



Department of Primary Industries
and Regional Development



PROJECT ESTIMATED BREEDING VALUES (EBVs) for Methane Production



Introduction

Reducing methane emissions from livestock is a key priority for improving the environmental sustainability of the Australian sheep industry. This booklet presents results from a project designed to quantify methane emissions in sheep and develop the foundation for genetic selection strategies to reduce these emissions over time. To support this objective, a mobile field-testing system using Portable Accumulation Chambers (PAC) was implemented across research and breeder flocks, including the MLA Resource Flock and associated satellite flocks. This approach enabled the collection of methane phenotype data from a large and diverse population of sheep under commercial and research conditions. This booklet also introduces and explains methane Project Breeding Values, the methodology, recording protocols and reports Project Breeding Values on sires whose progeny have been recorded.

This project is a collaborative project that included Prof. Julius van der Werf & Pete Fitzgerald from the University of New England, Ed Clayton, Alistair Donaldson & Prof. Hutton Oddy from the Department of Primary Industries, Prof. Daniel Brown & Dr Michael Aldridge from AGBU, Sheep Genetics & Meat and Livestock Australia.

Purpose and description

A mobile field test was developed for measuring methane emissions from 10,000 sheep in research and breeder flocks as part of this project. The MLA Resource Flock and breeder satellite flocks are ideal to build reference populations for genomic prediction of methane emission traits enabling the development of breeding values. It is expected that such a strategy will allow Australian sheep to reduce methane emissions by ~1% per year while at the same time improving production efficiency and product quality. These improvements are permanent and cumulative.

The investment goal is to develop Australian Sheep Breeding Values (ASBVs) for methane traits so producers can select animals as part of an emissions reduction strategy alongside genetic improvement for productivity and product quality. This project aims to develop ASBVs and help inform future selection indexes that allow balanced genetic improvement of Australian sheep to cumulatively and permanently reduce methane emissions, while at the same time improve or maintain production efficiency and product quality.



Measuring methane phenotypes

Methane phenotypes are measured by keeping sheep for a certain amount of time in a Portable Accumulation Chamber (PAC). The basic principle of Portable Accumulation Chambers (PAC), is that if the volume of the PAC is known, as is the weight and duration the animal is inside the chamber, and the concentration of methane inside the chamber at the end of that duration, which grants the ability to calculate the rate at which methane was produced by that animal.

It is important to remember that most animals are only measured once for 40 or 50 minutes which provides a single spot-measure. However, methane production fluctuates across an individual day and across a lifetime which is why methane rate (ml of CH₄ / minute) is the trait currently used. For an estimate of methane production (g of CH₄ / day), multiple measures of each animal would need to be made across a day, across multiple days, and repeated multiple times in its lifetime.

For ranking purposes, methane rate is sufficient to make selection decisions which will reduce methane production. Previous experiments show there is high repeatability between PAC methane rate measurements and a high correlation with methane production as recorded with respiration chambers (Goopey et al. 2011).

The production of methane is highly dependent on the diet and environmental conditions. For example, a property that has limited feed on offer and a high daily temperature, will cause animals to produce less methane than a property with excess feed on offer and mild weather conditions.

The type of feed on offer can also affect methane production with low digestible feeds typically associated with higher methane production. Additionally, a property with limited feed on offer will also have less variation between animals measured. For genetic models to effectively rank animals, there needs to be variation in the trait measured.

The protocol for measuring methane tries to limit differences between sites and maximise variation within the site and is therefore a factor that is considered for determining when a site is visited for methane recording. However, this is not always possible within the practical limitation of a sheep production system. This is also why the protocol now calls for having a high quality lucerne hay on offer during the 24 hours before recording.

The efforts made to standardise the recording protocol has improved the consistency between flocks and ensures there is variation between animals within a flock. To correct for remaining differences, statistical methods are used to further standardise the methane rate trait. Within flock the mean is standardised to zero, this corrects for the properties that had high quality pasture available which would unfairly produce more methane than a property with less and/or lower quality pasture available. It follows the same principle as comparing animals with each other for other traits in a contemporary group. Secondly, the variation within each flock is then standardised by dividing the animal differences by each flock's standard deviation. Other known non-genetic factors are fitted in the models used to calculate the Project Breeding Values.



Estimating methane rate Project Breeding Values

An estimated breeding value for Methane rate (CH₄ ml/min) describes the genetic differences between animals in methane production. A negative Project Breeding Value indicates a lower rate of methane production compared with an animal with a Project Breeding Value of 0, which is associated with lower total methane production. The Project Breeding Value is a value that can be compared across the flocks in the below analyses that were measured in the project.

Merino and Dohne methane Project Breeding Values

While methane rate was recorded on multiple breeds, this analysis was limited to only include Australian Merino and Dohne sheep. The analysis includes data from ongoing projects, which included 6,998 genotyped animals with CH₄ rate measured.

The data was collected across 16 sites, which includes both industry and research flocks. The flocks were spread across Australia but were predominately from NSW and WA. The ewes were from seedstock breeders and the Merino Lifetime Productivity (MLP) project, and lambs from the MLA Resource Flock (RF). Due to heterogeneity of the data, CH₄ rate was standardised by flock mean and flock standard deviation.

The heritability of methane rate was 0.20 ± 0.03 which is considered moderately heritable. While this analysis used a single univariate trait model to develop Project Breeding Values, the plan is expanded to multi-trait evaluations and a pipeline to ASBVs.

Multibreed methane Project Breeding Values

Only recently has there been enough data collected across maternal and terminal breeds that an evaluation for multibreed sheep has been possible. The analysis includes animals from the following breeds Aussie White, Border Leicester, Coopworth, Corriedale, Dorper, Hampshire Down, NZ Romney, Poll Dorset, Romney, Southdown, Suffolk, Texel, White Dorper, White Suffolk, and Composite Maternals, Shedders, and Terminals.

The analysis includes data from ongoing projects, which included 5,026 genotyped animals with CH₄ rate measured. The data was collected across 7 sites, which includes both industry and research flocks.

The flocks were spread across Australia but were predominately from NSW and WA. The ewes measured were from seedstock breeders and lambs from the MLA Resource Flock (RF).

A single-step approach was used to derive the Project Breeding Values; this was to align with current Sheep Genetics evaluations. The heritability of methane rate was 0.23 ± 0.03 . While this analysis used a single univariate trait model to develop Project Breeding Values, multi-trait evaluations will be explored a pipeline to ASBVs.

Project Breeding Values

Project Breeding Values are calculated from raw experimental data collected within the *Low Methane Sheep* project from over 10,000 measurements. They are subject to change as more animals are added to the reference population and the model is improved.

Project Breeding Values help to refine the performance recording, refine the analysis, and facilitate discussions with industry stakeholders, as part of the development of Research and commercial breeding values.



How to interpret breeding values

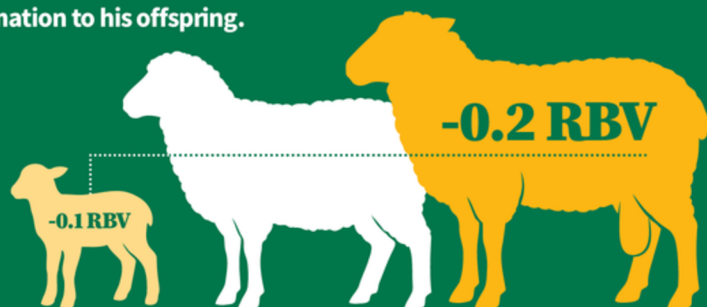
- The reports section shows the name of the Stud that owns the animal and the animal ID that the results the following results are based off.
- The CH4 and CH4 acc columns show the methane breeding value and its overall accuracy. The other production traits reported in the report are from the main MERINOSELECT, Dohne or LAMBPLAN Evaluations.
- Highlighted values are within the top 20th percentile for that trait.
- A negative project breeding value for methane indicates an animal will produce progeny that produced less methane than an animal with a project breeding value of 0.

How methane Research Breeding Values (RBVs) work

A sire passes on 50% or half of his genetic information to his offspring.

A sire with a negative methane RBV (less than the current breed average of 0), will produce offspring with at least half its potential to emit less methane.

For example, a sire with an RBV value of -0.2 grams per day (g/day) will produce offspring with a -0.1g/day RBV.



Disclaimer: The project partners and Sheep Genetics do not accept responsibility for accuracy of the information in this or accompanying documents. Due to the preliminary nature of the results and to maintain anonymity, only sires used in resource flocks 26IN01 and 26IN08 with methane measured on lambs have been presented. For each sire, Project Breeding Values were derived from 7th and 15th May MERINOSELECT & LAMBPLAN analysis.

