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FACTORS INFLUENCING LACTATION PERSISTENCY ESTIMATES MEASURED BY RATIOS METHOD

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ABSTRACT

Data for the present investigation were obtained from 2201 lactation records during the years from 2005-2007, at Dina Farms which located eighty kilometers north of Cairo. The data were used to study the effect of genetic and non-genetic factors on persistency.

Regarding to non-genetic factors, age at first calving, preceding calving interval, and current days open had significant effects on persistency estimates measured by ratio methods, except in case of persistency measured based on ratio of partial yield (200 days).Order of lactation has a significant effect on persistency estimates measured by ratio methods, except persistency measured based on maximum yield over total yield (305 days) was non-significant. Moreover, dry period, season and year of calving have significant effects on persistency values measured by ratio methods.

Regarding to the genetic factors, our data showed that, high heritability estimate (0.34) was obtained for persistency measured based on ratio of partial yield (200 days). In addition, low heritability estimates were obtained for persistency measured based on ratio of partial yield 305 days (-0.01), persistency measured based on ratio of total yield either for 200 or 305 days over maximum yield, and persistency measured based on ratio of maximum yield over total yield either for 200 days(-0.12) or for 305 days(-0.32). Moreover, phenotypic and genetic correlations between different factors affecting the persistency were estimated, our results revealed that low genetic correlation were found at age at first calving and persistency measured based on ratio of partial yield 200 days (0.33).

INTRODUCTION

One of the most traits, which can be described by lactation curve, is persistency. Persistency of lactation is typically defined as the rate of decline in production after peak production has been reached; high persistency is associated with a slow rate of decline in production, whereas low persistency is associated with a rapid rate of decline.

Ghanem et al. (1991) studied genetic and non-genetic factors affecting lactation persistency in Friesian cows in Egypt. They reported that the non-genetic factors affecting lactation persistency were age at first calving, year and season of calving, lactation order, and lactation length. While, genetic parameters affecting lactation persistency were heritability, genetic and phenotypic correlations. Heritability of persistency increased with lactation number for all traits, genetic correlation between persistency in different lactation were smaller than those for 305–day yield and persistency was not genetically correlated with the total yield in lactation **(Strabel and Jamrozik 2006)**.

Against this background, the aim of this study was to investigate different methods of estimating persistency based on ratio methods. The relationship between the level of production and the shape of lactation curve and its components.

MATERIALS AND METHODS

The present study was done in Dina Farms (The Modern Agricultural Development), located about 80 Km in Cairo-Alexandria Desert Road. The original herd of American Holstein Friesian cows was established between 1987 and 1996 by importation of American Holstein Friesian cows. The data were obtained from 2201 lactation records of American Holstein Friesian cows covering the period 2005-2007. All animals were kept in an open yard with sheds allover the year round, supplied with a cool spraying system during hot climate. Animals had free access to clean water. The animals allover the year were fed on total mixed ration (TMR). All cows are machine-milked, three times with 8 hrs interval between milking. Cows were dried – off about 60 days before expected calving date. Cows producing 7 kg or less milk were dried– off. Cows and heifers were inseminated artificially using frozen semen from the best 100 total predicted index (T.P.I) Holstein bulls in U.S.A and Canada. Heifers were bred at 375 kg body weight.

Several methods (exponential curves, regression coefficients, and ratio production in different sections of the lactation) were adopted to obtain the persistency index **(Ghanem et al., 1991).** Persistency estimate is measured by using ratio methods according to **Ibrahim (2002)** as the following:

$$\text{PRPY-200 days} = \frac{\text{Partial yield days 101 – 200}}{\text{Partial yield days 1 – 100}}$$

$$\text{PRPY-305 days} = \frac{\text{Partial yield days 201 – 305}}{\text{Partial yield days 1 – 100}}$$

$$\text{PRTY-200 days} = \frac{\text{Total yield days 1 – 200}}{\text{Maximum yield days 1 – 100}} \times 100$$

$$\text{PRTY-305 days} = \frac{\text{Total yield days 1 – 305}}{\text{Maximum yield days 1 – 305}} \times 100$$

$$\text{PRMY-200 days} = \frac{\text{Maximum yield days 1 – 200}}{\text{Total yield days 1 – 200}} \times 100$$

$$\text{PRMY-305 days} = \frac{\text{Maximum yield days 1 – 305}}{\text{Total yield days 1 – 305}} \times 100$$

Where:

PRPY-200 and 305 days: Persistency measured based on ratio of partial yield either for 200 or 305 days.

