



AIPL RESEARCH REPORT  
CH10 (2-98)

# Changes in USDA-DHIA genetic evaluations (February 1998)

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## Expected inbreeding

The expected inbreeding percentage of future progeny has been added to format 38. An expected inbreeding of future progeny was obtained by examining each bull's pedigree and comparing it to others in the breed. Each breed was represented by a sample of 300 males (if available) and 300 females from the latest birth year. Inbreeding can rise quickly if mates are highly related. The animals most related or least related to the current calves were identified. Expected inbreeding for any animal is its average relationship to the sample population divided by 2. For active Holstein bulls, expected inbreeding of progeny ranges from 3.1 to 7.2%. For cows, expected inbreeding is also calculated but not yet made available. Recent research at North Carolina State University and the American Jersey Cattle Association indicated that methods to locate outcross bulls were feasible. Presently, yield, productive life, somatic cell score, and type evaluations account for changes in genetic variation with inbreeding but do not adjust for inbreeding depression. In the future, use of these expected inbreeding values may enable improved accounting for inbreeding.

## Reliability for yield

A single reliability for yield is now available to summarize the reliabilities for protein and for milk and fat. Protein reliability historically was lower than that for milk and fat because many herds weren't tested for protein, but the two reliabilities now are similar. For November 1997 evaluations, mean reliability of active Holstein bulls was 84% for protein and 85% for milk and fat. Correlation of the two reliabilities was 99%. The new reliability for yield is computed as the reliability of milk-fat-protein dollars, a variable already provided with cow evaluations. The individual trait reliabilities continue to appear in the formats for documentation and research purposes, but the reliabilities of yield and net merit dollars are recommended for use in advertising.

## Use of INTERBULL evaluations

The Brown Swiss Cattle Breeder's Association has requested that more International Bull Evaluation Service (INTERBULL) evaluations be designated as official for its breed. For Brown Swiss bulls, the INTERBULL evaluation will be official if its reliability is 5 units higher than the U.S.-only evaluations. For other bulls, the INTERBULL evaluation is not official if the reliability of the U.S.-only evaluation is 80% or higher.

## Animal ID and format changes

The U.S. dairy industry agreed to an expanded identification (ID) system that provides unique lifetime ID and is better suited to handle international ID numbers. The new system includes a 2-character breed code, 3-character country code, and 12-character animal ID. For most reports, the country code is displayed if it is different from USA, and the leading zeros of the animal ID are not printed. The bull ID codes assigned by the National Association of Animal Breeders now include a 3-character controller number, 2-character breed code, and 5-character bull ID. Also, all dates now include four characters for year instead of two to accommodate the year 2000. Because of these changes, former bull evaluation formats 380 and 380S were replaced by the new format 38. The bull evaluation and daughter (BEAD) list was discontinued. For artificial insemination (AI) organizations, a file of daughter evaluations (format 105N) or a printable list resembling the daughter portion of the BEAD list was provided. To reduce the labor required to deliver the genetic evaluation information, a postcard with bull evaluation information was sent to owners of non-AI bulls. For further details, see *Changes to Files and Reports Released for the February 1998 Genetic Evaluations* (<http://aipl.arsusda.gov/memos/html/chngfile298.html>).

## **Animal model evaluation of type**

For breeds other than Holstein, type data are now evaluated by an animal model instead of a sire model. Multitrait equations are used for linear traits; single trait equations are used for final score. For some breeds, final score is not an independent trait but is a mathematical function of the linear traits. Appraisals from 1980 and later are included. An appraisal during first lactation is required, except for Brown Swiss and Milking Shorthorn where an appraisal in first or second lactation is required. Appraisals after the age for mandatory scoring are excluded. The sire model used pedigree groups based on final score, no relationships among sires, and single-trait methods. Linear trait rankings changed noticeably for some bulls with few daughters but were more similar for well proven bulls. Predicted transmitting abilities for Jersey bulls with at least 20 daughters were correlated by .77 to .91 with previous evaluations for the same trait. The lowest correlation was for udder cleft and the highest was for foot angle. New age adjustment factors and heritabilities were also estimated. The evaluation programs and variance components were developed by Nicolas Gengler, Faculté Universitaire des Sciences Agronomiques, Gembloux, Belgium.