Changes in USDA-DHIA genetic evaluations (January 1994)

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

Productive Life

National evaluations for productive life (PL) were calculated for the first time. This trait is based on the months that a cow is in milk (up to a maximum of 10 months per lactation) until the cow dies or is 84 months old. For living cows, predicted months of PL are used. A cow's age, age at first calving, stage of lactation, and accumulated months in milk affect this prediction. PL measures a cow's ability to resist culling of all types: yield, reproduction, mastitis, etc. Although conformation and other data could add to the accuracy of PL evalua-tions, this information isn't included yet.

Statistical methods for calculation of PL evaluations are documented in two *Journal of Dairy Science* papers (VanRaden and Klaaskate, 1993, JDS 76:2758; VanRaden and Wiggans, 1994, in preparation). A heritability of 8.5% is assumed. Properties of the evaluations were described at the 1993 meeting of the American Dairy Science Association (VanRaden and Wiggans, 1993, handout).

PL evaluations for bulls now accompany yield eval-uations on computer tape and on listings for bulls in active AI service.

Somatic Cell Score

National evaluations for linear somatic cell score (SCS) also were calculated for the first time. Recent data were provided by all dairy records processing centers except the Cornell Dairy Records Processing Laboratory and Michigan DHIA. Because some centers have pro-vided data only for a short time, many older bulls don't have SCS evaluations.

SCS evaluations are expressed relative to the average age-adjusted scores of first-lactation cows born in 1985. Breed averages changed slightly with the addition of new data. Base SCS for each breed were:

Ayrshire	3.15
Brown Swiss	3.09
Guernsey	3.45
Holstein	3.29
Jersey	3.52
Milking Shorthorn	2.94

Higher SCS evaluations indicate more mastitis and lower quality payments.

Data, edits, and evaluation procedures are described in three *Journal of Dairy Science* papers (Boettcher et al., 1992, JDS 75:1127; Schutz, 1994, in press; Shook and Schutz, 1994, in press). A heritability of 10% is as-sumed.

SCS evaluations for bulls were released to the indus-try on computer tape and on listings for bulls in active AI service.

Net Merit

PL and SCS evaluations were incorporated with yield evaluations in an economic index called net merit. Yield traits are represented by milk-fat-protein dollars multi-plied by .7 to remove feed costs. A net instead of gross value is necessary to combine yield evaluations with PL and SCS evaluations.

Relative emphasis of yield:PL:SCS is 10:4:-1. Rela-tive economic weights were obtained from literature esti-mates for PL and from the combined costs of mastitis treatment, discarded milk, and quality losses for SCS.

The net merit index also was provided only for bulls and was released to the industry on computer tape and on listings for bulls in active AI service.

Inbreeding

Percentage of inbreeding was calculated for all ani-mals. The greater similarity in genes expected from an inbred parent was accounted for in constructing the in-verse of the relationship matrix. This change was found to have only a small impact on bull evaluations. How-ever, levels of inbreeding are rising, and this impact is expected to increase. The adjustment for inbreeding af-fects only genetic variance and not the standardized rec-ord because a second adjustment to include regression on inbreeding was not implemented. Adjustment of genetic variance for inbreeding also is included in calculation of PL and SCS evaluations.

The percentage of inbreeding for bulls was released to the industry only on computer tape.