



Canadian Simmental Association Fall 2008 Genetic Evaluation Quick Reference Guide

The summary statistics presented are the result of the Fall 2008 Multi-Breed International Cattle Evaluation (MB-ICE) conducted by the American Simmental Association in Bozeman, MT. 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
SC	Scrotal Circumference	Centimetres
Stay	Stayability	% Probability
CWT	Carcass Weight	Pounds
YG	Yield Grade	% of Yield Grade 3 (lower #'s are better)
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 used to show how traits are related in terms of evaluation. Correlations can range from -1.00 to +1.00.

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**)

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	YG	MS
Carcass Weight (CWT)	0.34	---	0.07
Yield Grade (YG)		0.26	0.12
Marbling Score (MS)			0.35

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

A Note on Using the Tables

A Percentile Rank Table is presented for the current population. Rather than comparing the EPDs to zero or the genetic base, animals should be compared to the population using the percentile rank table.

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Current Population

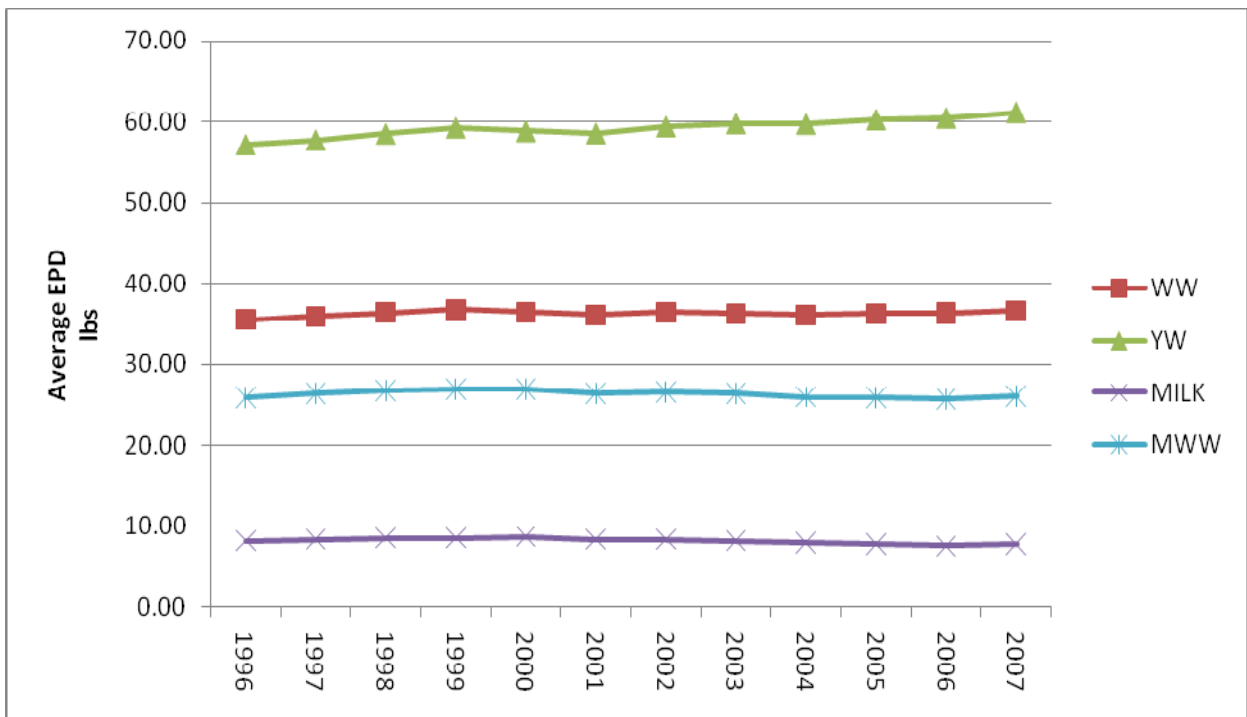
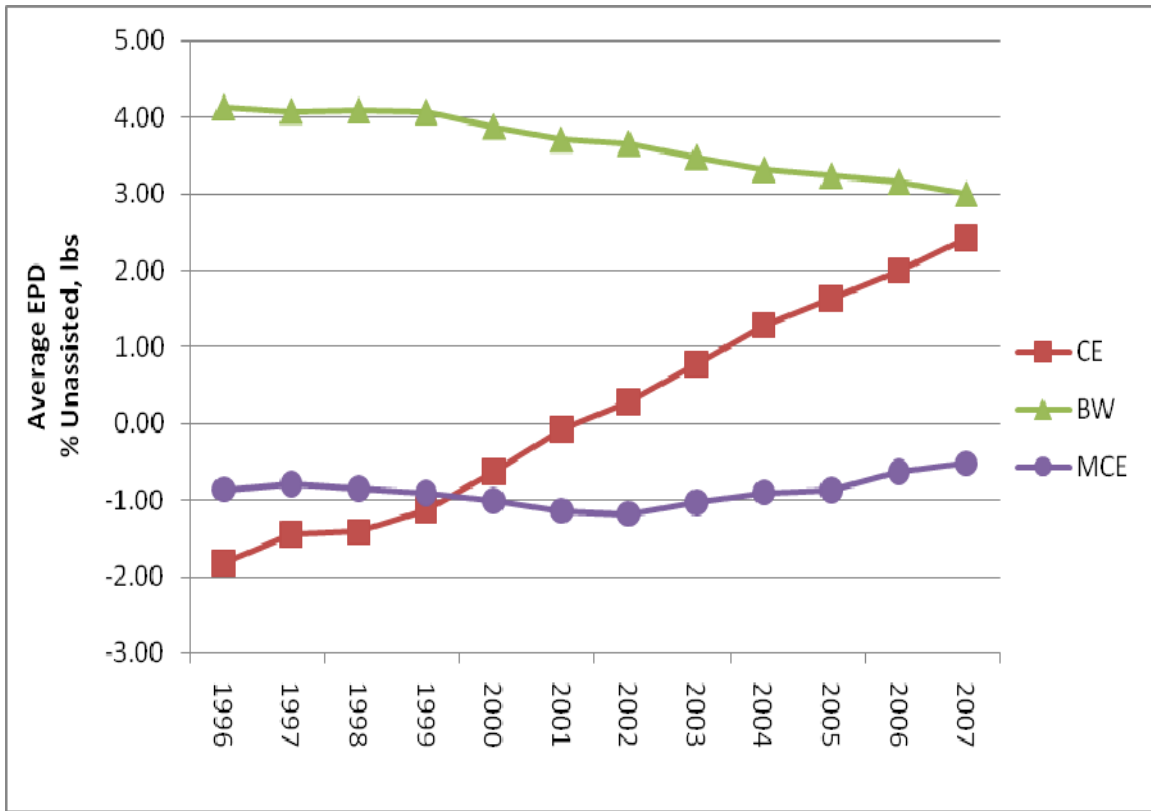
The current population is defined as all animals with reported performance information born in the last two years (2006-2007).