PRTY-200 and 305 days: Persistency measured based on ratio of total yield either for 200 or 305 days over maximum yield.

PRMY-200 and 305 days: Persistency measured based on ratio of maximum yield over total yield either for 200 or 305 days.

RESULTS AND DISCUSSION

I. Non–genetic factors affecting persistency:

I. A. Factors affecting persistency measured based on ratio of partial yield 200 and 305 days (PRPY-200 and 305 days).

Table (1) showed the least squares means, standard errors and test of significance of differences among means for different factors affecting PRPY-200 and 305 days.

Age at first calving had a significant effect ($P \leq 0.05$) on persistency measured based on ratio of partial yield 305 days. Lactation order had significant effects ($P \leq 0.05$) on PRPY for either 200 or 305 days. The findings of **Ali et al. (1996) and Tekerli et al. (2000)** confirm the significant effects of lactation order on PRPY either for 200 or for 305 days.

Calving interval had no significant effect (P≥ 0.05) on persistency measured based on ratio of partial yield 200 days, while it had a significant effect on persistency measured based on ratio of partial yield 305 days.

Table (1) Least squares means, standard errors of various factors affecting on persistency measured based on ratio of partial yield 200 and 305 days (PRPY-200 and 305 days).

Classification	PRPY- 200 days				PRPY- 305 days			
	No.	mean	±	S.E.	No.	mean	±	S.E.
Age at first calving (months)								
Less than 30	295	0.92^{a}	±	9.98	169	0.78^{a}	±	1.52
30 – 41	36	0.86^{a}	±	3.06	24	0.66^{b}	±	4.52
42 – 53	32	0.93^{a}	±	3.48	10	0.66^{b}	±	5.99
54 – and over	39	0.86^{a}	±	2.73	14	0.62^{c}	±	5.11
Order of lactation								
The first	83	0.89^{b}	±	0.02	33	0.59^{b}	±	0.04
The second	363	0.92^{b}	±	0.02	181	0.66^{a}	±	0.03
The third	258	0.92^{b}	±	0.02	110	0.68^{a}	±	0.03
The fourth	127	0.92^{b}	±	0.02	71	0.69^{a}	±	0.03
The fifth and higher lactation	186	0.95^{a}	±	0.02	87	0.70^{a}	±	0.03
Calving interval (days)								
Less than 365	226	0.92^{a}	±	0.02	90	0.64^{b}	±	0.03
365 – 424	275	0.91^{a}	±	0.02	143	0.66^{a}	±	0.03
425 – 484	163	0.91^{a}	±	0.20	88	0.65^{a}	±	0.03
485 and over	353	0.94^{a}	±	0.02	161	0.71^{a}	±	0.03
Days open (days)								
Less than 85	117	0.93^{a}	±	0.02	17	0.62^{b}	±	0.05
85 – 114	137	0.93^{a}	±	0.02	23	0.67^{a}	±	0.04
115 – 144	129	0.90^{a}	±	0.02	32	0.66^{a}	±	0.04
145 and over	634	0.92^{a}	±	0.02	410	0.72^{a}	±	0.03
Dry period (days)								
Less than 45	64	0.95^{a}	±	0.03	23	0.71^{a}	±	0.04
45 – 59	435	0.91^{b}	±	0.03	203	0.64^{b}	±	0.02
60 – 74	425	0.91^{b}	±	0.02	208	0.66^{a}	±	0.02
75 and over	93	0.92^{b}	±	0.02	48	0.65^{a}	±	0.03
Season of calving								
Summer (May to October)	643	0.86^{b}	±	0.02	162	0.57^{b}	±	0.03
Winter (November to April)	374	0.98^{a}	±	0.02	320	0.76^{a}	±	0.03
Year of calving								
2005	135	0.95^{a}	±	0.02	127	0.59^{b}	±	0.03
2006	839	0.88^{b}	±	0.01	331	0.65^{a}	±	0.03
2007	43	0.94^{b}	±	0.03	24	0.75^{a}	±	0.05

Within the same classification, the appearance of the same letter with two means signifies that they do not differ significantly (5% level). Otherwise they do.

