grade cows (1, 9, 10), and among different milk recording programs (25). Bara et al. (2)

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examined relationship between disposal rates and herd size and found no effect.

Economic return of a cow depends partially on her parity (23), and distribution of parities within a herd influences farm income. Knowledge of this distribution is beneficial for economic studies on dairy farming (6, 23) and economic decision making on the farm.

The purpose of this study was to provide current information about herd life of US dairy cows, including survival rate, number of parities, productive herd life, and herd composition (distribution of parities). Trends with time and differences between registered and grade cows were examined.

#### MATERIALS AND METHODS

Data were lactation records from the master computer files of the Animal Improvement Programs Laboratory, ARS, USDA, for dairy herds enrolled in the National Cooperative Dairy Herd Improvement Program. Only records of cows that first calved in 1966 and later were included. Date of first test for a herd was the earliest calving date recorded for that herd. Last possible sample day was April 30, 1986. To avoid unusual disposals of cows when data first become available to a herd manager, only records from cows that first calved when the herd was on test for at least 365 d were included. Age at first calving was calculated by subtracting birth date from earliest calving date and restricted to 15 to 36 mo. Calving intervals were determined by comparing consecutive calving dates and restricted to 270 to 650 d. The 650-d limit was to assure that no parity was omitted. Analysis was within breed for Ayrshires, Brown Swiss, Guernseys, Holsteins, and Jerseys. To reduce computing expense, a representative sample of every 15th herd was used for Holsteins.

Differences in life expectancy between cows from herds continuing enrollment in a production record program and those from herds terminating testing are significant (1). Data subsets were created based on the opportunity of each cow to have calved for each parity. Opportunity primarily meant verifying that the herd stayed on test so that derived results would represent closely the actual circumstances within the herd. Cows with a termination code 2 (herd discontinued testing or cow was sold

for dairy purposes) in their last lactation record were considered not to have had an opportunity to have a subsequent calving. The subset for parity 2 contained data for all cows for which the herd remained on test 900 d after the cow's first calving (450 d allowed for calving interval and 450 d for completion of second lactation and submission of record to USDA). For each additional parity through eighth, another 450 d were allowed. Data for parities after eighth were not included. The subsets permitted using a higher percentage of data and more current data than would have been possible otherwise. Studies that do not impose a herd opportunity restriction underestimate length of herd life and survival rates to various degrees. Numbers of cows with an opportunity to calve for each parity are in Table 1 by breed and registry status.

Survival rates were calculated by dividing number of cows calving by number of cows with an opportunity to calve for each parity. The denominator decreased as parity increased because of requirements that herds remain on testing programs longer. Survival rate for parity 1 was assumed to be 100%. Although a percentage of yearling heifers obviously failed to calve, no information was available for this group of animals for this study. Average number of calvings was also used as a measure of herd life. Average number of calvings was sum of average survival rates (in decimal form) for each parity.

Average productive herd life was calculated by:

$$H = \left\{ \sum_{i=1}^6 [(S_{i+1})C_i + (S_i - S_{i+1})D_i] + (S_8)365.25 \right\} / 30.4375$$

where H = average productive herd life in months,  $S_i$  = survival rate to parity  $i$ ,  $C_i$  = average calving interval in days initiated by parity  $i$ , and  $D_i$  = average days in milk for parity  $i$  for cows without a subsequent lactation. Average calving intervals for parities 1 through 7 were those reported by Nieuwhof et al. (17); average lactation lengths for cows without a subsequent lactation are in Table 2. All cows with an eighth calving were assumed to have survived for 1 yr after calving. Average replacement rate was calculated by  $100/(H/12)$ .

To calculate herd composition, each year was assumed to be represented for each herd

TABLE 1. Numbers of cows with opportunity to calve by parity, registry status, and breed.

