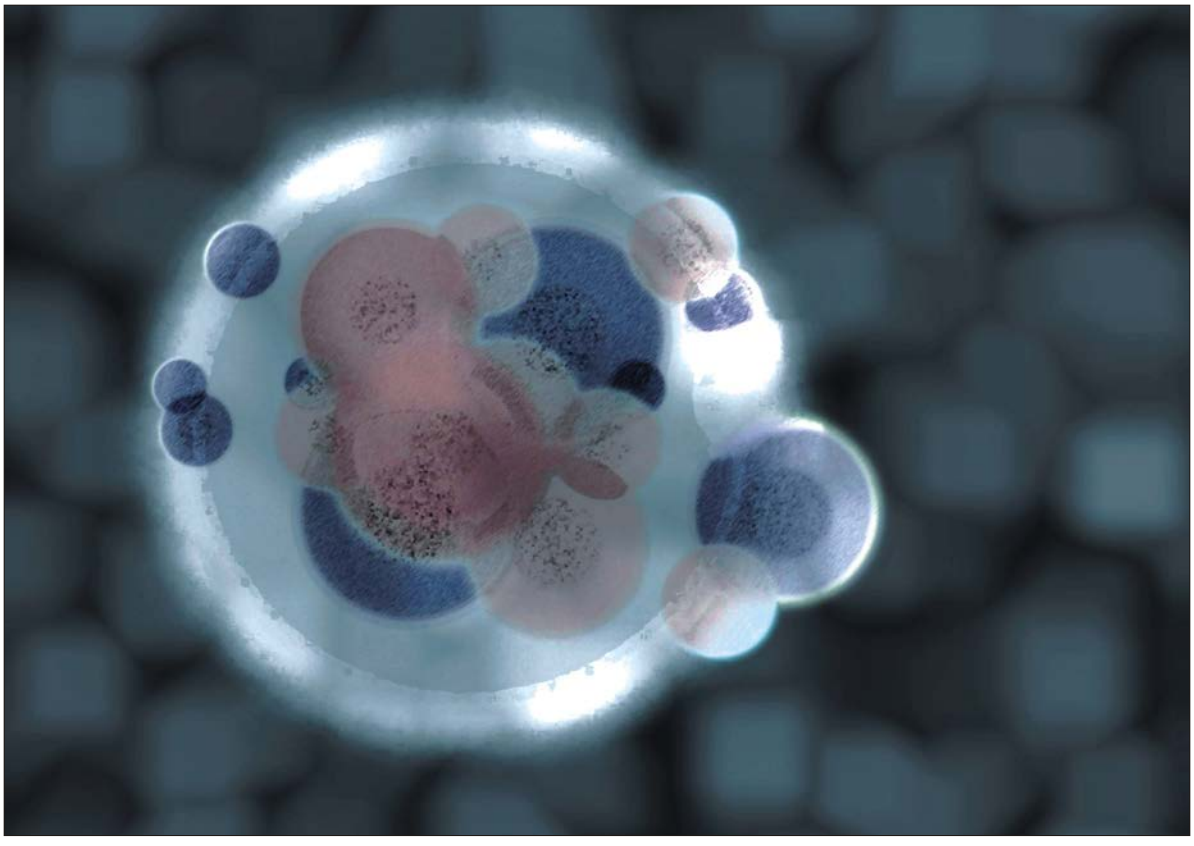

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Estimates of Trends Components of 305 Days Milk Yield at Holstein Cattle's

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Abstract: The purpose of this study was to determine the trends components of 305 day milk yield of Holstein cattle raised at Ankara Sugar Factory Farm were studied. The environmental effect of the phenotypic trend was estimated by using corrected milk records of cows for 2 consecutive years. The environmental change per year was estimated as -177.00 kg year^{-1}. The regressions of the corrected milk yield averages on years for were found to be 72.87 kg year^{-1}. Considering this value, the genetic change was calculated to be 249.87 kg year^{-1}.

Key words: Genetic trends, holstein cattle, milk yield

INTRODUCTION

At firstly, improvement of primitive dairy cattle raised at Türkiye were based on selection. For this aims, primitive dairy herd to established and selected. But, yields of primitive cattle breeds were not increased, sufficiently. Thus, importation of culture cattle breeds were started[1]. According to the Institutes of Government Statistics' records 1984 year, there are 11.973.000 million cattle in Türkiye. Holstein were the common culture cattle breeds in Türkiye (47%). On the other hand, Holstein crossbreds were secondly common culture crossbreeds cattle breeds. Especially, Holstein cows have been importation expansively in since 1958. At present, Holstein cattle's are maintained at as many farms in Türkiye. This cows are breeds as purely as well as crosbreeds[2].

