Genetic Evaluation of some Productive and Days Open Traits in a Commercial Friesian Herd in Egypt Using Different Animal Models

Shalaby, N. A.; M. A. Mostafa; M. N. Al-Arani; M. F. Abd-Algalil and Manal K. Ismail

1Animal Production Dept., Fac. Agric., Mansoura University, Egypt.
2Animal Production. Research Institute, Agric Res Center, Ministry of Agric. Egypt.

ABSTRACT

Estimates of covariance component and some genetic parameters were evaluated by using multi traits animal models, for Total milk yield (TMY), Lactation length (LL), Dry period (DP) and Days open (DO). In this study the normal lactation records (4758) of Friesian cattle collected during the period from 2002 to 2010 from the farm of Investment Company Dairy Products Kilo 80 Cairo Alexandria Desert Road (Dina farm) were used. In the three mixed model used the analysis included the non genetic effects of month and year of calving and the random effects of additive direct genetics, maternal effect and residual. The overall means for TMY, LL, DP and DO were 10224 kg, 413d, 80d and 221d, respectively. However, the coefficient of variation (CV%) were ranged from (32%) TMY to (82%) DP during the first lactation. The large coefficient of variation, would be important indicative leaders in this study. The results showed the estimates of covariance components and heritability for different studied traits. The obtained results showed that, Additive genetic variances were higher; in model(2) for total milk yield, in model(3) for lactation length, in model(1) for dry period and in model(3) for days open. However, the other side maternal genetic variances was higher in model(3) for the studied traits. However, residual and phenotypic variances were higher mostly in model (2) and model (3) than their corresponding values in model (1). The estimates of heritabilities using the three models for TMY, LL, DP and DO were ranged from (0.48±0.04) to (0.59±0.03), (0.01±0.00) to (0.06±0.3), (0.03±0.07) to (0.08±0.03) and (0.01±0.0) to (0.12±0.03), respectively. However, the obtained estimates of maternal heritabilities were very low in the three models for TMY, LL, DP and DO. It ranged from (0.00±0.00) to (0.19±0.02), (0.00±0.00) to (0.01±0.01), (0.01±0.01) to (0.07±0.02) and (0.00±0.0) to (0.01±0.01), respectively. The results recorded different estimates of phenotypic and genetic values between examined traits. The experimental results lead to conclude that, the influence of the maternal genetic effect for traits were the lowest, thereby no relative efficiency of improvement vice-versa, direct heritability for TMY and DO would be efficiency.

Keywords: Total milk yield, Lactation length, Dry period, Days open, direct additive heritability, maternal heritability and Holstein Friesian, Egypt.

INTRODUCTION

Recently in Egypt, many private dairy cattle farms were established through introducing Holstein Friesian cattle. Some genetic aspects of productive and reproductive performance of this breed under the Semi-Arid Conditions in Commercial herds were reviewed by Abdel-Salam et al. (2001), Affifi et al. (2002), El-Arani et al. (2003), Nigm et al. (2003), Zahed et al. (2003). Milk yield and fertility traits are the principal factors affecting profitability of a dairy herd. Early postpartum breeding of dairy animals for high fertility, short dry period and early maturity are resulted in more calves and high milk yield per unit of time throughout the herd life (Britt,1975). Nevertheless, genetic improvement of productive and reproductive traits is almost non-existent in Egypt. Even some improvement programs for increasing dairy yield have been implemented they have not survived due to the lack of financial resources, Garcia et al., 2002; Grajales et al., 2006.

The objective of this study was to determine the genetic, phenotypic parameters for Total milk yield (TMY), Lactation length (LL), Dry period (DP) and Days open (DO) using different animal models in Friesian cattle in Egypt.

MATERIALS AND METHODS

Data used in the present study was obtained from the milk records of Friesian cows maintained at Investment Company Dairy Products (Dina farm) Kilo 80 Cairo Alexandria Desert Road, Egypt. The nucleus of this herd was imported to Egypt from the United States of America (USA) as pregnant heifers in (1968). A Total of (4758) normal lactation records spread over the period from 2002-2010. First, the milk records used were from 996 Holstein Friesian cows, daughters of 695 dams and 98 sires. Abnormal records of cows affected by diseases (such as mastitis and udder troubles) or reproductive disorders were excluded.

The data were edited with wrong and missing information excluded from the data set. All cows had their sire and dam identified for the analysis of genetic value and based on this information in the farm. The heifers were served for the first time when reached 18 month or 350 kg of weight. Traits studied were total milk yield (TMY), lactation length (LL), dry period (DP) and days open (DO).