Parity	Registry status	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
1	Registered	79,184	94,778	277,127	131,177	341,072
	Grade	8572	13,955	54,370	163,018	80,839
	All cows	87,756	108,733	331,497	294,195	421,911
2	Registered	57,097	63,794	204,171	91,453	229,264
	Grade	5596	8862	40,614	107,488	54,217
	All cows	62,693	72,656	244,785	198,941	283,481
3	Registered	47,016	51,024	171,706	74,754	174,343
	Grade	4514	7041	34,387	85,127	42,251
	All cows	51,530	58,065	206,093	159,881	216,594
4	Registered	38,979	41,032	144,936	61,818	147,094
	Grade	3661	5499	29,132	67,566	36,483
	All cows	42,640	46,531	174,068	129,384	183,577
5	Registered	32,646	33,053	122,268	51,532	120,794
	Grade	2929	4318	24,508	53,855	30,435
	All cows	35,575	37,371	146,776	105,387	151,229
6	Registered	27,208	26,730	102,641	42,906	99,558
	Grade	2383	3437	20,563	43,266	25,123
	All cows	29,591	30,167	123,204	86,172	124,681
7	Registered	22,734	21,539	85,851	35,262	82,194
	Grade	1895	2695	16,907	34,020	20,682
	All cows	24,629	24,234	102,758	69,282	102,876
8	Registered	18,621	17,298	70,729	28,976	67,578
	Grade	1506	2038	13,777	26,837	16,260
	All cows	20,127	19,336	84,506	55,813	83,838

and parity. Average proportion of cows in a herd by parity was calculated by:

$$P_i = [(S_{i+1})C_i + (S_i - S_{i+1})D_i] / 30.4375 (H)$$

where  $P_i$  = proportion of cows in herd with parity  $i$  ( $i = 1, \dots, 7$ ). Because all cows with an eighth calving were assumed to have survived 1 yr after calving,  $P_8 = (S_8) / 12/H$ .

TABLE 2. Average lactation lengths of cows without a subsequent lactation by breed and parity.

Parity	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
	(d)				
1	219.7	209.9	212.2	226.0	222.2
2	223.2	224.1	223.3	236.4	228.9
3	229.5	233.0	228.4	236.8	234.8
4	230.3	235.1	229.2	236.5	233.1
5	232.6	233.8	228.0	235.1	232.4
6	229.6	233.4	227.4	230.9	230.3
7	236.6	246.7	235.6	237.3	234.9

## RESULTS AND DISCUSSION

Survival rates by breed and year of first calving are in Tables 3 through 9 for parities 2 through 8. Breed differences for survival rate were evident as SE for average survival rates were .2 for Ayrshires and Brown Swiss and .1 for the other breeds for all parities. Changes in survival rates were influenced somewhat by changes in the size of the national dairy herd, which in turn reflected national economic conditions. However, the impact of economic pressures was reduced because of the requirement for herds to be on test for at least 365 d.

Average survival rate to parity 2 (Table 3) weighted to be representative of national breed population sizes was 78% across breeds. Holsteins and Jerseys had the highest rates at 78% and were followed by Ayrshires at 77%, Brown Swiss at 76%, and Guernseys at 74%. Survival rate to parity 2 appears to have shifted over time. For annual estimates, SE ranged from .4 to .7. Percentage of Ayrshires that survived to parity 2 declined from 79 in 1966 to 74 in 1975 but has increased since. Survival to parity

2 for Guernseys has declined and remains lower than for other breeds. For Holsteins, survival rate to parity 2 remained steady across time. Across breeds, Jerseys have had the highest survival rates to parity 2 since 1978.

Average survival rate to parity 3 (Table 4) across breeds was 57% and by breed was 58% for Holsteins and Jerseys, 55% for Ayrshires and Brown Swiss, and 51% for Guernseys. Survival to parity 3 declined in the late 1960s and 1970s for Ayrshires and Brown Swiss but began to recover by the 1980s. Guernsey survival rates declined across time with no apparent recovery. Survival to parity 3 remained high for Holstein cows through 1975, whereas survival rates for Jerseys showed a fairly steady increase across time.

Average survival rates across breeds were 40% to parity 4 (Table 5), 27% to parity 5 (Table 6), 17% to parity 6 (Table 7), 10% to parity 7 (Table 8), and 5% to parity 8 (Table 9).