The non-significant and the significant effects of calving interval on PRPY either for 200 or for 305 days, respectively are in consistence with the findings of **Dekkers et al. (1998)**

and Muir et al. (2004). Days open had a significant effect (P≤ 0.05) on persistency measured based on ratio of partial yield 305 days.

Dry period had significant effects on PRPY-200 and 305 days (P≤ 0.05). The season of calving had a significant effect (P≤ 0.01) on PRPY either for 200 or for 305 days which in consistence with the findings of **Gengler (1990) and Ghanem et al. (1991).** The significant effect of year of calving on PRPY either for 200 or for 305 days is in consistence to the findings of **Tekerli et al. (2000).** On the contrary, **Koley et al. (1979)** observed that the effect of year of calving on PRPY for either 200 or 305 days was non- significant.

I. B. Factors affecting persistency measured based on ratio of total yield 200 and 305 days over maximum yield (PRTY-200 and 305 days).

Table (2) showed the least squares means, standard errors and test of significance of differences among means for different factors affecting persistency measured based on ratio of total yield either for 200 or 305 days over maximum yield (PRTY-200 and 305 days).

Age at first calving had significant effects on PRTY-200 and 305 days. The significant effects of age at first calving on PRTY-200 and 305 days is consistent and contradict, respectively with the findings of **Wang et al. (1994), and Tekerli et al. (2000).**

Lactation order had significant effects on PRTY-200 and 305 days. When the animals attain the second and the third season, there are some changes, which have great influence in milk production and lactation persistency such as development in the size and function of rumen as well as progress in mammary secretory cells function and number, which help cows to keep the peak of milk yield for long time, so the lactation curve appeared more flattened. The clear effect of lactation order on PRTY-200 and 305 days is in accordance with the findings of **Fadlelmoula et al. (2007).**

Calving interval had significant effects (P≤ 0.01) on PRTY-200 and 305 days. The significant effect of calving interval on PRTY-200 and 305 days is agreed with the findings of **Muir et al. (2004).** The significant effect of days open on PRTY-200 and 305 days is in agreement with the findings of **Sölkner and Fuchs (1987) and Tekerli et al. (2000).**

In general, the winter season showed the highest persistency values may be due to availability of green feeder and/or suitability of climatic conditions. The great effect of season of calving on (PRTY-200 and 305 days) is agreed with the findings of **Ghanem et al. (1991).** The significant effect (P≤0.01) of year of calving on PRTY-200 and 305 days is in consistence to the findings of **Tekerli et al. (2000).** On contrary, **Koley et al. (1979)** observed that the effect of year of calving on PRTY-200 and 305 days was non-significant.

I. C. Factors affecting persistency measured based on ratio of maximum yield over total yield 200 and 305 days (PRMY-200 and 305 days).

Table (3) showed the least squares means, standard errors, and test of significance of differences among means for different factors affecting persistency measured based on ratio of maximum yield over total yield either for 200 or 305 days (PRMY-200 and 305 days).

Table (2) Least squares means, standard errors of various factors affecting on persistency measured based on ratio of total yield 200 and 305 days over maximum yield (PRTY-200 and 305 days).

