THE EBV/EPD "PROOF IS IN THE PUDDING" PROGENY TEST

May 14, 2025

Jim Long of Rocking 711 Ranch
Jim@Rocking711.com

A progeny test was conducted, the primary purpose of which was to evaluate the correlation of the Australian Wagyu Association ("AuWA") Estimated Progeny Value ("EBV") and American Wagyu Association Estimated Progeny Differences ("EPD") genomic evaluation data to actual outcomes in the progeny of several bulls with outstanding EBVs.

BACKGROUND:

Many Wagyu producers, including myself, have often wondered how well EBV and EPD genomic evaluation rankings correlate with actual offspring results. In other words, how well do EBVs predict the outcome for the measured trait? If a Wagyu producer breeds some of their cows to a bull that has a relatively higher EBV (or EPD) for Marbling, and some of their cows to a bull that has a relatively lower EBV (or EPD) for Marbling, they would expect the offspring from the calves sired by the relatively higher-ranked bull to have relatively better actual marbling, compared to offspring from breedings from the bull with a relatively lower Marbling rank, right? EBV and EPD "numbers" are supposed to predict how the offspring of an animal should be influenced by such parent. Do they? The primary purpose of this particular progeny test was to evaluate how well EBVs and EPDs do at predicting actual outcomes in offspring for four measured carcass attributes.

An Expected Progeny Difference ("EPD", as used in the United States by the American Wagyu Association) is half of an EBV and predicts the "difference" between the animal's offspring and the breed average (half of the "value" the animal brings to offspring as one of such offspring's parents), whereas an EBV predicts the "value" the animal brings to its offspring – hence the reason for an EPD being half of the value of an EBV for the same predicted influence on offspring.

EBVs and EPDs for all animals in the breed association's registry, for each measured attribute, start out when the genetic evaluation system is created, at some number approximating beginning system startup "breed average" and then change (as does "breed average") based upon data submitted to the registry for the animal and for the animal's progeny, and for progeny of progeny, etc. The numbers are then "genomically enhanced" through the system evaluating the genes seen in a particular animal and comparing such genes to a database of genes that are known to impact a particular attribute. For some data, "cross-breed genomic data" is also used to influence the data. Progeny test data, including data from percentage Wagyu animals, so long as they are raised and fed and grouped within a contemporary group, can and are used to modify EBVs and EPDs. Results from progeny tests can also be used to "verify" and "cross check" whether or not EBVs and EPDs are effectively predicting offspring outcomes by evaluation of the offspring of different bulls that have substantially varying EBVs and EPDs, bred to a group of very similar cows, and then raised and fed the same way, to see how well actual results correlate with the outcomes predicted by the EBVs and EPDs of the bulls tested in the progeny test.

For this progeny test, the goal of which was to evaluate the correlation between EBVs (and EPDs), and actual results from offspring, 5 bulls with high genomic EBVs in at least 2 of the 4 carcass attributes that were to be evaluated, along with highly respected and "well understood" foundation sire Itoshigenami TF148, who's EBV accuracy is amongst the highest in the Wagyu breed, were tested. Also tested were 3 lower genomic EBV, lower EBV accuracy bulls that were used as natural service cleanup bulls following artificial insemination breeding. Essentially, the goal was to see if there was "proof in the pudding" as the saying goes. If a bull had a relatively higher EBV (or EPD) for a particular evaluated carcass attribute compared to another tested bull, then we should expect to see better results from such better EBV bull's offspring, on average. This was the goal of this particular progeny test.

Progeny tests require patience. It takes years to complete a progeny test. The cows must be bred, then 9 months gestation period before the calves are born, then 2+ years until the calves are harvested and their carcasses evaluated. Then more time for evaluation and reporting of the data.

At the time the progeny test was commenced back in 2021, the American Wagyu Association ("AmWA") had not yet introduced their EPD program, and therefore it was not planned at such time to evaluate the progeny test results outcome as compared to the AmWA EPDs. But since the time the progeny test was commenced, the AmWA has published EPDs, and even though the AmWA EPDs are less "mature" compared to the AuWA EBVs, the fact that there is meaningful difference and conflict between the EPDs and EBVs for certain individual animals has resulted in continued speculation regarding the ability of EPDs and EBVs to accurately predict the outcome in offspring for each area of EPDs and EBVs. Because the AmWA EPDs are now published, even though less mature compared to the AuWA EBVs, they are set forth herein within the progeny test results for analysis of the AmWA EPDs, along with the AuWA EBVs, for each measured attribute.

THE 4 CARCASS ATTRIBUTES EVALUATED AND MEASURMENT METHODS:

For this progeny test, it was planned to evaluate the hot carcass weight ("HCW"), marbling ("Marbling"), ribeye, or eye muscle area ("EMA") and yield grade ("YG"). It would have been great to evaluate other data such as birth weight, weaning weight, yearling weight, marbling fineness, etc., but there were limitations on the data that could be obtained from the producer based upon their commercial cow-calf operation, and by the carcass evaluation technology that existed at the processing plant that was used for processing. Regarding the "yield grade" attribute, there is no direct correlation between an EBV and the YG attribute, so we are comparing in this evaluation YG to the "Retail Beef Yield %" EBV since YG is a measure of external carcass fat thickness and attempts to predict the beef yield from a carcass. This is an imperfect comparison but it is the best comparative analysis that could be done for YG given the data available.

HCW was determined by the use of the certified scale installed at the processing plant to weigh each carcass. EMA and YG were determined at the 12th-13th rib using an E+V Technologies VBG2000 carcass camera system installed at the processing plant. According to the manufacturer's website, the VBG2000 carcass camera is used to grade approximately 95% of the fed cattle that are processed in North America, and over the last 15 years hundreds of millions of processed cattle have been graded using this carcass camera system. A carcass camera correlation study conducted in 2024 by the AmWA in conjunction with Colorado State University determined that the VBG2000 carcass camera Marbling results were more closely correlated with lipids extracted from a ribeye muscle sample as compared to two other popular carcass cameras. And the VBG2000 carcass camera was the only option available at the processing plant used for processing at the time the progeny test calves were processed, and was therefore the only available option for grading these carcasses. Unfortunately, the VBG2000 carcass camera does not evaluate marbling fineness, so that attribute was not evaluated in this progeny test.

THE COW HERD:

For a traditional progeny test such as this one, a group of bulls, which group contains at least one "proven" bull to serve as a "reference" to compare the other bulls to, are used to breed a consistent cow herd, and the variation in calves is 100% attributed to the bull that sired the calf. Of course this is not a perfect scenario, because there is of course variation in the cows, but it is best to keep the cow variability to a minimum by using a consistent cow herd, and a sufficient number of offspring from each tested bull is needed so that the average of the offspring of each bull is not meaningfully impacted by the differences in the cows. In this case, the cow herd utilized for this progeny test was a Red Angus cow herd owned by Double 7 Ranch, at Voca, Texas. Double 7 Ranch created and maintained their cow herd by purchasing all original cows and heifers, as well as all replacement heifers, from Peiper Red Angus, a highly respected 40+ year breeder of Red Angus seedstock cattle. Because the Red Angus breed is known to be a very genetically consistent

breed, and because 100% of this particular cow herd was from a single highly-respected Red Angus seedstock breeder, there was a high degree of confident that this was a very consistent cow herd for use for this important progeny test.