Breed ranking in survival shifted across parities. Holsteins had the highest average survival rate to parity 2, ranked third in survival to parity 5, and were next to lowest for survival

TABLE 3. Survival rates<sup>1</sup> to parity 2 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
(%)					
1966	79.2	78.3	75.1	79.8	77.5
1967	78.3	78.4	74.8	78.5	75.9
1968	79.1	76.4	75.2	78.9	76.2
1969	78.5	75.3	74.9	78.4	75.4
1970	76.6	76.6	74.9	80.0	76.6
1971	76.3	76.3	75.0	79.1	76.3
1972	74.8	76.0	73.6	78.4	76.3
1973	76.4	76.7	73.8	79.2	76.6
1974	76.6	76.3	72.3	79.3	77.2
1975	74.3	75.9	72.4	79.6	76.5
1976	76.2	74.6	72.2	77.6	78.6
1977	74.9	71.8	72.2	77.7	77.1
1978	77.8	74.7	72.9	77.0	78.4
1979	78.5	76.4	73.4	78.3	78.9
1980	78.7	77.1	73.1	78.6	80.1
1981	79.3	76.3	73.3	78.6	80.2
1982	77.8	75.8	72.1	77.4	79.1
1983	76.4	74.2	71.9	75.5	78.8
Average	77.2	75.9	73.7	78.2	77.8

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

TABLE 4. Survival rates<sup>1</sup> to parity 3 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
			(%)		
1966	57.7	58.1	53.7	58.4	55.2
1967	57.5	58.7	51.9	57.7	54.4
1968	54.8	55.7	51.9	57.4	55.9
1969	55.5	55.0	52.5	57.4	55.2
1970	54.2	57.4	52.6	59.0	56.9
1971	53.3	55.7	51.2	57.2	55.0
1972	52.2	57.6	51.8	58.2	57.0
1973	52.6	55.6	50.1	58.9	57.4
1974	53.2	55.5	50.6	59.5	57.8
1975	53.2	53.1	50.0	58.9	58.3
1976	53.7	51.8	49.5	56.9	58.2
1977	53.6	51.4	49.7	57.5	56.9
1978	57.8	52.8	50.6	57.4	58.4
1979	56.6	56.0	50.8	58.4	59.9
1980	56.6	57.0	49.6	56.8	61.9
1981	57.2	55.5	50.1	57.1	61.1
1982	53.8	54.7	48.2	54.6	61.8
Average	55.0	55.3	51.1	57.6	57.9

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

TABLE 5. Survival rates<sup>1</sup> to parity 4 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
			(%)		
1966	42.2	42.9	37.1	40.9	39.7
1967	40.7	43.3	35.0	41.0	40.1
1968	38.1	41.3	34.9	41.1	41.1
1969	41.0	39.2	35.4	40.3	40.2
1970	37.9	42.1	35.5	41.5	40.7
1971	38.8	42.1	35.0	41.1	41.1
1972	36.8	42.3	34.7	42.0	41.9
1973	36.4	40.7	34.2	42.9	42.6
1974	37.0	40.0	33.4	42.2	43.1
1975	36.5	37.1	33.2	41.0	42.1
1976	38.0	37.4	33.3	40.0	42.5
1977	39.3	38.3	33.4	40.9	41.4
1978	41.4	38.6	33.7	39.8	43.3
1979	39.7	40.5	32.7	40.4	43.9
1980	39.6	41.0	32.4	38.7	45.3
1981	40.3	43.0	33.3	39.3	47.1
Average	38.9	40.4	34.4	40.7	42.3

