



Canadian Simmental Association Fall 2004 Genetic Evaluation Quick Reference Guide

The summary statistics presented are the result of the Fall 2004 Multi-Breed International Cattle Evaluation (MB-ICE) conducted by the Animal Breeding Group at Cornell University in Ithaca, NY. Data is pooled from the Canadian and American Simmental Associations and evaluated using a multiple trait approach. All statistics presented refer to the North American population.

Table 1. Expected Progeny Difference Abbreviations

Abbreviation	Meaning	Units
MB-ICE	Multi-Breed International Cattle Evaluation	
EPD	Expected Progeny Difference	
CE	Calving Ease	% Unassisted Calving
BWT	Birth Weight	Pounds
WWT	Weaning Weight	Pounds
YWT	Yearling Weight	Pounds
MCE	Maternal Calving Ease	% Unassisted Calving
Milk	Maternal Milk	Pounds of Weaned Calf
MWWT	Maternal Weaning Weight	Pounds of Weaned Calf
CWT	Carcass Weight	Pounds
PRC	Percent Retail Cuts	% Boneless Closely Trimmed Retail Product
MS	Marbling Score	Marbling Score Units
REA	Rib-Eye Area	Square Inches
WBSF	Warner Bratzler Shear Force	Pounds of Force
D WT	Daughter Weight	Pounds
D HT	Daughter Height	Frame Score Units
Acc	Accuracy	%

Heritability and Correlations

Heritability describes the portion of variation in a trait that is due to genetics. Correlations are

Table 2. Heritabilities* and Genetic Correlations used in the Simmental Growth evaluation

	BWT	WWT	YWT	Milk
Birth Weight (BWT)	0.39	0.49	0.32	-0.15
Weaning Weight (WWT)		0.28	0.51	-0.32
Yearling Weight (YWT)			0.38	-0.02
Maternal Milk (Milk)				0.16

* - used in MB-ICE for >75% Simmental animals
Heritabilities are on the diagonal (**bold**)

used to show how traits are related in terms of evaluation. Correlations can range from -1.00 to +1.00.

Correlations nearing either of these values show a strong linear relationship between the traits being evaluated. Correlations near 0.00

represent traits with little relationship between them.

Table 3. Heritabilities* and Genetic Correlations used in the Simmental Calving Ease evaluation

	BWT	CE	MCE
Birth Weight (BWT)	0.18	0.41	-0.18
Calving Ease Direct (CE)		0.18	-0.13
Calving Ease Maternal (MCE)			0.19

Heritabilities are on the diagonal (**bold**)

Table 4. Heritabilities* and Genetic Correlations used in the Simmental Carcass evaluation

	CWT	PRC	MS
Carcass Weight (CWT)	0.34	---	0.07
Percent Retail Cuts (PRC)		0.26	0.12
Marbling Score (MS)			0.35

Heritabilities are on the diagonal (**bold**)

A Note on Using the Tables

Tables are presented for Active Sires, Active Dams, Current Males and Current Females. Rather than comparing the EPDs to zero or the genetic base, animals should be compared to the population using the table that best represents them. That is yearling and two year old bulls should be compared to the Current Males, females in your cowherd compared to Active Dams, and replacement females to the Current Female table.

CSA Fall 2004 Genetic Evaluation Quick Reference Guide

Active Simmental Sires

Active sires are defined as bulls that have had performance information reported on progeny born within the last two years (2002 – 2003) or progeny born to a daughter calving for the first time at 33 months of age or less in the past two years.