THE PROGENY TEST CALVES:

All of the calves resulting from this breeding program were 50% Wagyu / 50% Red Angus genetics animals and were purchased through prior agreement by Mishima Reserve for their Wagyu beef program, with a commitment from Mishima Reserve that the calves would all enter the same feeding program on the same day, and be fed the same way at the same feeding facility, and would all be processed on the same day at the same facility, and that the 4 carcass attributes would be collected at the time of processing.

105 Red Angus cows at the Double 7 Ranch were bred via AI breeding to 5 bulls on May 3, 2021. 90 offspring from this progeny test breeding program were weaned and backgrounded for a short time at Double 7 Ranch, then purchased by Mishima Reserve, fed together at the same facility, using the same feeding protocol, and harvested, and DNA samples collected, on March 14, 2024 at the One World Beef facility at Brawley, California.

Of these 90 calves that were processed, the DNA sample failed for 5 of the calves and therefore the sire was unable to be determined for such 5 calves. The sires of 85 of the 90 calves were able to be determined. The sires of 72 of the 85 calves were determined through DNA parent-verification by the AmWA. 13 of the 85 calves did not DNA parent-verify to any registered bull in the AmWA registry and were determined to be sired by the Circle8Bulls Q122 bull because that bull is not registered with the AmWA and that was the only bull that these 13 calves could have been sired by since the producer property is high-fenced and there were no other bulls on the property other than the cleanup bulls, and the producer verified that no other bulls were with this set of cows for the entire breeding period. It is planned that the DNA data for these 13 calves assumed to be sired by the Circle8Bulls Q122 bull will be transferred by the AmWA to the AuWA for future DNA parent-verifying of these 13 calves at the AmWA, but because these calves are almost certainly sired by the Circle8Bulls Q122 bull, these results are being published as if this is the case.

Of the 85 calves, as determined from DNA testing, 56 were steers and 29 were heifers.

58 of the 85 calves were conceived through AI breeding to one of the 5 tested AI sires and 27 were conceived by natural service from one of the 3 cleanup bulls.

THE PROGENY TEST BULLS:

105 Red Angus cows were bred via AI breeding to 5 bulls on May 3, 2021. These 5 bulls AI bulls were:

- ITOSHIGENAMI TF148 (FB3682 / IMUFQTF148) – the reference sire
- CIRCLE8BULLS Q122 (N/A / LTCFQ122)
- TBR SHIGENAMINAMI 3024Z (FB19599 / TRIFH3024Z) - but the calves DNA verified to full brother TBR SHIGENAMINAMI 3023Z (FB19598 / TRIFH3023Z) due to an error in labeling of the semen straws at the bull collection facility, so the 3023Z bull was the bull that was actually tested)
- TYDDEWI N4431 (FB60630 / DSWFN4431)
- TYDDEWI N7245 (FB72133 / DSWFN7245)

3 cleanup bulls were used to naturally service the group of 105 cows to ensure that those for which the AI breeding did not result in a pregnancy would be bred in a short period of time, hopefully within two 21-day estrus cycles, resulting in a tight calving window so that the age of the calves at harvest would be similar. These 3 natural service cleanup bulls were:

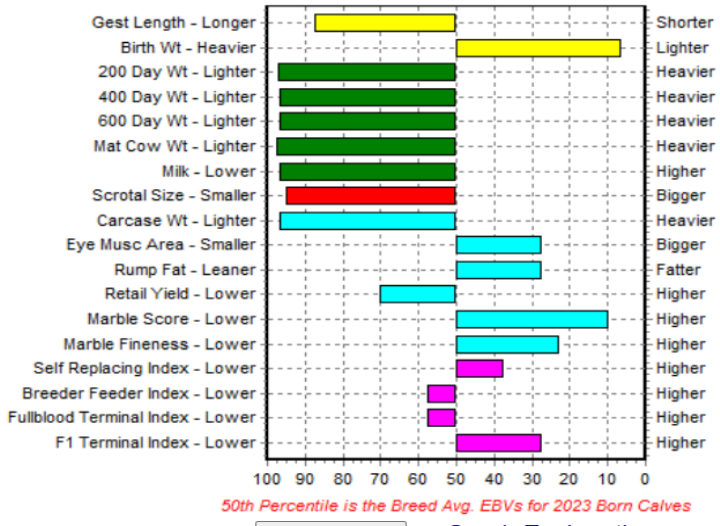
- 711 ITOYASUZURU 620E (FB30406 / 711FN620E)
- 711 SHIGEZURUTANI 635C (FB30366 / 711FL635C)
- 711 SHIGESIMBO 650G (FB55454 / 711FQ650G)

The following 8 pages show screen shots of the AuWA EBVs and AmWA EPDs, for each of the 8 tested bulls, and are useful in evaluating the relative rankings of each progeny test measured attribute, for each bull, as predicted by each of the two major genomic merit evaluation systems.

ITOSHIGENAMI TF148 (FB3682 / IMUFQTF148)

(the “reference sire”, with EBV accuracy of 98% to 99% for each evaluated carcass attribute)

EBV Percentiles for ITOSHIGENAMI (IMP USA)



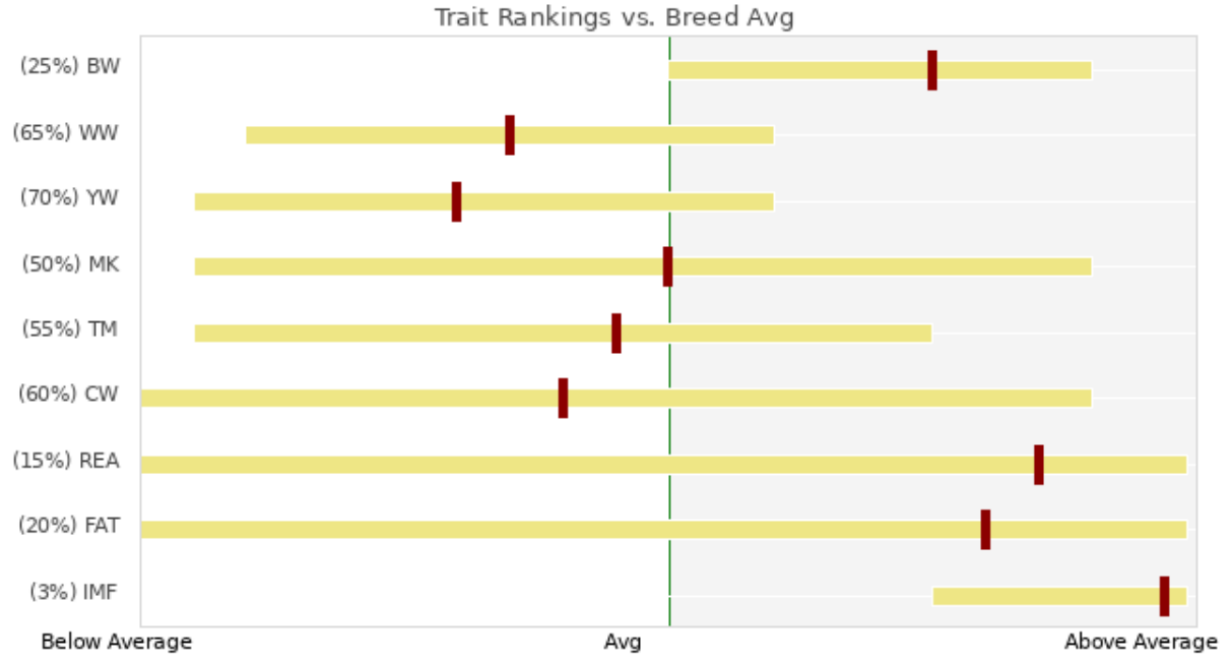
Switch Graph Graph Explanation

May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	+1.2	-1.6	-6	-9	-13	-23	-6	-1.6	-14	+5.5	+1.1	-0.2	+2.5	+0.32
Accuracy	98%	99%	99%	99%	99%	98%	99%	98%	99%	98%	98%	98%	99%	98%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