Classification	No.	PRTY- 200 days			PRTY- 305 days		
		mean	±	S.E.	mean	±	S.E.
Age at first calving (months)							
Less than 30	600	463.96[c]	±	6.74	545.01[b]	±	10.09
30 – 41	64	464.64[b]	±	19.10	558.20[a]	±	28.44
42 – 53	62	479.65[a]	±	19.22	539.42[c]	±	26.72
54 – and over	73	457.77[d]	±	16.92	507.16[d]	±	22.30
Order of lactation							
The first	157	472.57[b]	±	8.83	544.17[b]	±	12.61
The second	644	468.36[d]	±	5.99	547.51[a]	±	8.56
The third	488	474.19[a]	±	6.33	547.40[a]	±	9.04
The fourth	254	468.36[d]	±	7.54	543.85[c]	±	10.76
The fifth and higher lactation	412	469.55[c]	±	6.64	543.16[c]	±	9.48
Calving interval (days)							
Less than 365	454	478.29[a]	±	6.50	551.85[a]	±	9.28
365 – 424	580	469.56[b]	±	6.28	542.61[c]	±	8.96
425 – 484	325	465.12[c]	±	7.32	539.89[d]	±	10.45
485 and over	596	469.45[b]	±	5.95	546.52[b]	±	8.50
Days open (days)							
Less than 85	374	448.01[d]	±	7.07	517.99[d]	±	10.09
85 – 114	367	460.09[c]	±	6.90	529.99[c]	±	9.86
115 – 144	305	496.38[a]	±	7.29	574.97[a]	±	10.42
145 and over	909	477.94[b]	±	5.89	557.93[b]	±	8.41
Dry period (days)							
Less than 45	106	467.45[c]	±	10.21	541.59[c]	±	14.58
45 – 59	790	475.46[b]	±	5.40	552.60[a]	±	7.72
60 – 74	870	476.95[a]	±	5.38	546.90[b]	±	7.68
75 and over	189	462.56[d]	±	8.34	539.78[d]	±	11.90
Season of calving							
Summer (May to October)	760	443.01[b]	±	5.87	513.32[b]	±	8.37
Winter (November to April)	1195	498.19[a]	±	6.89	577.12[a]	±	9.83
Year of calving							
2005	163	519. 13[a]	±	9.78	575.07[b]	±	13.96
2006	1377	509.33[b]	±	5.04	589.07[a]	±	7.19
2007	415	383.36[c]	±	7.15	471.51[c]	±	10.21

Within the same classification, the appearance of the same letter with two means signifies that they do not differ significantly (5% level). Otherwise they do.

Table (3): Least squares means, standard errors of various factors affecting on persistency measured based on ratio of maximum yield over total yield for either 200 or 305 days (PRMY-200 and 305 days).

Classification	No.	PRMY- 200 days			PRMY- 305 days		
		mean	**±**	**S.E.**	**mean**	**±**	**S.E.**
Age at first calving (months)							
Less than 30	600	27.46[a]	±	0.72	25.32[a]	±	0.77
30 – 41	64	26.70[b]	±	2.08	23.92[c]	±	2.26
42 – 53	62	26.03[b]	±	2.38	24.48[b]	±	2.48
54 – and over	73	26.82[b]	±	2.12	25.41[a]	±	2.20
Order of lactation							
The first	157	26.63[b]	±	1.02	24.58[a]	±	1.06
The second	644	27.09[a]	±	0.69	24.86[a]	±	0.72
The third	488	26.58[b]	±	0.73	24.45[a]	±	0.76
The fourth	254	26.91[b]	±	0.87	24.70[a]	±	0.90
The fifth and higher lactation	412	26.86[b]	±	0.76	24.77[a]	±	0.79
Calving interval (days)							
Less than 365	454	25.63[c]	±	0.75	23.52[c]	±	0.78
365 – 424	580	26.54[b]	±	0.72	24.41[b]	±	0.75
425 – 484	325	27.43[a]	±	0.84	25.31[a]	±	0.88
485 and over	596	27.67[a]	±	0.68	25.45[a]	±	0.71
Days open (days)							
Less than 85	374	31.81[a]	±	0.81	29.75[a]	±	0.85
85 – 114	367	26.62[b]	±	0.79	24.62[b]	±	0.83
115 – 144	305	22.73[c]	±	0.84	20.54[d]	±	0.87
145 and over	909	26.10[b]	±	0.68	23.77[c]	±	0.70
Dry period (days)							
Less than 45	106	26.69[b]	±	1.17	24.53[b]	±	1.22
45 – 59	790	26.08[b]	±	0.62	23.88[c]	±	0.65
60 – 74	870	25.86[c]	±	0.62	23.81[c]	±	0.64
75 and over	189	28.64[a]	±	0.96	26.47[a]	±	0.99
Season of calving							
Summer (May to October)	760	27.92[a]	±	0.67	25.92[a]	±	0.70
Winter (November to April)	1195	25.71[b]	±	0.79	23.42[b]	±	0.82
Year of calving							
2005	163	23.76[c]	±	1.12	21.21[b]	±	1.17
2006	1377	28.18[b]	±	0.58	19.78[c]	±	0.60
2007	415	35.51[a]	±	0.82	33.02[a]	±	0.86