Animals were kept under Semi-open asbestos sheds. All cows were fed concentrate mixture with Egyptian clover and rice straw during the year. Grasses during the dry season (cold or hot), were usually insufficient because of the lack of irrigation. Thus, rice straw, hay and silage were used as supplements. The concentrate mixture used was composed of 45% cotton seed cake. 26% wheat bran, 17% yellow maize, 7.5% rice bran, 2% molasses, 1% sodium chloride and 2% calcium carbonate. The concentrate was offered twice daily before milking according to animal body weight and its milk production. Cows In general, were artificially inseminated during the first two heats after 60 days postpartum using important frozen semen from USA. Heifers were artificially inseminated for the first time once they attained 350 kg of live body weight or 18 month of age. The cows were machine milked three times a day at 4.00, 12.00 and 19.00h. The born calves were artificially suckled from birth to weaning excluding Colostrums period. Water and minerals mixture were also available freely all time.

The collected data were analyzed using multi-trait animal model of VCE-6 computer package (Groeneveld et al., 2008) for estimate genetic parameters by restricted Maximum Likelihood procedures (REML).
using multi-trait animal models. The following three models were used:

\[ y = x \beta + z_1 \alpha + e \]

**Model 1:** $y = x \beta + z_1 \alpha + e$

**Model 2:** $y = x \beta + z_2 \alpha + z_3 \mu + e$, $\text{Cov}(\alpha, \mu) = 0$

**Model 3:** $y = x \beta + z_2 \alpha + z_3 \mu + e$, $\text{Cov}(\alpha, \mu) = \alpha \sigma(a, m)$

The models of statistical analysis used for studying factors affecting some productive traits i.e., Total milk yield (TMY/kg), Lactation length(LL/d), Dry period (DP/d) and one of reproductive traits i.e., Days open (DO/d).in the first lactation.

Where:

- $y$ is being the vector of observations for the traits (TMY, DP, LL, and DO on the animal)
- $x$ is being the incidence matrix of fixed effects
- $b$ is being the vector of fixed effects (e.g. year, season, including lactation number, breed group and year–season of calving)
- $z_1$ and $z_2$ are corresponding design matrices associating the fixed and random effect to the observations
- $z_3$ is being the incidence matrix of maternal random additive effects
- $a$ and $m$ are being the vector of random direct additive genetic effect of the animal and maternal genetic effect.
- $e$ is being the vector of random residuals.

The assumptions about the variances of the random effects were:

\[ \text{Var}(a) = A \sigma_a \]

\[ \text{Var}(e) = 1 \sigma_e \]

Where:

- $\sigma_a$ is the additive direct and maternal genetic.
- $1$ is the identity matrix.
- $\sigma_e$ is the additive numerator of the identity matrix.

The models of statistical analysis used for studying factors affecting some productive traits, i.e., Total milk yield in this study (Table1.), was much higher than that 327 days obtained by Shalaby, et al., (2013). However, it was 221 days. Total milk yield (TMY/kg), Lactation Length (LL/d), Dry period (DP/d) and one of reproductive traits, i.e., Days open (DO/d).in the first lactation. The present lactation length (413 days) was higher than that 327 days obtained by Shalaby, et al., (2013) (291 days) by Sattar et al., (2005) and 315 days by Ayalew, et al., (2017).

Table 1. Estimate of overall means, standard deviations (± SD) and coefficient variabilities (C.V %) for Total Milk yield (TMY), Lactation Length (LL), Dry period (DP) and Days Open (DO), during the first lactation

<table>
<thead>
<tr>
<th>Traits</th>
<th>Mean ±SD</th>
<th>C.V%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMY/kg</td>
<td>10224 ±69.8</td>
<td>6.74%</td>
</tr>
<tr>
<td>LL/day</td>
<td>413 ±15</td>
<td>35.03%</td>
</tr>
<tr>
<td>DP/day</td>
<td>108 ±9</td>
<td>10.52%</td>
</tr>
<tr>
<td>DO/day</td>
<td>221 ±135</td>
<td>6.12%</td>
</tr>
</tbody>
</table>

Table 1 shows that mean of DO of Holstein Friesian cattle was 221 days. The present lactation length was much higher than that 327 days obtained by Shalaby et al., (2013). The obtained mean of DO was 108 days at first lactation. It was longer than that 65 days of Kattab and Atill (1999) and 63 days, of Salem et al., (2006) by Shalaby et al., (2013) using Friesian cattle in Egypt. However, Shalaby et al., (2013) recorded shorter mean of DP (72 days). In other studies Shalaby et al., (2013) obtained 141 days and Abo Elfadi and Radwan, (2016) obtained 185 days.

