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PRODUCTIVE AND REPRODUCTIVE PERFORMANCE OF RUSSIAN BLACK PIED COWS IN THE FIRST THREE LACTATIONS UNDER HOT CLIMATE CONDITIONS IN UZBEKISTAN

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ABSTRACT

Data on 1809 records of productive and reproductive traits in Black Pied cows were studied to determined the performance of these cows under hot-climate conditions in Uzbekistan Republic during the first three lactations and to analyze some genetic and environmental factors affecting these traits. The random effects studied were sire and dam within sire. The fixed effects were season of calving/birth (winter from October to March and summer from April to September), year of calving (1971 to 1983)/birth (1968 to 1981) and parity (1 to 3). Data were analyzed using linear mixed model least squares and maximum likelihood (LSMLMW) computer program of Harvey (1990). The overall mean (±S.D) of total milk yield (TMY) was 4056±1112 kg, 305-d milk yield (305-dMY) was 3860±959 kg, fat percentage (FP%) was 3.69±0.16, lactation period (LP) was 307±58.4 days, dry period (DP) was 79.3±37.7 days, fat yield (FY) was 150±40.7 kg, fat-corrected milk was 3865±1051 kg, annualized milk yield was 3861±991 kg, calving interval (CI) was 386±62.9 days, days open (DO) was 103±63.1 days and age at first calving (AFC) was 871±110 days. Sire of the cow (father) had significant effect on all studied traits except on LP, DP and AFC. Year of calving/birth significantly affected all studied traits except on DP and FCM was not significant. On the other hand, season of calving/birth had insignificant effect on all traits. Parity had significant effect on all traits except LP and CI did not affect significantly by parity. First parity cows had significantly lower TMY, 305-DMY, FP, FCM and AMY means than cows with more than parity. TMY in the 3rd lactation was significantly higher than that in the 2nd and 1st lactation by 11.5 and 28.6%, respectively (4689 *VS* 4205 and 3645 kg, respectively). Each of 305dMY, FY, FCM, and AMY followed the same trend of the TMY during the first three lactations. Therefore, more attention should be given to cows in the first parity in order to improve the productivity of the cows. Genetic improvement could be also achieved on these traits through sire selection.

INTRODUCTION

The Black Pied breed developed from crossing the local cattle in various areas with the Dutch Black Pied and East Friesian breeds. Pure breeding of Dutch cattle in Russia was conducted on only a small scale. The Central, Ukrainian, Siberian and other strains of Black Pied cattle were formed by absorptive and reproductive crossing (Dmitriev and Ernst, 1989).

The Black Pied breed is noted for high milk production (the highest among the dairy breeds), good conformation and good beef qualities. Due to the high productivity, adjustment to machine milking, well-defined beef features and the ability to acclimatize, the population of this breed is increasing year by year. By the beginning of 1980 the number of Black Pied cattle in the former USSR was 16 449 000 excluding the Baltic population. In numbers they are second (25.2%) among 50 cattle breeds in the country (Dmitriev and Ernst, 1989).

The Black Pied breed comprises five large populations: Central (Mid-Russian), Baltic, Ural, Siberian, and other zones, namely Ukraine, Byelorussia, Central Asia, and parts of Transcaucasia. The animals of the Central group (where the animals of this study were lived in Uzbekistan, Central Asia) are the largest (live weight 550-650 kg), with a more compact conformation, relatively shortlegged and a good exterior appearance. This group is noted for the highest milk production (5500-6500 kg) with low butterfat content (3.6-3.7%).

It is known that milk yield is the major trait of economic importance in dairy breeds. The yields of farm animals are the result of the combined effects of genotype and environmental conditions. In order to increase the yield level, it is necessary to optimize the environmental conditions and to improve the genetic structure of the animals.

In the same trend, Milk yield and reproductive traits are key traits in dual-purpose herds, because they have a direct effect on their productivity and profitability. Knowledge of the environmental factors that affect these traits can help the producer to establish better management programs. Improvement of productive and reproductive performance traits is an increasingly important breeding goal in dairy cattle and other livestock production systems.