Within the same classification, the appearance of the same letter with two means signifies that they do not differ significantly (5% level). Otherwise they do.

Age at first calving had significant effects ($P \leq 0.05$) on PRMY-200 and 305 days. The significant effect of age at first on PRMY-200 and 305 days is contradicted with the findings of **Wang et al. (1994) and Tekerli et al. (2000).**

Lactation order had a significant effect on PRMY-200 days, while it had no significant effect on PRMY-305 days. The significant and the non-significant effects of lactation order on PRMY-200 and 305 days are in agreement with the findings of **Fadlelmoula et al. (2007).**

Calving interval had significant effects on PRMY for either 200 or 305 days. The significant effect of calving interval on PRMY-200 and 305 days is agreed with the findings of **Muir et al. (2004).** On the other hand, the present result contradicts with the findings of **Ibrahim (2002).** Shortening days open leads to higher milk production per days of herd life, but the animals not have the chance to keep peak milk yield for long time so they become less persistent, however, longer days open usually associated by variable persistency measures. The highly significant effect of days open on PRMY-200 and 305 days is in agreement with the findings of **Tekerli et al. (2000).**

The significant effect of dry period on PRMY-200 and 305 days is similar to the findings of **Ghanem et al. (1991).** The significant effects of season of calving on PRMY-200 and 305 days are in accordance with the findings of **Ghanem et al. (1991)**. On Contrary, **Schneeberger (1981)** observed that the effect of season of calving on PRMY-200 and 305 days was non-significant. The significant effect of year of calving on PRMY-200 and 305 days is in consistence with the findings of **Tekerli et al. (2000).**

II. Genetic parameters affecting lactation persistency:

II. A. Heritability estimate:

Table (4) showed the estimates of heritability of various factors affecting the persistency estimates measured by ratios method.

High heritability estimates was obtained for PRPY-200 days (0.34). The high estimate of heritability of PRPY-200 days is in consistence with the findings of **Ageeb and Hays (2000).** In the contrast to the above, **Farghaly and Schleppi (2001)** reported low heritability for PRPY-200 days. However, **Cole and Van Raden (2006)** achieved medium heritability for PRPY-200 days.

Low heritability estimates were obtained for each of PRPY-305 days (-0.01), PRTY-200 days (-0.12), PRTY- 305days (-0.32), PRMY-200 days (-0.34), and PRMY-305 days (-0.36). The low estimate of heritability of PRPY-305 days is in accordance with many authors, including **Rao and Sundaresan (1981), Ibrahim (2002).** On the other hand, **El-Bayomi (1986)** reported high heritability of PRPY-305 days.

II. B. Phenotypic and genetic correlations among different investigated traits:

Table (5) showed the phenotypic and genetic correlations among different factors affecting persistency.

Positive highly significant phenotypic correlations were obtained between LL with each of PRTY-200 days (0.51) and PRTY-305 days (0.65). In addition, negative significant and highly significant phenotypic correlations were obtained between LL with each of PRPY-200 days (-0.14), PRMY-200 days (-0.42) and PRMY-305 days (-0.49).

Table (4) Heritability estimates of various factors affecting the persistency estimates measured by ratios method.

