A study of performance of Holstein dairy cattle in Iran

N. Emam Jomeh Kashan and M.R. Salehi
Abureyhan College of Agriculture,Tehran University,P.O Box 2719
and Animal Breeding Center, P.O Box 31585-963, Karadj, Iran

Summary

The performance of Holstein dairy breed, consisted of Canadian Holstein (CH) and Holstein cattle originated from other countries (U.S.A and European countries) called Non Canadian Holstein (NCH) studied. The results are as follows:

The average milk yield(305,2X,ME) for all,CH and NCH was 6367.4 (± 31.2) , 6472.2 (± 38.2) and 6292.2 (± 46.6) Kg respectively.

The average of fat yield for all, CH and NCH animals was 204.8 (± 3.0), 205.0 (± 2.0) and 206.0 (± 1.6) Kg respectively.

The variations of milk and fat production in different years and seasons was significant. The cows delievered in winter and summer had the highest and lowest milk yields respectively.

The variation between herds was significant. The maximum and minimum of milk yield in CH herds was 7261, 5433 and for the NCH herds was 10814, 4930 Kg respectively.

Introduction

The exotic dairy breeds have been imported to Iran since 40 years ago (4,5,6). The Holstein is dominating breed and imported mostly from European countries. During years 1983-1984 some 1600 Registered heifers imported from Canada and distributed in 20 herds in order to collect their bull calves for semen production. The official record keeping (registration and milk recording) of animals have been carried out in these new herds (called Canadian Holstein = CH) and other herds which had previously been established (called Non Canadian Holstein = NCH).

The countries from which the Holstein dairy breed is imported are different with Iran from the climatological point of view (temperature, latitude, etc) and the level of management in the dairy farms. Therefore, the amount of adaptation of animals and also factors affecting their performance are needed for planning breeding programs which are investigated in this study.

Materials and Methods

In this study a dataset containing the milk records of 6731 lactations of 3543 cows (2406 CH and 1137 NCH in 46 herds from various provinces of the country was used. The data were collected by the Animal Breeding Center (Karadj) during years 1984-1991.

The weighting factors for correction of data for days of milk production, number of milking per day and age of the cows were estimated from the data and corrected for 305,2X,ME. The Harvey PC-1 computer program package (1) used for analysis of data.

Results

The average milk and fat yield of the population was 6367.4 (± 31.3) and 204.8(± 2.0) Kg respectively (table 1). The average milk and fat yield of CH cows was 6472.2 (± 38), 205 (± 2.0) and for the NCH cows was 6292.2 (± 47), 206 (± 1.6) Kg respectively and the differences was not significant (tables 2 & 3). The variation of milk and fat yield in different years and seasons of delivery of cows were significant ($P<0.01$). The average of calving interval, dry days and open days for whole population was 403.9 (± 1.8), 83.1 (± 0.7), 125.8 (± 1.8) and for CH cows was 410.2 (± 2.0), 83.7 (± 0.8), 132.2 (± 2.0) and for NCH cows was 379.4 (± 2.9), 79.6 (± 1.7) and 101.4 (± 2.9) days respectively.

Discussion

The large variation of milk yield between herds in population (5433 to 7261 in CH herds and 4930 to 10814 Kg in NCH herds) shows the genetic potential of cows for improving the average milk yield. However, by improving the management levels and reducing the environmental effects, the estimation of breeding values are more accurate and the genetic gain will be higher. The high demand for milk products (in comparison with fresh milk) and the low fat percentage in the population (table 1) justifies considering the milk fat and possibly other constituents (protein, dry metter) as selection criteria. The averages of reproduction traits are high (table 4), but the present data do not provide information to distinguish main factors causing the high values. However, the level of management can be one important factor.

References

1- Harvey,W.R.(1977)4255 Mumford Drive,Columbus, Ohio 43220 U.S.A.

2- Horst,S. and Scheffer, L. R (1992) Annual research report. University of Guelph, Ontario, Canada.

3- Ptak, E. and Scheffer, L. R (1992) Annual research report. University of Guelph, Ontario, Canada.

4- Sanjabi, M.R.(1981) Msc thesis, College of agriculture, Tarbiat Modarres University, Iran.

5- Salehi, M.R. (1993) Msc thesis, College of agriculture, Tarbiat Modarres University, Iran.

6- Sharifloo, M.R. (1990) Msc thesis, College of agriculture, Tehran University, Iran.

