Evaluation of different methods of estimating correction factors for milk production records in dairy cattle

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5- SUMMARYThe present study was undertaken in a commercial Holstein herd located at El-Salhia, (El-Salhia farm), Ismailia Governorate, Egypt. This herd belongs to the General Cooperative for Developing the Animal Wealth and Products.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 analysed using the least-squares maximum likelihood computer program of Harvey (1990). The main results obtained could be summarized as follows:The actual means and standard deviations (SD) for 90-day milk yield, 305-day milk yield and total milk yield were 1574 ± 375 Kg, 5275 ± 1279 Kg and 6496 ± 1823 Kg, respectively. Coefficients of variation of these traits in the same order were 18.52, 18.74 and 18.28%, respectively.Different sets of additive and multiplicative correction factors for non-genetic factors (year of calving, month-of-calving age of cow at calving, days open and/or lactation period) were constructed to adjust milk yield traits (90-day, 305-day and total milk yield) in the Holstein herd of this study. The additive correction factors for the non-genetic effects of the considered (independent) factor were calculated using two methods. In the first method, additive correction factors were calculated according to Turner and Young (1969), while in the second one, additive correction factors were calculated according to Gandhi and Gurnani (1997).Summary 88Summary 89Year of calving additive correction factors esti ated for 90-day, 305-day and total milk yield according to Turne and Young(1969) increased with advance of year of calving om 1984 to1992, while the reverse was observed when calculated according to Gandhi and Gurnani (1997).Month of calving additive correction factors for 90-day, 305-day and total milk yield estimated according to Turne and Young (1969) were the highest for lactations started in November and the lowest for lactations started in March, while tho e estimated according to Gandhi and Gurnani (1997) were highest forlactations started in March and the lowest for lactations started in November.Age at calving additive correction factors for day and total milk yield estimated according to Turne (1969) were higher for young cows than for cows while the reverse was observed for age at calv correction factors calculated according to Gandhi a (1997).Days open additive correction factors for 90-• and total milk yield estimated according to either Young (1969) or Gandhi and Gurnani (1997) did n consistent trend of change with increase of days open.Lactation period additive correction factors de the increase of lactation period when calculated a Turner and Young (1969) and showed a reverse estimated according to Gandhi and Gurnani (1997).0-day, 305-and Young if older age ng additive d Gurnaniay, 305-day urner and it show anyreared with cording to trend whenMultiplicative correction factors for the same non-genetic effects of the considered (independent) factors were calculated using three types of procedures being: (1) polynomial regression analysis based on the average yield of the modal subclass, (2) polynomial regression analysis based on the average yield of the maximal production subclass and (3) gross comparison method.Year of calving multiplicative correction factors for 90-day, 305-day and total milk yield estimated according to polynomial regression analysis based on either the average milk yield trait for the modal subclass or the average milk yield for the maximal production subclass increased with advance of year of calving from 1984 to 1992. Similarly, the multiplicative correction factors established by the gross

comparison method showed the same trend with advance of year of calving.Month-of-calving correction factors for the three milk yield traits of the study, using polynomial regression analysis based on the average yield of either the modal or the maximal production subclass in addition to those constructed by using the gross comparison method were found to increase slightly with advance of month of calving from January to December.Age-of-cow at calving multiplicative correction factors for 90-day, 305-day and total milk yield estimated by using polynomial regression analysis based on the average yield of either the modal subclass or the maximal production subclass in addition to those calculated using the gross comparison method decreased in general with advance of age of the cow.Summary 90Days open multiplicative correction factors constructed by using polynomial regression analysis based on either average yield of the modal subclass or average yield of the maximal production subclass increased linearly with increase of days-open length for 90-day milk yield while decreased with the increase of days open length from 60-79 days up to 160-179 days thenafter increased for305-day milk yield.Days-open multiplicative correction factors estimated through the gross comparison method increased linearly with the increase of days open for 90-day milk yield. For 305-day milk yield the same correction factors decreased with the increase of days open length from 60-79 to 140-159 days and increased thenafter with the increase of days-open till reaching 240 days. A reverse trend was observed when considering days-open multiplicative correction factors calculated by the same (gross comparison) method for total milk yield, since these factors increased with the increase of days open from 60-79 days to 120-139 days anddecreased thenafter.Multiplicative lactation period correction factors of total milk yield estimated by using polynomial regression analysis based on either the average milk yield of the modal subclass or the average milk yield of the maximal production subclass in addition to those calculated by using the gross comparison method decreased lineary with the increase of lactation period.To decide which of the five types of correction factors calculated is the best, the effects of non-genetic factors on milk yield traits were removed once by using each of these types ofSummary 91correction factors to adjust the actual milk yield records to obtain 5 sets of adjusted data for each milk yield trait.Milk yield records after correction for all non-genetic factors included in the models of the analyses by different five types of correction factors were analyzed using the same models used to analyse the uncorrected data in the first analysis. The values of four criteria were obtained through analysing the corrected data by the five types of correction factors used and the values of those criteria obtained through analysing the uncorrected data, (i.e., before correction) were compared. These criteria are (1) F-values of the factors included in the models of analyses, (2) residual mean-squares, (3) the coefficients of determination (R2-values) for the models used and (4) coefficients of variation (CV%).Summary 92