<table>
<thead>
<tr>
<th>Traits</th>
<th>Mean ±SD</th>
<th>C.V%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMY/kg</td>
<td>10224 ±69.8</td>
<td>6.74%</td>
</tr>
<tr>
<td>LL/day</td>
<td>413 ±15</td>
<td>35.03%</td>
</tr>
<tr>
<td>DP/day</td>
<td>108 ±9</td>
<td>10.52%</td>
</tr>
<tr>
<td>DO/day</td>
<td>221 ±135</td>
<td>6.12%</td>
</tr>
</tbody>
</table>

**RESULTS AND DISCUSSION**

The overall means, standard deviations (SD) and coefficient variabilities (C.V %) for different studied traits at the first lactation are present in Table 1. The obtained mean for TMY, LL, DP and DO were 10224 kg, 141 days, 108 days and 221 days respectively.

Total milk yield in this study (Table 1) was much higher than the estimates of Friesian cattle in Egypt 2737 kg by Oudah and Zainab (2010), 3639 kg by ElAwady and Oudah (2011) and 5387 kg by Shalaby et al., (2013). However, it was lower than estimated by Rushdi et al., (2014) 10718 kg.

The high milk yield usually indicated to genetic and environment mainly the good nutrition program.

Table 2. Estimates of covariance components and heritabilities for different studied traits

<table>
<thead>
<tr>
<th>Traits</th>
<th>Model</th>
<th>$\sigma^2_a$</th>
<th>$\sigma^2_m$</th>
<th>$\sigma^2_e$</th>
<th>$h^2_a$±SE</th>
<th>$h^2_m$±SE</th>
<th>$R_m$±SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMY</td>
<td>1</td>
<td>227.7±27.3</td>
<td>---</td>
<td>---</td>
<td>246.6</td>
<td>474.3</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>275.3±112</td>
<td>0.17±0.39</td>
<td>---</td>
<td>286.6</td>
<td>561.9</td>
<td>0.49±0.02</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>241.2±17.4</td>
<td>79.3±8.5</td>
<td>-155.2±13.4</td>
<td>398.3</td>
<td>408.8</td>
<td>0.59±0.03</td>
</tr>
<tr>
<td>LL</td>
<td>1</td>
<td>136.5±66.9</td>
<td>---</td>
<td>---</td>
<td>2138.5</td>
<td>2275</td>
<td>0.06±0.3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>291.0±75.3</td>
<td>1.46±5.63</td>
<td>---</td>
<td>28801.5</td>
<td>29100</td>
<td>0.01±0.00</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>535.1±208.9</td>
<td>158.9±158.5</td>
<td>-254.0±133.7</td>
<td>2389</td>
<td>2675</td>
<td>0.02±0.00</td>
</tr>
<tr>
<td>DP</td>
<td>1</td>
<td>611.8±233.9</td>
<td>---</td>
<td>---</td>
<td>7035.7</td>
<td>7647</td>
<td>0.08±0.03</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>269.8±57.87</td>
<td>96.9±11.7</td>
<td>---</td>
<td>8626.3</td>
<td>8993</td>
<td>0.03±0.07</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>298.0±157.7</td>
<td>559.1±169.0</td>
<td>21.6±77.7</td>
<td>6571.3</td>
<td>7450</td>
<td>0.04±0.02</td>
</tr>
<tr>
<td>DO</td>
<td>1</td>
<td>278.6±893.6</td>
<td>---</td>
<td>---</td>
<td>2042</td>
<td>2321</td>
<td>0.12±0.03</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>263.4±66.5</td>
<td>2.20±4.57</td>
<td>---</td>
<td>2308</td>
<td>2634</td>
<td>0.01±0.00</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>455.1±147.0</td>
<td>321.5±163.4</td>
<td>-314.2±76.5</td>
<td>871</td>
<td>2275</td>
<td>0.02±0.01</td>
</tr>
</tbody>
</table>

TMY = Total Milk yield (TMY/kg), LL = Lactation length (LL/d); DP = Dry period (DP/d); DO = Days open (DO/d); $a$ = direct additive genetic variance; $m$ = maternal additive variance; $e$ = residual variance; $h^2_a$ = phenotypic variance $h^2_m$ = maternal heritability $h^2_a$ = direct heritability; $R_m$ = correlation between direct and maternal additive genetic effect.