Traits Analysed: Genomics

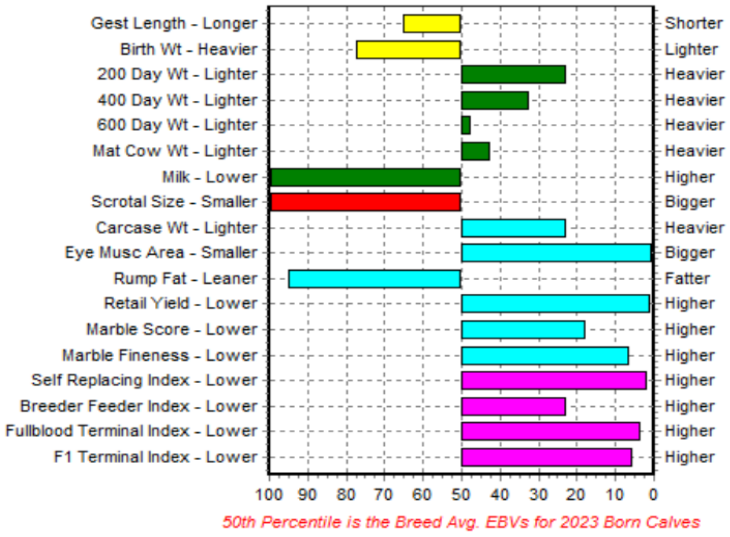
Statistics: Number of Herds: **167**, Progeny Analysed: **3989**, Scan Progeny: **738**, Carcase Progeny: **775**, Number of Dtrs: **1501**

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 206	+$ 191
Breeder Feeder Index ($)	+$ 231	+$ 250
Fullblood Terminal Index ($)	+$ 176	+$ 194
F1 Terminal Index ($)	+$ 226	+$ 169



CIRCLE8BULLS Q122 (N/A / LTCFQ122)

EBV Percentiles for CIRCLE8BULLS Q122 (ET)



50th Percentile is the Breed Avg. EBVs for 2023 Born Calves

Switch Graph Graph Explanation

May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	+0.3	+2.7	+18	+26	+27	+30	-13	-2.2	+38	**+12.4**	-3.9	**+2.5**	+2.2	+0.43
Accuracy	94%	97%	97%	96%	93%	84%	78%	83%	92%	89%	89%	78%	91%	75%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

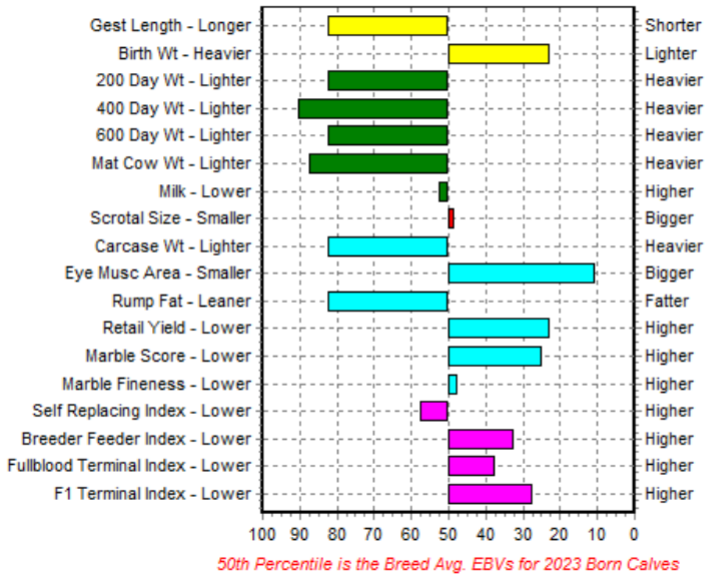
Traits Analysed: 200WT,400WT,SS,FAT,EMA,IMF,Genomics

Statistics: Number of Herds: **42**, Progeny Analysed: **599**, Scan Progeny: **38**, Carcase Progeny: **62**, Number of Dtrs: **26**

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 366	+$ 191
Breeder Feeder Index ($)	+$ 342	+$ 250
Fullblood Terminal Index ($)	+$ 391	+$ 194
F1 Terminal Index ($)	+$ 331	+$ 169

TBR SHIGENAMINAMI 3023Z (FB19598 / TRIFH3023Z)

EBV Percentiles for TBR SHIGENAMINAMI 2 3023Z (ET)



50th Percentile is the Breed Avg. EBVs for 2023 Born Calves

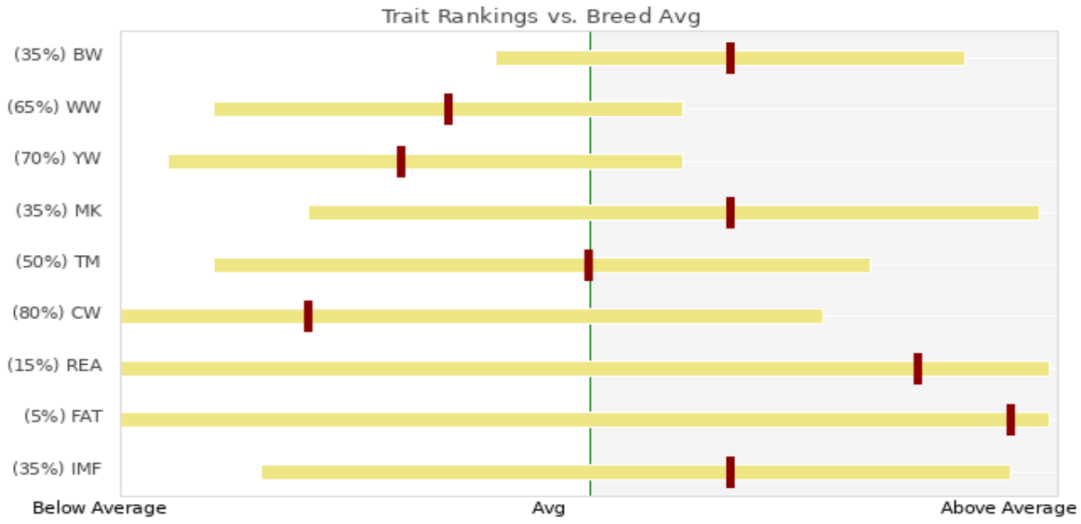
Switch Graph Graph Explanation

May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	+1.0	-0.2	+2	-1	+5	-4	0	-0.2	+2	+7.7	-2.3	+1.0	+2.0	+0.21
Accuracy	74%	82%	80%	81%	80%	74%	74%	67%	75%	68%	69%	59%	69%	63%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