Trait	$h^2 \pm$ S.E.
Persistency measured based on ratio of partial yield 200 days.	0.34 ± 0.25
Persistency measured based on ratio of partial yield 305 days.	- 0.01 ± 0.18
Persistency measured based on ratio of total yield 200 days over maximum yield.	- 0.12 ± 0.17
Persistency measured based on ratio of total yield 305 days over maximum yield.	- 0.32 ± 0.15
Persistency measured based on ratio of maximum yield over total yield 200 days.	- 0.34 ± 0.14
Persistency measured based on ratio of maximum yield over total yield 305 days.	- 0.36 ± 0.14

Positive significant and highly significant genetic correlations were obtained between AFC with each of PRPY-200 days (0.33), PRPY-305 days (0.22) and PRTY-200 days (0.13).

Lactation length had positive significant and highly significant genetic correlations were obtained between LL with each of PRMY-200 days (0.19) and PRMY-305 days (0.13). Positive significant genetic correlations were obtained between LL with PRMY either for 200 or 305 days is in agreement with the findings of **El-Bayomi (1986).**

The highly positive significant phenotypic correlation between TMY with each of PRTY either for 200 or 305 days are in agreement with the reports of **Hareth (2005).** In addition, negative significant phenotypic correlation between TMY with each of PRMY either for 200 or 305 days are in agreement with the findings of **Kamidi (2005).** There were positive significant and highly significant phenotypic correlations between 305-day ME with each of PRPY-200 days (0.18), PRPY-305 days (0.17), PRTY-200 days (0.34) and PRTY-305 days (0.29).

Concerning to 305-day ME, there were positive significant and highly significant genetic correlations were obtained between 305-day ME with PRMY-200 days (0.19).

Moreover, negative significant and highly significant genetic correlations were obtained between 305-day ME with PRPY-200 days (-0.13). Positive significant genetic correlation was obtained between 305-day ME with PRMY-200 days is in consistence with the reports of **Cole and Van Raden (2006) and Strabel and Jamrozik (2006**).

Negative significant genetic correlations, which obtained between PMY with each of PRMY-200 days and PRMY-305 days, are in accordance with the findings of **Fadlelmoula et al. (2007).** There was a positive significant genetic correlation was obtained between PRPY-200 days and PRTY-200 days (0.13). Moreover, a negative significant genetic correlation was obtained between PRPY-200 days and PRMY-200 days (-0.15).

Concerning to PRPY-305 days, there were positive highly significant phenotypic correlations were obtained between PRPY-305 days with each of PRTY-200 days (0.43) and PRTY-305 days (0.35). There were negative highly significant phenotypic correlations were obtained between PRTY-200 days with each of PRMY-200 days (-0.84) and PRMY-305 days (-0.86). In addition, positive significant phenotypic correlation was obtained between PRTY-200 days with PRTY-305 days (0.89). Moreover, there were negative significant phenotypic correlations were obtained between PRTY-305 days with each of PRMY 200 days (-0.74) and PRMY-305 days (-0.81). Concerning to PRMY-200 days, there was positive significant phenotypic correlation was obtained between PRMY-200 days with PRMY-305 days (0.99).

With reference to PRTY-200 days, there were negative highly significant genetic correlations were obtained between PRTY-200 days with each of PRMY-200 days (-0.26) and PRMY-305 days (-0.32). Moreover, a positive highly significant genetic correlation was obtained between PRTY-200 days and PRTY-305 days (0.30). There were negative highly significant genetic correlations were obtained between PRTY-305 days with each of PRMY-200 days (-0.25), and PRMY-305 days (-0.29). There was a positive highly significant genetic correlation was obtained between PRMY-200 days and PRMY-305 days (0.25).

Table (5): Phenotypic and genetic correlations among different factors affecting persistency estimates measured by Ratios Method.

