

(Co)variance components and genetics parameter estimation for linear traits in Holstein cattle in Indonesia: traits related to foot/leg and udder

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Abstract	<p>The availability of (co)variance components and genetics parameter estimates for traits included in a selection program is crucial since the estimated breeding values of the selected traits are computed based on the available (co)variance components and genetics parameters. The present study aimed to estimate (co)variance components and genetics parameters for linear traits related to foot/leg and udder (i.e. rear legs set, foot angle, udder depth, and teat length) in Holstein cattle in Indonesia. Linear traits were measured (instead of scored) on 310 lactating Holstein cows raised in the National Breeding Centre for Dairy Cattle and Forage of Indonesia (BBPTUHPT Baturraden). These were nearly all cows in lactation owned by the centre at the time of study. Lactating cows which were not measured during study were those which are technically difficult to handle. The Average Information Restricted Maximum Likelihood (AI-REML) method of the DMU program was used to estimate the (co)variances and genetics parameters of the considered linear traits. A four-multivariate animal model was employed by including farm (fixed), animal (random), and age (covariate) effects in the model of analysis. The phenotypic means (standard deviation) for rear legs set, foot angle, udder depth, and teat length were 139.70 (6.03), 50.65 (5.04), 10.67 (6.19), and 5.27 (0.96), respectively. The results showed that the estimated heritability (h^2) was 0.334, 0.236, 0.147, and 0.213 for rear legs set, foot angle, udder depth, and teat length, respectively. The genetic (phenotypic) correlations between linear traits rear legs set-foot angle, rear legs set-udder depth, rear legs set-teat length, foot angle-udder depth, foot angle-teat length, and udder depth-teat length were -0.08 (-0.043), -0.6 (0.002), 0.101 (0.036), 0.002 (-0.017), -0.186 (-0.146), and -0.834 (0.019), respectively. The present study concluded that the linear traits could be used in the selection program, though the traits should be properly weighted to avoid deteriorating selection response.</p>
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