Table 5. Percentile Levels for Active Simmental Sires

%	CE	BW	WW	YW	MCE	Milk	MWWT	CWT	PRC	MS	Fat	REA	WBSF	D WT	D HT
1	14.2	-2.2	60.0	96.7	10.6	21.6	42.7	29.7	0.47	0.40	-0.04	0.50	-0.68	49.5	0.50
2	12.9	-1.5	56.5	91.9	9.5	19.9	40.8	24.1	0.40	0.34	-0.04	0.43	-0.61	44.4	0.47
3	12.2	-1.1	54.5	88.6	8.8	19.0	39.5	22.0	0.37	0.31	-0.03	0.39	-0.53	42.8	0.43
4	11.8	-0.8	52.9	86.3	8.3	18.2	38.4	19.4	0.33	0.29	-0.03	0.34	-0.51	40.4	0.39
5	11.4	-0.5	51.6	84.6	8.0	17.4	37.6	17.4	0.30	0.27	-0.03	0.32	-0.49	38.2	0.36
10	10.3	0.4	47.8	78.1	6.5	15.1	34.6	12.5	0.22	0.22	-0.02	0.24	-0.36	29.4	0.28
15	9.5	0.9	45.1	74.0	5.5	13.6	32.8	9.9	0.17	0.17	-0.02	0.19	-0.30	24.3	0.24
20	8.7	1.3	43.1	70.9	4.7	12.3	31.2	7.5	0.14	0.15	-0.01	0.15	-0.24	21.7	0.21
25	8.0	1.6	41.5	68.3	4.1	11.3	29.9	5.7	0.10	0.13	-0.01	0.11	-0.19	17.9	0.17
30	7.4	2.0	39.9	65.9	3.5	10.4	28.7	4.3	0.08	0.11	-0.01	0.07	-0.16	15.8	0.14
35	6.8	2.2	38.6	63.7	3.0	9.6	27.6	2.9	0.05	0.10	-0.01	0.04	-0.13	14.1	0.11
40	6.1	2.5	37.4	61.6	2.6	8.8	26.5	1.4	0.03	0.08	0.00	0.02	-0.09	12.0	0.08
45	5.4	2.8	36.0	59.7	2.1	8.0	25.5	0.3	0.01	0.07	0.00	-0.01	-0.03	9.7	0.06
50	4.7	3.0	34.8	57.8	1.7	7.2	24.6	-0.9	-0.01	0.05	0.00	-0.03	-0.02	7.1	0.04
55	3.9	3.3	33.8	55.9	1.2	6.5	23.6	-1.9	-0.03	0.04	0.00	-0.06	0.02	5.4	0.02
60	3.0	3.6	32.7	54.1	0.7	5.7	22.6	-3.1	-0.05	0.02	0.00	-0.08	0.05	3.3	0.00
65	2.2	3.9	31.4	52.2	0.1	4.9	21.7	-4.3	-0.08	0.01	0.01	-0.10	0.08	1.4	-0.02
70	1.2	4.2	30.2	50.3	-0.5	4.2	20.7	-5.9	-0.11	-0.01	0.01	-0.12	0.11	-0.5	-0.05
75	0.1	4.6	28.9	48.1	-1.2	3.3	19.7	-7.7	-0.13	-0.02	0.01	-0.15	0.17	-2.9	-0.07
80	-1.2	5.0	27.4	45.6	-2.0	2.3	18.6	-9.3	-0.17	-0.04	0.01	-0.18	0.19	-5.4	-0.10
85	-2.7	5.5	25.7	42.7	-3.1	1.3	17.4	-11.6	-0.21	-0.07	0.02	-0.21	0.24	-9.1	-0.14
90	-4.8	6.1	23.4	39.1	-4.6	-0.2	15.9	-14.9	-0.26	-0.11	0.02	-0.26	0.34	-14.7	-0.20
95	-7.9	7.0	20.0	33.6	-7.3	-2.6	13.7	-19.4	-0.33	-0.18	0.03	-0.34	0.46	-22.5	-0.29
Avg	3.6	3.1	35.3	58.3	1.2	7.3	24.9	-0.9	-0.01	0.05	0.00	-0.02	-0.02	7.4	0.04
Low	-28.9	-8.0	-4.8	-5.1	-27.6	-22.5	-7.5	-47.8	-0.83	-0.67	-0.09	-0.82	-0.91	-86.1	-0.88
High	19.0	13.7	96.5	147.0	21.3	30.1	57.0	47.3	0.91	0.73	0.09	0.78	0.70	73.0	0.68

Active Dams

Active Dams are defined as any female that has had a calf reported in the last two years (2002-2003).