Trait	AFC	LL	TMY	305-day ME	PMY	DP	DO	CI	IMY	TAPMY	RALC	LMY	TALMY	RDLC	PRPY-200 days	PRPY-305 days	PRTY-200 days	PRTY-305 days	PRMY-200 days	PRMY-305 days
AFC	—	-0.04	-0.01	-0.30**	0.16*	0.07	-0.04	-0.05	0.03	-0.04	0.05	0.02	-0.03	-0.01	-0.03	-0.12	-0.004	-0.06	-0.05	-0.03
LL	0.25**	—	0.90**	0.23**	0.05	-0.02	0.83**	0.08	0.02	0.21**	-0.09	-0.38**	0.58**	0.05	-0.14*	-0.12	0.51**	0.65**	-0.42**	-0.49**
TMY	0.20**	0.44**	—	0.24**	0.25**	-0.01	0.81**	0.15*	0.09	0.22**	-0.07	-0.22**	0.51**	0.05	-0.09	-0.06	0.57**	0.67**	-0.49**	-0.55**
305-day ME	-0.24**	-0.09	0.02	—	0.42**	-0.01	0.17**	0.15*	0.06	0.17**	0.04	0.32**	0.03	0.02	0.18**	0.17**	0.34**	0.29**	-0.28**	-0.29**
PMY	-0.08	0.08	0.12	0.25**	—	-0.01	0.04	0.11	0.17**	0.12	0.18**	0.28**	-0.04	0.01	0.08	0.002	0.13*	0.06	-0.20**	-0.18**
DP	0.20**	0.30**	0.27**	-0.07	0.03	—	0.01	0.28**	-0.05	0.02	0.02	-0.01	-0.002	-0.05	0.0001	0.002	-0.02	-0.01	0.04	0.03
DO	0.27**	0.27**	0.26**	-0.25**	-0.01	0.47**	—	0.15*	0.04	0.14*	-0.07	-0.31**	0.47**	0.05	-0.12	-0.09	0.33**	0.47**	-0.29**	-0.35**
CI	0.38**	0.32**	0.23**	-0.37**	0.07	0.37**	0.43**	—	-0.02	0.13*	0.002	0.04	-0.03	0.001	0.14*	0.26**	0.07	0.07	0.004	-0.01
IMY	0.02	-0.30**	-0.11	-0.07	-0.26**	-0.02	-0.10	-0.01	—	-0.14*	-0.60**	0.24**	0.18**	0.06	-0.40**	-0.32**	0.02	0.02	-0.08	-0.07
TAPMY	0.14*	0.08	0.16*	0.04	0.18**	0.12	0.29**	0.28**	-0.20**	—	-0.31**	-0.10	0.02	-0.03	0.29**	0.41**	0.26**	0.23**	-0.17**	-0.19**
RALC	-0.08	0.01	0.06	0.14*	0.20**	-0.04	-0.06	-0.10	-0.09	0.10	—	-0.02	-0.13*	0.01	0.13*	0.03	-0.12	-0.12	0.12	0.12
LMY	-0.14*	-0.10	-0.08	0.23**	0.09	-0.23**	-0.16*	-0.25**	0.02	0.06	0.24**	—	-0.42**	0.01	-0.002	0.24**	-0.23**	-0.36**	0.15*	0.21**
TALMY	-0.03	0.01	-0.03	-0.20**	-0.25**	0.36**	-0.03	-0.16*	0.11	-0.42**	-0.09	-0.13*	—	0.13*	-0.40**	-0.51**	0.43**	0.60**	-0.35**	-0.41**
RDLC	-0.04	-0.11	-0.09	-0.04	-0.04	0.04	-0.15*	-0.01	-0.07	-0.01	-0.03	0.11	-0.23**	—	-0.06	-0.06	0.06	0.06	-0.06	-0.06
PRPY-200 days	0.33**	0.01	0.01	-0.13*	0.18**	0.17**	0.14*	0.11	0.08	0.20**	-0.20**	-0.16*	-0.25**	-0.03	—	0.70**	0.52**	0.03	-0.12	-0.05
PRPY-305 days	0.22**	0.05	0.04	-0.01	0.06	-0.04	0.12	0.02	0.05	0.16*	-0.07	-0.05	-0.13*	-0.06	-0.11	—	0.43**	0.35**	-0.10	-0.36**
PRTY-200 days	0.13*	-0.12	-0.08	-0.12	0.18**	0.13*	-0.05	-0.07	0.02	-0.03	0.04	-0.03	-0.15*	-0.04	0.13*	0.02	—	0.89**	-0.84**	-0.86**
PRTY-305 days	0.01	-0.13*	-0.12	-0.09	0.22**	-0.04	-0.13*	-0.22**	0.06	0.04	-0.04	-0.01	-0.23**	-0.06	0.01	0.51**	0.30**	—	-0.74**	-0.81**
PRMY-200 days	-0.07	0.19**	0.16*	0.19**	-0.25**	-0.10	0.15*	0.11	-0.02	0.01	-0.06	-0.01	0.25**	0.02	-0.15*	0.19**	-0.26**	-0.25**	—	0.99**
PRMY-305 days	-0.04	0.13*	0.12	0.11	-0.21**	0.03	0.13*	0.19**	-0.03	-0.87**	0.03	0.01	0.24**	0.06	-0.04	-0.51**	-0.32**	-0.29**	0.25**	—