Dohne Methane Results:

Name	Animal ID	CH4	CH4 acc	Dohne+	PWT	YCFW	YFD	YEMD	YFAT	MWWT	NLW
DENVALE-150350	5100762015150350	0.078	32	149.14	5.62	-0.43	1.23	1.65	0.04	-0.45	0.09
GLEN HOLME-194902	5101842019194902	0.055	34	154.33	3.77	18.46	-1.21	0.81	0.76	1.15	0.04
GLEN HOLME-206057	5101842020206057	0.19	46	156.89	6.06	6.12	-1.2	0.07	-0.08	-1.5	0.1
GLEN HOLME-206139	5101842020206139	0.027	40	162.2	4.97	14.16	-0.21	0.54	0.41	-0.67	0.1
GLEN HOLME-216869	5101842021216869	0.115	47	161.59	5.3	15.34	-0.96	-1.06	-0.33	-0.32	0.16
HAREWOOD-173019	5101402017173019	0.123	43	175.99	3.55	6.6	-0.61	2.2	1.5	1.84	0.1
HAREWOOD-204040	5101402020204040	-0.034	38	157.17	3.48	3.4	-0.67	2.24	1.13	0.52	0.06
HAROLD PARK NORTH-190079	5101632019190079	0.128	37	176.77	8.31	11.36	0.54	2.75	0.22	0.06	0.01
HAROLD PARK NORTH-190162	5101632019190162	0.06	32	180.39	10.48	3.74	1.25	2.52	0.44	0.28	0.03
JAG-190949	5102042019190949	0.131	28	150.79	2.78	13.46	-0.27	1.06	-0.06	1.03	0.03
KINTAIL PARK-190118	5100082019190118	0.129	28	147.61	3.62	7.77	-0.23	1.12	0.31	-0.3	0.06
KINTAIL PARK-190395	5100082019190395	0.109	30	151.96	4.75	0.34	-0.15	1.59	0.41	0.1	0.07
MACQUARIE-202392	5100042020202392	-0.017	21	151.92	4.73	10.18	0.01	0.52	-0.16	0.45	0.13
MACQUARIE-202864	5100042020202864	0.097	39	135.43	4.61	9.61	0.05	1.36	0.15	1.89	-0.08
O'BRIEN DOHNE-200092	5102082020200092	0.478	44	163.14	7.56	11.5	-0.31	0.55	-0.05	0.69	0.09
STIRLING-200036	5101862020200036	0.101	45	150.63	5.23	19.74	-0.43	0.65	0.11	-0.07	0.01

The top 20% percentile and above are highlighted green

Merino Methane Results:

Name	Animal ID	CH4	CH4 acc	SM	YWT	YCFW	YFD	YEMD	YFAT	YWEC	WR
ANDERSON-160729	6091472016160729	0.513	68	149.75	13.63	23.83	0.25	1.17	0.49	-47.03	0.17
ANDERSON-200136	6091472020200136	0.059	68	141.48	13.18	32.91	-0.34	2.06	1.05	-38.88	0.03
ANDERSON-200504	6091472020200504	0.044	76	157.47	11.31	26.16	-0.6	1.12	0.52	-54.98	0.27
BAREGA-140054	5092562014140054	0.022	46	121.82	3.48	-18.97	-3.02	3.82	2.24	-36.52	0.24
BELLA LANA-180188	5050502018180188	0.135	56	129	5.13	16.4	-0.77	1.89	0.9	64.02	0.07
BELLA LANA-200707	6016232020200707	0.206	58	131.54	5.56	8.77	-0.73	0.42	1.62	-5.5	0.21
BELMONT PARK-190553	6001172019190553	0.002	38	147.04	6.53	43.44	-0.87	-0.94	-1.05	-10.27	0.01
BENEFIELD-200055	6093022020200055	0.326	57	150.48	12.16	31.45	-0.03	0.24	-0.41	45.79	0.11
BILLANDRI-210979	6005712021210979	0.173	52	151.18	10.78	32.69	-1.94	1.5	-0.07	-8.23	0.13
BOXLEIGH PARK-181057	5092322018181057	0.279	56	151.21	10.16	7.6	-0.73	1.55	1.63	-28.62	
BULLOCK HILLS-200208	6093282020200208	0.156	56	130.18	11.08	11.01	-0.88	2.98	0.78	8.34	0.15

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	SM	YWT	YCFW	YFD	YEMD	YFAT	YWEC	WR
BUNDILLA POLL-191174	6014352019191174	-0.058	59	149.65	7.77	40.11	-1.17	1.54	0.22	9.88	0.07
BUNDILLA POLL-200810	6014352020200810	-0.08	61	156.62	6.41	16.19	-1.84	2.69	-0.08	-8.92	0.3
CALLOWIE-190150	6009012019190150	0.043	32	134.57	7.17	21.73	-0.52	-1.31	-1.12		
CASSILIS-191268	5045782019191268	-0.053	59	118.87	4.2	5.15	-0.81	0.74	-0.37	35.65	
CENTRE PLUS POLL-807380	6012502018807380	0.249	75	150.64	5.36	34.65	-1.77	0.73	0.78	-43.56	0.1
CENTRE PLUS POLL-907478	6012502019907478	0.428	70	150.49	9.19	14.73	-2.35	0.64	0.77	8.15	0.32
COROMANDEL POLL-180193	6005532018180193	0.147	46	133.29	7.88	15.67	-1.81	0.53	-0.69	-21.13	
COROMANDEL POLL-200045	6005532020200045	0.083	57	152.34	9.29	30.16	-1.38	-0.53	-0.6	-3.34	
CRANMORE POLL-200048	6001392020200048	0.139	59	126.29	5.78	13.65	-2.03	-0.45	-1.06	4.49	
DEEP DENE-180020	6008962018180020	0.241	50	163.98	4.44	29.35	-1.55	1.01	-0.35	-56.96	0.13
EDALE MF-15Z158	502756201515Z158	0.558	69	127.28	1.05	27.8	-1.07	-0.11	-0.24	-14.01	0.07
EDALE SF-19X454	504358201919X454	-0.114	72	122.65	1.3	5.04	-3.7	-1.35	-0.55	-14.05	0.06
EGELABRA-174143	5000322017174143	-0.046	39	116.4	-2.16	14.54	-1.48	0.72	0.6	12.05	
EGELABRA-180171	5000322018180171	-0.063	52	133.04	5.65	19.32	-0.7	-1.27	-0.33	4.11	
EGELABRA-190145	5000322019190145	0.042	51	129.98	4.69	21.65	-1.28	0.29	0.34		
EJANDING POLL-215492	6004432021215492	0.063	58	151.99	11.13	25.16	-1.69	2.04	0.39	29.35	0.31
ELLA MATTA-200144	6014502020200144	-0.001	61	140.08	4.78	25.51	-1.82	-0.16	0.78	-74.2	-0.06
ELLA MATTA-210083	6014502021210083	-0.021	58	132.03	7.01	25.57	-1.07	1.95	0.13	24.47	0.11
FOREST SPRINGS-190193	6014652019190193	0.124	46	153.27	11.6	22	-0.66	1.32	0.5	-26.04	
FOREST SPRINGS-200102	6014652020200102	-0.281	60	143.92	12.56	18.39	-1.83	0.95	0.76	-5.97	
FOREST SPRINGS-210257	6014652021210257	0.406	59	156.69	13.36	28.36	-1.78	-0.12	0.04	44.6	
GLENDEMAR-202050	5030702020202050	0.143	62	141.91	11.16	12.99	-0.49	1.54	0.84	-33.96	0.13
GOLDALEA-199238	6014072019199238	0.042	56	122.92	7.06	6.88	-1.87	0.47	-0.28	24.22	0.11
GRASS MERINOS-182011	5038842018182011	0.007	64	148.58	5.93	24	-2.21	-0.97	-1.3	-31.55	0.2
GRASS MERINOS-202082	5038842020202082	-0.066	56	145.23	6.68	43.18	-1.2	-0.64	-0.11	35.83	0.09
GREENDALE-190435	5050692019190435	0.188	60	132.63	3.26	34.02	-3.27	-1.8	-0.69	42.48	-0.09
GRINGEGALGONA-200114	6013212020200114	-0.001	55	131.31	2.99	17.96	-1.92	0.86	-0.78	8.32	0
GUNNEGALDERIE-170442	5092742017170442	0.221	59	138.07	10.21	14.24	-0.43	2.08	-0.09	-13.57	
HANNATON POLL-200155	6008042020200155	0.103	60	149.46	9.38	24.92	-1.26	-0.66	-1.1	23.76	0.17
HAZELDEAN-002980	5003832018002980	0.173	56	142.19	4.57	31.98	-2.78	-1.02	-1.47	-6.44	-0.02
HILL PADUA-210273	5092622021210273	0.226	60	136.82	10.13	6.44	0.06	3.49	3.14	-28.12	0.19
KAMBAH-200580	6015402020200580	-0.068	60	153.74	8.71	20.01	-1.74	0.5	-0.07	-1.88	0.26
KARBULLAH-200554	6013652020200554	-0.118	55	136.04	6.95	8.38	0.02	1.2	0.12	20.12	0.18
KURRA-WIRRA-191190	5041732019191190	0.347	48	130.62	8.22	26.48	-1.35	0.5	0.19	-22.94	-0.05