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

TABLE 6. Survival rates<sup>1</sup> to parity 5 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Survival rates (%)		
			Guernsey	Holstein	Jersey
1966	28.9	33.9	24.8	28.0	28.3
1967	27.7	31.3	23.7	28.2	29.3
1968	25.2	29.0	23.0	28.4	29.9
1969	28.4	27.7	22.8	27.0	28.5
1970	27.3	30.1	23.6	29.0	29.8
1971	27.5	32.1	21.7	28.1	29.3
1972	25.2	30.3	21.2	28.4	29.7
1973	24.6	28.6	21.1	28.1	30.6
1974	24.1	27.8	21.1	27.8	29.6
1975	24.4	25.2	21.4	26.4	29.9
1976	27.0	26.9	21.5	27.3	30.3
1977	26.9	28.7	21.4	26.5	29.8
1978	28.6	26.8	21.8	25.6	30.6
1979	25.5	28.5	20.4	25.6	30.6
1980	30.9	30.9	22.9	23.0	34.0
Average	26.5	28.9	22.2	27.2	29.8

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

by parity 8. Jerseys had the highest average survival rates for all parities after second. Ayrshire survival rates were consistently intermediate across parities. Brown Swiss were next to lowest for survival to parity 2 but then increased to next to highest by parity 5 and

retained that ranking through parity 8. Guernseys had the lowest average survival rates for all parities. Differences in survival rates are dependent on many economic factors and breeder preferences as well as on the cow's ability to produce profitably over a number of lactations.

TABLE 7. Survival rates<sup>1</sup> to parity 6 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Survival rates (%)		
			Guernsey	Holstein	Jersey
1966	19.6	23.0	15.6	17.8	19.9
1967	18.5	21.8	15.0	17.8	20.4
1968	16.5	20.9	14.7	17.8	20.9
1969	19.2	19.2	14.3	17.6	19.9
1970	18.8	20.6	14.1	18.9	20.3
1971	18.7	21.7	13.4	18.1	20.6
1972	17.5	21.6	13.1	16.9	20.4
1973	15.2	19.2	12.2	17.3	20.3
1974	16.4	18.8	12.7	17.1	20.1
1975	16.3	17.5	13.1	16.1	20.3
1976	17.8	18.1	13.2	17.0	20.7
1977	17.1	18.9	12.5	16.2	20.5
1978	18.2	18.2	12.7	15.3	20.0
Average	17.6	19.8	13.7	17.1	20.3

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

TABLE 8. Survival rates<sup>1</sup> to parity 7 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Guernsey			Jersey
			Holstein	Holstein		
			(%)			
1966	12.6	14.8	9.2	10.2	13.2	
1967	11.4	14.5	8.5	11.0	13.3	
1968	10.8	14.1	9.0	10.7	14.0	
1969	13.0	13.2	8.2	10.4	13.0	
1970	11.6	14.1	8.5	11.3	12.9	
1971	11.3	14.2	7.6	10.1	12.8	
1972	11.2	14.0	7.6	9.6	12.7	
1973	10.1	11.3	7.2	9.8	13.3	
1974	11.1	12.6	7.6	9.6	13.4	
1975	9.8	11.2	7.4	8.9	13.8	
1976	10.2	11.6	7.3	9.1	13.2	
1977	10.1	11.0	6.6	9.0	13.0	
Average	11.1	13.0	8.0	9.9	13.2	

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

Insufficient information is available to attribute breed differences in survival to these various causes, but lower survival rates for Guernseys probably are related to decline in herd and cows on milk recording during the same period (21).

Table 10 shows differences in survival rates between registered and grade cows. For all breeds and parities, survival rates were higher for registered cows than for grades. Registry

status differences in survival to parity 2 were highest for Brown Swiss (5.5%) and lowest for Holsteins (2.0%). Advantage in survival to later parities for registered cows sometimes exceeded 8% for both Brown Swiss and Jerseys. Previous research (9, 20, 22) indicated that these differences are due primarily to differences in voluntary culling. Genetic differences between registered and grade populations that would account for a discrepancy of this size are un-

TABLE 9. Survival rates<sup>1</sup> to parity 8 by breed and year of first calving.

