Genetic and phenotypic analysis of Israeli Holstein milk, fat and protein production as determined by the AfiLab real-time milk analyzer

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ABSTRACT

Daily "AfiLab" records for milk production, and fat and protein concentration collected from January 2014 through January 2016 from 47 large Kibbutz (communal) herds distributed throughout Israel with a total of 37,486 Israeli Holstein cows were compared to the same statistics derived from monthly test day records derived by Bentley and Foss milk analyzers at the central laboratory of the Israel Cattle Breeders Association (ICBA). The SD for first and second parity daily records scored by the ICBA and AfiLab system were very similar for all traits, except for fat percentage, but even for this trait the difference was no more than 0.1% . The SD for complete lactation production were slightly lower for the AfiLab results for all traits, except protein production. The lactation means for all traits were quite similar by the two methods in both parities, except for fat production, which was higher for the ICBA records. This corresponds to the fat lactation curves, which show that the ICBA results were higher with low days in milk (DIM), but nearly equal to the AfiLab results after 125 DIM. AfiLab overestimated protein percentage prior to 150 DIM, and underestimated protein percentage in the second half of the lactation. First parity heritabilities were higher for AfiLab lactations for all traits, except for protein percentage. For AfiLab records, coefficients of determination to predict future lactation production from truncated lactations were greatest and root mean squared errors were smallest if the mean production from the last 2 weeks prior to the truncation date were used to estimate future production. AfiLab first parity partial lactations with < 150 DIM predicted future lactations more accurately than the corresponding ICBA partial lactations. With only 30 DIM, genetic correlations between predicted and actual lactations ranged from 0.73 to 0.79 for the 3 traits. Further study is required in order to compare results of individual cows on multiple lactations, and to determine the optimum interval between calibrations for AfiLab meters.

Key words: AfiLab, Fat, Protein, lactations, milk meters.