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	SM	YWT	YCFW	YFD	YEMD	YFAT	YWEC	WR
KURRA-WIRRA-210561	5041732021210561	0.331	63	150.92	8.02	48.56	-0.13	0.71	-0.1	17.01	0.03
LEAHCM POLL-182259	6008152018182259	-0.035	43	138.8	6.05	22.88	-1.9	-0.09	-0.45	-0.24	-0.09
MALLEETECH-200119	6095332020200119	-0.004	60	160.18	14.13	22.9	-0.42	0.61	-0.59	-41.26	0.31
MANUNDA POLL-190065	6004552019190065	0.032	56	133.35	6.59	25.22	-0.49	-0.91	-1.54	-6.14	
MERINO TECH-177026	6090402017177026	-0.142	62	132.96	7.23	21.37	-0.54	0.16	-0.4	-8.07	0.17
MERINO TECH-199019	6090402019199019	0.117	68	136.07	9.57	16.13	0.13	1.79	1.64	-49.33	0.29
MERINO TECH-199576	6090402019199576	-0.043	69	129.32	8.82	15.42	-0.32	2.18	0.53	-54.56	0.2
MIRAMAR-200023	6093672020200023	0.083	41	154.31	11.4	24.6	-1.4	-0.12	-0.35	20.47	
MOOJEPIN-160003	5046372016160003	-0.166	75	135.64	10.88	10.22	-0.41	1.98	1.32	-23.93	0.05
MULGA SPRINGS-211341	6008322021211341	0.079	46	146.85	10.29	26.23	-0.35	1.31	0.38		
MUMBLEBONE-191150	500632019191150	-0.244	55	145.19	7.4	20.65	-0.17	2.76	1.52	-50.46	0.16
MUMBLEBONE-200904	500632020200904	-0.254	64	151.03	6.98	27.9	0.23	3.36	2.14	-49.06	0.19
NEPOWIE POLL-190004	6000592019190004	0.187	35	148.64	9.99	31.51	-1.23	-1.35	-2.36	21.65	
OBRIEN POLL-190455	6014702019190455	0.023	59	163.62	11.82	33.08	-1.53	0.57	-0.55	-5.35	0.02
OBRIEN POLL-191035	6014702019191035	0.196	50	157.09	5.68	41	-1.29	0.49	-0.88	-9.58	0.13
PARKDALE-201261	5046382020201261	0.018	56	136.72	5.21	11.79	0.32	1.34	1.21	-36.3	
POLL BOONKE-200780	6000012020200780	0.172	63	137.71	6.52	34.17	-1.28	-0.25	-1.25	18.53	
POOGINOOK POLL-190453	6014422019190453	0.081	47	142.37	9.96	27.37	-1.45	-0.16	0.57	79.19	0.03
POOGINOOK POLL-210502	6014422021210502	0.15	58	160.06	10.27	33.86	-1.25	2.05	0.72	21.83	0.21
PYRAMID POLL-170388	6013812017170388	0.034	38	127.48	4.5	26.3	-0.54	-0.29	-0.75	23.57	
RIDGWAY ADVANCE-190355	6013072019190355	0.177	49	124.12	3.54	17.09	-1.2	0.14	-0.05	-3.88	-0.12
RISSMERINO-190288	6093272019190288	-0.012	37	139.84	5.55	11.63	-1.81	0.03	-0.42	22.66	0.2
RISSMERINO-201530	6093272020201530	0.081	46	137.16	7.97	4.38	-1.5	1.21	0.46	-26.43	0.23
RISSMERINO-214784	6093272021214784	0.079	57	149.32	13.45	7.95	-1.45	0.9	0.61	-44	0.21
ROCKLYN-190204	5010392019190204	0.022	49	149.59	10.01	27.87	-1.14	-0.03	0.52	14.38	0.2
ROCKLYN-190271	5010392019190271	0.202	56	147.67	9.7	21.43	-1.96	1.36	0.03	-28.29	0.15
ROSEVILLE PARK POLL-210059	6012882021210059	0.131	57	139.37	8.41	10.19	-1.61	2.52	1.23	-40.68	0.13
STOCKTON-200041	5035642020200041	0.249	50	142.15	4.09	10.02	-2.09	0.18	-0.82	5.6	
THE RIDGE-190020	6092642019190020	0.208	74	148.21	11.54	16.78	-2.28	-0.37	0.15	-46.02	0.25
THE RIDGE-200048	6092642020200048	0.212	70	150	11.93	21.21	-1.83	-0.3	0.83	-49.52	0.23
THE YANKO-190310	5046942019190310	0.201	47	148.7	9.68	26.68	-0.92	-0.9	-0.5	44.95	0.22
THE YANKO-200356	5046942020200356	0.237	54	137.6	8.31	38.65	-1.22	-1.89	-1.26	55.43	0.09
THE YANKO-210006	5046942021210006	0.13	62	139.64	7.35	32.31	-1.1	-0.18	-0.91	63.55	0.06

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	SM	YWT	YCFW	YFD	YEMD	YFAT	YWEC	WR
THE YANKO-800054	5046942018800054	0.091	50	149.97	10.2	34.84	-1	-0.55	-0.43	-17.46	0
TOLAND POLL-191851	6010822019191851	-0.058	58	142.72	9.65	10.23	-0.83	0.64	-0.27	-38.51	0.13
TRIGGER VALE-190039	6092512019190039	-0.081	64	153.4	11.6	23.91	0.52	1.5	1.12	-39.58	0.23
TRIGGER VALE-190760	6092512019190760	0.075	58	141.9	7.56	13.22	-1.09	3.47	1.81	-26.47	0.12
TRIGGER VALE-210463	6092512021210463	-0.042	62	142.19	12.39	13.99	0.62	3.14	2.86	-40.77	0.2
TURKEY LANE-200042	5090692020200042	0.162	60	154.16	6.24	24.76	-3.37	0.69	0.5	-60.6	-0.02
WATTLE DALE-190730	5033582019190730	-0.062	52	156.62	9.65	43.7	-1.38	-0.53	-1	79.12	0.19
WATTLE DALE-210304	5033582021210304	-0.259	55	148.37	2.47	25.98	-2.06	-1.07	-1.22	37.78	0.18
WATTLE DALE-211087	5033582021211087	-0.011	63	158.6	10	32.05	-1.57	-0.35	-0.86	9.51	0.16
WILLANDRA POLL-190514	6006102019190514	0.265	38	120.14	5.69	25.14	-0.16	0.6	-0.99		-0.07
WILLERA MERINOS-200400	6013802020200400	-0.09	61	146.28	10.2	29.31	-0.11	2.39	1.58	13.06	0.08
WOODYARRUP POLL-200151	6013182020200151	0.057	57	153.05	8.15	34.99	-2.28	0.44	-1.16	16.99	
WOODYARRUP-171883	5004122017171883	0.038	50	128.82	8.73	28.32	-0.84	-1.14	-1.28	35.85	0.06
YALGOO-180006	5015522018180006	0.164	49	122.63	3.28	17.14	-2.56	-0.74	0.33	-16.86	0
YALGOO-190110	5015522019190110	0.149	63	154.6	7.69	15.34	-2.29	1.01	-0.32	-56.24	0.1

The top 20% percentile and above are highlighted green

Maternal Methane Results:

Name	Animal ID	CH4	CH4 acc	MCP+	BWT	PWT	AWT	MWWT	PEMD	PFAT	WR
BLACKWOOD-190074	0324012019190074	-0.53	47	123.24	0.05	3.9	-1.77	-1.2	1	1.18	0.07
BLACKWOOD-190180	0324012019190180	-0.356	49	113.2	0.23	6.22	6.67	-1.5	0.58	-0.7	0.04
BLACKWOOD-200063	0324012020200063	-0.46	56	137.01	0.42	8.02	6.13	-0.22	1.6	-0.28	0.13
BLACKWOOD-200074	0324012020200074	-0.365	54	118.92	0.21	8.95	8.64	0.14	-0.4	-1.25	-0.01
BLACKWOOD-200264	0324012020200264	-0.282	58	106.46	0.29	6.96	9.07	0.09	-0.2	-1.25	-0.04
CASHMORE NUDIES-207078	CS00012020207078	0.22	75	129.41	-0.17	10.86	9.83	0.05	-0.56	-0.18	0.15
CASHMORE NUDIES-207256	CS00012020207256	0.17	73	139.24	0.15	8.89	7.71	1.1	0.73	-0.44	0.13
CASHMORE NUDIES-207573	CS00012020207573	-0.462	65	101.49	0.24	8.31	10.83	-3.62	1.11	-1.2	-0.01
CASHMORE NUDIES-216710	CS00012021216710	0.033	69	165.06	0.05	16.41	10.5	1.01	1.74	-0.46	0.06
CASHMORE NUDIES-218366	CS00012021218366	0.142	76	147.49	0.68	14.75	16.45	1.43	0.62	-0.12	0.19
CASHMORE OAKLEA-180585	1500992018180585	0.165	66	158.03	0.43	16.1	20.55	-1.53	1.42	-1.52	0.32
CASHMORE OAKLEA-182214	1500992018182214	0.111	81	169.66	0.45	13.95	13.92	-0.41	2.71	-1.48	0.23
CASHMORE OAKLEA-192304	1500992019192304	0.006	59	172.56	0.75	16.29	17.55	0.42	1.48	-0.72	0.3