Year	Ayrshire	Brown Swiss	Guernsey			Jersey
			Holstein	Holstein		
			(%)			
1966	6.5	7.1	4.2	4.9	7.0	
1967	6.1	7.3	3.8	5.4	7.2	
1968	5.0	6.6	3.9	5.1	7.6	
1969	6.7	6.4	3.8	4.6	6.9	
1970	5.9	6.1	3.7	4.9	6.8	
1971	5.2	7.1	3.2	4.2	6.5	
1972	6.5	6.3	3.7	4.1	6.2	
1973	5.1	5.2	3.0	4.1	6.8	
1974	5.3	5.3	3.2	4.1	7.0	
1975	5.2	5.0	3.0	3.5	6.8	
1976	4.6	5.8	2.9	4.1	7.2	
Average	5.7	6.2	3.5	4.4	6.9	

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

TABLE 10. Survival rates<sup>1</sup> by breed, registry status, and parity.

Parity	Ayrshire		Brown Swiss		Guernsey		Holstein		Jersey	
	Regis-tered	Grade	Regis-tered	Grade	Regis-tered	Grade	Regis-tered	Grade	Regis-tered	Grade
2	77.7	72.4	76.6	71.1	74.4	70.2	79.3	77.3	78.8	73.4
3	55.4	50.6	56.3	48.3	51.9	47.0	59.1	56.3	59.4	51.5
4	39.3	34.8	41.4	33.3	35.1	30.7	42.4	39.2	43.9	35.7
5	26.9	21.7	29.9	21.5	22.9	19.0	28.5	25.9	31.3	24.0
6	18.0	13.9	20.6	13.4	14.2	11.1	18.5	15.7	21.5	15.8
7	11.4	7.6	13.7	7.5	8.3	6.2	10.8	8.9	14.0	10.2
8	5.8	3.8	6.5	3.5	3.7	2.7	4.9	3.8	7.2	5.5

(%)

<sup>1</sup> Survival rate = (number of cows that calved)/(number of cows with opportunity to calve).

likely because both populations are sired primarily by the same bulls. Little justification exists for discriminatory culling practices as these two breeds both have open herdbooks.

Differences within breed generally were larger than differences between breeds. Survival of grades generally was more similar to that of registered cows for Holsteins than for other breeds, because Holstein grades had higher survival rates than did grades of other breeds for earlier parities. This result was not surprising as percentage of first lactation cows that were grades (Table 1) was much higher for Holsteins (55%) than for other breeds (10 to 19%). Grades in herds with registered and grade cows probably are culled more heavily than are cows in either all-registered or all-grade herds. The reason for this difference in culling apparently is to increase percentage of registered cows. Similar culling rates for all-registered and all-grade herds would mask large differences between registered and grade survival rates for mixed herds.

Average number of parities through parity 8 was over 3 for all breeds (Table 11). Jerseys averaged the most parities (3.5), which probably was related to an increase in the number of cows on test in recent years (21). Guernseys averaged the fewest parities (3.1). Registered cows had more parities than did grades for all breeds (from .16 more parities for Holsteins to .46 more for Brown Swiss). Average number of parities was related directly to survival rates; therefore, trends were the same as for survival rates: some decline for Ayrshires, Brown Swiss, and Guernseys and an increase for Jerseys.

Average productive herd life through parity 8 (Table 12) ranged from 34.6 mo for Guernseys to 39.4 mo for Brown Swiss and Jerseys. Registered cows had 2.4 mo longer herd life than did grades for Holsteins and from 3.4 to 6.5 mo longer for other breeds. Andrus et al. (1) found herd life expectations of 3.22 yr (38.6 mo) for registered cows and 3.06 yr (36.7) for grade cows. Similar to number of parities, shorter herd life across time was apparent for Ayrshires, Brown Swiss, and Guernseys. Average replacement rates [100/(average productive herd life/12)] were 30.5% for Brown Swiss and Jerseys, 31.2% for Holsteins, 31.8% for Ayrshires, and 34.7% for Guernseys. Although Brown Swiss had lower survival rates than did Jerseys, their calving intervals were longer (17),



TABLE 11. Average number of parities<sup>1</sup> through parity 8 by breed, year of first calving, and registry of status.