Estimation of covariance components and heritabilities ($h^2$) for studied different traits are present in Table 1. The additive genetic variances were found to be higher in model (2) than model (1) and model (3) for total traits. Shalaby, N. A. et al.
milk yield was higher in model(3) than model(2) and model(1) for lactation period; was higher in model(1) than model(2) and model(3) for dry period and was higher in model(3) than model(1) and model(2) for days open. Table (2) showed also that maternal genetic variances was higher in model(3) than model(1) and model (2) for the studied traits. However, residual and phenotypic variances were higher mostly in model (2) and model(3) than the corresponding value in model(1).

In a similar study, Abolfadi and Radwan.,(2016) applied different animal models to compare full animal model, with covariance or without covariance between direct and maternal genetic effects. They obtained additive genetic variance for total milk yield of 39528.9 in model(2) at the first lactation. The previous results of Abolfadi and Radwan.,(2016) contradicted the present study that the highest variances components in model(2) for first lactation not only depend on genetic potential of an animal but also on maternal effect plus environment either permanent or temporary.

In the case of the estimates of direct heritability for TMY by the three models, it ranged from (0.48±0.04 to 0.59±0.03), the higher value of estimates was in model(3), while the lowest value was in model(1). The results indicated that most of the performance of productive traits not only depend on genetic potential of an animal but also on maternal effect plus environment either permanent or temporary. The obtained present estimate of direct heritability was higher than 0.20 obtained by Ozyurt and Akman(2009) for Friesian cattle. However, the present value was near to that (0.4) found by Abdel Gill (1996) for TMY. Abolfadi and Radwan.,(2016) recorded direct heritability for TMY(0.26,0.43 and 0.25) by using the three models.

The estimates of direct heritability for (LL) in the three used models ranged between (0.01±0.00 to 0.06±0.03). The higher estimate was obtained by model(3), while the lowest value was in model(1). In this respect, the estimate of (LL) was (0.14) found by Kassab et al.,(2001) to be lower than that of the present study.

The estimate of direct heritability for DP in the three models were ranged from (0.03±0.07) in model 2 to (0.08±0.03) in model 1. These values were higher than 0.05 and 0.02 by Salem et al.,(2006) and Salem and Adel Raouf.(1999), respectively on Holstein Frisian cattle in Egypt. Nearly, similar values were given by Javed et al.,(2001) shown the estimates of heritability for DP on the basis of first lactation was 0.026±0.027 and Ahmad et al.,(2001) recorded 0.07±0.02 for dry period. Table (2) showed The estimates of direct heritability of DO. It ranged between 0.01±0.00 to 0.12±0.03. Similar estimate (0.11±0.033) by Birhanu et al.,(2015) on Holstein Frisian cattle was found.

The values of direct heritability for DO in the examined three models were ranged between 0.01±0.00 in model 2 to 0.12±0.03 in model 1; to be similar trend of direct heritability of LL. The similar trend for LL and DO may be due to the longer days open in side of the period of lactation length.

The values of present estimates of maternal heritability Table (2) was very low in the three models for TMY, LL, DP and DO ranged from (0.00±0.00 to 0.19±0.02, (0.00±0.00 to 0.01±0.01), (0.01±0.01 to 0.07±0.02 and (0.00±0.00 to 0.01±0.01) respectively. Nearly similar results were found by Khattab, et al.,(2005) and Mostafa et al.,(2013), thus it could be concluded that maternal effects not so important for milk traits in dairy cattle. In the same trend of estimates herein for maternal heritability those obtained by Lee and Han.,(2004) for DO (0.005) on Korean Holstein cows and by Berry et al.,(2008) was (0.01) for TMY on Friesian.

The Direct genetic correlations and maternal genetic correlations of studied traits in examined Friesian cattle were given in Table (3). From this results it could be noticed that the direct genetic correlations between (TMY and DO) in the three models were ranged from (0.15) to (0.99). However, the estimate obtained by Hammound.,(2013) on Egyptian Holstein cows was negative (-0.30). Also, Table(3) showed that genetic correlations between (TMY and LL) in the three models ranged from (0.26 to 0.99) This will be expected to be in normal to be high. Similar values in dairy animals by Mostafa et al.,(2012) and Khattab et al.,(2003) showed also, genetic correlations between (TMY and LL) to be positive and higher. Thus, selection on the basis of length of lactation of this results lead to improve TMY and in the same time the other traits.

