Changes in USDA-DHIA Genetic Evaluations (January 1993)

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Canadian Evaluations

Genetic material is traded across countries, but genetic evaluations from different countries usually have been separate and not directly comparable. Effective January 1993, evaluations from Canada are converted and combined with U.S. information to make comparison of bulls from these two countries simpler and more accurate. Bulls with 10 or more U.S. daughters may have Canadian data included in their evaluations if they appear to have been sampled initially in Canada or simultaneously in both Canada and the United States. Although sampling status is difficult to determine, bulls will have Canadian data included if they have 1) a Canadian owner indicated in the Canadian evaluation file and 2) one of the following controller number conditions in the U.S. file: a) no controller, b) a Canadian controller (National Association of Animal Breeders' controller codes 28, 39, 69-74, 89, 94, or 97), c) a U.S. controller and no semen distribution before the bull was 40 months old, or d) a U.S. controller and a Canadian evaluation before the bull was 7 years old (this won't be known for many bulls for the next few evaluations). These bulls will have evaluations on the format 380 tape that include data from the previous Canadian evaluation (July 1992). Inclusion of Canadian daughter information will be indicated by the percentage of U.S. daughters being less than 100.

Bulls with semen available in Canada, a Canadian evaluation, and less than 10 U.S. daughters will have a converted or combined evaluation distributed at the same time that the bulls in active artificial-insemination service are announced. This later release will use current Canadian evaluations (January 1993), and the new conversion equations to be used will be computed immediately on receipt of January 1993 Canadian evaluations.

Editing System

A new editing system was implemented at the Animal Improvement Programs Laboratory (AIPL) that allows lactation and pedigree data to be compared with existing data as they are received. The new programs detect conflicts between an animal's birth date and its parents' birth or calving dates, retain some records that formerly were excluded because of conflicts, and allow more rapid checking of newly arriving data. Overall accuracy of the AIPL data base should improve because more types of invalid data can be detected and the procedures to correct errors and retain valid information have been enhanced.

In-House Computing

The animal model equations now are solved on an IBM RISC system 6000 workstation computer at AIPL instead of at the Cornell National Supercomputer Facility. The programming changes necessary in switching to the smaller computer have had extremely little effect on predicted transmitting abilities (PTA's). Reliability calculations begin with cow reliabilities from the previous evaluation rather than from population averages. Cow reliabilities now are more precise and have increased up to 3% for smaller breeds; average Holstein reliabilities were unaffected.

Genetic Improvement

Table 1 shows the improvement in PTA for cows in the last complete birth year compared with cows born in the previous year. Genetic improvements for yield depend on mean breeding values, which are twice the values reported here. Mean PTA by birth year was smoothed to compute these values.

TABLE 1. Superiority of cows born in 1989 over those born in 1988 for PTA's for milk, fat, and protein and for MFP$.[1]

Breed	PTA milk	PTA fat	PTA protein	MFP$
	(lb)	*(lb)*	*(lb)*	*($)*
Ayrshire	69	3	2	9
Brown Swiss	71	3	2	9
Guernsey	109	5	3	14
Holstein/Red and White	185	7	5	22
Jersey	127	6	4	17
Milking Shorthorn	85	3	3	11

[1]MFP$ = $.04895 (PTA milk) + $.79 (PTA fat) + $1.45 (PTA protein).

Table 2 shows estimated PTA's for calves that will be born in 1994. These are the calves expected to result from matings using 1993 semen purchases. Average sire merit was projected for these calves and also is shown in Table 2. Estimates were obtained by extending the increasing rates of progress observed for PTA's of cows born since 1970.

TABLE 2. Expected average PTA's of calves born in 1994 and of their sires based on current estimates of trend within each breed.

	PTA milk		PTA fat		PTA protein		MFP$	
Breed	Calves	Sires	Calves	Sires	Calves	Sires	Calves	Sires
	(lb)	*(lb)*	*(lb)*	*(lb)*	*(lb)*	*(lb)*	*($)*	*($)*
Ayrshire	656	960	27	40	21	29	84	121
Brown Swiss	596	663	27	32	22	24	82	93
Guernsey	1008	1309	41	58	31	40	127	168
Holstein/Red and White	1718	2293	61	85	52	74	208	287
Jersey	1184	1766	58	84	40	60	162	240
Milking Shorthorn	768	1021	24	31	30	41	100	134

These tables may help remind producers to update their selection standards to keep current with the genetic merit of the general population and to use the best bulls that become available each year.