Table 6. Percentile Levels for Active Simmental Dams

%	CE	BW	WW	YW	MCE	Milk	MWWT	CWT	PRC	MS	Fat	REA
1	9.7	-2.0	56.8	92.9	8.1	20.8	42.0	23.1	0.38	0.39	-0.04	0.42
2	9.0	-1.4	54.0	88.6	7.3	19.1	40.0	19.9	0.32	0.33	-0.03	0.35
3	8.7	-1.0	52.3	85.7	6.9	18.1	38.7	18.3	0.29	0.30	-0.03	0.31
4	8.3	-0.6	51.0	83.6	6.4	17.3	37.7	17.1	0.26	0.27	-0.02	0.29
5	8.0	-0.4	50.0	82.0	6.1	16.7	36.9	16.0	0.24	0.25	-0.02	0.26
10	7.0	0.4	46.5	76.0	4.9	14.6	34.2	11.8	0.17	0.20	-0.02	0.20
15	6.2	1.0	44.1	72.3	4.1	13.2	32.4	9.3	0.13	0.17	-0.01	0.15
20	5.6	1.4	42.2	69.3	3.4	12.1	31.0	7.4	0.10	0.15	-0.01	0.11
25	4.9	1.8	40.7	66.8	2.9	11.2	29.7	5.9	0.07	0.12	-0.01	0.08
30	4.3	2.1	39.3	64.6	2.4	10.4	28.6	4.4	0.04	0.11	0.00	0.05
35	3.7	2.4	38.0	62.6	2.0	9.6	27.5	3.0	0.02	0.10	0.00	0.03
40	3.1	2.7	36.8	60.7	1.6	8.8	26.5	1.8	0.00	0.08	0.00	0.01
45	2.4	2.9	35.7	58.9	1.2	8.1	25.6	0.7	-0.02	0.07	0.00	-0.01
50	1.8	3.2	34.6	57.1	0.8	7.4	24.6	-0.4	-0.04	0.05	0.00	-0.03
55	1.1	3.5	33.5	55.3	0.4	6.7	23.7	-1.5	-0.06	0.04	0.01	-0.05
60	0.5	3.8	32.4	53.4	0.0	6.0	22.8	-2.7	-0.08	0.02	0.01	-0.08
65	-0.2	4.1	31.2	51.5	-0.5	5.3	21.8	-3.9	-0.10	0.01	0.01	-0.10
70	-1.0	4.4	30.0	49.5	-1.0	4.4	20.8	-5.3	-0.13	0.00	0.01	-0.12
75	-1.7	4.8	28.7	47.4	-1.6	3.6	19.7	-6.7	-0.16	-0.02	0.01	-0.14
80	-2.6	5.2	27.3	45.0	-2.3	2.6	18.5	-8.2	-0.18	-0.04	0.02	-0.17
85	-3.6	5.6	25.6	42.1	-3.1	1.5	17.2	-10.2	-0.22	-0.06	0.02	-0.20
90	-4.9	6.3	23.4	38.5	-4.2	0.1	15.5	-12.3	-0.26	-0.10	0.02	-0.25
95	-6.9	7.2	20.2	33.2	-5.8	-2.2	13.0	-15.9	-0.33	-0.14	0.03	-0.32
Avg	1.4	3.3	34.8	57.2	0.5	7.4	24.8	-0.4	-0.04	0.05	0.00	-0.03
Low	-18.5	-6.8	-4.8	-7.4	-18.0	-23.3	-12.8	-66.1	-0.79	-0.40	-0.07	-0.88
High	13.2	15.8	80.3	138.4	15.8	31.7	51.9	36.3	0.72	0.89	0.13	0.70

CSA Fall 2004 Genetic Evaluation Quick Reference Guide

Current Population

The current population is defined as all animals with reported performance information born in the last two years (2002-2003).