N.B. Figures above the diagonal represent phenotypic correlations, while these below the diagonal represent genetic correlations.

* Significant at level 0.05 ** Significant at level 0.01

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الملخص العربى

العوامل التى تؤثر على المثابرةالمقاسة بطريقة النسب

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** قسم تنمية الثروة الحيوانية - كلية الطب البيطري – جامعة الزقازيق

جمعت بيانات هذه الدراسة من مزارع دينا الواقعة بعد على ٨٠ كم شمال القاهرة ، وقد تم الحصول على بيانات ٢٢٠١ سجل لبن لأبقار فريزيان نقية خلال الفترة من ٢٠٠٥ – ٢٠٠٧ ، وأجريت التحليلات الإحصائية للبيانات الخاصة بالدراسة اعتمادا على برنامج SAS .

وقد أظهرت الدراسة النتائج الآتية :

للفترة بين ولادتين ، للفترة المفتوحة و للعمر عند أول ولادة تأثير معنوي على جميع قيم المثابرة التى تم حسابها بطريقة النسب ماعدا قيمة المثابرة التي تم الحصول عليها من الإنتاج الجزئي للبن في ٢٠٠ يوم ، وكان لترتيب موسم الحليب تأثير معنوي على كل الصفات التى تمت دراستها ماعدا قيمة المثابرة التي تم الحصول عليها من الإنتاجية العظمى بالنسبة للإنتاج الكلى خلال ٣٠٥ يوم ، وكان لفترة الجفاف ، موسم وسنة الولادة تأثير معنوي على جميع قيم المثابرة التى تم حسابها بطريقة النسب.

كان لبعض قيم المثابرة التى تم حسابها بطريقة النسب مكافئ وراثي منخفض مثل قيمة المثابرة المحسوبة اعتمادا على الإنتاج الجزئي للبن خلال ٣٠٥ يوم،(0.01-)، قيمة المثابرة المحسوبة اعتمادا على الإنتاجية الكلية سواء خلال ٢٠٠ يوم(o.12-) أو ٣٠٥ يوم(0.32-) و بالنسبة للإنتاجية العظمى للبن ، وقيمة المثابرة المحسوبة اعتمادا على الإنتاجية العظمى للبن بالنسبة للإنتاجية الكلية خلال ٢٠٠ يوم (0.34-) و ٣٠٥ يوم(0.36 -) ،أما قيمة المثابرة المحسوبة اعتمادا على الإنتاج الجزئي للبن خلال ٢٠٠ يوم فكان لها مكافئ وراثي عالي(0.34).

اختلفت الارتباطات الوراثية والمظهرية بين المثابرة وبين العوامل المؤثرة عليها فكانت الارتباطات الوراثية ضعيفة مثل الارتباط بين العمر عند أول ولادة و بين قيمة المثابرة اعتمادا على الإنتاج الجزئي للبن خلال ٢٠٠ يوم(0.33).