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**ABSTRACT**

The objectives of this research were to investigate the QTL affecting milk yield and fertility traits in Thai crossbred Holsteins. In addition, pleiotropic effect of QTL affecting both traits was expected. A daughter design with five Thai crossbred Holsteins families from Farm Chok Chai population was selected. A total of 449 daughters from all sires were analyzed for mapping quantitative trait loci (QTL) affecting milk yield (MY), age at first calving (AFC) and calving interval (CI). Forty two microsatellite markers with coverage of 7 bovine autosomes were studied. Both yield deviations (YD) and the estimated breeding values (EBV) from single (ST) and multiple (MT) trait analysis were used. Therefore, there were ten data sets used for QTL analysis. The putative QTL were scanned every 1 cM within the region covered by all markers. Ten thousand permutations were used to estimate the 1, 5, and 10% chromosome-wise significance thresholds. EBV was the most suitable data set for QTL analysis, especially EBV/MT, which advantage for fertility traits since they had low heritability. The putative QTL affecting MY were found on chromosome 4 (near BMS789), chromosome 6 (near BMS5037), chromosome 7 (near BM6117 and naer BMS1979), chromosome 18 (near BMS2213), and chromosome 27 (between BMS2104-BM871). The QTL found on chromosome 27 was the first report in crossbred population. In addition, the putative QTL affecting AFC and CI were most found linkaged on the same chromosome, which were chromosome 4 (between BMS827-BMS789), chromosome 7 (BM6117-OARAE129), and chromosome 23 (between BM1818-DIK4203). However, the QTL affected AFC alone were also found on chromosome 2 (near BL1028), and chromosome 6 (near BMS2508, near DIK2294, and near ILSTS035). No evidence favoring the pleiotropic QTL affecting
milk yield and fertility traits was found. From this study, using QTL-MAS could be applied to improve efficiency for selecting dairy sires with several advantages, such as reduce the generation interval, improve the geneic response for both milk production and fertility traits. In addition, the main benefit is to add value of sires and their frozen semen and also fasten the dairy genetic improvement in the future.