Table 7. Percentile Levels for Current Population of Males

%	CE	BW	WW	YW	MCE	Milk	MWWT	CWT	PRC	MS	Fat	REA
1	10.8	-1.9	55.9	91.6	7.9	20.6	41.3	34.2	0.55	0.42	-0.05	0.55
2	10.2	-1.3	53.5	87.8	7.3	19.0	39.7	31.0	0.49	0.38	-0.04	0.49
3	9.7	-1.0	51.9	85.4	6.8	17.9	38.6	28.0	0.42	0.36	-0.04	0.46
4	9.4	-0.7	50.8	83.6	6.4	17.1	37.6	24.8	0.39	0.33	-0.03	0.43
5	9.1	-0.5	49.8	82.1	6.0	16.5	37.0	23.1	0.37	0.31	-0.03	0.40
10	8.3	0.2	46.6	77.0	4.9	14.5	34.4	17.8	0.28	0.26	-0.03	0.33
15	7.6	0.7	44.5	73.6	4.2	13.3	32.7	14.2	0.22	0.22	-0.02	0.28
20	7.0	1.1	42.8	71.0	3.6	12.2	31.4	12.1	0.18	0.19	-0.02	0.24
25	6.4	1.4	41.4	68.8	3.0	11.3	30.2	9.9	0.15	0.17	-0.01	0.21
30	5.9	1.7	40.1	66.8	2.6	10.6	29.1	8.2	0.12	0.15	-0.01	0.17
35	5.3	2.0	39.0	64.9	2.1	9.8	28.2	6.1	0.09	0.13	0.00	0.14
40	4.7	2.3	37.8	63.1	1.7	9.1	27.3	4.0	0.06	0.12	0.00	0.11
45	4.1	2.6	36.7	61.5	1.3	8.4	26.4	2.1	0.03	0.10	0.00	0.08
50	3.4	2.9	35.7	59.8	0.8	7.8	25.5	0.8	0.01	0.08	0.00	0.06
55	2.7	3.2	34.6	58.2	0.4	7.1	24.7	-1.0	-0.02	0.06	0.01	0.03
60	2.0	3.5	33.6	56.4	-0.1	6.5	23.8	-3.0	-0.04	0.04	0.01	0.00
65	1.3	3.8	32.5	54.6	-0.6	5.8	22.9	-5.0	-0.07	0.02	0.01	-0.03
70	0.6	4.1	31.4	52.8	-1.1	5.1	22.0	-6.9	-0.10	0.00	0.02	-0.07
75	-0.2	4.5	30.1	50.9	-1.6	4.3	21.1	-9.1	-0.14	-0.02	0.02	-0.10
80	-1.1	4.9	28.7	48.6	-2.3	3.5	20.1	-11.6	-0.17	-0.04	0.02	-0.14
85	-2.1	5.4	27.2	46.0	-3.1	2.5	19.0	-14.1	-0.22	-0.06	0.03	-0.19
90	-3.3	6.0	25.2	42.8	-4.1	1.3	17.6	-17.2	-0.29	-0.10	0.04	-0.23
95	-5.1	6.8	22.3	38.1	-6.1	-0.5	15.5	-22.5	-0.37	-0.14	0.05	-0.30
Avg	2.9	3.0	35.8	59.9	0.5	7.9	25.8	0.3	0.01	0.08	0.01	0.05
Low	-18.1	-4.9	-0.6	2.4	-18.0	-13.5	0.3	-92.6	-0.69	-0.34	-0.07	-0.58
High	14.2	12.4	71.3	117.5	12.0	28.4	51.8	43.0	0.92	0.78	0.11	0.71

