SUMMARY

5. CONCLUSIONS

Animals of the commercial Holstein Friesian herd of the study recorded better performances than those of the cited literature for age at first calving , longevity traits (age at last calving , length of productive life , length of herd life and number of lactations completed before disposal) in addition to lifetime milk production traits (lifetime 305-day milk yield , lifetime total milk yield , lifetime days in milk and milk yield per day of productive life) . This would refer to the preferential husbandry in the commercial herd of the study

Percentages of variation in longevity and major lifetime milk production traits generally make it possible to improve these traits through phenotypic selection .

Year of birth was found to have an important significant ($p < 0.05$, $p < 0.01$ or $p < 0.001$) effect on all longevity and most lifetime milk production traits .

Results of the effect of the interaction between year of birth and season of birth constituted an important significant ($p < 0.05$, $p < 0.01$ or $p < 0.001$) source of variation in longevity and lifetime milk production traits indicating that the effect of season of birth on these traits differs from one year of birth to another .

Expected genetic improvement in longevity traits through direct selection would probably be ineffective (little or nill) .

Results of this work would indicate that direct selection for early age at first calving and high first lactation milk yield would lead to increase lifetime milk yield , number of complete lactations given and prolong longevity of cows .

The strong genetic correlation coefficients among longevity and lifetime milk production traits in all possible combinations would suggest that any of these traits adequately measures the performance of the cow for any of these traits and the improvement in one of them would result in an improvement in any of the others .

6 . SUMMARY

A study on age at first calving , longevity traits and lifetime milk production traits was carried out in a commercial Holstein Friesian herd raised in El-Salhia , Esmaillia Governorate . That herd belongs to the General Cooparative for Developing the Animal Weath and Products .

Longevity traits were represented by age at last calving , length of productive life , length of herd life and number of lactations completed by the cow before its disposal . Lifetime milk production traits studied were lifetime 305-day milk yield , lifetime total milk yield , lifetime days in milk , milk yield per day of lifetime days in milk , milk yield per day of productive life and milk yield per day of herd life .

Data dealt with were taken on 5662 normal lactations given by 1029 cows sired by 139 bulls during nine consecutive years (1984 - 1992) . These data were analyzed using the least-squares maximum likelihood computer program of **Harvey (1990) .**

The main results obtained could be summarized as follows :

Actual means were 23.7±1.7 months for age at first calving , 91.2±22.62 months for age at last calving ., 80.7±24.01 months for length of productive life , 104.4±23.9 months for length of herd life and 5.5±1.41 for number of lactations completed by the cow before its disposal .

The actual mean ranged from 24498 to 29504 kg for lifetime 305-day milk yield , from 33720 to 35741 kg for lifetime total milk yield ,

from 2082 to 2480 days for lifetime days in milk , from 16 to 17 kg for milk yield per day of lifetime days in milk , from 10 to 11 kg for milk yield per day of herd life and 14 kg for milk yield per day of productive life .

Coefficient of variation was 6.3 % for age at first calving and ranged from 22.32 to 28.88 % for longevity traits (age at first calving , length of productive life , length of herd life and number of lactations completed) , from 10.33 to 38.06 % (mostly from 30.46 to 38.06 %) for major lifetime milk production traits (lifetime 305-day milk yield , lifetime total milk yield and lifetime days in milk) and from 13.19 to 18.09 % for minor lifetime milk production traits (milk yield per day of lifetime days in milk , milk yield per day of productive life and milk yield per day of herd life) .

Year of birth did not exert any significant effect on age at first calving but contributed significantly ($p < 0.01$ or $p < 0.001$) to the variance of all longevity traits and most lifetime milk production traits.

Season of birth constituted a significant ($p < 0.001$) source of variation in age at first calving ($p < 0.001$) , lifetime days in milk ($p < 0.05$) , milk yield per day of lifetime days in milk ($p < 0.05$ or $p < 0.01$) and milk yield per day of productive life ($p < 0.05$) . While it was not so for all longevity traits , lifetime 305-day milk yield , lifetime total milk yield and milk yield per day of herd life .

The effect of the interaction between year of birth and season of birth was statistically significant ($p < 0.05$, $p < 0.01$ or $p < 0.001$) on

age at first calving , all longevity traits and lifetime milk production traits .

Results of partial linear and quadratic regression coefficients of longevity traits on age at first calving proved negative dependent relationship between age at first calving and all these traits but this relationship was significant($p < 0.01$or $p < 0.001$) only when considering length of productive life and number of lactations completed before the cow was disposed .

Age at first calving showed significant ($p < 0.05$, $p < 0.01$ or $p < 0.001$) negative dependent relationship with longevity and lifetime milk production traits .

First 305-day milk yield effect on lifetime milk production traits was significant ($p < 0.01$ or $p < 0.001$) and proved that relative to all non-genetic factors included in the model of analysis it constituted the most important factor influencing longevity and lifetime milk production traits . At the same time it proved to have positive curvilinear association with longevity traits and positive association with lifetime milk production traits .

Sire effect was evidenced to have significant effect on age at first calving , and all longevity traits along with lifetime 305-day milk yield , lifetime total milk yield , milk yield per day of productive life and milk yield per day of herd life . This effect was responsible for 9.48 , 4.63 – 5.10 and 0.68 – 5.21 % of the total variance of age at first calving , all longevity traits and lifetime milk production traits , respectively .

Sire heritibility estimate was moderate (0.38 ± 0.10) for age at first calving , generaliy moderate (0.19-0.20) for longevity traits and ranged from low to moderate (0.027 – 0.208) for lifetime milk production traits .

The phenotypic correlation coefficients were positive and strong among longevity traits , positive and moderate or strong among lifetime milk production traits and between longevity and lifetime milk production traits . Most of these coefficients were significant ($p < 0.05$, $p < 0.01$) . The corresponding genetic correlation coefficients exhibited the same picture but with higher magnitudes .