Several workers have shown that productive and reproductive traits are heritable and they are greatly influenced by the genes which the dams and sires transmit to their progenies. Therefore it seems necessary to study the effect of sire on productive and reproductive traits (Petrovic, 1992, Ali, 1995 and Ali and El-Banna, 2001).

The objectives of the present study were to obtain estimates of productive and reproductive traits for Black Pied cows under hot-climate conditions in Uzbekistan Republic during the first three lactations and to evaluate the effect of some genetic and environmental factors on these traits.

MATERIALS AND METHODS

Data

Data on the productive and reproductive performance of 892 Russian Black Pied herds located in Chinaz, Uzbekistan, for the period 1968 to 1983 were used. The data were collected from records of Russian Black Pied cows belonging to Chinaz Farm located at Chinaz region (about 60 km west of Tashkent City, Uzbekistan Republic). The area of study is located between 40° 56’ and 40° 92’ north latitude and 68° 44’ and 54° 60’ east longitude. The climate of this region is hot. The monthly maximum temperature varies between 35° and 45°C. The total numbers of records during the first lactation (parity) were 819, during the second lactation were 598 and during the third lactation were 392. Thus, the total number of records used in the present study were 1809. Data were distributed according to season of calving to two seasons, winter from October to March (771 records) and summer from April to September (1038 records). The corresponding figures for season of birth in case of age of first calving were 431 and 338 for winter and summer, respectively.

The studied traits:

The following productive traits were studied: Total milk yield (TMY, kg), 305-day milk yield (305-dMY, kg), lactation period (LP, day), dry period (DP, day), fat percentage **(**FP%), fat yield (FY, kg), fat corrected milk (4%) (FCM, kg). Annualized milk yield (AMY, kg). Fat corrected milk was calculated according to the formula of Gaines and Overman (1938): FCM= (0.4*TMY) + (15*FY), where: TMY = total milk yield (kg), FY = fat yield (kg). Annualized milk yield was calculated according to Million and Tadelle. (2003): AMY= (TMY/CI)*365, Where: TMY= total milk yield (kg), and CI= Calving interval (days).

The following reproductive traits were studied: Calving interval (CI, day): was computed as the interval between the two successive calving. Days open **(**DO, day): was computed as the interval in days between the date of calving and the date of conception. Age at first calving (AFC, day), was computed as the difference between first calving date and date of birth.

Management: The main characteristics of this herd under study were described by Oudah (1996). Briefly, the general management of the herds is based on cows were milked twice daily at 6 am and 4 pm. Milk yield was recorded once each month in certain day for all cows (test day record). Monthly milk yield was calculated by multiple test day milk yield record by 30 days. Total milk yield during all lactation was calculated by summation of all monthly milk yields. The cows were dried off 2 months before the next calving or when its milk yield was less than 0.5 kg/milking. Cows were inseminated during the 3rd or 4th estrus after calving. Heifers were inseminated when its weight 350 kg or 18 months of age which comes first.

Statistical analysis

Data were analyzed using linear mixed model least squares and maximum likelihood (LSMLMW) computer program of Harvey (1990). Three models of statistical analysis were used for analyzing factors affecting productive and reproductive traits as follows:

The first mixed model was used to analyze productive traits, i.e. TMY, 305-dMY, LP, DP, FP, FY, FCM and AMY as follows:

$$Y_{ijklmn} = \mu + S_i + D_j(S_i) + Se_k + Y_l + P_m + bL\ (X - X) + bQ\ (X - X)^2 + e_{ijklmn} \quad (1)$$

Where:

Y_{ijklmn} = dependent variable (TMY, 305-dMY, LP, DP, FP, FY, FCM and AMY),

μ = the generalized least squares mean,

S_i = the random effect of the i^{th} sire,

$D_j(S_i)$ = the random effect j^{th} dam within the i^{th} sire,
Se_k = the fixed effect of the j^{th} season of calving (winter = 1, summer = 2),
Y_l = the fixed effect of the l^{th} year of calving (1971, 1972, 1973 …and 1983),
P_m = the fixed effect of the m^{th} parity,
bL&bQ = partial linear and quadratic regression coefficients, respectively for productive traits on days open (day), **X** = day open (day) of cow, X_1 average days open (days); and
e_{ijklmn} = residual error assumed as random .