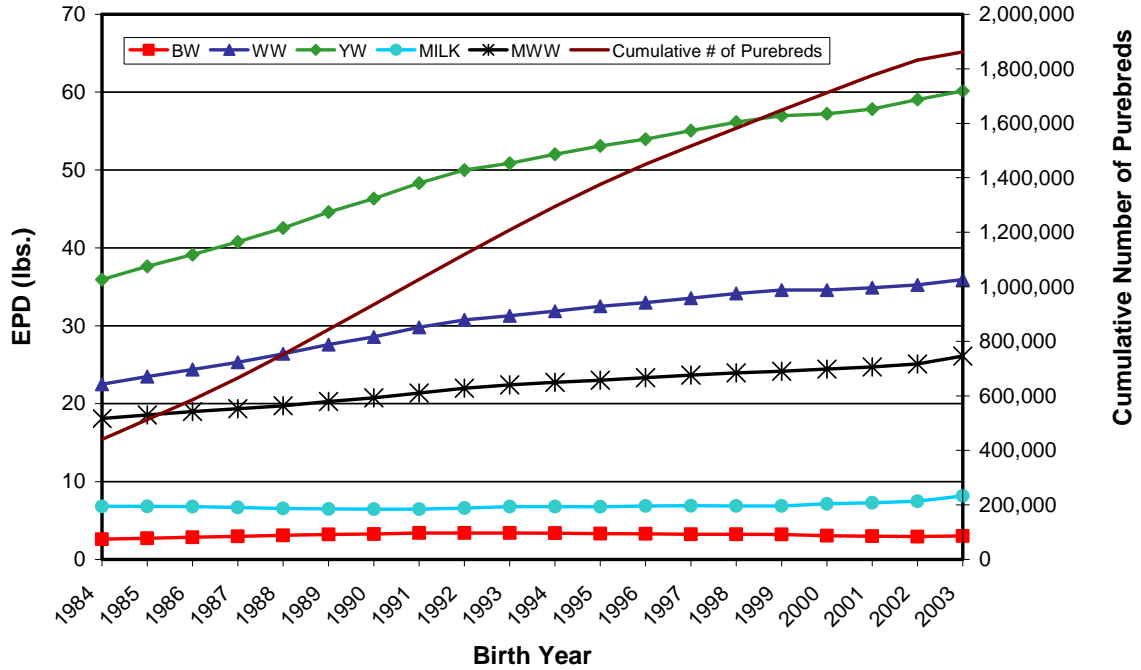
Table 8. Percentile Levels for Current Population of Females