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	MCP+	BWT	PWT	AWT	MWWT	PEMD	PFAT	WR
CASHMORE OAKLEA-192440	1500992019192440	0.167	67	188.88	0.71	16.61	13.82	-0.09	3.36	0.24	0.25
CASHMORE OAKLEA-192507	1500992019192507	0.154	83	184.29	0.68	14.9	17.31	-1.08	2.6	-0.93	0.48
CASHMORE OAKLEA-200237	1500992020020237	0.413	57	139.98	0.22	15.81	22.11	0.74	0.34	-1.42	0.19
CASHMORE OAKLEA-205815	1500992020205815	0.269	70	162.24	0.36	15.16	15.88	-1.84	2.5	-1.23	0.24
CASHMORE OAKLEA-206718	1500992020206718	0.004	71	165.92	0.06	13.77	13.88	1.63	3.88	0.53	0.07
CASHMORE OAKLEA-210182	1500992021210182	0.121	65	170.49	0.25	16.94	21.27	-0.03	0.64	-1.85	0.45
CASHMORE OAKLEA-212956	1500992021212956	-0.208	77	174.48	0.1	11.3	11.02	-1.6	3.85	1.6	0.31
CASHMORE OAKLEA-213371	1500992021213371	0.205	64	163.39	0.87	16.07	17.44	-1.3	3.21	-0.72	0.2
CLOVEN HILLS-180191	CM00092018180191	-0.061	73	175.77	0.98	14.62	13.01	-0.33	1.79	-1.55	0.27
CLOVEN HILLS-190333	CM00092019190333	0.13	67	164.99	0.71	14.23	11.6	-0.68	1.22	-0.55	0.19
CLOVEN HILLS-191418	CM00092019191418	0.148	69	175.5	0.76	16.96	17.09	1.38	2.95	-0.42	0.17
CLOVEN HILLS-191527	CM00092019191527	0.196	73	159.86	0.6	12.47	13.97	0.21	3.5	0.48	0.14
CLOVEN HILLS-202127	CM00092020202127	0.371	74	169.63	0.35	14.28	14.81	-0.5	2.01	-0.22	0.33
CLOVEN HILLS-202537	CM00092020202537	-0.072	69	176.27	0.71	14.75	10.21	-0.82	2.53	-0.12	0.21
CLOVEN HILLS-213498	CM00092021213498	0.006	63	162.48	0.48	11.73	12.01	0.42	2.69	-0.19	0.19
CLOVEN HILLS-213631	CM00092021213631	0.231	68	182.29	0.24	15.33	13.85	0.77	1.36	-0.72	0.41
COOTA KELSO-200049	CM00292020200049	-0.329	47	153.95	0.04	10.91	11.01	1.09	1.42	0.65	0.25
COOTA KELSO-200221	CM00292020200221	-0.257	56	155.31	0.25	10.64	7.82	0.54	1	-0.29	0.19
COOTA KELSO-200253	CM00292020200253	-0.028	54	165.11	0.49	13.56	12.79	-1.2	2	-0.17	0.3
CORRIEDALE HILLS-170251	0301062017170251	-0.48	51	102.08	0.21	4	2.32	0.15	-0.47	-1.26	-0.03
DAYS-19M027	CM0017201919M027	-0.16	57	166.49	0.63	14.11	11.62	-0.02	3.58	-0.84	0.1
DAYS-20M036	CM0017202020M036	-0.21	66	184.52	0.37	12.46	6.71	0.57	3.67	-0.64	0.21
ELLA MATTIA-200M18	CM00242020200M18	-0.047	63	180.86	0.29	10.21	8.76	1.46	3.33	0.99	0.34
ELLA MATTIA-210M10	CM00242021210M10	-0.053	65	179.42	0.2	12.64	11.66	-0.24	2.82	0.43	0.42
GERALDINE-200017	0233692020200017	-0.185	66	107	0.21	6.82	10.64	1.9	0.15	0.43	-0.14
GLENCORRIE-200069	0247572020200069	0.031	65	128.39	0.61	13.49	16.98	1.54	-0.66	-1.06	0.03
GLENEITH-190282	0219292019190282	-0.288	61	136.02	0.33	9.6	11.2	1.47	0.74	-1.31	0.07
GLENEITH-190432	0219292019190432	-0.215	64	114.78	0.55	13.11	19.43	2.13	-1.22	-1.93	-0.03
GLENEITH-200504	0219292020200504	-0.219	67	152.8	0.14	9.47	9.03	1.57	0.27	1.2	0.23
INVERBRACKIE-190041	0242392019190041	0.021	61	151.07	0.26	13.06	14.43	2.18	0.93	1.65	0.16
INVERBRACKIE-190281	0242392019190281	0.042	69	153.24	0.11	14.32	15.72	2.44	1.42	-0.68	0.04
INVERBRACKIE-190304	0242392019190304	0.108	77	173.94	0.18	13.13	16.08	2.5	1.5	3.42	0.4
INVERBRACKIE-190801	0242392019190801	0.089	63	167.64	0.39	12.51	12.8	-0.1	2.26	1.04	0.3
INVERBRACKIE-194707	0242392019194707	0.152	77	158.03	0.48	9.98	12.42	0.76	2.76	2.96	0.22

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	MCP+	BWT	PWT	AWT	MWWT	PEMD	PFAT	WR
INVERBRACKIE-200257	0242392020200257	-0.131	64	162.27	0.24	13.47	11.53	1.65	2.55	2.09	0.08
INVERBRACKIE-200632	0242392020200632	-0.085	66	141.79	0.3	10.93	14.33	0.42	2.31	1.59	0.1
INVERBRACKIE-200776	0242392020200776	-0.095	66	150.96	0.36	11.16	13.44	1.86	1.8	0.57	0.16
INVERBRACKIE-210317	0242392021210317	-0.088	68	163.33	0.02	12.45	15.28	0.16	2.34	1.13	0.26
JOHNOS CREEK-190290	0244112019190290	-0.041	61	121.59	0.28	11.75	17.8	0.09	0.98	-0.57	0
KARRAWARRA PASTORAL-183283	CM02032018183283	0.049	39	157.65	0.86	11.94	13.63	2.26	0.3	-0.8	0.26
KARRAWARRA PASTORAL-194042	CM02032019194042	-0.169	48	134.78	0.83	13.47	14.62	-0.5	1.09	-0.19	-0.02
KARRAWARRA PASTORAL-194290	CM02032019194290	0.181	43	129.62	0.75	12.87	16.06	0.6	-1.92	-2.34	0.15
KARRAWARRA PASTORAL-210846	CM02032021210846	-0.014	56	157.32	0.93	13.78	12.71	2.49	0.26	-1.48	0.2
KARRAWARRA PASTORAL-210859	CM02032021210859	-0.232	53	140.21	0.99	12.34	12.31	-1.79	0.11	-1.14	0.13
KARRAWARRA PASTORAL-210947	CM02032021210947	0.109	33	148.22	1.14	11.39	10.31	0.24	-1.12	-2.45	0.25
KIRANDA MATERNAL-185453	CM02022018185453	-0.066	42	134.9	0.48	10	11.31	1.64	1.15	0.5	0.04
KIRANDA MATERNAL-185727	CM02022018185727	0.025	39	159.59	0.68	15.65	16.93	2.14	1.23	0.03	0.18
LAMBPRO-184292	CM00052018184292	-0.142	54	164.91	0.49	11.3	12.25	0.89	1.78	0.51	0.33
LAMBPRO-193431	CM00052019193431	0.036	49	167.73	0.32	11.41	8.99	1.03	2.58	0.61	0.26
LAMBPRO-207290	CM00052020207290	0.107	67	160.66	0.42	13.92	11.54	0.6	0.21	-1.08	0.18
LAMBPRO-218845	CM00052021218845	-0.087	75	179.67	0.33	11.36	12.03	1.12	3.39	0.37	0.37
LINTON-190708	0246422019190708	-0.39	65	128.79	0.13	7.85	10.79	1.09	1.11	0.26	0.07
LINTON-210748	0246422021210748	-0.125	68	163.03	0.27	12.53	15.36	0.81	1.05	0.36	0.33
LOW FOOTPRINT LAMB-190084	CS00042019190084	-0.342	78	127.71	0.05	5.17	4.85	1.18	2.11	-1.65	0.02
LOW FOOTPRINT LAMB-190093	CS00042019190093	-0.242	72	104.57	0.49	10.21	14.35	-0.26	1.54	1.37	-0.15
LOW FOOTPRINT LAMB-200057	CS00042020200057	-0.517	77	137.77	0.19	7.17	4.63	1.14	2.04	-0.21	0.02
MOUNT RONAN-180052	CM00082018180052	0.158	46	138.41	0.13	10.94	12.29	-0.96	0.87	-0.63	0.12
MOUNT RONAN-190403	CM00082019190403	0.435	45	148.47	0.45	12.54	14.4	-0.24	3.18	-0.08	0.09
MURNONG HIGHLANDER-190960	CM02012019190960	0.05	37	153.24	1.11	15.35	19.07	1.9	1.72	-0.22	0.12
NAYOOK SOUTH-210050	0322722021210050	-0.786	59	128.62	0.35	6.09	1.67	-0.74	0.26	-1	0.08
NAYOOK SOUTH-210103	0322722021210103	-0.66	52	121.08	0.29	5.22	3.39	-0.45	0.76	-0.02	0.02
NEW ARMATREE-190029	0247862019190029	-0.108	67	155.93	-0.05	10.76	11.39	0.97	2.53	0.35	0.21
NEW ARMATREE-190475	0247862019190475	-0.204	76	130.34	0	7.56	7.74	0.06	1.41	0.71	0.01
NEW ARMATREE-210077	0247862021210077	0.096	77	178.8	0.38	13.04	13.14	1.17	1.76	1.28	0.4
NEW ARMATREE-210189	0247862021210189	0.193	75	161.72	0.96	14.41	17.05	1.88	0.76	0.63	0.26
NEW ARMATREE-210339	0247862021210339	-0.109	76	158.66	0.31	8.79	9.17	0.52	2.54	1.34	0.25
PARADOO PRIME-200209	1500582020200209	-0.008	56	171.6	0.51	13.3	14.98	0.16	1.35	1.46	0.38
PROBREED HL-202056	CM00372020202056	0.089	54	151.27	0.38	12.47	13.02	0.52	0.79	-0.3	