Table 1- The average milk, fat yield and fat percent of all population+

source of variace	observation (No)	Milk (Kg) LSM	S.E.	Fat (Kg) LSM	S.E.	Fat % LSM	S.E.
Year:		**		**		NS	
1984	137	5565	123	185	6.8	3.30	0.07
1985	315	6267	81	200	4.4	3.20	0.05
1986	823	6767	51	205	2.9	3.10	0.03
1987	882	6667	49	213	2.9	3.30	0.02
1988	1286	6413	42	212	2.3	3.30	0.02
1989	1237	6301	43	214	3.1	3.40	0.03
1990	1540	6423	42	199	3.4	3.10	0.03
1991	393	6530	70	208	5.2	3.20	0.04
Total average		6367.4	31	204.8	2.0	3.25	0.02
Season$:		***		***		***	
spring	1862	6356	53	203	2.8	3.22	0.02
summer	1955	6132	50	199	2.6	3.29	0.02
autumn	1589	6386	51	208	2.6	3.31	0.03
winter	1277	6593	56	207	2.9	3.20	0.03

+305,2X,ME - $ the season of calving of the cows

Table 2- The average milk, fat yield and fat percent of Canadian cows+

source of variace	observation (No)	Milk (Kg) LSM	S.E.	Fat (Kg) LSM	S.E.	Fat % LSM	S.E.
Year:		**		**		NS	
1984	137	5657	131	187	6.8	3.29	0.09
1985	315	6360	85	202	4.4	3.24	0.06
1986	823	6887	56	207	2.9	3.02	0.04
1987	817	6800	55	214	2.9	3.20	0.04
1988	914	6511	53	214	3.3	3.32	0.04
1989	718	6405	60	218	3.1	3.37	0.04
1990	631	6574	66	199	3.4	3.04	0.04
1991	218	6582	99	203	5.2	3.15	0.07
Total average		6472	38	205	2.0	3.20	0.03
Season$		***		***		***	
spring	1220	6423	53	203	2.8	3.16	0.04
summer	1332	6216	50	200	2.6	3.24	0.03
autumn	1150	6503	51	211	2.6	3.27	0.03
winter	871	6746	56	209	2.9	3.14	0.04

+305,2X,ME - $ the season of calving of the cows
*** P<0.001 ** P<0.01

Table 3- The average milk, fat yield and fat percent of Non-Canadian cows+

source of variace	observation (No)	Milk (Kg) LSM	S.E.	Fat (Kg) LSM	S.E.	Fat % LSM	S.E.
Year:		**		**		NS	
1987	65	6346	146	211	5.1	3.37	0.06
1988	372	6297	67	201	2.3	3.22	0.03
1989	519	6147	57	202	2.0	3.33	0.02
1990	909	6225	47	208	1.7	3.36	0.02
1991	175	6444	92	211	3.2	3.33	0.04
Total Average		6292	47	206	1.6	3.32	0.02
Season$:		***		***		***	
spring	612	6350	59	207	2.0	3.30	0.02
summer	594	6111	64	201	2.2	3.33	0.03
autumn	429	6283	65	208	2.2	3.36	0.03
winter	405	6426	63	210	2.2	3.30	0.03

+ 305,2X,ME $ The season of calving of the cows
** P<0.01 *** P<0.001

Table 4-The performance of reproductive traits of CH and NCH cows &

Lactation No	Observation	C.Age+ (month) LSM	S.E	C.Int$ (days) LSM	S.E	Dry days LSM	S.E	Open days LSM	S.E
CH&:									
1st	1120	34.4	1.1	--	--	77.7	1.7	--	-
2nd	1450	54.3	1.1	428.5	4.2	78.5	1.3	150	2.0
3rd	910	65.2	1.3	402.3	3.1	87.6	1.6	124	3.1
4th	605	77.9	1.6	404.1	1.3	90.7	2.0	126	3.9
5th	293	88.0	2.1	--	-	--	-	--	-
Ave	--	--	--	410.2	2.0	83.7	0.8	132	2.0
NCH&:									
1st	412	31.7	0.5	--	-	75.0	1.9	--	--
2nd	395	44.6	0.5	376.2	3.4	81.0	2.1	98	3.4
3rd	257	56.7	0.7	382.4	3.7	78.9	3.3	104	3.7
4th	224	67.1	0.8	374.9	5.7	83.5	5.0	96	5.7
5th	149	79.8	1.1	384.2	8.7	--	-	106	8.7
Ave	--	--	--	379.4	2.9	79.6	1.7	101	2.9

& CH=Canadian Holstein & NCH=Non Canadian Holstein
+ Calving age $ Calving Interval