%	CE	BW	WW	YW	MCE	Milk	MWWT	CWT	PRC	MS	Fat	REA
1	10.8	-2.1	56.3	91.9	7.9	20.2	41.0	29.6	0.46	0.52	-0.04	0.59
2	10.2	-1.5	53.6	88.0	7.2	18.6	39.2	26.4	0.39	0.44	-0.04	0.54
3	9.7	-1.2	51.9	85.4	6.7	17.5	38.0	24.7	0.38	0.40	-0.04	0.52
4	9.4	-0.9	50.8	83.6	6.3	16.8	37.2	23.6	0.35	0.39	-0.04	0.47
5	9.2	-0.7	49.8	82.1	5.9	16.2	36.4	22.5	0.34	0.38	-0.03	0.45
10	8.3	0.1	46.4	76.7	4.9	14.2	33.9	18.0	0.28	0.30	-0.03	0.36
15	7.6	0.6	44.1	73.2	4.1	12.9	32.1	14.7	0.21	0.25	-0.02	0.31
20	7.1	1.0	42.4	70.5	3.6	11.9	30.8	11.5	0.17	0.22	-0.02	0.26
25	6.5	1.4	40.8	68.1	3.1	11.0	29.6	9.1	0.13	0.19	-0.01	0.23
30	6.0	1.7	39.5	66.0	2.6	10.2	28.5	7.1	0.10	0.16	-0.01	0.19
35	5.5	2.0	38.3	64.1	2.2	9.4	27.5	5.5	0.06	0.14	0.00	0.16
40	4.9	2.2	37.2	62.3	1.8	8.8	26.6	4.3	0.04	0.11	0.00	0.11
45	4.4	2.5	36.1	60.6	1.4	8.1	25.7	3.4	0.01	0.09	0.00	0.08
50	3.8	2.8	35.1	58.9	1.0	7.4	24.9	1.6	-0.01	0.07	0.01	0.04
55	3.1	3.1	34.0	57.2	0.6	6.8	24.0	0.6	-0.03	0.05	0.01	0.01
60	2.5	3.4	32.9	55.5	0.2	6.1	23.2	-0.9	-0.07	0.03	0.01	-0.02
65	1.7	3.7	31.9	53.7	-0.3	5.5	22.3	-3.1	-0.09	0.00	0.01	-0.05
70	1.0	4.0	30.8	51.9	-0.8	4.8	21.5	-5.0	-0.12	-0.02	0.02	-0.08
75	0.2	4.4	29.5	49.9	-1.3	4.1	20.6	-6.8	-0.15	-0.04	0.02	-0.13
80	-0.7	4.8	28.1	47.7	-2.0	3.3	19.6	-9.1	-0.19	-0.07	0.03	-0.18
85	-1.7	5.3	26.4	45.1	-2.8	2.4	18.4	-10.9	-0.22	-0.10	0.03	-0.23
90	-3.0	5.9	24.4	41.8	-3.8	1.2	17.1	-13.2	-0.29	-0.14	0.04	-0.28
95	-4.9	6.8	21.3	36.6	-5.7	-0.6	15.0	-16.3	-0.41	-0.22	0.04	-0.35
Avg	3.1	2.9	35.2	59.0	0.7	7.6	25.2	1.8	-0.02	0.08	0.01	0.04
Low	-17.6	-5.6	-1.4	-3.7	-18.0	-14.1	1.1	-33.7	-0.76	-0.36	-0.06	-0.76
High	14.2	12.3	74.5	121.7	14.0	26.2	52.4	37.3	0.60	0.62	0.09	0.69

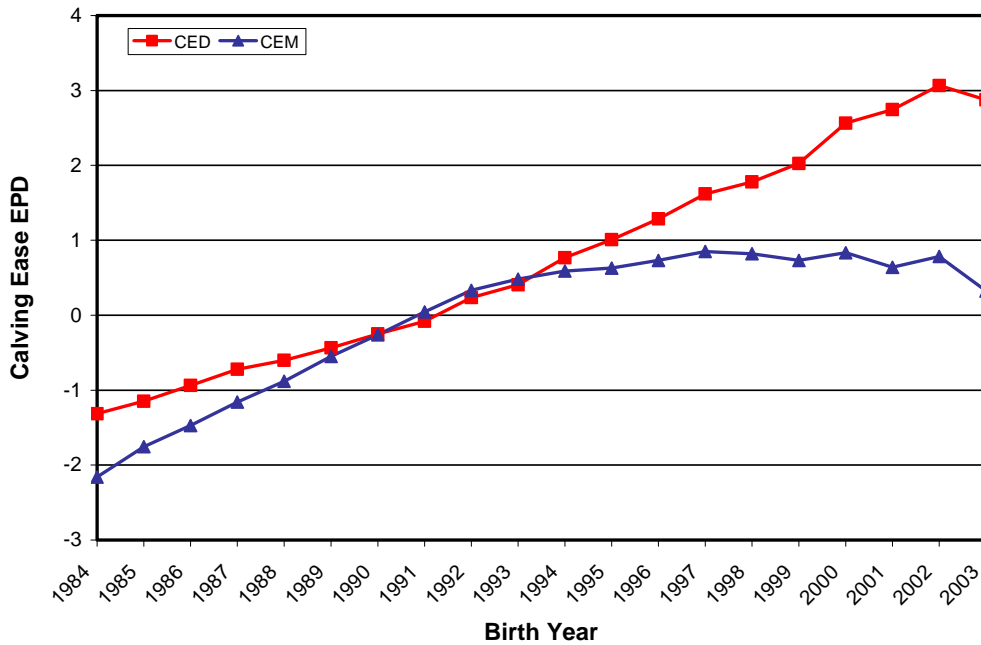
CSA Fall 2004 Genetic Evaluation Quick Reference Guide

