The numbers you will see on the Outstanding Genetics Website are estimated breeding values, or EBVs. An EBV is essentially an estimation of an animal's genetic superiority or inferiority compared to the population average for a specific trait. We calculate EBVs on juvenile goats (those without their own progeny or performance records) based on the performance data of their female relatives. As a goat acquires its own records and has progeny with their own records, the EBVs are changed to reflect this information. EBVs are calculated for individual milk production and body confirmation traits; the individual traits are combined using appropriate weights to create the three selection indices (see table 2 for weights).

Table 1: A brief description of the EBV codes you will see on the Outstanding Genetics Website.

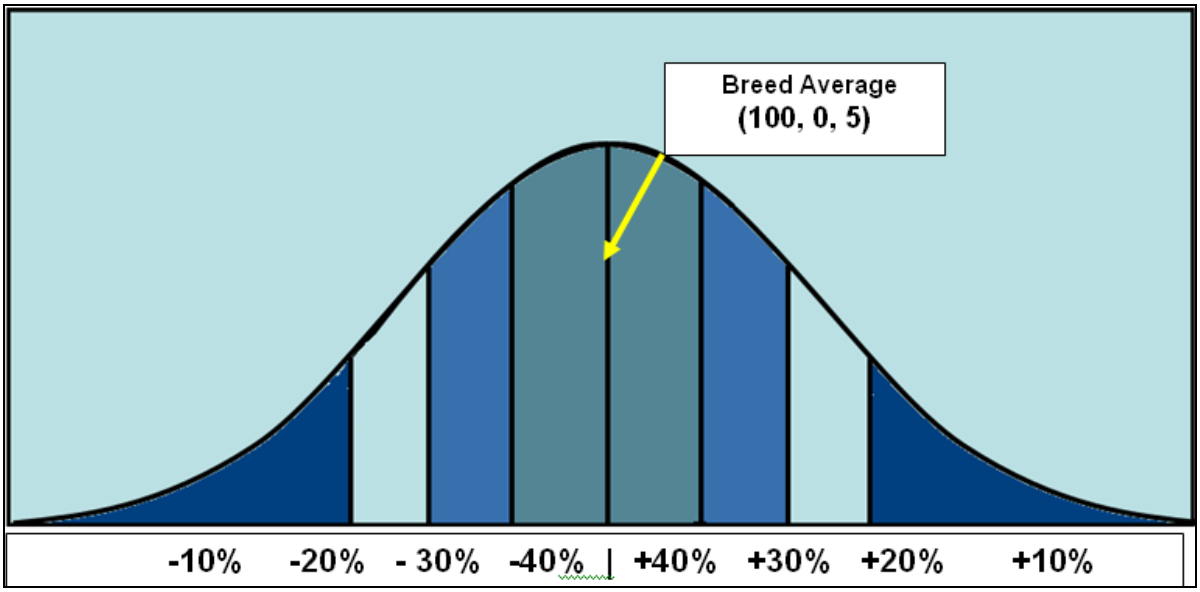
EBV Code	EBV Name	Description
Comb'd Index	Combined Index	Selection index based on 60% Production and 40% Type (Fig 1)
Prod'n Index	Production Index	Selection index based on milk production traits
Type Index	Type Index	Selection index based on CGS 8 linear type traits
Milk	Milk Weight	EBV for milk production in Kg per lactation, expressed as a deviation of breed average which is set to 0.
Prot	Protein Yield	EBV for Protein yield, in Kg per lactation, expressed as a deviation of breed average, which is set to 0
Fat	Fat Yield	EBV for Butter fat yield, given in Kg per lactation, expressed as a deviation of breed average, which is set to 0.
S/R	Structure/Rump	For a brief explanation of each trait, see table 4. For a detailed description on the type classification scoring system in Canada, please contact the Canadian Goat Society. These EBVs are based on the first classification of each animal during its first or second lactation and are expressed as a deviation of breed average, which is assumed to be 5.
SL	Suspensory Ligament	
RU	Rear Udder	
FU	Fore Udder	
DC	Dairy Character	
TE	Teats	
BC	Body Capacity	
FL	Feet and Legs	

Table 2:
This table shows how the individual traits are weighted in creating the selection indices. Please note we do not individually display the Mammary System Index and include it only as a component of the overall Type index.

Index Name	Trait Component	Trait Weighting
Production Index	Milk Yield	50%
	Fat Yield	50%
Mammary System	Suspensory Ligament	35%
	Fore Udder	28%
	Rear Udder	28%
	Teats	9%
Type Index	General Appearance	25%
	Feet and Legs	12%
	Body Capacity	10%
	Dairy Character	10%
	Mammary System Index	43%
Combined Index	Production Index	60%
	Type Index	40%

To better understand each ranked animal's EBVs, please review the tables below, followed by a practical example of how to apply this information to individual animals. The table provides the ranking brackets used for each EBV trait. Below that is a visual representation of this concept. The ranking brackets are determined by setting the population average to a specified value and then using the trait value's distribution over the whole population to determine each individual's EBV ranking.

Table 3/Figure 1: The table below shows the break down of EBV scores across the breeds. The curve is added to illustrate how the trait EBV values are determined by standardizing each trait value's distribution over the entire population.