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	MCP+	BWT	PWT	AWT	MWWT	PEMD	PFAT	WR
PROBREED PLUS-180049	CM00392018180049	0.262	38	125.08	0.57	12.41	15.84	-2.94	-0.23	-0.92	0.13
QUAMBY PLAINS-190104	0300362019190104	-0.379	42	123.49	0.31	6.27	5.97	-0.05	-0.11	0.8	0.13
QUAMBY PLAINS-190331	0300362019190331	-0.509	40	97.42	0.77	4.28	5.12	-0.51	-0.53	-0.98	-0.1
QUAMBY PLAINS-190355	0300362019190355	-0.379	40	96.09	0.05	3.08	3.84	-1.6	-0.05	-0.9	-0.04
QUAMBY PLAINS-200001	0300362020200001	-0.377	52	117.33	0.27	4.94	2.58	-0.06	0.38	-1.31	0.03
QUAMBY PLAINS-200202	0300362020200202	-0.627	55	116.1	0.19	2.66	0.65	-0.11	0.12	-1.25	0.09
QUAMBY PLAINS-210191	0300362021210191	-0.472	52	116.44	0.41	5.49	2.66	-0.37	-0.23	-1.23	0
QUAMBY PLAINS-210211	0300362021210211	-0.535	57	133.81	0.37	4.1	-0.06	1.23	0.9	-1.29	0.11
SOUTHWEST GENETICS-190882	1500482019190882	0.172	49	150.77	0.66	15.07	16.3	-0.96	1.37	-0.13	0.11
SOUTHWEST GENETICS-200889	1500482020200889	-0.141	56	150.79	0.94	13.63	14.49	1.09	1.18	-1.06	0.12
SOUTHWEST GENETICS-200965	1500482020200965	0.209	59	163.12	0.59	14.55	12.86	0.7	1.27	0.05	0.22
STRATHVIEW-210267	1500672021210267	-0.209	65	169.77	0.33	11.39	11.45	0.4	2.35	0.82	0.33
STRATHVIEW-210297	1500672021210297	-0.281	61	170.82	0.44	12.51	10.76	-0.41	1.08	0.79	0.39
SUMMIT PARK-200423	CM04202020200423	-0.348	58	144.14	0.1	9.94	9.59	0.01	2.26	0.88	0.08
THE WILLOWS-20M224	CM0028202020M224	0.012	56	162.04	0.45	15.81	15.91	-0.95	3.04	-0.72	0.13
Y-NOT-190055	0324242019190055	-0.748	53	109.51	0.48	5.12	1.78	-1.75	-2.15		

The top 20% percentile and above are highlighted green

Terminal Methane Results:

Name	Animal ID	CH4	CH4 acc	TCP	PWT	PEMD	PFAT	LMY	IMF	SHEARF5	LE
ALLENDALE-180010	1900602018180010	0.539	45	140.46	16.61	-0.07	-0.98	1.4	0.36	-0.05	1.02
ALLENDALE-190317	1900602019190317	0.283	44	131.98	8.26	1.76	0.49	2	-0.72	-1.21	1.44
ANDEN WHITE SUFFOLKS-190083	2300912019190083	0.592	55	146.5	18.42	2.78	-0.13	4.44	-0.44	3.95	-3.16
ANDEN WHITE SUFFOLKS-200292	2300912020200292	0.592	49	149.99	18.07	2.79	-0.05	4.13	-0.05	1.44	-2.26
ANDERSON-210357	1650252021210357	0.583	57	145.48	18.15	1.27	-0.39	2.71	-0.18	3.92	0.43
ASHMORE-180080	2300992018180080	0.64	52	158.48	19.97	3.2	0.09	3.89	-0.41	-0.76	-2.16
ASHMORE-190016	2300992019190016	0.404	49	147.85	17.98	2.71	-0.04	3.26	-0.08	1.41	-0.91
ASHMORE-200602	2300992020200602	0.43	58	153.87	19.15	2.72	-1.14	5.39	-0.93	4.47	0.05
ASHMORE-200667	2300992020200667	0.159	60	156.77	16.38	3.77	-0.52	4.52	0.12	0.39	1.04
ASHMORE-200912	2300992020200912	0.449	50	156.07	20.37	2.09	-0.57	4.18	-0.22	1.53	-0.39
ATHLONE-190146	1638852019190146	0.726	48	116.24	13.19	1.03	-0.87	3.98	-1.72	12.09	-0.63
ATHLONE-210288	1638852021210288	0.287	48	129.19	13.29	1.34	-1.04	3.56	-0.9	6.78	0.39

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	TCP	PWT	PEMD	PFAT	LMY	IMF	SHEARF5	LE
AURORA PARK BURRANDOOL-131321	1100392013131321	0.368	58	135.65	13.29	0.95	0.12	2.1	-0.33	-3.43	0.42
AURORA PARK BURRANDOOL-171710	1100392017171710	0.382	61	138.07	12.3	1.08	-0.39	2.88	-0.47	-1.24	0.5
AURORA PARK BURRANDOOL-188020	1100392018188020	0.511	49	129.48	10.92	-0.48	-0.41	0.64	-0.08	-1.84	2.71
AURORA PARK BURRANDOOL-200041	1100392020200041	0.234	58	140.73	13.43	0.07	-0.38	0.91	0.65	-8.03	-1.75
AURORA PARK BURRANDOOL-211032	1100392021211032	0.624	58	120.84	10.64	1.76	1.04	1.6	-0.4	0.82	-1.38
AYLESBURY FARM-188262	2300172018188262	0.213	48	135.28	14.46	1.3	-0.44	2.24	-0.47	0.94	-1.67
BARINGA-17A021	250004201717A021	-0.041	65	123.94	9.52	0.21	-0.64	3.16	-1.15	4.07	-0.59
BARINGA-18W042	230827201818W042	0.12	46	139.63	14.83	1.76	-0.82	3.58	-0.8	0.62	-2.62
BARINGA-19W043	230827201919W043	0.284	48	135.54	14.3	0.01	-1.13	3.09	-0.47	2.02	-1.92
BOWEN-190915	1919682019190915	0.288	43	126.25	9.64	0.43	-1.21	3.29	-0.06	0.89	0.76
BOWEN-190922	1919682019190922	0.446	46	121.3	11.94	0.41	-0.45	1.47	-0.32	1.63	-0.56
BOWEN-200035	1919682020200035	0.595	56	116.12	11.82	-0.22	-0.58	2.52	-0.62	3.77	0
BRIGHTSIDE-200017	1646312020200017	0.666	61	111.38	9.62	-0.3	-0.82	2.05	0.31	6.49	-0.24
BRUAN-210084	1635282021210084	0.339	65	156.69	13.87	3.47	-0.8	4.5	0.16	3.13	3.12
BUNDARA DOWNS-170180	1643242017170180	0.365	52	135.77	17.45	2.53	-1.72	5.29	-1.94	12.94	-3.31
BUNDARA DOWNS-205582	1643242020205582	0.255	49	148.98	17.45	2.62	-0.43	3.92	-0.65	5.56	-1.43
CHANDPARA-130148	1423342013130148	0.417	52	112.48	11.02	1.83	0.54	0.7	-0.26	6.06	0.43
COTTER SUFFOLKS-191033	1922672019191033	0.357	48	124.75	10.35	2.19	0.85	2.01	-0.39	1.61	0.65
CURLEW VALLEY-200008	1920952020200008	0.195	60	144.25	9.97	2.96	0.66	1.11	-0.1	-5.28	2.45
CURLEW VALLEY-211023	1920952021211023	0.14	66	159.46	13.94	1.81	0.07	1.19	0.26	-10.06	-0.05
CYPRESS PARK-200365	1703442020200365	-0.066	53	148.92	9.55	2.67	-0.98	5.55	-0.49	-0.16	0.26
DAYS-190114	2307362019190114	0.691	55	146.4	18.18	2.54	-0.02	3.35	-0.45	3.33	0.16
DAYS-210332	2307362021210332	0.63	62	156.24	15.95	3.62	0.55	2.58	-0.22	0.15	1.3
DELL-190746	4004112019190746	0.507	54	133.81	7.25	1.72	0.47	1.65	-0.65	-1.57	2.55
DELL-200037	4004112020200037	0.604	62	135.42	9.05	1.74	0.09	3.12	-0.7	-1.24	-0.18
DELL-200732	4004112020200732	0.291	66	131.55	10.41	1.66	0.57	3.07	-1.07	3.26	2.91
DELORAINE DOWNS-200181	1642232020200181	0.436	59	139.96	14.04	3.87	-1.16	5.15	-2.07	9.29	-3.39
DETPA GROVE-200477	2300432020200477	0.556	57	145.45	15.45	2.72	-0.57	5.01	-1.06	2.65	-0.7
DOUWANA-200178	4000482020200178	0.416	74	129.87	10.96	1.97	1.85	0.7	-0.44	-1.98	0.39
DOUWANA-210181	4000482021210181	0.883	60	128.51	9.17	1.7	0.27	1.66	-1.33	2.98	0.9
ELLA MATTIA-190030	2300012019190030	0.476	58	145.63	16.66	3.23	0.74	3.14	-0.16	3.64	2.29
ELLA MATTIA-200339	2300012020200339	0.504	63	171.23	20.94	3.2	-0.98	4.35	-0.37	-0.71	4.36
ELLA MATTIA-210270	2300012021210270	0.54	56	164.18	18.88	3.6	0.3	2.87	0.35	-5.04	3.51

