

AIPL Changes to Evaluation System - August 2002

Correlations between productive life and yield reduced

By Paul VanRaden

Productive life PTA's were computed with a revised correlation matrix provided in the [Multi-trait Productive Life](#) document. Estimated genetic correlations with productive life were reduced from .30 to .15 for protein, from .29 to .13 for milk, and from .26 to .12 for fat based on several tests indicating that productive life and yield traits have become less correlated over time. Statistical tests included regressions of later on earlier PTA, changes in correlations among PTA over time, genetic covariance estimation including records from 1 million cows, and additional research at Holstein Association USA using random regression. For Holstein bulls in active AI status in May 2002, average productive life PTA decreased .2 months and average Net Merit decreased \$12. For 50 bulls with over \$500 Net Merit in May that did not yet have daughters over 36 months of age, average productive life PTA decreased .5 months and Net Merit decreased \$43. Much of this decrease in Net Merit was actually caused by yield PTA's which decrease slightly as daughter data replaces parent average. Some reliabilities for PL also decreased because of the revised correlations. Many new bulls and foreign bulls now have reduced productive life evaluations that should be more stable as actual daughter culling observations are added.

Sire-maternal grandsire (MGS) threshold model for calving ease (CE)

By George Wiggans and Curt Van Tassell

A process was developed to store CE data in a database and to improve detection of multiple records for the same calving and MGS identification for the calf. Queries were developed for participating artificial-insemination organizations to view the data and evaluations from a password-protected web page. The genetic analysis includes effects for herd-year, year-season, parity-gender, sire birth year, MGS birth year, sire, and MGS. Identification information for MGS was missing for about 25% of the data and was effectively dropped from the model for those records. Service bull CE (sire effect) measures the effect of the calf itself on calving ease. Daughter CE measures the ability of a particular cow (daughter) to calve easily. The test computation of CE evaluations included 38,769 AI bulls that either were the service sire for a cow with a calving record (for service bull CE) or had a daughter with a calving record (for daughter CE). The CE evaluations are expressed as percent difficult births in heifers (%DBH), where difficult births are those scored as requiring considerable force or being extremely difficult. The genetic base was established based on bulls born in 1995 for service bull CE and in 1990 for daughter CE, and the averages for service bull CE and daughter CE were set to the average %DBH for mates or daughters, respectively. The heritability of service sire calving ease was reduced from 16% in the previous sire model to 8% based on analysis of 5 samples of approximately 200,000 records. The correlation between the service sire and daughter calving ease is positive although it includes a negative correlation between direct and maternal effects.

Adjustment for heterogeneous variance in genetic evaluation of type traits

By George Wiggans and Jan Wright

The procedure implemented for Jersey type (conformation) traits in May 2001 has been extended to Ayrshires, Brown Swiss, Guernseys, Milking Shorthorns, and Red and Whites. Because that method estimates the variances during the iteration to solve for breeding values, the adjustment is more accurate than if data were adjusted before analysis. For each contemporary group (parity-herd-appraisal date), the variance calculated from the observations is regressed towards a population variance estimated with a model that includes average final score, group size, appraisal month, and 6-month period. The degree of regression depends on the amount of information available. New (co)variance components and age adjustments were estimated for Brown Swiss.
