V. SUMMARY

This study was carried out using milk production records collected during the period 1959-1980 on the buffaloe herd located at Mehallet Mousa Experimental Station which belongs to Animal Production Research Institute, Ministry of Agriculture. Two sets of data were prepared. The 1st set comprised 888 normal lactation records of different lactation sequence produced by 190 buffaloe cows that existed in the herd in 1959 and remained hereafter (considered as the base population). The 2nd set included the normal 1st lactation records of 1254 buffaloes maintained in the herd from 1959 to 1980. The 1st set was used to investigate the non-genetic factors that influence milk production traits (initial milk yield, 6-month milk yield, 305-day milk yield and length of lactation period). The 2nd set was analysed to evaluate phenotypic and genetic improvement of the traits under study and to estimate for them some genetic and phenotypic panameters. Results obtained are summarized as follows:

Non-genetic factors:

- Year of calving constituted a considerable highly significant ($P<0.01$) source of variation in milk yield of different stages of lactation studied and in length of lactation period.

- Spring calvers showed the best performance for all traits of the study except initial milk yield for which summer calvers recorded the highest production. Differences due to season of calving effects on all traits was limited, but showed significance for 305-day milk yield ($P<0.01$) and length of lactation period ($P<0.05$).

- Milk yield of the 3 stages of lactation studied indicated in general, an ascending trend as parity advanced, However, length of lactation period increased from the 1st parity to the 2nd and decreased thereafter. Parity effects were highly significant ($P<0.01$) for both initial and 6-month milk yields but non-significant for 305-day milk yield and length of lactation period.

- Estimates of linear and quadratic regression coefficients of milk yield of the 3 stages of lactation studied on age of 1st calving showed significant ($P<0.01$ or $P<0.05$) curvelinear effects. Age at first calving did not exert any significant effect on length of lactation period.

Phenotypic and genetic improvement

- During the period of study, phenotypic improvement in milk yield of the 3 stages of lactation investigated was achieved, but not in length of lactation period. The average

phenotypic change per generation was 6.6, 13.6 and 17.0 kg in initial, 6-month and 305-day milk yields, respectively and -2.9 days in length of lactation period.

- A general slight positive genetic improvement per year, in milk production traits studied, was indicated. The estimate of average genetic improvement per year, obtained by the 3 methods applied, ranged between 5.0 and 5.6 kg for initial milk yield, between 3.8 and 7.0 kg for 6-month milk yield, between 2.8 and 23.6 kg for 305-day milk yield and between 2.6 and 12.0 days for length of lactation period.

Heritability, phenotypic and genetic correlations

- Heritability estimates of milk production traits studied were low (ranged between 0.021 and 0.111).

- Strong positive highly significant ($P<0.01$) phenotypic correlation coefficients were estimated among milk yields of the 3 stages of lactation studied (ranged between 0.670 and 0.852). Also, there was a strong positive phenotypic correlation coefficient between 305-day milk yield and length of lactation period (0.652).

- Estimates of genetic correlation coefficients among initial, 6-month and 305-day milk yields in all possible connections indicated the presence of positive genetic association among them. The most efficient estimate is that between 6-month and 305-day milk yield (0.995 ± 0.004) because of its low standard error.

- Estimates of genetic correlation coefficients between length of lactation period on one hand and each of initial, 6-month and 305-day milk yields were 1.097, 1.434 and 1.461, respectively.