Changes in USDA-DHIA genetic evaluations (July 1994)

P.M. VanRaden and G.R. Wiggans
Animal Improvement Programs Laboratory
USDA-ARS, Beltsville, MD 20705-2350

Multitrait Productive Life

The Holstein Association combined productive life (PL) evaluations with a function of the linear type traits and evaluations for milk and fat to create an approximate multitrait evaluation for PL. An indirect PL evaluation was computed by genetic regression on the other traits. A direct, single-trait PL evaluation was computed by USDA from each cow's months in milk. To calculate the multitrait PL evaluation, the in-direct PL evaluation was combined with the single-trait PL evaluation according to weights that reflect the reliabilities (REL's) of each PL evaluation. On average, single-trait PL received twice the emphasis of indirect PL. The REL of multitrait PL evaluations also was approximated by a function of the REL's for single-trait and indirect PL evaluations.

For Holsteins, the multitrait PL evaluation replaced the single-trait PL evaluation previously included in the bull evaluation computer file (format 380). The multitrait evaluation is more accurate than the single-trait evaluation and allows the net merit (NM) index to include information from Holstein type traits. For the average Holstein bull in active artifi-cial insemination (AI) service, REL for PL rose to 60% in July 1994 compared with 57% in January 1994. Gains were greater for younger bulls.

For breeds other than Holstein, a single-trait PL evaluation still is reported.

Net Merit for All Bulls

For the few bulls that previously lacked evaluations for PL and somatic cell score (SCS), parent averages were substituted. Thus, bulls received an NM ranking even without having daughters for these traits. Because NM was available for every bull eval-uated, percentile ranking for bulls was based on NM instead of MFP$, the economic index based on gross values of milk, fat, and protein. This change also was implemented for Canadian bulls without U.S. daughters but that are included with converted/combined evaluations.

Reliability of Net Merit

The REL's for milk, fat, protein, PL, and SCS were combined according to relative economic values and genetic correlations into an REL for NM. This index REL should reflect total accuracy better than the individual REL's of the traits in the index.

Somatic Cell Score Evaluations

New edits for SCS data caused some erroneous records to be deleted and more short records to be retained. Lactations with few somatic cell samples recorded in relation to the days in milk were included by adjusting the individual sample-day SCS to a 305-day basis. Previously cows with 3 SCS samples during their lactation and more than 140 days in milk (limits were lower for 1 or 2 samples) were not used because the lactation length adjustments were not appropriate if samples were primarily from the end of a lactation.

Average SCS of cows born in 1985 increased slightly (by .02 for Holsteins) for all breeds except Milking Shorthorn, thus raising the average predicted transmitting ability for SCS. Number of daughters and reported REL decreased slightly for many bulls.

Date Entered Artificial Insemination

In the bull evaluation computer file (format 380), the birth date of a bull's first AI daughters was replaced by his date of entry into AI.