2. The second mixed model was used to analyze reproductive traits i.e. CI (day) and DO, (day) as follows:

$$Y_{ijklmn} = \mu + S_i + D_j(S_i) + Se_k + Y_l + P_m + bL\,(X - X) + bQ\,(X - X)^2 + e_{ijklmn} \quad (2)$$

where all definitions as mentioned in equation (1) except for:
Y_{ijklmn} = dependent variable (CI and DO),
bL&bQ = partial linear and quadratic regression coefficients, respectively for reproductive traits on TMY, **X** = TMY (kg) of cow, X_1 average TMY (kg).

3. The third mixed model was used to analyze age at first calving (day) as follows:

$$Y_{ijkm} = \mu + S_i + Se_j + Y_k + + e_{ijkm} \quad (3)$$

Where:
Y_{ijklm} = dependent variable (AFC),
μ = the generalized least squares mean,
S_i = the random effect of the i^{th} sire
Se_j = the fixed effect of the j^{th} season of birth (winter, summer);
Y_k = the fixed effect of the k^{th} year of birth (1968, 1969, 1970 …and 1981);
e_{ijkm} = residual error assumed as random.

RESULTS AND DISCUSSION

Sire effect:

Analyses of variance showed that sire had significant effect on all productive traits except for LP and DP (Table 3) and also on reproductive traits except for AFC. Several workers have shown that productive and reproductive traits are heritable and they are greatly influenced sire (Petrovic, 1992, Ali, 1995 and Ali and El-Banna, 2001). Genetic improvement could be also achieved on these traits through sire selection.

Environmental factors:

The unadjusted overall mean ± standard deviation of total milk yield (TMY) was 4056±1112 kg, 305-d milk yield (305-dMY) was 3860±959 kg, fat percentage (FP%) was 3.69±0.16, lactation period (LP) was 307±58.4 days, dry period (DP) was 79.3±37.7 days, fat yield (FY) was 150±40.7 kg, fat-corrected milk was 3865±1051 kg, annualized milk yield was 3861±991 kg, calving interval (CI) was 386±62.9 days, days open (DO) was 103±63.1 days and age at first calving (AFC) was 871±110 days (Table 1). TMY in the 3rd lactation was significantly higher than that in the 2nd and 1st lactation by 11.5

and 28.6%, respectively (4689 *VS* 4205 and 3645 kg, respectively). Each of 305dMY, FY, FCM, and AMY followed the same trend of the TMY during the first three lactations (Table 1). Unadjusted overall mean of 305-dMY gradually increased to achive the highest in the third lactation (4455 Kg). overall unadjusted mean of FP recorded same value in first, second, third and all lactation (3.7%). The high coefficient of variation in both DP and DO during the three lactations (45.5 to 50.2% for DP and 62.0 to 62.3% for DO) reflects the great variation in the cow of this herd regarding these traits (Table 1).

Table 1: Unadjusted means(X) standard division (S.D) and coefficients of variation (C.V %) of studied productive on and reproductive traits during the first three lactations.

