

STØTTET AF

Mælkeafgiftsfonden

Singlestep with SNP solutions

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Comparison of singlestep GEBVs from the current singlestep model, a new singlestep model with SNP solutions and a new singlestep model with SNP solutions where genotypes before 2005 are removed. For bulls results are shown for Nordic AI bulls with genotypes. For cows results are shown for Nordic cows with genotypes, no matter if it has a phenotype or not.

This is done for HOL, RDC and JER for three traits (BV3=Chest width, BV18=rear udder width and BV20=udder depth). Chest width are studied since it is a trait with no genetic trend. Rear udder width is studied since it is a trait, which in earlier studies have had high levels of inflation for singlestep especially for RDC. Udder depth are studied since it is a trait with positive genetic trend and a trait where we in earlier studies have found high inflation.

For HOL the current model is from November while for RDC and JER the current model is from August. This has no effect on the conclusions.

Explanations for correlations for HOL

- `nov_full_SNP_&trait` = correlation between November singlestep full and November singlestep full with SNP solutions for the trait of interest
- `nov_full_SNP2005_&trait` = correlation between November singlestep full and November singlestep full with SNP solutions with deleted genotyped before 2005 for the trait of interest
- `novSNP_full_reduc_&trait` = correlation between November singlestep full with SNP solutions and November singlestep reduc with SNP solutions for the trait of interest
- `novSNP2005_full_reduc_&trait` = correlation between November singlestep full with SNP solutions and deleted genotyped before 2005 and November singlestep reduc with SNP solutions and deleted genotyped before 2005 for the trait of interest
- `nov_full_reduc_&trait` = correlation between November singlestep full and November singlestep reduc for the trait of interest

Explanations for means and standard deviations for HOL

- `novSNP_full_&trait_mean` = mean of November singlestep full with SNP solutions for the trait of interest
- `novSNP_reduc_&trait_mean` = mean of November singlestep reduc with SNP solutions for the trait of interest
- `novSNP2005_full_&trait_mean` = mean of November singlestep full with SNP solutions and deleted genotypes before 2005 for the trait of interest
- `novSNP2005_reduc_&trait_mean` = mean of November singlestep reduc with SNP solutions and deleted genotypes before 2005 for the trait of interest
- `nov_full_&trait_mean` = mean of November singlestep full for the trait of interest
- `nov_reduc_&trait_mean` = mean of November singlestep reduc for the trait of interest

Explanations for correlations for RDC and JER

- `augfull_novSNPfull_&trait` = correlation between August singlestep full and November singlestep full with SNP solutions for the trait of interest
- `augfull_novSSNP2005full_&trait` = correlation between August singlestep full and November singlestep full with SNP solutions with deleted genotyped before 2005 for the trait of interest
- `novSNP_full_reduc_&trait` = correlation between November singlestep full with SNP solutions and November singlestep reduc with SNP solutions for the trait of interest
- `novSNP2005_full_reduc_&trait` = correlation between November singlestep full with SNP solutions and deleted genotyped before 2005 and November singlestep reduc with SNP solutions and deleted genotyped before 2005 for the trait of interest
- `aug_full_reduc_&trait` = correlation between August singlestep full and August singlestep reduc for the trait of interest

Explanations for means and standard deviations for RDC and JER

- `novSNP_full_&trait_mean` = mean of November singlestep full with SNP solutions for the trait of interest
- `novSNP_reduc_&trait_mean` = mean of November singlestep reduc with SNP solutions for the trait of interest
- `novSNP2005_full_&trait_mean` = mean of November singlestep full with SNP solutions and deleted genotypes before 2005 for the trait of interest
- `novSNP2005_reduc_&trait_mean` = mean of November singlestep reduc with SNP solutions and deleted genotypes before 2005 for the trait of interest
- `aug_full_&trait_mean` = mean of August singlestep full for the trait of interest
- `aug_reduc_&trait_mean` = mean of August singlestep reduc for the trait of interest

Results

The correlations between the EBV and the singlestep GEBV are at similar level for “current singlestep”, for “singlestep SNP” and for “singlestep SNP2005”. The levels are as expected. For singlestep full the correlations to EBV are high until 2016. The correlations for singlestep reduced are low for the latest birth classes, as expected, since it is only pedigree information.

In general, for the latest birth classes the standard deviation is lower for “singlestep SNP” and “singlestep SNP2005” than for November singlestep (current model). The “singlestep SNP” and “singlestep SNP2005” have lower means than the current model, and therefore the problem with too high breeding values for latest birth classes is reduced when “singlestep SNP” and “singlestep SNP2005” is used instead of current singlestep model.

We have earlier showed that the singlestep reduc for the current model is higher than expected and much higher than the singlestep full in the current model. Generally, the difference between the reduced and the full run for the two SNP models is reduced, which is in line with results shown for production traits.

For udder depth (BV20) and for rear udder width (BV18 - only JER) the “SNP reduc” is lower than “SNP full” and “SNP2005 reduc” is lower than “SNP2005 full”.

In the table below is a summary of the results for the three traits, for the three breed and two sexes. For additional results, see the appendix.

