
0368 Genetic evaluation of dairy cow livability.

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Predicted transmitting abilities (PTA) for cow livability (LIV) were developed to measure a cow's ability to stay alive while on the farm, whereas PTA for productive life (PL) measures a cow's ability to avoid dying on the farm or being culled. About 20% of dairy cows died instead of being sold over the last decade, averaging 7% per lactation. LIV has been recorded since 1970. Records for 69,710,392 lactations of 25,514,760 cows were evaluated with an all-breed animal model, using edits similar to a 2008 study. The scale reports cow livability instead of mortality so that positive PTAs are favorable (0 = died; 100 = lived for each lactation) and reports PTA on lifetime instead of per lactation basis to express LIV differences as a percentage of all cows exiting the herd. The model used individual lactation records for culling as a correlated trait to increase reliability of LIV. Heritability was 1.3% on the observed scale for LIV per lactation vs. 3.0% for overall culling per lactation. The SD of true transmitting ability for LIV was 0.82% per lactation or 2.3% per lifetime using an average of 2.8 lactations per cow. For recent bulls with > 80% reliability, PTA LIV were correlated favorably to PTA for PL (0.70), daughter pregnancy rate (0.45), and somatic cell score (-0.25); correlations with PTA for yield traits were low. The 0.70 correlation with PL was sufficiently below 1 to add value from selecting for both LIV and PL in an index. Genomic PTA (GPTA) for young bulls computed from 4-yr truncated LIV data had squared correlations with future data about twice as high as parent averages (PA) for LIV. Genomic reliability was 56% compared with 30% for PA, but lower than 70% for GPTA PL. Economic values for LIV and PL were estimated assuming \$1,200 less income for cows that die than for those sold for beef. Relative emphasis on LIV was 7% of total emphasis, but relative emphasis on PL declined to 14% from 19% currently used in net merit. Thus, total emphasis on PL and LIV could increase to 21% using 2 correlated traits instead of 19% with just 1 trait. The United States in 1994 was the first country to evaluate longevity, and can also become the first country to evaluate cow mortality or livability as a specific economic trait.

Key Words: mortality, productive life, economic value

0369 Genetic associations between milk production and growth traits in Guzerat breed.

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In Brazil, the Guzerat breed is used for beef, milk production or as dual purpose breed. Progeny tests of dairy bulls are available for the breed (Programa Nacional de Melhoramento Genético do Guzerá para Leite–National Breeding Program of Dairy Guzerat Cattle), in addition to genetic evaluations of growth traits performed by the Brazilian Association of Zebu Breeders (Associação Brasileira de Criadores de Zebu-ABCZ). For this reason, beef bulls are used in dual purpose herds. To identify differences in the growth and milk production patterns of bulls of this breed, two-trait analyses were performed between cumulative milk production at 305 d (P305) and weight at 120 d (W120), weaning weight (WW), yearling weight (YW), post-weaning weight (PWW), and weight at 24 mo of age (W24). The data files contained 97,394, 65,181, 50,443, 40,425, and 31,279 records, respectively, obtained from the database maintained by ABCZ. The model used included the fixed effects of contemporary group and age of cow at calving (linear and quadratic covariate), and direct additive genetic, permanent environmental (maternal for weights; direct for milk) and residual effects as random effects. The variance components were estimated by the restricted maximum likelihood method using the WOMBAT program. The heritabilities estimated in the two-trait analyses were 0.24 (0.003), 0.14 (0.009), 0.16 (0.0012), 0.18 (0.0014), 0.21 (0.0017) and 0.22 (0.020) for P305, W120, WW, YW, PWW and W24, respectively. The genetic correlations between weights at different ages and P305 were positive but low, ranging from 0.27 (0.111) to 0.38 (0.099), indicating a low association between the breeding values of the traits. Selection for P305 resulted in a low correlated response to increase weights at the ages studied. Based on the breeding values estimated, bulls with a high milk production potential and bulls with a high beef production potential were identified by cluster analysis. The separation of bulls for each selection objective will potentiate the result of genetic selection of the breed.

Key Words: production traits, selection criteria, dual purpose, genetic parameters, Zebu