Traits Analysed: Genomics

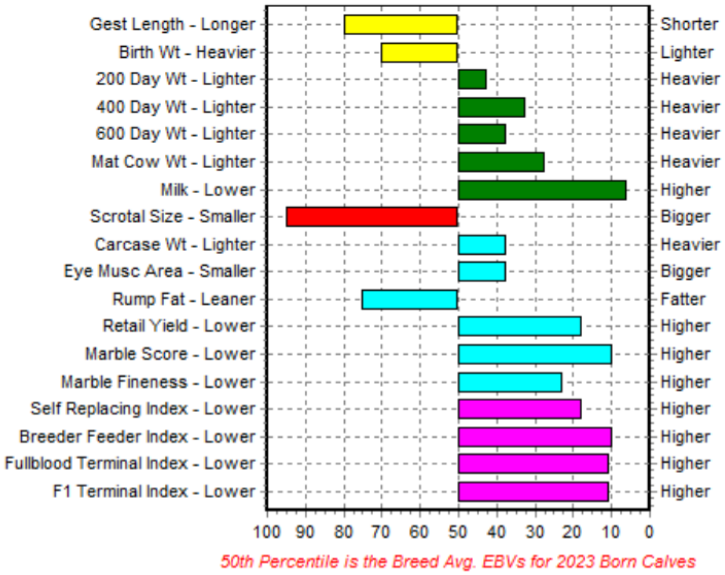
Statistics: Number of Herds: **2**, Progeny Analysed: **10**, Number of Dtrs: **9**

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 175	+$ 191
Breeder Feeder Index ($)	+$ 308	+$ 250
Fullblood Terminal Index ($)	+$ 233	+$ 194
F1 Terminal Index ($)	+$ 231	+$ 169



TYDDEWI N4431 (FB60630 / DSWFN4431)

EBV Percentiles for TYDDEWI N4431 (ET)



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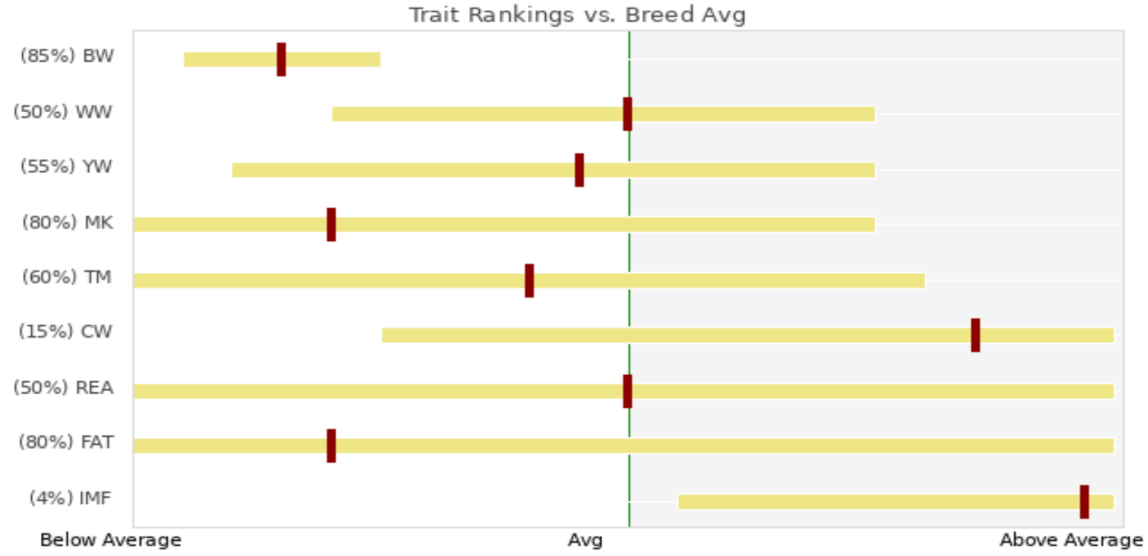
May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	+0.9	+2.3	+13	+25	+31	+42	+5	-1.6	+28	+4.2	-1.7	+1.2	+2.5	+0.35
Accuracy	96%	98%	97%	96%	95%	90%	89%	85%	93%	89%	90%	78%	92%	77%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

Traits Analysed: BWT,Genomics

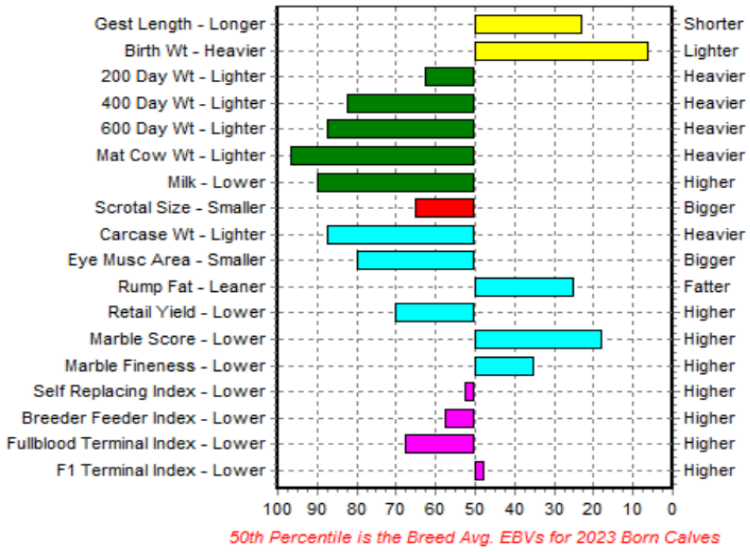
Statistics: Number of Herds: **83**, Progeny Analysed: **912**, Scan Progeny: **30**, Carcase Progeny: **65**, Number of Dtrs: **62**

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 265	+$ 191
Breeder Feeder Index ($)	+$ 429	+$ 250
Fullblood Terminal Index ($)	+$ 321	+$ 194
F1 Terminal Index ($)	+$ 294	+$ 169



TYDDEWI N7245 (FB72133 / DSWFN7245)

EBV Percentiles for TYDDEWI N7245 (ET)



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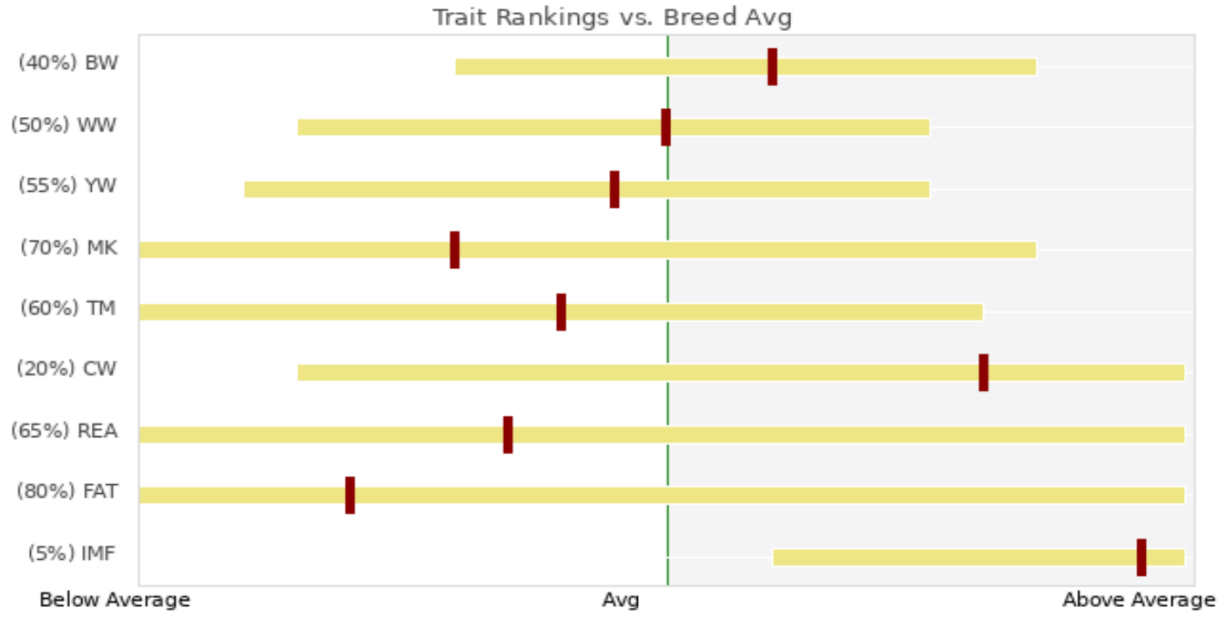
May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	-1.4	-1.7	+8	+4	+1	-19	-4	-0.6	-1	+0.2	+1.3	-0.2	+2.2	+0.30
Accuracy	94%	97%	95%	95%	95%	90%	86%	85%	92%	88%	88%	75%	91%	76%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