Trait*	1st lactation (n = 819)		2nd lactation (n = 593)		3rd lactation (n = 392)		All lactations (n = 1809)			
	X±S.D	CV%	*X*±S.D	CV%	*X*±S.D	CV%	*X*±S.D	CV%	Max	Min
					Productive traits					
TMY	3645±959	26.3	4205±1107	26.3	4689±1063	22.7	4056±1112	27.4	9225	1155
305-dMY	3459±809	23.4	4020±934	23.2	4455±905	20.3	3860±959	24.8	8755	1155
FP%	3.69±0.16	4.37	3.70±0.16	4.41	3.69±0.17	4.73	3.69±0.16	4.46	4.90	3.0
LP	308±59.0	19.2	303±60.5	20.0	312±53.1	17.0	307±58.4	19.0	588	174
DP	76.9±35.0	45.5	82.4±41.4	50.2	79.6±36.7	46.1	79.3±37.7	47.5	294	10
FY	134±34.8	26.0	155±40.7	26.2	173±38.7	22.4	150±40.7	27.2	346	42
FCM	3471±903	26.0	4013±1050	26.2	4465±1001	22.4	3865±1051	27.2	8879	1094
AMY	3489±861	24.7	4012±972	24.2	4409±959	21.7	3861±991	25.7	8723	1059
					Reproductive traits					
CI	385±63.3	16.4	383±61.7	16.1	393±64.2	16.3	386±62.9	16.3	585	300
DO	102±63.5	62.1	99.2±61.8	62.3	110±64.3	58.6	103±63.1	61.3	300	20
AFC	871±110	12.6								

***TMY = total milk yield (kg), 305-dMY = 305-day milk yield (kg), LP = lactation period (day), DP = dry period (day), FP% = fat percentage, FY = fat yield (kg), FCM = fat corrected milk (4%) (kg), AMY = annualized milk yield (kg), CI = calving interval (day), DO = days open (day) and AFC = age at first calving (day).**

Comparing the results of the present study with other investigations, Abou-Ela *et al.* (2001) found that TMY in the 1st , 2nd and 3 rd lactations were 7079, 7332 and 7526 kg, respectively on Holstein Friesian cattle in Hungary which were high than the estimates reported in the present study. Detilleux *et al.* (1997) reported that dry period ranged from 40-135 day on Holstein Friesian in U.S.A. These differences may be due to many environmental factors such as used number of animals, method used of statistical analyses, climate, nutrition and other management conditions as well as differences in genetic composition from herd to another.

The generalized least squares means ± standard errors of TMY was 4144±56.9 kg, 305-dMY was 3971±48.3 kg, FP was 3.71±0.01, LP 308±1.58 was days, DP was 81.4±1.25 days, FY was 154±2.09 kg, FCM was 3961±54.0 kg, AMY was 3902±55.9 kg, CI was 390±3.88 days, DO was 107±3.79 days and AFC was 882±4.61 days (Tables 2, 4 and 6).

Table 2: Least squares means and standard error (±S.E) for productive traits as affected by different factors (n=1809).

Classification	No.	TMY	%	305-dMY	%	FP	%	LP	%
Overall mean	1809	4144±56.9		3971±48.3		3.71±0.01		308±1.58	
Season of calving									
Winter	771	4191±66.9	100	4009±56.5	100	3.71±0.01	100	310±2.51	100
Summer	1038	4097±65.8	98	3933±55.6	98	3.72±0.01	100	306±2.42	99
Year of calving									
1971	46	4112±372	91	3613±310	85	3.80±0.07	99	348±20.5	98
1972	108	4252±303	94	3700±252	87	3.83±0.05	100	354±16.6	100
1973	136	4445±249	98	4032±208	94	3.76±0.04	98	338±13.6	95
1974	149	4517±206	100	4116±172	96	3.72±0.04	97	333±11.1	94
1975	190	4454±164	99	4202±137	98	3.71±0.03	97	312±8.70	88
1976	223	4487±124	99	4238±103	99	3.67±0.02	96	315±6.30	89
1977	192	4392±107	97	4217±89.9	99	3.66±0.02	95	310±5.30	88
1978	170	4256±124	94	4194±104	98	3.65±0.02	95	288±6.32	81
1979	162	4334±160	96	4275±134	100	3.66±0.03	96	285±8.47	81
1980	133	4025±213	89	4083±178	96	3.65±0.04	95	282±11.5	80
1981	116	3337±260	74	3377±216	79	3.76±0.05	98	282±14.2	80
1982	114	3463±313	77	3619±261	85	3.73±0.05	97	278±17.2	79
1983	70	3802±388	84	3961±324	93	3.65±0.07	95	278±21.4	79
Parity									
1	819	3564±87.3	76	3470±73.3	78	3.68±0.01	99	301±4.01	95
2	598	4169±64.3	89	3999±54.4	90	3.72±0.01	100	306±2.30	97
3	392	4700±93.3	100	4446±78.3	100	3.73±0.02	100	317±4.41	100
Regression on days open									
Linear		4.620±0.742		2.052±0.618		0.000±0.000		0.485±0.041	
Quadratic		-0.005±0.008		-0.015±0.006		0.000±0.000		0.001±0.000	

Table 2: Cont.