Table 3. Estimates of direct genetic correlations and maternal genetic correlations of studied traits for three models of Friesian cows in Egypt.

<table>
<thead>
<tr>
<th>Traits</th>
<th>Model1</th>
<th>Model2</th>
<th>Model3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R_{G}</td>
<td>R_{G}</td>
<td>R_{G}</td>
</tr>
<tr>
<td>TMY x DO</td>
<td>0.15</td>
<td>0.99</td>
<td>0.16</td>
</tr>
<tr>
<td>TMY x LL</td>
<td>0.26</td>
<td>0.99</td>
<td>0.24</td>
</tr>
<tr>
<td>TMY x DP</td>
<td>0.11</td>
<td>0.09</td>
<td>0.19</td>
</tr>
<tr>
<td>DO x LL</td>
<td>0.89</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>DO x DP</td>
<td>0.54</td>
<td>0.05</td>
<td>-0.08</td>
</tr>
<tr>
<td>LL x DP</td>
<td>0.66</td>
<td>-0.07</td>
<td>-0.77</td>
</tr>
</tbody>
</table>

R_{G} = direct genetic correlation; R_{m} = maternal genetic correlation; R_{gen} = correlations between direct and maternal additive genetic effect.

The genetic correlations between (TMY and DP) in the three models ranged from (-0.04 to 0.11), Nearly similar trend showed by Shalaby et al.,(2013), that genetic correlations coefficients between (TMY and DP) was lower -0.54. From table (3) it could be noticed that genetic correlations between (DO and LL) in the three models were (0.09 to 0.99) which is positive and higher than that obtained by Azizi et al.,(2001) (0.07). Also table (3) showed that genetic correlations between (DO and DP) in the three models were (-0.11) to (0.54), Shalaby et al.,(2013) obtained genetic correlations between (DO and DP) was (0.58). Genetic correlations between (LL and DP) in the three models was (-0.7 to 0.66) while Shalaby et al.,(2013) showed genetic correlations between (LL and DP) was negative (-0.44).

From table (3) it could be noticed that the estimates of maternal genetic correlation between (TMY and DO), (TMY and LL),(TMY and DP), (DO and LL),(DO and DP) and (LL and DP) in the three models were ranged from (0.16 to 0.33),(0.24 to 0.65),(0.015 to 0.19) and (0.57 to 0.99), (-0.69 to -0.80) and (-0.77 to 0.12). Table(4) showed the phenotypic correlation by the three models for the examined traits.
Table 4. Estimates of phenotypic correlations of studied traits by the three models of Friesian cattle.

<table>
<thead>
<tr>
<th>Traits</th>
<th>Model1</th>
<th>Model2</th>
<th>Model3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R_p</td>
<td>R_m</td>
<td>R_p</td>
</tr>
<tr>
<td>TMY x DO</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>TMY x LL</td>
<td>0.66</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>TMY x DP</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>DO x LL</td>
<td>0.74</td>
<td>0.73</td>
<td>-0.7</td>
</tr>
<tr>
<td>DO x DP</td>
<td>-0.01</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td>LL x DP</td>
<td>-0.19</td>
<td>-0.20</td>
<td>-0.20</td>
</tr>
</tbody>
</table>

RP = phenotypic correlations

The phenotypic correlations in the case of (TMY and DO) of the three models were (0.01 to 0.06). In the same trend Dematawewa and Berger (1998) obtained 0.27 value between the same traits .Also in table (4) the phenotypic correlations between (TMY and LL) was positive from (0.028 to 0.66) that value was similar to that estimated by Marai et al. (2009) (0.77) on Egyptian buffaloes and 0.16 by Shalaby et al. (2013) in Friesian. However, Phenotypic correlations between (TMY and DP) was negative and lower from (-0.01 to 0.029) .The results of Shalaby et al (2013) showed the phenotypic correlations between (TMY and DP) was negative (-0.02). Also the phenotypic correlations in the present study between (DO and LL) was ranged (0.72 to 0.74). It was positive and higher than that found by Aziz et al. (2001) (0.47) on Egyptian buffaloes, and in agreement with Shalaby et al. (2013) (0.73). The phenotypic correlations in table (4) between (DO and DP) was (-0.045 to -0.01). Negative and lower results than that reported by Shalaby et al. (2013) was (0.4). Also the phenotypic correlations between (LL and DP) was ranged from (-0.20 to 0.19) (Table 4).