	Maximum EBV/Index in bottom					Minimum EBV/Index in top			
	10%	20%	30%	40%	**Average**	40%	30%	20%	10%
C Index	68	79	87	94	100	106	113	121	132
P Index	68	79	87	94	100	106	113	121	132
T Index	68	79	87	94	100	106	113	121	132
Milk	-112	-74	-46	-22	0	22	46	74	112
Fat	-3.42	-2.24	-1.39	-0.67	0.00	0.67	1.39	2.24	3.42
Prot	-2.98	-1.95	-1.21	-0.58	0.00	0.58	1.21	1.95	2.98
S/R	4.69	4.80	4.88	4.94	5.00	5.06	5.12	5.20	5.31
SL	4.64	4.76	4.85	4.93	5.00	5.07	5.15	5.24	5.36
RU	4.41	4.61	4.76	4.88	5.00	5.12	5.24	5.39	5.59
FU	4.40	4.61	4.76	4.88	5.00	5.12	5.24	5.39	5.60
TE	4.32	4.55	4.72	4.87	5.00	5.13	5.28	5.45	5.68
DC	4.70	4.81	4.88	4.94	5.00	5.06	5.12	5.19	5.30
BC	4.61	4.74	4.84	4.92	5.00	5.08	5.16	5.26	5.39
FL	4.63	4.76	4.85	4.93	5.00	5.07	5.15	5.24	5.37

Example:

For the July 2006 Evaluation, the Top Alpine buck's line looked as follows:

				Milk Production					Type Classification (if available)					
Comb'd Index*	Goat's Name Goat's Owner	Sire#	Reg# Dam#	Daus Herds	Milk (kg)	Fat (kg)	Prot (kg)	Prod'n Index	Daus Herds	S/R SL	DC FU	BC RU	FL TE	Type Index
171	MIKADO DES BALIVEAUX		A87703	11	302	11.5	9.7	195	8	4.9	5.6	5.6	4.7	90
	Ferme Valaisanne	A6303594067	A79257	1					2	4.6	5.0	4.5	5.0	

This goat, Mikado, has a Combined Index of 171 and Production Index of 195 (both are greater than 132, the cut off for the top 10% of goats). If you look at Table 1, you can see that his is in the top 10% for both of these indices. If you look at the type index, however, you can see that Mikado has a value of 90, meaning he is in the bottom 30%-40% bracket (his Index value falls in between 87 and 94).

	Maximum EBV/Index in bottom					Minimum EBV/Index in top			
	10%	20%	30%	40%	**Average**	40%	30%	20%	10%
C Index	68	79	87	94	100	106	113	121	132
P Index	68	79	87	94	100	106	113	121	132
T Index	68	79	87	94	100	106	113	121	132

If you look at Mikado's production traits, you can also see that he is well above the cut off values for the top 10% for milk, fat and protein: 112kg/lactation, 3.42kg/lactaton and 2.98 kg/lactation respectively.

Maximum EBV/Index in bottom						Minimum EBV/Index in top			
	10%	20%	30%	40%	**Average**	40%	30%	20%	10%
Milk	-112	-74	-46	-22	0	22	46	74	112
Fat	-3.42	-2.24	-1.39	-0.67	0.00	0.67	1.39	2.24	3.42
Prot	-2.98	-1.95	-1.21	-0.58	0.00	0.58	1.21	1.95	2.98

Now, looking at Mikado's type trait EBVs, you can see more variation. For instance, his EBV for suspensory ligament (SL) is 4.6, which falls in the bottom 10% - 20% bracket (being between 4.64 and 4.76). His value for dairy character (DC) of 5.6, however, falls above the cutoff for the top 10% bracket (5.3).

Maximum EBV/Index in bottom						Minimum EBV/Index in top			
	10%	20%	30%	40%	**Average**	40%	30%	20%	10%
SL	4.64	4.76	4.85	4.93	5.00	5.07	5.15	5.24	5.36
DC	4.70	4.81	4.88	4.94	5.00	5.06	5.12	5.19	5.30

Type EBVs

EBVs for type traits are all based on the individual animal scores taken from the Canadian Goat Society's type classification program. EBVs at CCSI for type traits are expressed such that the average for each breed is 5. For more information, please visit the CGS website http://www.goats.ca.

Table 2	Description of Type Traits that the Type EBVs are based on
S/R	This is a score combining the structure and rump classification scores, formerly designated GA. Proper structure is defined as being "attractive individually indicating vigour, strength, stretch, size and stature with harmonious blending. Head, shoulder assembly, loin strength, stature and size are considered individually to give an overall structure score. Rump is a separately evaluated trait, but we combine the two scores to give an indication of overall appearance. Rump is evaluated on width and slope.
SL	This is an evaluation of the overall mammary system. Scoring is broken down into evaluations of medial suspensory, udder depth and texture. There are also individual categories for both fore and rear udder.
RU	Rear udder is scored on correct height, width and profile.
FU	Fore udder is scored on fore attachment to the body, length and width.
DC	Dairy Character is an evaluation of the evidence of milking ability, angularity and general openness, as well as freedom from coarseness.
TE	Teats
BC	Body Capacity is scored based on chest width, depth of heart, overall body depth and length
FL	Feet and Legs combine the categories of bone quality, rear leg set, strength of pastern and balance of the front and rear feet.

Production EBVs

Based on performance data, we also calculate EBVs for milk, fat and protein. These EBVs are ranked according to the current breed averages and are expressed in the same units you would use to measure those traits. For instance, if the goat has a +30 EBV for milk, that means the goat is estimated to have the genetic potential to produce, over the year, 30 kg more milk than the breed average. The same principle applies for protein and fat yield.