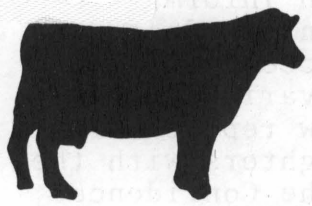


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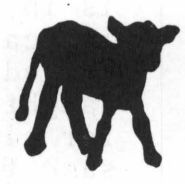
N DIVISION VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY BLACKSBURG, VIRGINIA



CONFIDENCE INTERVAL

A good alternative to repeatability

Mike McGilliard and Ron Pearson
Department of Dairy Science



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There is a column labelled "CONF" in your sire summary. This lists a Confidence Interval for each bull's predicted difference for milk (PDM).

Anytime we calculate a predicted difference for a bull, we are estimating his true genetic quality to the best of our ability. This Confidence Interval is the range of PDM which probably encompasses the true genetic quality of the bull.

The Confidence Interval is directly associated with repeatability as shown in table 1. Any Holstein bull with 70% repeatability has a Confidence Interval of ± 254 lbs. of PD milk. This means that a bull such as ABS's Money-Maker* (PDM = 1828) probably^a has a true genetic value between +2082 and +1574 (1828 ± 254). He looks like this in the Sire Summary:

CODE	NAME	RPT	MILK	CONF	%FAT	\$\$
29H2847	Money-Maker	70	+1828	254	-.23	+162

Note in table 1 that the interval becomes narrower as the repeatability increases. The more daughters in a bull's proof, the less likely the proof will be affected by additional daughters, and the more closely the proof will resemble the bull's real transmitting ability.

Table 1. Relationship of repeatability and Confidence Interval.

Repeatability (%)	Confidence Intervals	
	Holstein Brown Swiss	Ayrshire Guernsey, Jersey
30	± 387	± 281
50	± 327	± 238
70	± 254	± 184
90	± 146	± 106

^a"Probably" means 60% chance of being in the interval, and 80% chance of being above the bottom of the interval.

The Confidence Interval is easier to interpret and use than is repeatability. Repeatability only measures how much information is in the sire's proof. Contrary to popular opinion, it does not indicate the percentage of daughters expected to exceed the PD or exceed herd mates. We cannot change the quality or variability of daughters thrown by a bull just by calculating a new repeatability for him. Old or young, he'll have good and bad daughters with the same frequency, regardless of his repeatability. The Confidence Interval, however, can be used with the PDM to evaluate both risk and opportunity.

Table 2 lists four bulls from Select Sires*, with their PD's and Confidence Intervals. The bulls are ranked from highest to lowest PDM. A pessimistic or conservative dairyman will see the lower limit of the Confidence Interval as the bull's probable future value. This will rank Nugget and Conductor as the safest choices.

The optimist, however, will look at the upper limit of the Confidence Interval as the bull's potential PD and choose the other two bulls, High Spot and Mars, as the best opportunities.

The realist (most of us we hope) will still recognize the bull's current PD as the best estimate of his genetic quality relative to other sires. This places High Spot and Nugget as the top choices.

Table 2. Examples of Confidence Intervals in action.

Sire	PD±CONF	The Future PD		
		Pessimistic	Realistic	Optimistic
High Spot	1724±314	+1410	+1724 (1)	+2038 (1)
Nugget	1713±123	+1590 (1)	+1713 (2)	+1836
Mars	1630±254	+1376	+1630	+1884 (2)
Conductor	1625± 46	+1579 (2)	+1625	+1671

A low-repeatability sire will have a large Confidence Interval. If his true genetic value were assumed to be his PD minus CONF, and this pessimistic estimate is still high, he is probably a superior sire. Use repeatability to indicate risk, but use predicted difference and the Confidence Interval to make decisions on low-repeatability sires.

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