Classification	No.	DP	%	FY	%	FCM	%	AMY	%
Overall mean	1809	81.4±1.25		154±2.09		3961±54.0		3902±55.9	
Season of calving									
Winter	771	82.7±1.93	100	155±2.46	100	4002±63.4	100	3923±64.8	100
Summer	1038	80.2±1.86	97	152±2.41	98	3921±62.4	98	3882±63.8	99
Year of calving									
1971	46	97.2±15.4	97	155±13.7	93	3976±352	92	3456±348	82
1972	108	99.8±12.5	100	161±11.1	97	4120±287	96	3500±283	83
1973	136	93.2±10.2	93	166±9.18	100	4273±236	99	3845±234	91
1974	149	90.7±8.37	91	167±7.57	100	4313±195	100	3916±193	93
1975	190	85.2±6.56	85	164±6.03	98	4248±155	98	4100±154	97
1976	223	78.9±4.76	79	164±4.55	98	4259±117	99	4160±117	99
1977	192	76.8±4.01	77	160±3.94	96	4160±102	96	4159±102	99
1978	170	78.1±4.77	78	155±4.56	93	4028±117	93	4181±117	99
1979	162	83.1±6.39	83	159±5.89	95	4117±152	95	4207±151	100
1980	133	83.4±8.68	84	147±7.83	88	3812±202	88	3979±200	95
1981	116	74.2±10.7	74	126±9.55	75	3224±246	75	3412±243	81
1982	114	61.4±3.0	62	130±11.5	78	3336±297	77	3690±293	88
1983	70	56.5±16.1	57	141±14.3	84	3631±368	84	4123±363	98
Parity									
1	819	75.9±3.04	90	131±3.21	75	3394±82.8	75	3463±83.4	80
2	598	84.6±1.77	100	155±2.36	88	3990±61.0	89	3910±62.6	90
3	392	83.7±3.34	99	175±3.43	100	4500±88.5	100	4333±88.9	100
Regression on days open									
Linear		0.213±0.031		0.174±0.027		4.457±0.703		-3.236±0.693	
Quadratic		0.000±0.000		0.000±0.000		-0.005±0.007		0.000±0.007	

Season of calving/birth:

Analyses of variance presented showed that season of calving/birth had insignificant effect on all productive (Table 3) and reproductive (Tables 5 and 7) traits. Ali (1995) and Tag El-Dein (1997) in Friesian cow, found that season of calving had no significant effect on CI. Darwash *et al.* (1997) reported that there was no significant effect of season on DO (spring 84.8, summer 90.6, autumn 87.9 and winter 85.3 day) in British Friesian cows. These results are in agreement with those reported in the present study.

Table 3: Analysis of variance for factors affecting productive traits.

S.V	D.F.	F-value and significance*							
		TMY	M305	FP	LP	DP	FY	FCM	AMY
Sire	35	1.79**	1.69**	1.69**	0.72 NS	0.95NS	1.79**	1.80**	2.00**
Dam within sire	712	1.62**	1.83**	1.3**	0.91 NS	1.09NS	1.60**	1.61**	1.54**
Season of calving	1	1.9 NS	1.79 NS	0.96 NS	1.2 NS	0.74NS	1.36NS	1.58NS	0.42NS
Year of calving	12	4.59**	6.82**	4.23**	2.04*	1.34NS	3.46**	3.93NS	5.04**
Parity	2	35.5**	38.2**	3.34*	2.62NS	4.4*	38.9**	37.8**	23.5**
Regression on days open:									
Linear		38.8**	11.0**	0.15 NS	138**	46.9**	40.5**	40.2**	21.8**
Quadratic		0.37 NS	5.82*	0.39NS	2.27 NS	0.71NS	0.54NS	0.47NS	0.00NS
Reminder	1044								