Traits Analysed: BWT,Genomics

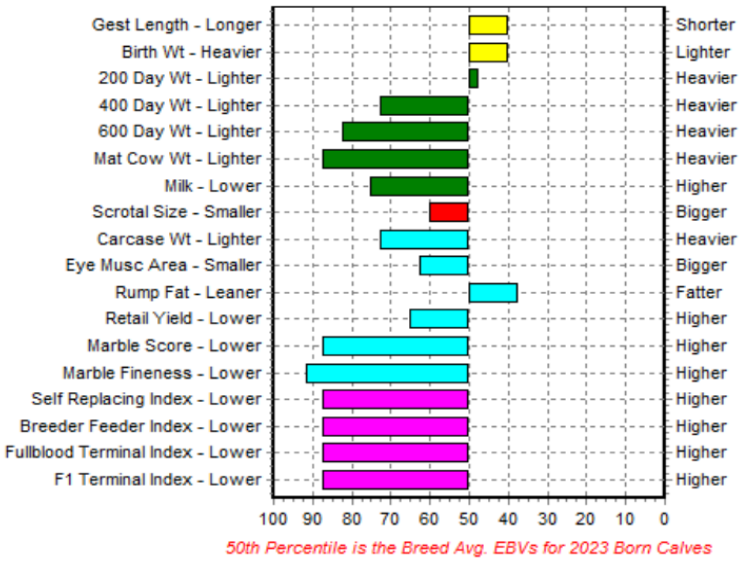
Statistics: Number of Herds: **38**, Progeny Analysed: **331**, Scan Progeny: **2**, Carcase Progeny: **44**, Number of Dtrs: **34**

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 180	+$ 191
Breeder Feeder Index ($)	+$ 233	+$ 250
Fullblood Terminal Index ($)	+$ 137	+$ 194
F1 Terminal Index ($)	+$ 180	+$ 169



711 ITOYASUZURU 620E (FB30406 / 711FN620E)

EBV Percentiles for 711 ITOYASUZURU 620E (ET)



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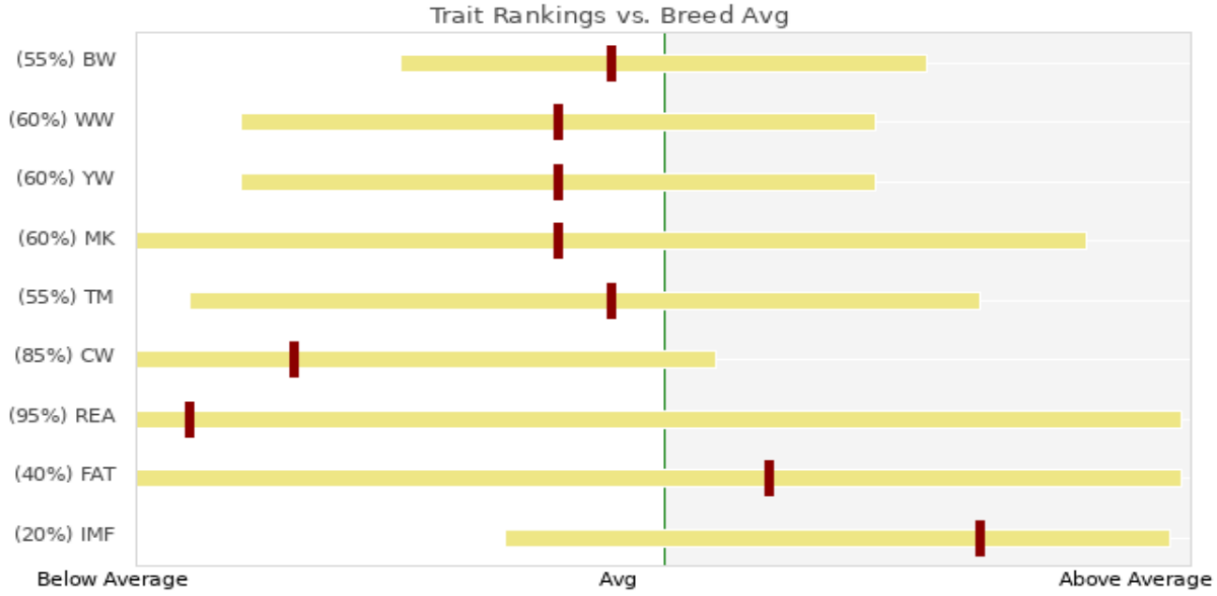
May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	-0.6	+0.8	+12	+9	+6	-3	-2	-0.4	+10	+2.2	+0.5	0.0	+0.4	+0.07
Accuracy	60%	69%	70%	68%	67%	59%	62%	54%	64%	61%	61%	49%	61%	54%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

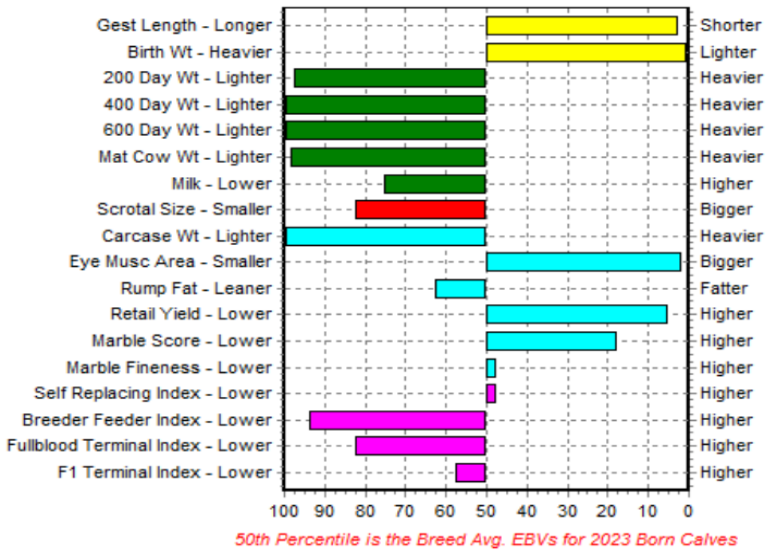
Traits Analysed: BWT,Genomics
Statistics: Number of Herds: **1**, Progeny Analysed: **1**,

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 108	+$ 191
Breeder Feeder Index ($)	+$ 100	+$ 250
Fullblood Terminal Index ($)	+$ 79	+$ 194
F1 Terminal Index ($)	+$ 62	+$ 169



