

Combining U.S. and Canadian Bull Evaluations

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ABSTRACT

Canadian and U.S. genetic evaluations for July 1991 were combined for 3304 Holstein bulls evaluated in Canada that had U.S. progeny or a cross-reference code. Canadian evaluations of the bulls and their sires and dams were converted to U.S. predicted transmitting ability (PTA). Combined PTA's were weighted averages of progeny information from both countries and parent average. Parent average was recomputed from the sire's combined evaluation and the dam's evaluation with the most daughter equivalents. Bulls were processed in birth year order so that combined evaluation of sire was available. Progeny contribution was adjusted to remove the influence of the bull's evaluation on progeny evaluations through their parent averages, which left only the portion due to progeny records and grandprogeny information. A weighted average of adjusted progeny contributions was combined with parent average to form a combined PTA more accurately than possible by averaging domestic and converted PTA's. Combined reliability was computed by summing daughter equivalents from progeny and from updated evaluations of parents. Canadian daughter equivalents were multiplied by .9 to approximate U.S. values. Combined evaluations simplify bull selection by providing comparable and complete information for bulls evaluated in two countries.

GOAL

A single evaluation that represents data from both the U.S. and Canada.

BACKGROUND

- Conversion formula.
- Linear model combination of bull evaluations.
- Joint evaluations (U.S.-Canadian Ayrshire and Jersey evaluations).
- Meeting on advertising guidelines.
- Canadian policy of replacing parent average (PA).

METHOD

- Extract progeny contribution (PC):

$$PC = (PTA - w_1 PA) / w_3.$$

- Adjust for bull contribution to progeny PA:

$$APC = [PC - f(PTA)] / (1 - f)$$

where APC is adjusted PC and f is weighted mean of progeny PA weights.

- Combine APC's from U.S. and Canada.
- Compute new PA from dam's evaluation with most information and combined sire evaluation.

RELIABILITY (REL)

- Convert daughter equivalents (DE's) and account for differences in heritability.
- Reduce Canadian DE ($.9 \times DE$) to be comparable with U.S. DE.
- Compute REL from ΣDE .

REL (BIRTH YEAR \geq 1977)

No. of U.S. daughters	No. of bulls	REL		
		U.S.	Canada	Combined
0-9	341	...	91	88
10-30	141	59	93	91
> 30	247	91	92	97
All	729	79	92	92

CORRELATIONS (NATIONAL WITH COMBINED EVALUATIONS)

No. of U.S. daughters	U.S.	Canada
0-9999
10-30	.837	.994
> 30	.983	.958

IMPLEMENTATION CHARACTERISTICS

- Bulls with \geq 10 daughters:
 - Previous Canadian evaluation combined with current U.S. evaluation becomes U.S. evaluation (starts January 1993).
- Bulls with < 10 daughters, semen available, and released Canadian evaluation:
 - Converted or combined evaluation using current Canadian evaluation released with active AI evaluations (starts July 1992).