*** Significant at P <0.05 ** Significant at P <0.01 N.S = Not significant**
TMY = total milk yield (kg), 305-dMY = 305-day milk yield (kg), LP = lactation period (day), DP = dry period (day), FP% = fat percentage, FY = fat yield (kg), FCM = fat corrected milk (4%) (kg), AMY = annualized milk yield (kg),)

Table 4: Least squares means and standard error (±S.E) for calving interval (CI, day) and days open (DO, day) as affected by different factors

Classification	No.	CI	%	DO	%
Overall mean	1809	390±3.88		107±3.79	1809
Season of calving					
Winter	771	388±4.30	99	105±4.22	96
Summer	1038	392±4.23	90	109±4.15	100
Year of calving					
1971	46	433±19.5	100	153±19.47	100
1972	108	423±15.9	98	141±15.89	92
1973	136	417±13.2	96	135±13.18	88
1974	149	393±11.0	91	111±11.00	73
1975	190	374±8.89	86	91.9±8.86	60
1976	223	371±6.89	86	88.1±6.85	58
1977	192	374±6.11	86	90.3±6.06	59
1978	170	371±6.89	86	87.1±6.85	57
1979	162	378±8.71	87	94.5±8.68	62
1980	133	389±11.4	90	105±11.3	69
1981	116	390±13.8	90	106±13.8	69
1982	114	380±16.5	88	96.0±16.5	63
1983	70	376±20.3	87	90.9±20.4	59
Parity					
1	819	388±5.28	98	106±5.21	95
2	598	387±4.18	98	103±4.09	92
3	392	395±5.54	100	112±5.49	100
Regression on: days open					
Linear		0.011±0.002		0.011±0.002	0.011±0.002
Quadratic		0.000±0.000		0.000±0.000	0.000±0.000

Year of calving/birth:

Year of calving/birth showed significant effects on all studied productive (Table 3) and reproductive (Tables 5 and 7) traits except for DP and FCM. For example, the highest TMY occurred in 1974 (4517 kg) and lowest occurred in 1981(3337 kg) (Table 2). The results obtained in the present study are in agreement with the findings obtained by other investigators, e.g. Oudah *et al.* (2000). The effects of this are a result of the interaction of a set of environmental, technical and administrative management practices that make its interpretation difficult; however, it is an important source of variation that must be considered in the statistical analysis in order to better interpret of results. Additionally. Year of calving have been recognized as an important factor affecting milk yield in dairy cows. Most of results attributed the difference in milk yield to year of calving. The present results indicate that the changes in milk production from year to another may be due to the changes in management and climatic conditions from year to year which consequently affect the phenotypic trend of milk production. On the other hand, Amin *et al.* (1996) did not show any significant effect of year of calving on TMY of Holstein Friesian cattle.

Parity number:

Concerning the effect of parity on productive and reproductive performance of Black Pied cows used in the present study, analyses of variance showed that parity had significant effect on all productive traits except for LP (Table 3) and it was also significant on CI (Table 5). Least squares means of TMY, 305-dMY, FY, FCM and AMY were increased obvious with increase of lactation order. Ashmawy and Khattab (1991) working on 1619 lactation records of Friesian cows, noticed that the effect of parity on AMY was significant ($P < 0.01$), and the AMY increased with the increase in the order of lactation. Tong *et al.* (1979) found that FY of 1st, 2nd and 3rd lactation of Holstein were 180, 206 and 255 kg, respectively. Thomas (1980) analyzed data of 177 and Red Dane in 1st and 2nd lactation, respectively. He found that the FY were 158.9 for 1st lactation and 184.5Kg for 2nd lactation. Parity had no significant effect on FP; Stenzel (1980) studied the first three lactations for 717 Polish Black and White lowland as well as 201 Polish Red and White lowland cows. He found that the average FP were 3.89 % in the 1st lactation and increased to 3.96 % in the 2nd lactation, and then it declined to 3.94 % in the 3rd lactation for the first breed, while it was 3.69, 3.87 and 3.87% for the same lactations for the second breed. The present results are in agreement with Tag El-Dein (1997) who reported that parity had non-significant effect on lactation length for Friesian cows. EL-Awady (1998) using Friesian cows in Egypt, noticed that parity had highly significant effected on 305-DMY. Shitta *et al.* (2002) found that parities had highly significant effect on DO. Ganah (2000) and Gabr (2005) found no significant effect on CI which is in agreement with the results obtained in the present study. On the other hand, Parity had no significant effect on dry period as reported by Rege *et al.* (1994) and Kassab (1995) who found non-significant differences among lactations in DP.