Genetic Trend

North American Simmental Growth and Maternal Traits Genetic Trend 1984 - 2003



North American Simmental Calving Ease Genetic Trend 1984 - 2003



CSA Fall 2004 Genetic Evaluation Quick Reference Guide

Accuracy

Every EPD is presented with an associated accuracy value. Accuracy values reflect the amount of information available on the animal and its relatives for use in genetic evaluation. As we obtain and use more information in evaluating an animal's genetic merit, the accuracy value will increase. Accuracy values can range from 0.00 and 1.00 with a higher value representing greater accuracy.

Table 9. Possible Change Values for Various Levels of Accuracy

Acc	CE	BWT	WWT	YWT	MCE	Milk	MWWT	CWT	PRC	MS
0.00	7.8	3.0	16.3	25.7	7.9	11.9	12.1	19.3	0.46	0.26
0.10	7.0	2.7	14.7	23.1	7.1	10.7	10.9	17.4	0.41	0.23
0.20	6.2	2.4	13.0	20.6	6.3	9.5	9.7	15.4	0.37	0.21
0.30	5.4	2.1	11.4	18.0	5.5	8.3	8.5	13.5	0.32	0.18
0.40	4.7	1.8	9.8	15.4	4.7	7.1	7.3	11.6	0.28	0.16
0.50	3.9	1.5	8.2	12.9	3.9	6.0	6.1	9.7	0.23	0.13
0.60	3.1	1.2	6.5	10.3	3.1	4.8	4.8	7.7	0.18	0.10
0.70	2.3	0.9	4.9	7.7	2.4	3.6	3.6	5.8	0.14	0.08
0.80	1.6	0.6	3.3	5.1	1.6	2.4	2.4	3.9	0.09	0.05
0.90	0.8	0.3	1.6	2.6	0.8	1.2	1.2	1.9	0.05	0.03
1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Because accuracy indicates available information, they are extremely valuable as a risk management tool. The higher the accuracy the more certain we are of an animal's genetic merit and thus, the less risk there is in using the animal. Table 9. shows the possible change (plus or minus) in the EPD of an animal, based on its' accuracy. Any EPD changes are expected to fall within this range (EPD plus and minus the possible change) 2/3 of the time.

EPDs are directly comparable, regardless of the accuracy, and they are also the most reliable reflection of an animal's genetic merit. Accuracies, simply reflect potential risk.

Genetic Base

EPDs are computed relative to a reference point or genetic base. The genetic base for the MB-ICE system has been set by summing to zero, the estimated values of Simmental, Angus, Hereford and Brahman genes represented in calves born in 1991. Recognize that Simmental average EPDs for 1991 are NOT zero (see Figures). The calving ease base has been set so the average EPDs for calving ease and maternal calving ease for purebred Simmental calves born in 1991 equal zero. Remember that calving ease and maternal calving ease EPDs are only calculated for Simmental animals. The base year of 1991 was selected on the recommendations in Guidelines for Uniform Beef Improvement 7th Edition (BIF, 1996). The carcass evaluation is not adjusted to a year genetic base. Thus the average carcass EPD for all traits is zero.

A Special Note

1. The EPDs for Daughter Weight and Height are currently being evaluated by ASA. As this evaluation progresses it is important for CSA members to be aware that they can collect this same information through participation in the Total Herd Evaluation program and participate in this evaluation.
2. Ultrasound data collected through Ultrasound Guidelines Council accredited technicians and labs is being included in the North American Carcass evaluation. Ask your ultrasound technician for details.