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ETIWANDA-215181	4700442021215181	0.255	61	132.09	8.23	2.28	0.27	2.96	-1.21	1.54	2.41
ETIWANDA-215352	4700442021215352	0.142	62	147.09	13.51	2.32	-0.18	2.27	-1.28	-0.63	3.94
ETIWANDA-215746	4700442021215746	0.291	56	141.26	8.54	2.47	-0.43	4.44	-1.44	3.31	2.68
EVANSTOKE-120005	1102012012120005	0.398	44	121.65	6.91	1.22	0.57	0.06	0.16	-3.03	-0.74
FAIRBANK-190506	2300202019190506	0.452	52	127.42	11.61	1.56	-0.11	2.87	-0.4	2.91	0.95
FAIRBANK-190751	1400312019190751	0.321	58	116.42	8.62	0.37	-1.35	0.23	-0.8	0.72	-0.49
FAIRBANK-190797	1400312019190797	0.494	48	122.29	13.67	-0.02	-1.07	2.76	-0.55	5.45	1.89
FAIRBANK-190807	1400312019190807	0.441	48	108.83	10.21	0.47	-1.05	3.61	-0.55	7.75	-0.94
FAIRBANK-191007	1400312019191007	0.513	54	137.03	14.21	1.01	-0.22	2.25	0.02	-1.34	0.29
FAIRBANK-200183	1614612020200183	0.326	64	135.63	16.41	1.29	-0.42	3.98	-0.29	4.76	-0.31
FAIRBANK-200687	2300202020200687	0.346	44	142.42	14.4	3.83	0.42	3.78	-0.99	6.44	2.44
FAIRBANK-200983	1400312020200983	0.55	56	116.36	13.58	-0.37	-1.07	2.04	-0.66	7.48	2.22
FAIRBANK-201153	1400312020201153	0.51	62	108.41	9.19	0.94	-0.8	0.57	-0.32	6.16	0.88
FAIRBANK-210132	1614612021210132	0.201	51	140.16	15.12	1.88	-0.32	2	-0.63	2.24	1.53
FAIRBANK-210529	2300202021210529	0.593	61	139.12	12.8	3.09	-1.07	4.18	-0.89	6.14	2.26
FAIRBANK-210919	1400312021210919	0.323	52	117.46	10.47	1.51	-0.55	-0.34	-1.33	5.58	0.65
FARRER-200172	2301392020200172	0.51	59	147.52	16.03	2.28	-0.61	3.29	-0.2	1.06	2.17
FARRER-210167	2301392021210167	0.329	59	143.06	18.28	1.59	-0.34	3.36	-0.2	5.15	0.45
FELIX-190002	2300482019190002	0.394	47	165.22	14.57	3.61	0.39	2.17	0.14	-7.46	-0.4
FELIX-190141	1636772019190141	0.721	62	161.04	19.31	3.25	0.48	2.45	-0.02	-1.52	-0.06
FELIX-200356	1636772020200356	0.418	61	167.86	18.62	3.4	-0.72	4.26	-0.49	1.37	1.96
FELIX-201156	2300482020201156	0.602	58	155.58	19.49	2.44	-0.08	3.85	-0.02	0.25	4.36
FELIX-210483	1636772021210483	0.444	56	157.05	17.55	3.4	0.08	4.12	-0.83	3.43	3.08
FELIX-210815	2300482021210815	0.38	64	151.23	17.14	3.7	0.56	3.22	0.22	1.8	-1.8
FELIX-211261	2300482021211261	0.477	57	150.32	16.61	2.53	1.35	0.87	0.7	-1.07	5.15
FELIX-211315	1636772021211315	0.708	63	156.68	18.92	1.97	-2.03	4.79	-0.12	2.67	-0.03
GALAXY PARK-190418	2300072019190418	0.539	57	154.36	24.12	0.82	-1.29	5.66	-0.99	4.68	0.25
GEMINI-190450	2302332019190450	0.393	46	168.46	19.98	2.74	-0.18	3.29	-0.21	-1.7	3.95
GOORAMMA-160308	1617782016160308	0.206	58	130.48	13.37	0.97	-0.94	3.58	-0.6	6.8	0.48
GOORAMMA-190041	1617782019190041	0.252	49	130.53	11.46	1.13	-0.92	2.51	-0.3	2.86	-1.84
GOORAMMA-200200	1617782020200200	0.571	63	132.47	11.39	1.03	-0.2	1.58	-0.17	1.38	1.36
HILLCROFT FARMS-208545	CT19722020208545	0.296	63	148.17	11.84	2.9	0.35	2.09	0.19	-2.56	0.87
HILLCROFT FARMS-217053	2400012021217053	0.323	60	147.85	13.17	2.37	0.82	2.31	0.39	-0.78	0.65