Regression coefficients:

Analyses of variance showed that partial regression coefficients of all studied productive traits on DO were positive (Table 2) and significant (Table 3) except for AMY was negative and for FP was not significant. Meanwhile, the corresponding quadratic coefficients were not significant except for 305dMY (Table 3). Regarding the linear and quadratic regression coefficients of reproductive traits, i.e. CI and DO on TMY, the results show that the linear regression coefficients of CI and DO on TMY were also positive (Table 4) and significant (Table 5) meanwhile, the quadratic coefficients were not significant. Hageman *et al.* (1991), Ganah (2000) reported highly significant linear regression of CI on milk yield, while they recorded non-significant quadratic regression for this relationship. Sweify (1997) did not find significant effect of DO length (131.7 vs. 136.6 days for high and low yield, respectively) on milk yield of Friesian cows in Egypt. The positive relationship between total milk yield and DO (poor fertility) may be attributed to the large deficient in energy balance that occurs in high producing dairy cows, especially during the first stage of lactation. Salem and Abdel-Raouf (1999) in Egypt found also that DO significantly (P < 0.01) affect 305-DMY. Ali *et al.* (2002) indicated that days open had highly significant effect on305-DMY. El-Sheikh (1995) found that the regression coefficient of lactation length on days open had highly significant (P < 0.01) effect at linear and quadratic values. On the other hand, Nenadovic *et al.* (1980) analyzed the milk records of 270 Holstein- Friesian heifers. They observed that days open averaged 135.8 days, and a negative correlated between the average milk FP and days open was also found for the whole lactation (-0.31) and for 305 days (-0.13).

Table 5: Analysis of variance for factors affecting calving interval (CI, day) and days open (DO, day) during across lactation.

		CI		DO	
S.V	**D.F.**	**F**	**Prop.**	**F**	**Prop.**
Sire	35	2.00	0.001 **	1.92	0.001 **
Dam within sire	712	2.76	0.000 **	2.78	0.000 **
Season of calving	1	1.36	0.243 NS	1.59	0.207 NS
Year of calving	12	4.33	0.000 **	4.39	0.000 **
Parity	2	2.41	0.091 NS	3.97	0.019 *
Regression on Total milk yield					
Linear	1	40.4	0.000 **	41.0	0.000 **
Quadratic	1	0.82	0.364 NS	0.95	0.331 NS
Reminder	1044				

*** Significant at P <0.05 ** Significant at P <0.01N.S = Not significant**

Table 6: Least squares means and standard error (±S.E) for age at first calving (AFC, day) as affected by different factors

Classification	N.O	AFC	%
Overall mean	819	882±4.61	
Season of birth			
Winter	431	883±5.87	100
Summer	388	881±6.24	100
Year of birth			
1968	16	995±28.8	100
1969	59	880±18.3	88
1970	73	840±16.9	84
1971	59	867±18.2	87
1972	75	859±14.8	86
1973	108	843±11.9	85
1974	68	836±14.3	84
1975	76	898±15.1	90
1976	64	870±15.2	87
1977	57	850±15.6	85
1978	64	897±16.2	90
1979	58	896±17.4	90
1980	33	924±22.1	93
1981	9	895±37.3	90

Table 7: Analysis of variance for factors affecting age at first calving (AFC, day)

		AFC	
S.V	**D.F.**	**F**	**Prop.**
Sire	35	0.87	0.684 ^{NS}
Season of birth	1	0.03	0.858 ^{NS}
Year of birth	13	4.09	0.000 **
Reminder	767		

Conclusion

The results of the present study indicated that the parity and sire have highly significant effects on most of the productive traits. Therefore, more attention should be given to cows in the first parity in order to improve the productivity of the cows. Genetic improvement could be also achieved on these traits through sire selection.