Generally, the values of genetic correlations between most of the studied traits were higher than the similar values of phenotypic correlations as shown in table 4.

CONCLUSION

The present results lead to the importance of using the animal models in raising the improvement in the examined milk production traits (Total milk yield, Lactation length, Dry period and Days open). The variations between the results of using the three models related to the examined traits which could be reflected by the additive genetic variance which was higher in model2 for milk yield, model 3 for lactation length, model1 for dry period and model3 for days open. From the maternal genetic variances views, model3 was the higher. However, residual and phenotypic variances were mostly in model2 and 3.

Also, the results of the three models regarding the heritabilities of the examined traits showed clear rang in each trait. However, the estimates of the heritabilities were very low in the three models for all examined traits (TMY, LL, DP and DO).

In the same direction, the estimates of either genetic and phenotypic correlations between the examined traits were differ from model to other.

The results showed that the estimates of traits under investigation did not influence by the maternal genetic effect, thereby no relative efficiency of improvement. Vice-versa, direct heritability for TMY, LL, DP and DO were efficiency. Genetic improvement for LL lead to following improve in each of TMY and DO. However, the estimates of heritability was low for DO, this indicated that the major part of the variation in this trait, was environmental, thereby the selection may not prove to be effective in this trait than that of genetic improvement. Therefore, preferable improving the management can play a major role in this trait.

Finally, it is important to used the animal models in the ways of improving the milk traits of these herds. In the same time more studies will be needed in the same directions for the new herds of Friesian in this ari of Egypt to improve the level of milk production on the basis of using different breeding models.

REFERENCES


Ayalew W., M.Aliy, and E.Negussie (2017).Estimation of genetic parameters of the productive and reproductive traits in Ethiopian Holstein using multi-trait models


257
التقييم الوريدي لبعض الصفات الإنتاجية والتناسلية لقطع جزئي تجري في مصر باستخدام نماذج إحصائية مختلفة

ناص_traffic: ناصح عبده الرحمان، محمد عبد الرحمن مصطفى، محمد نجيب العراي، محمد فرج الجليل، و مثل إسماعيل.

عمه بحث الإنتاج الحيواني مركز البحث الزراعي – وزارة الزراعة – مصر

كان الفروض من هذه الدراسة لمقدمة ثلاثة نماذج في تقدير المعيار الوريدي والتناسلي، مكونات التنافر الوريدي والأمومة والظاهري، باستخدام نماذج الوراثة المغلقة كنماذج انتاجية والوزن الأول، ثم محاسبة نقاط الوراثة في تلك النماذج، وتستعمل النماذج الثلاثة في تقدير نماذج الوراثة الأولية في هذه الدراسة، تمت من خلال تحليل البيانات باستخدام برنامج VCEV Software (2012)، وتم استخدام نماذج تحليل مقدرة مقارنة ل acompaña الإنتاجية في النماذج الإنتاجية ونماذج الوراثة الأولية ونماذج الوراثة النباتية.

وتقول النتيجة النهائية للنماذج الثلاثة أن النموذج الأولي هو النموذج الذي يقدم النتائج الأكثر دقة ودقة في تقدير نماذج الوراثة الأولية، حيث تقليل النتائج النهائية النماذج الثلاثة لصفر أثر لـ 0.1، ونهاية لا يزيد عن 0.05، ونهاية لا يزيد عن 0.01، ونهاية لا يزيد عن 0.001.

وتقول النتيجة النهائية للنماذج الثلاثة أن النموذج الأولي هو النموذج الذي يقدم النتائج الأكثر دقة ودقة في تقدير نماذج الوراثة الأولية، حيث تقليل النتائج النهائية النماذج الثلاثة لصفر أثر لـ 0.1، ونهاية لا يزيد عن 0.05، ونهاية لا يزيد عن 0.01، ونهاية لا يزيد عن 0.001.

وتقول النتيجة النهائية للنماذج الثلاثة أن النموذج الأولي هو النموذج الذي يقدم النتائج الأكثر دقة ودقة في تقدير نماذج الوراثة الأولية، حيث تقليل النتائج النهائية النماذج الثلاثة لصفر أثر لـ 0.1، ونهاية لا يزيد عن 0.05، ونهاية لا يزيد عن 0.01، ونهاية لا يزيد عن 0.001.