Fundamental aims of Animal Breeding Sciences increase to profits from animal breeding. Because of this reason, breeding animals should be phenotypic value. Improvement of animals phenotypic value are two ways: a) genetic improvement of animals b) adjustment of environmental conditions.

Partitioning of phenotype into genetic and environmental component in the performance traits plays an important role in estimating the real achievement. Genetic trend is defined as a change in performance per unit of time due to change in mean breeding value while environmental trend is a change in production per unit of time due to change in mean environment[3].

During the past 40 years, the average production of all cows has increased milk yield. In one respect, the improvement of dairy cattle is somewhat easier than with other classes of farm animals, for a measure of a cows producing ability may be secured over her whole production life. In another respect, dairy cattle improvement is more difficult than in other classes of livestock, since producing ability is poorly predicted from the exterior form. For example, the male cannot express the quality for which the species is kept; i.e the bull yield no milk. So his genetic merit can be measured only through the performance or transmitting ability of his offspring.

The purpose of this study was to determine the genetic trend of 305 days milk yield Holstein cattle raised at Sugar Factory Farm in Ankara.

MATERIALS AND METHODS

In this study data for the 305 days milk yield collected through the years 1983-93 from Holstein cows raised at Sugar Factory Farm in Ankara were used in the genetic analyzed.

There are used roughages such as; dry clover grass, silage, molasses and beet sugar waste, and are used concentrate feeds such as; barley, corn and oil seed meal. Roughages were consumed in paddock, whereas concentrate feeds consumed while milking.

Hollanda methods were used for to calculate 305 days milk yield from monthly control yields[4]. Lactations longer than 130 days were included in the analyzed. Also

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lactation longer than 305 days the total milk yielded in the first 305 days were used. 305 days milk yield were corrected to effect of lactation number and calving season.

To examine the effect of environmental factors (except year effect) on 305 days milk yield used least squares technique[5]. The following mathematical model was adopted:

$$Y_{ijk} = \mu + a_i + b_j + e_{ijk}$$

where, Y_{ijk} 305 days milk yield, μ overall mean, a_i is ith lactation season effects, b_j jth lactation number effects, e_{ijk} is random error NID (0, σe^2).

The environmental effect on the phenotypic trend was estimated by using corrected milk yield records of cows for 2 consecutive years. The difference between the first and second year milk records of a cow was assumed to be a result of calculated according to difference between phenotypic and environmental trends[6,7].

RESULTS AND DISCUSSION

The means of the uncorrected and corrected 305 days milk yield according to year and seasons were presented in Table 1. The regressions of the corrected 305 days milk yield averages on years were found to be 72.87 kg year^{-1}. This value was found to be highly significant (P<0.01). On the other hand, environmental effect of the phenotypic trend as estimated by using corrected 305 days milk yields of cows for 2 consecutive years. The difference between the first and second year milk records of a cow was assumed to be a result of environmental fluctuations. By taking the weighted mean these differences the environmental change per year estimated as 177 kg year^{-1} (Table 2). Considering this value, the genetic change was calculated to be 249.87 kg year^{-1}, which was also greater than 149 kg year^{-1}[8], 70-78 kg year^{-1}[9], 71.7 kg year^{-1}[10], 0.309 kg year^{-1}[11], -8.1 kg year^{-1}[12], -34.5 kg year^{-1}[13] in Holstein Cattle, 156-158 kg year^{-1}[14], 11.37-12.37 kg year^{-1}[15] and -53.6 kg year^{-1}[16] in Brown Swiss Cattle, 33.6 kg year^{-1}[17] and -12.3 kg year^{-1}[12] in Jersey. At the same time, this value was higher below the expected rate of 1% without progeny testing in a closed herd.