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الصفات الإنتاجية والتناسلية لماشية البلاك بيد الروسية خلال الثلاث مواسم الحليب الأولى تحت ظروف المناخ الحارفى أوزيكسان

السعيد زهرى محمود عوده ، محمد عبد الرحمن مصطفى ، محمد نجيب العريان و رحاب فوزى صديق عبد الفتاح إسماعيل
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تم دراسة 1809 سجل خاصة بالصفات التناسيلية والإنتاجية فى ماشية البلاك بيد لمعرفة أداء هذه الأبقار فى ظل المناخ الحار فى جمهورية أوزبكستان خلال الثلاثة مواسم الأولى لتحليل بعض العوامل البيئية والوراثية التى تؤثر على هذه الصفات0

وقد تم دراسة التأثيرات العشوائية وكانت الذكر والأنثى خلال الذكر إما التأثيرات الثابتة فكانت موسم الولادة / الميلاد (فصل الشتاء من أكتوبر حتى مارس وفى فصل الصيف من إبريل حتى سبتمبر) , وسنة الولادة / الميلاد من(1971 - 983), ومن (1968 - 981) وترتيب موسم اللبن من (1- 3). وقد تم تحليل هذه البيانات باستخدام برنامج هارفى (1990)0 وكان المتوسط العام لإنتاج اللبن الكلى 4056 ± 1112 كجم , ومحصول اللبن (305 يوم) 3860± 959 كجم , وكانت النسبة المئوية للدهن 3.69% ± 0.16% وكان طول موسم الحليب 307 ±58.4 يوم , وكانت فترة الجفاف 79.3 + 37.3 يوم وكان محصول الدهن407 ± 150 كجم وكان إنتاج اللبن المصحح 3865 ± 1051 كجم وإنتا ج اللبن السنوى 3861 ± 991 كجم وكانت الفترة بين ولادتين 386± 62.9 يوم ، والفترة المفتوحة كانت 103 ± 63.1 يوم والعمر عند أول ولادة كان 817 ± 110 يوم وكان ذكر البقر (الأب) له تأثير معنوى على كل الصفات المدروسة ماعدا طول موسم الحليب وفترة الجفاف والعمر عند أول ولادة . سنة الولادة (الميلاد) كان لها تأثير معنوى على كل الصفات ماعدا فترة الجفاف وإنتاج اللبن المعدل . وايضا لم يؤثر فصل الولادة (الميلاد) تأثيرا معنويا على كل الصفات وكان ترتيب موسم الحليب ذو تأثير معنوى على الصفات فيماعدا طول موسم الحليب والفترة بين ولادتين. وكان متوسط إنتاج اللبن , ومحصول اللبن (305) يوم , والنسبة المئوية للدهن , وإنتاج اللبن المعدل لأبقار الموسم الأول أقل من المواسم التالية وكانت ذات تأثير معنوى . وكان إنتاج اللبن فى الموسم الثالث أعلى معنويا من الموسم الثانى والأول بنسبة 11.5 % , 28.6 % تباعا (4689 مقابل 4205 , 3645 كجم تباعا) وكذلك بالنسبة لمحصول اللبن (305 يوم) ومحصول الدهن وإنتاج اللبن المعدل وإنتاج اللبن السنوى سلكت نفس أتجاة إنتاج اللبن الكلى خلال المواسم الثلاثة الأولى. لذا يجب الاهتمام أكثر بالأبقار خلال الموسم الأول من أجل زيادة إنتاجية الأبقار0 أيضا يجب أجراء تحسين وراثى لهذه الصفات من خلال انتخاب الذكور 0