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HILLCROFT FARMS-217180	2400012021217180	0.101	60	153.72	14.13	2.71	-0.33	4.6	-0.63	2.45	2.82
HILLCROFT FARMS-217256	2400012021217256	0.453	66	130.7	13.79	1.54	0.22	3.15	-1.48	4.31	-0.1
HILLDEN-160780	1615932016160780	0.561	50	114.27	14.8	-0.13	-1.2	4.47	-1.42	13.53	-2.61
HOPEA-20S028	192200202020S028	0.54	55	130.98	12.73	2.35	0.46	2.62	-0.77	4.34	0.35
IVADENE-170095	1611582017170095	0.445	49	139.68	18.89	0.82	-0.75	3.44	-0.74	3.82	-3.51
JEWSHARP-190439	1635802019190439	0.448	59	156.96	13.19	4.2	-0.38	2.96	0.14	-1.42	-1.84
KALINDA-210533	1930262021210533	0.395	56	143.71	15.28	1.47	-0.26	2.58	-0.2	-2.31	-0.83
KALINDA-210537	1930262021210537	0.592	58	157.68	20.14	1.12	-1.52	4.56	-0.38	-3.61	-1.81
KARINYA-199028	1917962019199028	0.327	55	154.12	17.79	1.44	0.39	1.62	0.61	-7.69	-1.91
KARRAWARRA PASTORAL-196076	CT02032019196076	0.193	42	141.14	11.59	2.82	0.48	1.48	0.05	-1.95	0.57
KARRAWARRA PASTORAL-206405	CT02032020206405	0.099	58	152.7	13.74	2.93	1.32	1.73	0	-1.82	2.06
KARRAWARRA PASTORAL-216384	CT02032021216384	0.197	60	152.51	13.55	3.68	1.43	2.06	-0.23	-0.81	0.8
KAYA (WHITE DORPERS)-200271	4701142020200271	0.144	67	158.07	14.75	0.47	-1.55	2.89	-0.34	-2.93	3.47
KAYA (WHITE DORPERS)-210074	4701142021210074	0.171	59	148.72	14.17	-0.13	-2.19	4.57	-0.76	2.95	3.27
KAYA (WHITE DORPERS)-210265	4701142021210265	0.108	63	147.2	13.11	0.57	-0.63	3.29	0.01	0.95	3.93
KAYA (WHITE DORPERS)-210735	4701142021210735	0.172	59	158.99	10.12	3.01	0.52	2.65	-0.09	-5.94	3.16
KAYA-200520	4000302020200520	0.268	63	147.13	14.72	1.27	-1.01	3.92	-1.51	0.73	-5
KAYA-200588	4000302020200588	0.164	66	135.29	9.94	1.68	0.52	0.96	0.02	-2.78	-0.24
KAYA-210160	4000302021210160	0.279	64	130.93	10.42	0.57	-1.08	3.34	-1.32	3.37	0.72
KAYA-210577	4000302021210577	0.301	65	134.36	12	0.17	-0.94	3.43	-1.4	3.45	-0.5
KAYA-210881	4000302021210881	0.221	64	149.24	12.4	2.47	-0.03	2.85	-0.74	-4.47	-4.25
KINELLAR-200193	1644252020200193	0.52	52	155.98	18.27	2.44	-0.78	4.32	-0.25	2.29	0.49
KINELLAR-200397	2305962020200397	0.422	45	137.57	19.12	1.92	0.37	3.26	-1.09	5.11	0.68
KINROSS STATION-190977	1102292019190977	0.33	48	138.51	11.63	1.07	0.5	-0.4	0.92	-7.8	-1.11
KINROSS STATION-202202	1102292020202202	0.222	52	153.39	16.27	0.83	-0.71	2.81	0.86	-5.24	-1.85
KIRANDA PRIME-186084	CT02022018186084	-0.064	36	132.15	9.55	1.52	-1.89	5.76	-1.1	7.32	0.21
KIRRIE-190910	1930292019190910	0.278	48	129.7	10.93	-0.09	-0.82	0.91	-0.19	-2.12	1.09
KURRALI-180744	1921892018180744	0.475	53	125.92	12.52	0.2	0.15	1.7	-0.36	-0.11	-2.09
KURRALI-180753	1921892018180753	0.645	49	124.03	11.36	1.53	1	1.95	-0.76	-0.42	0.29
KURRALI-200941	1921892020200941	0.232	50	126.37	11.97	0.8	0.05	1.94	-0.09	-0.83	-2.24
LANGLEY HEIGHTS-180072	2300022018180072	0.404	42	134.11	15.58	3.76	0.72	3.42	-1.13	8.21	2.32
LANGLEY HEIGHTS-180231	2300022018180231	0.583	57	158	17.45	3.89	0.6	2.71	0.65	-4.18	2.02
LANGLEY HEIGHTS-190090	2300022019190090	0.452	42	139.68	15.72	2.67	0.85	0.69	-0.24	-0.34	2.75

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LEAHCIM-180091	2300182018180091	0.46	45	132.62	13.61	1.93	0.12	1.77	0.39	1.16	-0.49
LEIPH-180175	2300302018180175	0.49	47	148.74	18.76	2.99	0.25	3.81	-0.44	4.62	2.83
LEIPH-210887	2300302021210887	0.504	60	161.52	18.61	5.17	1.09	4	-0.07	-0.45	3.47
LINTON-190128	1622882019190128	0.326	55	127.78	13.65	1.32	0.29	2.34	0.26	4.37	2.39
LINTON-200174	1622882020200174	0.496	61	148.35	12.55	3.63	0.09	2.23	0.38	-3.16	-1.91
LINTON-200224	1622882020200224	0.392	55	140.81	11.01	3.31	0.51	1.33	0.04	-0.12	0.75
LINTON-210143	1622882021210143	0.403	45	156.4	13.7	1.62	-0.71	1.86	1.27	-6.49	2.13
MAJARDAH-190086	1618862019190086	0.158	56	147.25	14.39	2.46	0.15	2.16	-0.5	1.64	-1.32
MAJARDAH-201781	2305402020201781	0.641	56	153.84	17.87	3.11	-0.07	3.42	-0.55	0.02	-0.74
MAJARDAH-201987	1618862020201987	0.695	63	138.5	15.37	1.6	-0.64	3.57	-0.72	5.45	0.93
MAJARDAH-212581	1618862021212581	0.355	65	147.04	12.62	4.07	1.42	0.82	0.68	-3.63	0.94
MAROOOLA-205250	2302812020205250	0.429	61	152.22	17.59	4.09	0.83	4.31	-0.44	3.02	2.84
MERTEX-170122	1703492017170122	0.013	50	148.32	12.84	1.38	-1.11	5.3	-0.43	-1.82	-1.88
MERTEX-180112	1703492018180112	-0.086	57	150.52	9.97	1.94	-1.06	4.57	-0.78	-2.97	-2.17
MERTEX-180532	2307992018180532	0.35	45	128.59	17.6	0.67	0.4	1.47	-0.17	4.15	-2.53
MERTEX-190021	1703492019190021	-0.091	52	146.5	8.64	3.2	-0.08	5.19	-0.45	-2.29	-1.9
MERTEX-200096	1703492020200096	-0.189	59	135.71	10.06	1.2	-1.37	4.68	-0.82	2.25	-2.06
MERTEX-200259	2307992020200259	0.017	52	142.43	11.74	2.17	-0.2	2.62	-0.47	-0.63	-1.36
MERTEX-210013	1703492021210013	-0.201	62	146.26	6.8	3.48	0.48	2.96	-0.02	-5.59	-1.95
MERTEX-210039	1703492021210039	-0.069	59	156.16	11.32	2.31	-0.34	3.39	-0.57	-6.4	-1.72
MERTEX-210633	2307992021210633	0.369	57	156.13	20.44	2.55	-0.31	4.67	-1.1	4.36	1.47
MOUNT RONAN-200006	2300902020200006	0.418	55	138.12	16.47	2.39	0.62	2.78	-0.14	3.93	2.67
MURNONG FOCUS PRIME-192501	CT02012019192501	0.14	50	165.59	15.41	2.65	-0.91	3.6	-0.15	-1.45	4.3
NEWBOLD-210016	1600012021210016	0.498	65	148.23	16.44	2.77	-0.77	3.71	-0.78	4.83	-1.47
OBERON-200145	1920672020200145	0.327	56	127.86	9.48	0.61	-0.31	1.31	-0.25	-3.02	0.66
OBERON-200152	1920672020200152	0.555	56	119.58	11.51	-0.41	-1.78	4.62	-1.02	5.35	-0.02
OLD WOOMBI-180425	1634572018180425	0.44	57	165.53	17.28	2.74	-1.14	4.06	0.05	-1.86	0.2
OMAD-210290	2306322021210290	0.524	58	146.07	20.26	3.27	1.32	3.49	-1	6.14	-0.15
PEPPERTON-190126	1640732019190126	0.498	58	154.35	20.09	1.98	-1.42	5.25	-1.14	5.09	0.82
PEPPERTON-190446	2305652019190446	0.333	52	156.39	17.35	2.16	-0.98	5.3	-0.83	3.62	1.24
PEPPERTON-200179	1640732020200179	0.369	60	152.35	16.09	3.22	-0.4	3.68	-0.63	2.6	0.39
PEPPERTON-200200	1640732020200200	0.42	63	158.33	15.18	4.04	-0.99	4.41	-0.42	5.72	1.42
PEPPERTON-200505	2305652020200505	0.415	62	167.63	13.12	6.13	0.07	3.65	0.14	0.55	2.59
PEPPERTON-210169	1640732021210169	0.319	62	159.7	16.94	3.66	0.25	3.36	-0.27	-0.53	-1.16