Table 1: Uncorrected and corrected 305 days milk yields

	N	Uncorrected X±Sx	corrected X±Sx
Overall	399	6803.39±89.50	6614.00±723.56
83	13	5410.00±425.50	5894.69±495.25
84	16	5309.31±383.54	5566.00±446.41
85	30	5800.93±280.10	6180.30±326.01
86	30	6222.73±280.10	6584.73±326.01
87	48	7066.35±221.44	7262.98±257.73
88	53	7672.92±210.73	7755.74±245.28
89	65	7267.25±190.29	7356.55±221.48
90	67	6846.64±187.43	7155.84±218.15
91	28	8133.50±289.93	5928.68±337.45
92	35	8304.26±259.32	6100.00±301.83
93	14	6803.36±410.02	6974.07±477.23

The regressions of the corrected 305 days milk yield averages on years were, Y = 201.2 + 72.87** X ± 61.61, ** P<0.01

Table 2: Estimates of environmental trends

Years	n	Differences
1983-84	11	-218.64±1626.2
1984-85	15	+670.20±419.06
1985-86	16	+42.875±1416.9
1986-87	14	-23.429±1585.9
1987-88	27	+283.93±1501.5
1988-89	35	-317.66±1617.8
1989-90	32	-655.62±1659.0
1990-91	12	+764.25±2638.0
1991-92	24	-429.92±2020.5
1992-93	11	-1530.9±2058.1
Weighted mean	197	-177.00±638.70

REFERENCES

1. Akman, N., M. Ertugrul, A. Eliçin and O. Alpan, 1991. Animal Improvement in Türkiye. 2. Congress of Animal Breeding, Ankara, pp: 119-144, 17-19.
2. Anonymous, 1964. European Committee on Milk-Butterfat Recording. European Agreement on the Standardization of Milk-Butterfat Recording Practices. No:236/64, Rome.
3. Herbert, S. and D.S. Bhatnagar, 1988. Genetic Trends of Economic Traits in Dairy Cattle : A Review. Agril. Rev., 9: 200-216.
4. Anonymous, 1991. Reports of Animal Breeding. Agriculture Minister Press. Ankara.
5. Harvey, W.R., 1987. User's Guide for LSMLMW, PC-1 Version, Ohio State Univ. Columbus USA.
6. lson, R.H., 1943. Measuring the Amount of Genetic Change in a Herd Average. J. Ani. Sci. Abst., 2: 358.
7. Lindström, U., 1968. Estimation of Genetic Changes in Artificially Bred Populations of Finnish Dairy Cattle. 1. Genetic Change in Populations of Ayrshire Breed in 1961 1966. vii+174 pp. Eng. With Finn. Summ., Eng. and Finn. Tables.
8. Gürdogan, T. and O. Alpan, 1990. The genetic trends of milk yield of Holstein cattle raised at the Ankara Sugar Factory Farms. J. Fac. Vet., 37: 101-115.
9. Yam, V. and O. Düzgüneş, 1984. The genetic and phenotypic trends of milk yield of Holstein raised at the Trakya TIGEM Farms. Ph.D Thesis, Faculty of Agriculture, University of Ankara.
10. McDaniel, B.T., R.D. Plowman and R.F. Davis, 1961. Causes and Estimation of Enviromental Change in a Dairy Herd. J. Dairy Sci., 44: 699-707.

11. Dillon, W.M., Jr.W.W. Yapp and R.W. Touchberry, 1955. Estimates changes in the environmental and average real procuding Ability in a Holstein from 1901. J. Dairy Sci., 38: 616.
12. Galaas, R.F. and A.D. Plowman, 1961. Effectiveness of statistical adjustments for yearly fluctuations in production. J. Dairy Sci., 44: 1188.
13. Johnson, K.R., D.O. Everson and W.R. Taylor, 1956. The importance of heredity and environment in causing variation in D.H.I.A. records made in idaho. J. Dairy Sci., 39: 1482.
14. Lak, A., 1987. The genetic trends of milk yield of Brown Swiss cattle raised at the Ankara Sugar Factory Farms. Ph. D Thesis. Faculty of Agriculture, University of Ankara.
15. Kaygısız, A., 1993. The genetic analsis of Brown Swiss cattle raised at the Regional Agricultural School in Van. Ph. D Thesis, Faculty of Agriculture, University of Yüzüncü Yıl. Van.
16. Akar, M. and E. Pekel, 1988. A study on genetic and phenotypic trends with the estimation of some parameters in milk yield of purebred and crosses cows raised at the *Eskigehir* seed Production Farm of the Türkish sugar company. J. Fac. Agri., 3: 51-65.
17. Arave, C.W., R.C. Laben and S.W. Mead, 1964. Measurement of genetic change in twelve California dairy herds. J. Dairy Sci., 47: 278-283.