Year	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
1966	3.47	3.58	3.20	3.40	3.41
1967	3.40	3.55	3.13	3.40	3.41
1968	3.30	3.44	3.13	3.39	3.46
1969	3.42	3.36	3.12	3.36	3.39
1970	3.32	3.47	3.13	3.45	3.44
1971	3.31	3.49	3.07	3.38	3.42
1972	3.24	3.48	3.07	3.38	3.44
1973	3.20	3.37	3.02	3.40	3.48
1974	3.24	3.36	3.01	3.40	3.48
1975	3.20	3.25	3.01	3.34	3.48
1976	3.27	3.26	3.00	3.32	3.51
Average					
Registered	3.34	3.45	3.11	3.43	3.56
Grade	3.05	2.99	2.87	3.27	3.16
All cows	3.33	3.40	3.07	3.35	3.48

<sup>1</sup> Average number of parities = sum of survival rates.

which resulted in an equal length of productive life.

Registered cows had longer herd life than did grades for all breeds. This could result from differences in yield, conformation, or management but probably is due primarily to culling practices imposed by dairy producers. Jerseys had an increasing trend for herd life, and Ayr-

shires, Brown Swiss, and Guernseys had decreasing trends. Holsteins had little trend until 1973, but then average herd life began to decline. These trends were similar to those for survival rate. Although this study indicated the possibility of survival problems for some breeds, data were not complete enough to determine reasons for survival differences. No

TABLE 12. Average productive herd life through parity 8 by breed, year of first calving, and registry status.

Year	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey
			(mo)		
1966	39.3	41.7	36.1	38.7	38.5
1967	38.5	41.4	35.2	38.7	38.4
1968	37.3	39.9	35.3	38.8	39.1
1969	39.0	38.7	35.3	38.5	38.2
1970	37.6	40.3	35.4	39.7	38.9
1971	37.4	40.7	34.7	38.8	38.6
1972	36.6	40.5	34.7	38.8	39.0
1973	36.1	39.2	34.0	39.2	39.4
1974	36.4	39.1	33.9	39.0	39.6
1975	36.0	37.2	33.8	38.2	39.4
1976	36.9	37.6	33.7	38.0	39.8
Average					
Registered	37.9	40.1	35.2	39.6	40.5
Grade	33.8	33.6	31.8	37.2	35.2
All cows	37.7	39.4	34.6	38.4	39.4

TABLE 13. Average herd composition by breed and parity.

Parity	Ayrshire	Brown Swiss	(%)		
			Guernsey	Holstein	Jersey
1	30.8	29.6	33.3	30.6	29.3
2	22.9	22.3	24.0	23.5	22.4
3	16.4	16.4	16.6	17.2	16.7
4	11.5	12.0	11.1	12.0	12.1
5	7.9	8.5	7.1	7.9	8.5
6	5.1	5.8	4.3	4.9	5.7
7	3.1	3.5	2.3	2.6	3.5
8	1.8	1.9	1.2	1.4	2.1

strong relationship existed between breed-average yield and survival rate.

Average herd compositions by parity are in Table 13. Distribution of parities weighted to be representative of national breed population sizes was similar within herds for all breeds: 31% first lactation, 23% second, 17% third, 12% fourth, 8% fifth, 5% sixth, 3% seventh, and 1% eighth. Brown Swiss and Jerseys had slightly lower percentages of cows in early lactations and slightly higher percentages of cows in later lactations than did other breeds as would be expected from herd life results.

#### CONCLUSIONS

Average productive herd life of US dairy cows was about 3 yr and 2 mo. Average number of parities was 3.3 for Ayrshires, 3.4 for Brown Swiss, 3.1 for Guernseys, 3.4 for Holsteins, and 3.5 for Jerseys. However, because data only from parities 1 through 8 were included, average herd life and average number of parities were underestimated slightly, especially for breeds with higher survival rates in later parities. Therefore, Jerseys would have been expected to have longest average herd life followed by Brown Swiss if parities beyond eight had been included. Guernseys would have had the shortest average herd life. Herd life for Ayrshires and Holsteins would have been intermediate. This current information about herd life and parity composition can provide valuable information for economic studies on dairy management.

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