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PEPERTON-210316	1640732021210316	0.594	64	175.55	17.9	4.45	-0.28	4.16	-0.34	0.18	0.83
PEPERTON-210511	2305652021210511	0.621	60	154.17	17.2	2.57	-0.29	3.03	0.18	-2.37	-2.79
PLG WILLOWS-201104	2350382020201104	0.213	48	154.73	15.25	3.07	-0.34	3.32	-0.83	1.05	0.52
POLLAMBI-180081	1612352018180081	0.501	49	147.41	19.7	2.79	-0.09	3.22	-0.91	4.47	-1.65
RANGEVIEW-190045	1639032019190045	0.342	61	137.99	13	3.48	-0.4	3.15	-0.66	5.45	-0.9
RANGEVIEW-190147	1639032019190147	0.717	64	143.2	14.38	1.72	-1.19	2.89	0.52	2.89	-0.22
RIDGEHAVEN-161362	1609182016161362	0.473	53	116.79	12.92	0.31	0.72	-0.67	0.41	-2.93	-1.18
RIDGEHAVEN-190083	1609182019190083	0.548	57	138.94	15.73	2.86	-0.5	2.47	0	4.24	-0.45
RIDGEHAVEN-210153	1609182021210153	0.52	61	127.84	17.61	-0.7	-0.37	2.53	-0.6	3.83	-1.66
RIDGEHAVEN-210417	1609182021210417	0.292	61	138.91	10.93	4.02	-0.37	2.87	-0.09	4.11	-0.09
SALTBUSH-190073	4700212019190073	0.034	62	130	7.16	1.85	-0.2	2.69	-0.65	0.6	1.7
SALTBUSH-190317	4700212019190317	0.095	66	142.02	12.59	1.07	-0.67	2.99	-1.01	-0.54	0.85
SALTBUSH-200058	4700212020200058	-0.033	64	124.76	6.06	2.28	0.11	1.27	-0.44	3.45	0.07
SAYLA PARK-210202	1922452021210202	0.598	53	124.65	12.63	0.54	-0.78	2.7	-0.91	1.7	-1.73
SHIRLEE DOWNS-190408	1614082019190408	0.415	51	138.58	16.7	1.53	-0.93	3.53	-1.05	6.23	0.08
SKYFALL-190078	1930432019190078	0.486	54	142.53	16.95	2.1	0.55	2.96	0.14	-2.87	-1.68
SMITHSTON-170543	2304642017170543	0.515	58	137.56	16.92	1.41	0.14	3.43	-0.6	1.05	-1.3
SMITHSTON-200882	2304642020200882	0.208	55	158.58	19.29	2.7	-0.35	5.18	-0.38	1.24	-4.72
SMPS-20P073	CT0048202020P073	0.416	58	145.6	15.12	0.39	-1.91	4.98	-0.31	6.58	2.79
SOMERSET-190001	2303652019190001	0.532	57	145	16.48	2.36	-0.52	4.83	-0.62	5.12	-0.11
SOMERSET-190158	2303652019190158	0.483	40	154.14	16.82	4.1	-0.71	6.19	-1.37	3.75	-7.27
SOUTH WEST GENETICS-190084	1700812019190084	0.194	52	169.67	15.4	4.42	-0.84	6.14	-0.73	-1.88	-1.62
SOUTH WEST GENETICS-200065	1700812020200065	0.307	66	160.27	15.5	3.06	-0.95	4.91	-0.57	-3.19	-1.91
SPRINGWATERS-180022	1628152018180022	0.466	57	124.47	15.93	-0.19	-0.29	2.99	-0.75	5	-0.57
STRATHVIEW-200250	CT00322020200250	-0.136	60	142.18	7.81	2.1	0.34	1	1.11	-2.93	-1.07
SUMMIT PARK TEXELS-190141	1704202019190141	0.008	51	144.67	9.79	4.57	0.89	4.55	-1.1	0.11	1.03
SUMMIT PARK TEXELS-200132	1704202020200132	-0.04	50	156.22	9.29	4.64	0.44	5.24	-1.37	-2.94	-2.31
SUMMIT PARK TEXELS-200223	1704202020200223	-0.104	58	157.67	14.28	3.98	-0.14	4.17	-0.94	1.46	1.22
SUMMIT PARK TEXELS-200341	1704202020200341	-0.164	60	138.65	7.85	5.15	0.39	4.88	-1.03	4.07	0.79
SUMMIT PARK-200089	2308622020200089	0.549	51	142.45	18	1.32	-1.2	4.66	-0.84	5.86	0.91
TATTYKEEL-141208	1609812014141208	0.23	50	129.37	13.53	0.73	0.23	1.76	-0.2	1.97	-0.89
TATTYKEEL-200583	1609812020200583	0.311	60	137.11	10.26	2.35	-0.27	1.88	0.69	-0.19	1.34
TRIGGER VALE-191124	2304502019191124	0.52	58	159.9	14.1	3.52	0.11	3.31	-0.02	-1.85	2.32
TRIGGER VALE-211456	2304502021211456	0.534	59	154.86	15.4	3.35	-0.31	3.98	-0.12	1.09	2.37

The top 20% percentile and above are highlighted green

Name	Animal ID	CH4	CH4 acc	TCP	PWT	PEMD	PFAT	LMY	IMF	SHEARF5	LE
TULLAMORE PARK-170020	1700212017170020	0.024	49	130.18	9	0.93	-1.97	6.03	-1.88	5.32	-1.91
TULLAMORE PARK-170030	1700212017170030	0.032	59	128.62	7.39	1.85	-0.92	4.3	-1	1.33	-1.07
TULLAMORE PARK-200016	1700212020200016	0.045	60	123.81	6.49	1.03	-1.33	3.95	-1.03	1.36	-0.43
TULLAMORE PARK-200075	1700212020200075	-0.015	60	130.99	12.91	2.21	-1.03	6.77	-1.7	7.84	-1.25
TULLAMORE PARK-200127	1700212020200127	-0.105	50	160.21	12.11	3.61	-1.37	6.03	-1.8	1.13	-0.12
VALLEY VISTA PARK-210002	1644882021210002	0.703	56	125.8	14.89	1.85	0.41	3	-1.55	6.92	-1.01
VALLEY VISTA PARK-210155	1644882021210155	0.29	49	128.22	13.3	0.9	-0.78	3.41	-0.2	5.28	-1.24
VALMA-192249	2309162019192249	0.353	48	147.28	14.69	4.91	0.59	4.3	-1.09	6.75	3.18
VALMA-200040	1600022020200040	0.54	63	168	15.47	3.63	0.16	2.37	1	-4.96	-0.19
VALMA-200063	1600022020200063	0.209	64	147.59	13.88	3.09	-0.14	3.26	-0.72	3.94	0.96
WARATAH-160253	2303182016160253	0.44	42	138.03	15.42	4.25	-0.43	4.81	-1.66	10.36	1.81
WARATAH-190417	2303182019190417	0.42	50	155	18.17	2.66	-0.12	3.16	0.12	-1.05	1.95
WARATAH-200661	2303182020200661	0.391	60	147.61	16.31	2.01	-0.15	2.92	-0.12	-0.75	1.09
WARBURN-190024	1607792019190024	0.636	67	141.16	15.3	2.53	-0.81	4.89	-0.9	6.77	-0.1
WARBURN-210303	2300722021210303	0.274	56	142.5	16.46	2.75	0.23	2.39	0.45	-0.93	1.2
WARRA-J-191920	1922182019191920	0.405	45	118.72	12.43	0.79	0.15	1.62	-0.2	4.84	-1.05
WARREN PARK-130576	1700372013130576	0.025	47	137.32	12.22	1.55	-1.06	6.42	-1.46	1.37	-2.62
WARREN PARK-180316	1700372018180316	0.028	46	157.82	15.31	2.09	-0.84	6.64	-1.31	-1.99	-3.27
WARREN PARK-190435	1700372019190435	-0.078	45	137.71	10.92	1.09	-1.61	4.81	-1.18	1.31	-1.28
WENDENLEA-190052	1912012019190052	0.355	57	132.37	14.92	-0.44	-1.78	2.91	-0.86	4	0.39
WENDENLEA-200095	1912012020200095	0.402	58	155.01	16.02	2.65	-0.65	2.48	-0.4	-2.82	0.77
WENDENLEA-210003	1912012021210003	0.205	64	144.56	14.48	3.47	1.04	2.24	-0.64	1.22	1.75
WENDENLEA-210027	1912012021210027	0.483	51	136.27	13.99	1.07	-0.43	3.04	-0.68	0.04	-1.8
WINGAMIN-171371	2300502017171371	0.369	46	131.33	12.9	2.09	-1.27	4.83	-1.72	8.12	-2.77
WIRRILLA-200977	1704442020200977	-0.114	59	132.2	9.99	2.36	-0.42	5.61	-1.5	5.38	0.75
WOOLUMBOOL-207491	1622482020207491	0.445	49	148.71	13.5	3.15	0.5	1.84	0.27	-1.95	-0.56
WUNNAMURRA-190087	1637212019190087	0.411	51	130.52	12.46	1.95	-0.04	1.56	-0.28	3.55	-0.11
WUNNAMURRA-200106	1637212020200106	0.584	56	146.85	16.27	2.24	-0.54	3.55	-0.72	-0.39	-1.43
WUNNAMURRA-200550	1637212020200550	0.556	58	156.46	19.06	2.12	-1.27	4.24	-0.39	3.51	0.04
WUNNAMURRA-210286	1637212021210286	0.426	58	158.9	18.19	2.85	-1.3	5.33	-0.73	2.82	-1.28
YANCO-190032	2305422019190032	0.527	55	148.17	15.83	2.53	0.3	2.49	0.45	-1.85	1.77
YENTRAC-200506	1421932020200506	0.321	54	100.72	10.53	0.34	0.13	0.3	0.32	8.69	1.28
YENTRAC-200671	1421932020200671	0.512	56	101.24	11.3	-0.4	-0.06	0.2	0.24	7.64	1.87

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