Table 5. Percentile Levels for Current North American Population

%	CE	BW	WW	YW	MCE	Milk	MWWT	SC	Stay	CWT	YG	MS	Fat	REA
1	12.4	-2.5	54.0	90.6	8.4	18.3	39.0	1.29	26.0	26.8	-0.11	0.29	-0.02	0.29
2	11.8	-2.0	51.5	86.3	7.8	16.8	37.0	1.13	25.1	23.8	-0.09	0.25	-0.02	0.25
3	11.4	-1.6	49.9	83.5	7.4	15.9	35.9	1.02	24.5	22.1	-0.08	0.23	-0.02	0.22
4	11.1	-1.3	48.7	81.7	7.1	15.2	34.9	0.98	24.1	20.6	-0.08	0.21	-0.02	0.20
5	10.9	-1.1	47.7	80.1	6.8	14.6	34.1	0.89	23.8	19.5	-0.07	0.20	-0.02	0.18
10	9.9	-0.4	44.4	75.0	5.8	12.4	31.3	0.74	22.6	15.7	-0.05	0.15	-0.01	0.13
15	9.1	0.0	42.3	71.8	4.9	10.9	29.4	0.61	21.9	13.3	-0.04	0.13	-0.01	0.10
20	8.5	0.4	40.6	69.2	4.3	9.8	27.9	0.52	21.2	11.4	-0.03	0.11	-0.01	0.08
25	7.9	0.7	39.2	67.1	3.7	8.9	26.7	0.44	20.6	9.8	-0.02	0.09	-0.01	0.06
30	7.4	0.9	37.9	65.1	3.3	8.2	25.7	0.37	20.0	8.3	-0.01	0.08	-0.01	0.04
35	6.9	1.2	36.8	63.3	2.8	7.5	24.8	0.32	19.4	7.0	0.00	0.07	-0.01	0.03
40	6.4	1.5	35.7	61.7	2.4	6.9	24.0	0.27	18.9	5.7	0.01	0.06	0.00	0.01
45	6.0	1.7	34.7	60.1	2.0	6.3	23.2	0.22	18.3	4.5	0.01	0.05	0.00	-0.01
50	5.5	1.9	33.8	58.6	1.6	5.8	22.5	0.18	17.6	3.3	0.02	0.04	0.00	-0.02
55	4.9	2.2	32.8	57.0	1.2	5.2	21.8	0.14	16.9	2.1	0.03	0.03	0.00	-0.03
60	4.4	2.4	31.8	55.4	0.8	4.7	21.1	0.09	16.0	0.9	0.03	0.02	0.00	-0.04
65	3.9	2.7	30.8	53.8	0.4	4.1	20.3	0.04	15.1	-0.4	0.04	0.01	0.01	-0.06
70	3.2	3.0	29.7	52.1	-0.1	3.4	19.6	-0.01	14.0	-1.7	0.05	0.00	0.01	-0.07
75	2.5	3.3	28.6	50.2	-0.6	2.8	18.7	-0.05	12.8	-3.1	0.05	-0.01	0.01	-0.09
80	1.7	3.7	27.3	48.1	-1.2	2.0	17.8	-0.10	11.3	-4.8	0.06	-0.02	0.01	-0.10
85	0.7	4.2	25.8	45.6	-1.9	1.1	16.7	-0.18	9.8	-6.7	0.07	-0.04	0.01	-0.12
90	-0.6	4.8	23.8	42.3	-2.9	-0.1	15.4	-0.27	8.2	-9.2	0.09	-0.06	0.02	-0.15
95	-2.5	5.6	20.7	37.3	-4.5	-1.9	13.4	-0.41	6.2	-13.1	0.11	-0.10	0.02	-0.20
Avg	5.0	2.1	33.9	58.6	1.5	5.9	22.9	-1.52	16.5	3.3	0.02	0.04	0.00	-0.01
Low	-13.8	-6.1	-1.4	0.3	-15.3	-16.9	-2.2	-1.52	-2.4	-43.3	-0.29	-0.39	-0.08	-0.65
High	16.8	10.5	70.3	124.6	12.0	29.8	53.0	1.99	32.0	46.6	0.45	0.80	0.14	0.63

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Canadian Genetic Trend



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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	YG	MS
0.00	7.8	3.0	16.3	25.7	7.9	11.9	12.1	19.3	0.20	0.26
0.10	7.0	2.7	14.7	23.1	7.1	10.7	10.9	17.4	0.18	0.23
0.20	6.2	2.4	13.0	20.6	6.3	9.5	9.7	15.4	0.16	0.21
0.30	5.4	2.1	11.4	18.0	5.5	8.3	8.5	13.5	0.14	0.18
0.40	4.7	1.8	9.8	15.4	4.7	7.1	7.3	11.6	0.12	0.16
0.50	3.9	1.5	8.2	12.9	3.9	6.0	6.1	9.7	0.10	0.13
0.60	3.1	1.2	6.5	10.3	3.1	4.8	4.8	7.7	0.08	0.10
0.70	2.3	0.9	4.9	7.7	2.4	3.6	3.6	5.8	0.06	0.08
0.80	1.6	0.6	3.3	5.1	1.6	2.4	2.4	3.9	0.04	0.05
0.90	0.8	0.3	1.6	2.6	0.8	1.2	1.2	1.9	0.02	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.