711 SHIGEZURUTANI 635C (FB30366 / 711FL635C)

EBV Percentiles for 711 SHIGEZURUTANI 635C ET (ET)



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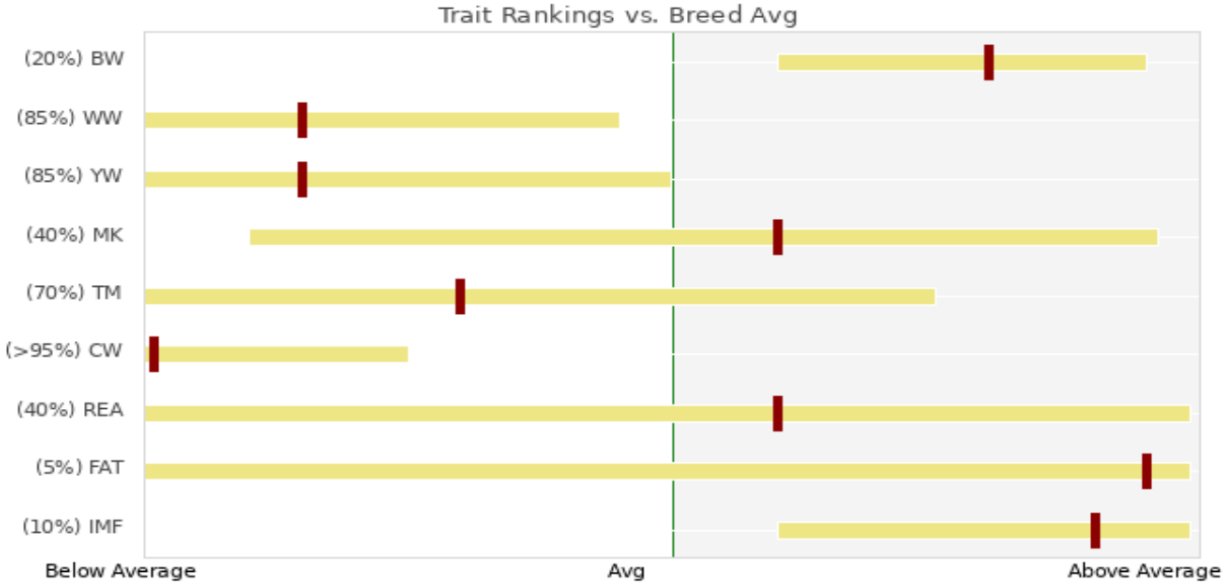
May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	-3.3	**-5.3**	-7	-21	-28	-26	-2	-1.0	-24	+11.9	-0.9	+1.9	+2.2	+0.27
Accuracy	69%	76%	76%	74%	73%	68%	68%	64%	71%	69%	69%	59%	69%	63%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

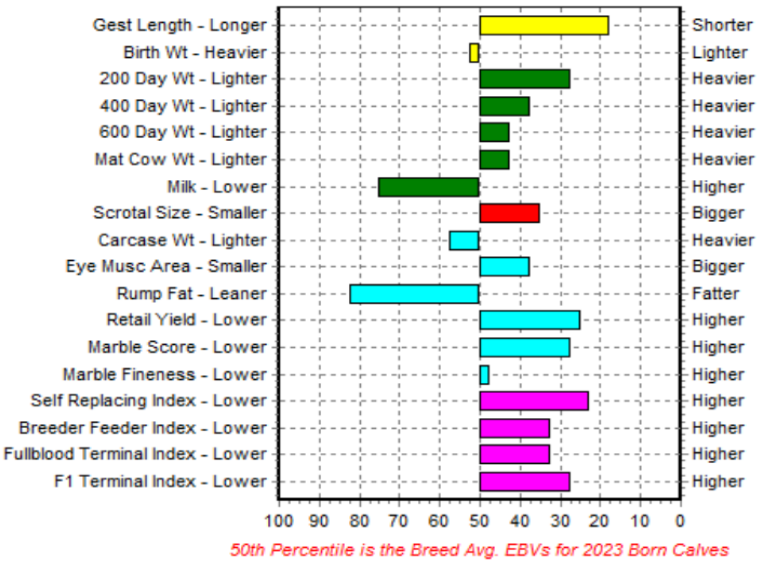
Traits Analysed: BWT,Genomics
Statistics: Number of Herds: **1**, Progeny Analysed: **6**,

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 189	+$ 191
Breeder Feeder Index ($)	+$ 50	+$ 250
Fullblood Terminal Index ($)	+$ 85	+$ 194
F1 Terminal Index ($)	+$ 149	+$ 169



711 SHIGESIMBO 650G (FB55454 / 711FQ650G)

EBV Percentiles for 711 SHIGESIMBO 650G (ET)



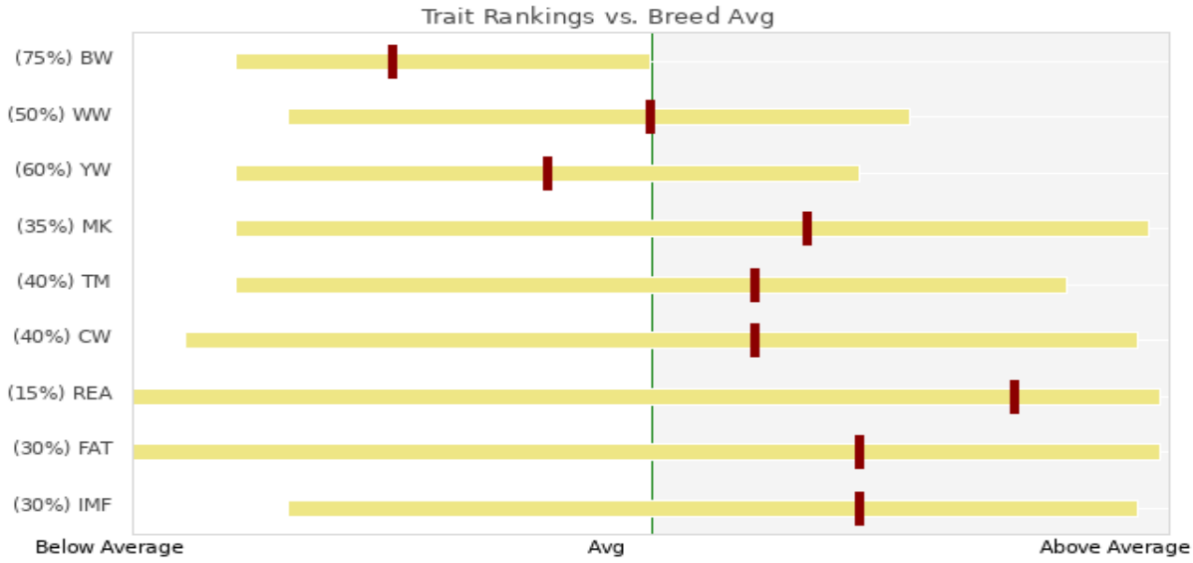
50th Percentile is the Breed Avg. EBVs for 2023 Born Calves

Switch Graph Graph Explanation

May (Run 1) 2025 Wagyu BREEDPLAN														
	Gestation Length (days)	Birth Wt (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)	Scrotal Size (cm)	Carcase Wt (kg)	Eye Muscle Area (sq cm)	Rump Fat (mm)	Retail Beef Yield (%)	Marble Score	Marble Fineness (%)
EBV	-1.6	+1.4	+17	+24	+30	+32	-2	+0.1	+17	+4.4	-2.3	+0.9	+1.9	+0.21
Accuracy	65%	71%	72%	70%	69%	63%	65%	59%	68%	65%	66%	54%	66%	59%
Breed Avg. EBVs for 2023 Born Calves Click for Percentiles														
EBV	-0.3	+1.3	+11	+19	+26	+27	+0	-0.2	+22	+3.3	-0.2	+0.3	+1.4	+0.23

Traits Analysed: BWT,Genomics

SELECTION INDEX VALUES		
Market Target	**Index Value**	**Breed Average**
Self Replacing Index ($)	+$ 246	+$ 191
Breeder Feeder Index ($)	+$ 317	+$ 250
Fullblood Terminal Index ($)	+$ 244	+$ 194
F1 Terminal Index ($)	+$ 227	+$ 169



THE 4 CARCASS TRAITS EVALUATED IN THE PROGENY TEST:

Each "side" of the 85 carcasses was evaluated, resulting in 170 sets of carcass "side" data.

Hot Carcass Weight ("HCW"). HCW was determined through the use of the certified scale installed at the processing plant and used in their daily operations.

Marbling. Marbling was determined by the E+V VBG2000 camera system, which outputs a number 0-1200. The VBG2000 camera system and its 0-1200 grading scale is known to "not go high enough" to evaluate fullblood Wagyu carcasses. But these were F1/50% Wagyu genetics carcasses, short-fed to a typical F1 Wagyu finishing level, and the E+V 0-1200 scale seemed to work for this process, as no carcass "side" graded at a perfect 1200 grade, and only 7 of the 170 carcass "sides" graded over 1100. Because the E+V 0-1200 scale for marbling is not well understood by the Wagyu producer community, a "derived" Digital Marbling Percent ("DMP") is also being shown in the results, which derived DMP was created through the use of a correlation table created for such purpose, with such correlation table created by using, for each quartile of the 0-1200 range the average DMP as determined by an Meat Image Japan ("MIJ") camera within a dataset of 476 carcass images from 3 other progeny tests for which both the E+V VGB200 and MIJ Mobile camera were both used, with a smoothing algorithm utilized to smooth the transitions between each E+V grade quartile. This is not a perfect solution, and the derived DMP numbers were not used for the ranking of results of the evaluated bulls (the E+V VBG2000 data grade was used), but the derived DMP does provide readers of the progeny test with results to compare the marbling result in a format that Wagyu producers are more used to seeing. DMP is the "visual" representation of intramuscular fat percentage ("IMF%) and is presented in a percentage format that is correlated with IMF% (although is proven to not the same as IMF%).

Ribeye Size, or Eye Muscle Area ("EMA"). EMA was determined at the 12th-13th rib by the E+V VGB2000 camera system.

Yield Grade ("YG"). YG was determined at the 12th-13th rib by the E+V VGB2000 camera system and is a measure of external fat cover on the outside of the carcass, and is an indication of the beef yield that will result from the carcass after such external fat is cut away during the carcass breakdown process. The YG is reported using the USDA method (1-5) yield grade, for which a lower number is better, being a lower amount of fat cover, indicating a leaner, higher-yielding carcass. There is no EBV for YG. There is an EBV for "Retail Beef Yield %", which is somewhat similar to YG, so YG is compared to the Retail Beef Yield % for each evaluated bull where EBVs are shown in the results. When reading the progeny test results, a lower YG is preferable/better, and therefore is inverted and results in a higher "rank".

Ranks and Ranking: The 4 evaluated attributes were each "ranked" best to worse. For HCW, Marbling and EMA, a higher number is better and results in a higher ranking. For YG, a lower number is better, and the lower the YG number the higher the "rank". The "average rank" is the simple average, or median rank for the 4 evaluated attributes, with "1" being a perfect score that would mean that such bull ranked #1 in all 4 evaluated attributes, and an "8" meaning that such bull ranked 8th out of 8, or last place, in all 4 evaluated attributes.

THE PROGENY TEST RESULTS DATA ANALYSIS METHODS:

The data being published consists of this discussion and analysis, along with an available downloadable spreadsheet that contains all of the source data that readers can download and evaluate on their own, and which can be used to evaluate the quality of the reporting. The original source data includes (1) the original output E+V VGB2000 system data and (2) the DNA testing data from the AmWA. This data was then evaluated.

Certain “raw” carcass data was adjusted as follows in order to make the data comparable:

- Age Adjustment For Cleanup Bull-Sired Calves. The age of natural service cleanup bull-sired calves is less compared to AI-sired calves because the cleanup bull would have bred the cow at a later date compared to the AI breeding date since the cleanup bulls were turned out several days after the AI breeding. The next possible breeding date would have been the next cow estrus cycle, which would have averaged approximately 21 days after the AI date, and might have been the second estrus cycle after the AI date, or an average of 42 days after the AI date, or even possibly the third estrus cycle after the AI date (as late as approximately 63 days after the AI date). The actual birth dates of the calves were not known. It was estimated that cleanup bull-sired calves were approximately 30 days younger compared to AI breeding-sired bulls. The difference between younger AI-sired offspring and older natural service-bred cleanup bulls was evaluated for both this test as well as for a set of 658 progeny from multiple progeny tests, and it was decided that the adjustments set forth below for natural service cleanup bull-bred offspring was appropriate and such adjustments were made:
    - An adjustment of 3.0% was made to the “raw” HCW.
    - An adjustment of 2.5% was made to the “raw” Marbling (a percentage of the marbling percent, not a 2.5% change to the actual marbling number – i.e. a marbling result of 10.00% became 10.25%).
    - An adjustment of 2.5% was made to the “raw” EMA.
- Adjustment for Heifer Calves. Heifers perform differently compared to steers in terms of carcass performance. They are smaller, and have a smaller ribeye size. The differences in HCW and EMA was evaluated for a set of 658 progeny from multiple progeny tests, as well as the data from this progeny test, and it was decided that the adjustments set forth below for heifer carcasses was appropriate and such adjustments were made:
    - An adjustment of 6.0% was made to the “raw” HCW
    - An adjustment of 3.0% was made to the “raw” EMA

As previously described, the bulls were ranked in order of “good” vs. “bad” results, with a lower number being better, and the #1 “ranking” being the best. For HCW, Marbling and EMS, a higher result number was better and for YG, a lower test result number was better. The “rank” of each of the 4 evaluated attributes was averaged using equal weighting to determine an overall bull average rank.

The EPD and EBV as of the time of publishing of this report are reported alongside the progeny test results for the purpose of allowing the reader to evaluate how the progeny test results correlate with such EPD and EBV related to such evaluated carcass attribute.

It is known by all experienced Wagyu producers that the AmWA EPD system has not been in use for as long as the AuWA EBV system, and the EPDs are based on lesser amounts of carcass data, and that the AmWA EPD system is therefore less “mature” at this time compared to the AuWA EBV system, and this shows, as expected, in the progeny test results.

The EBVs and EPDs, while not entirely correlating with the progeny test results, did, overall, roughly predict “big picture” outcomes. The overall top ranked test bulls were in fact high-EBV bulls. There were anomalies, however, that show that even the more mature AuWA EBVs are imperfect in their ability to predict actual outcomes. But it is encouraging to see that, generally speaking, some of the newer high-EBV bulls are able to out-perform a highly respected, high-accuracy EBV bull, which is also reputationally well-known, such as Itoshigenami TF148.

PROGENY TEST RESULTS, ANALYSIS AND RANKINGS:

For anyone interested in auditing the results, or sorting and analyzing the results from the source data, the master Excel spreadsheet used to analyze the results and calculate rankings, which includes each of the 85 animals in the test, with links to their AmWA registry pages, can be downloaded by **CLICKING HERE**.

Below are tables showing the rankings of the bulls for the 4 measured carcass attributes, each sorted by rank. The first table immediately below shows the rankings for each individual evaluated category and the average of the 4 rankings, sorted by the average ranking. The 4 tables further below show the results and rankings for each evaluated attribute, and are sorted by rank for the particular attribute.

SIRES				HCW	MARB	EMA	YG	RANK
Sire Name	Sire AmWA#	Sire AmWA#	# Of Prog-eny	Rank	Rank	Rank	Rank	Avg Rank
TBR SHIGENAMINAMI 2 3023Z	FB19598	TRIFH3023Z	9	1	6	1	3	2.75
TYDDEWI N4431	FB60630	DSWFN4431	15	2	1	4	5	3.00
CIRCLE8BULLS Q122	N/A	LTCFQ122	13	3	7	2	1	3.25
TYDDEWI N7245	FB72133	DSWFN7245	11	5	3	3	4	3.75
711 SHIGEZURUTANI 635C	FB30366	711FL635C	9	6	4	5	2	4.25
711 SHIGESIMBO 650G	FB55454	711FQ650G	11	4	2	8	7	5.25
ITOSHIGENAMI TF148	FB3682	IMUFQTF148	10	7	8	6	6	6.75
711 ITOYASUZURU 620E	FB30406	711FN620E	7	8	5	7	8	7.00

SIRES				HCW							
Sire Name	Sire AmWA#	Sire AmWA#	# Of Prog-eny	HCW in LBs	HCW in KGs	% / Avg	% / TF148	Rank	AmWA EPD in LBs	AuWA EVB in KGs	AuWA EBV Accu%
TBR SHIGENAMINAMI 2 3023Z	FB19598	TRIFH3023Z	9	1115.6	506.0	105.5%	111.0%	1	-22.00	2.00	69%
TYDDEWI N4431	FB60630	DSWFN4431	15	1096.5	497.4	103.7%	109.1%	2	10.00	28.00	93%
CIRCLE8BULLS Q122	N/A	LTCFQ122	13	1089.9	494.4	103.1%	108.4%	3	N/A	38.00	92%
711 SHIGESIMBO 650G	FB55454	711FQ650G	11	1083.3	491.4	102.4%	107.8%	4	-4.00	17.00	68%
TYDDEWI N7245	FB72133	DSWFN7245	11	1053.6	477.9	99.6%	104.8%	5	4.00	-1.00	92%
711 SHIGEZURUTANI 635C	FB30366	711FL635C	9	1017.8	461.7	96.3%	101.3%	6	-38.00	-24.00	71%
ITOSHIGENAMI TF148	FB3682	IMUFQTF148	10	1005.0	455.8	100.0%	100.0%	7	-34.00	-14.00	99%
711 ITOYASUZURU 620E	FB30406	711FN620E	7	997.6	452.5	94.3%	99.3%	8	-26.00	10.00	64%

SIRES				MARBLING							
Sire Name	Sire AmWA#	Sire AmWA#	# Of Prog-eny	E+V Marb Score	Derived DMP	% / Avg	% / TF148	Rank	AmWA EPD	AuWA EVB	AuWA EBV Accu%
TYDDEWI N4431	FB60630	DSWFN4431	15	977.8	19.03	111.3%	119.4%	1	1.80	2.50	92%
711 SHIGESIMBO 650G	FB55454	711FQ650G	11	912.7	17.54	103.9%	111.4%	2	0.60	1.90	66%
TYDDEWI N7245	FB72133	DSWFN7245	11	883.9	15.58	100.6%	107.9%	3	1.74	2.20	91%
711 SHIGEZURUTANI 635C	FB30366	711FL635C	9	872.6	16.37	99.4%	106.5%	4	1.56	2.20	69%
711 ITOYASUZURU 620E	FB30406	711FN620E	7	867.9	16.17	98.8%	105.9%	5	0.99	0.40	61%
TBR SHIGENAMINAMI 2 3023Z	FB19598	TRIFH3023Z	9	856.2	15.82	97.5%	104.5%	6	0.48	2.00	69%
CIRCLE8BULLS Q122	N/A	LTCFQ122	13	835.4	15.44	95.1%	102.0%	7	N/A	2.50	91%
ITOSHIGENAMI TF148	FB3682	IMUFQTF148	10	819.2	15.21	93.3%	100.0%	8	2.00	2.50	99%

SIRES				EMA							
Sire Name	Sire AmWA#	Sire AmWA#	# Of Prog-eny	EMA in sq. Inch	EMA in sq. CM	% / Avg	% / TF148	Rank	AmWA EPD in Sq. In.	AuWA EVB in Sq. Cm	AuWA EBV Accu%
TBR SHIGENAMINAMI 2 3023Z	FB19598	TRIFH3023Z	9	15.69	39.85	107.4%	112.1%	1	0.19	7.70	68%
CIRCLE8BULLS Q122	N/A	LTCFQ122	13	15.56	39.52	106.5%	111.1%	2	N/A	12.40	89%
TYDDEWI N7245	FB72133	DSWFN7245	11	14.86	37.74	101.7%	106.1%	3	-0.02	0.20	88%
TYDDEWI N4431	FB60630	DSWFN4431	15	14.79	37.57	101.3%	105.6%	4	0.04	4.20	88%
711 SHIGEZURUTANI 635C	FB30366	711FL635C	9	14.50	36.83	99.3%	103.6%	5	0.07	11.90	69%
ITOSHIGENAMI TF148	FB3682	IMUFQTF148	10	14.00	35.56	95.9%	100.0%	6	-0.04	5.50	98%
711 ITOYASUZURU 620E	FB30406	711FN620E	7	13.83	35.13	94.7%	98.8%	7	-0.14	2.20	61%
711 SHIGESIMBO 650G	FB55454	711FQ650G	11	13.61	34.57	93.2%	97.2%	8	0.18	4.40	65%

SIRES				YG						
Sire Name	Sire AmWA#	Sire AmWA#	# Of Prog-eny	YG	% / Avg	% / TF148	Rank	AmWA EPD	AuWA EVB	AuWA EBV Accu%
CIRCLE8BULLS Q122	N/A	LTCFQ122	13	4.00	93.1%	91.0%	1	N/A	2.50	78%
711 SHIGEZURUTANI 635C	FB30366	711FL635C	9	4.11	95.5%	93.4%	2	-0.06	1.90	59%
TBR SHIGENAMINAMI 2 3023Z	FB19598	TRIFH3023Z	9	4.14	96.2%	94.1%	3	-0.06	1.00	59%
TYDDEWI N7245	FB72133	DSWFN7245	11	4.27	99.2%	97.0%	4	0.01	-0.20	75%
TYDDEWI N4431	FB60630	DSWFN4431	15	4.38	101.8%	99.5%	5	0.01	1.20	78%
ITOSHIGENAMI TF148	FB3682	IMUFQTF148	10	4.40	102.3%	100.0%	6	-0.20	-0.30	98%
711 SHIGESIMBO 650G	FB55454	711FQ650G	11	4.55	105.7%	103.4%	7	-0.03	0.90	54%
711 ITOYASUZURU 620E	FB30406	711FN620E	7	4.57	106.2%	103.9%	8	-0.02	0.00	49%