A, B and C means that SNP and SNP2005 performs better or equal to the current model and these are coloured green. D means that there is no effect of the model, and this is seen for check width (BV3) where there is no genetic trend. E means that the level for reduced is lower than the level for full.

Explanations for the table:

A: "SNP2005" < "SNP" < "current"

B: "SNP2005" < "SNP" = "current"

C: "SNP2005" = "SNP" < "current"

D: "SNP2005" = "SNP" = "current"

E: reduced < full

		HOL bulls	HOL cows	RDC bulls	RDC cows	JER bulls	JER cows
BV3	Mean	D	D	D	D	D	D
	Std	A	A	C	A	C	C
BV18	Mean	A	B	A	A	A E	A E
	Std	C	C	A	C	C	C
BV20	Mean	B E	A E	A E	A E	A E	A E
	Std	C	C	C	C	C	C

Appendix

HOL

Bulls

Correlations to EBV and singlestep full

	EBV SNP_full	BV3 EBV SNP2005_full	EBV curr_full	EBV SNP_full	BV18 EBV SNP2005_full	EBV curr_full	EBV SNP_full	BV20 EBV SNP2005_full	EBV curr_full
2010	0.937	0.944	0.924	0.936	0.938	0.917	0.926	0.932	0.918
2011	0.933	0.938	0.928	0.933	0.937	0.913	0.936	0.942	0.923
2012	0.912	0.918	0.902	0.943	0.945	0.925	0.932	0.937	0.920
2013	0.933	0.944	0.918	0.965	0.964	0.957	0.965	0.970	0.952
2014	0.966	0.967	0.959	0.968	0.972	0.956	0.972	0.974	0.965
2015	0.949	0.953	0.942	0.967	0.971	0.963	0.975	0.976	0.969
2016	0.929	0.937	0.916	0.978	0.980	0.973	0.967	0.969	0.957
2017	0.809	0.824	0.773	0.876	0.879	0.840	0.859	0.871	0.835
2018	0.690	0.706	0.640	0.858	0.864	0.823	0.682	0.695	0.649
2019	0.684	0.686	0.640	0.822	0.847	0.793	0.687	0.718	0.643
2020	0.570	0.540	0.557	0.894	0.900	0.876	0.414	0.463	0.327

Correlations to EBV and singlestep reduc

	EBV SNP_reduc	BV3 EBV SNP2005_reduc	EBV curr_reduc	EBV SNP_reduc	BV18 EBV SNP2005_reduc	EBV curr_reduc	EBV SNP_reduc	BV20 EBV SNP2005_reduc	EBV curr_reduc
2010	0.937	0.946	0.923	0.938	0.942	0.923	0.929	0.937	0.921
2011	0.931	0.939	0.925	0.934	0.942	0.914	0.938	0.946	0.922
2012	0.908	0.917	0.902	0.944	0.948	0.927	0.923	0.931	0.909
2013	0.724	0.727	0.726	0.816	0.818	0.794	0.820	0.816	0.812
2014	0.744	0.707	0.761	0.799	0.794	0.785	0.875	0.869	0.884
2015	0.731	0.747	0.723	0.798	0.819	0.807	0.853	0.840	0.858

2016	0.720	0.720	0.737	0.779	0.795	0.766	0.762	0.756	0.757
2017	0.492	0.502	0.472	0.681	0.684	0.641	0.709	0.720	0.695
2018	0.516	0.511	0.507	0.716	0.722	0.663	0.505	0.519	0.482
2019	0.491	0.479	0.459	0.649	0.700	0.630	0.557	0.619	0.517
2020	0.461	0.377	0.472	0.840	0.836	0.818	0.269	0.337	0.173

BV3

Correlations

			novSNP_		novSNP2005_		
			nov_full_	nov_full_	full_	full_reduc_	nov_full_
Obs	BYR		SNP_3	SNP2005_3	reduc_3	3	reduc_3
1	2010		0.996	0.990	0.996	0.995	0.994
2	2011		0.998	0.994	0.994	0.993	0.993
3	2012		0.998	0.993	0.994	0.992	0.993
4	2013		0.996	0.989	0.861	0.847	0.872
5	2014		0.996	0.992	0.830	0.799	0.847
6	2015		0.998	0.996	0.852	0.859	0.851
7	2016		0.998	0.995	0.859	0.850	0.878
8	2017		0.995	0.985	0.868	0.858	0.883
9	2018		0.991	0.982	0.933	0.921	0.941
10	2019		0.987	0.970	0.916	0.912	0.910
11	2020		0.996	0.977	0.975	0.963	0.976

Means

			novSNP_		nov			
			full_3_	reduc_	full_3_	reduc_		
Obs	BYR	_FREQ_	mean	3_mean	mean	3_mean	nov_full_3_mean	nov_reduc_3_mean
1	2010	226	101.6	101.6	101.9	101.8	101.6	101.5
2	2011	167	102.1	102.1	102.2	102.1	102.1	102.1
3	2012	172	102.4	103.2	102.6	103.4	102.4	103.3
4	2013	120	101.8	103.0	102.0	103.3	101.8	103.1
5	2014	104	100.1	102.5	100.4	103.0	99.9	102.3
6	2015	80	99.8	100.8	100.2	101.5	99.6	100.7
7	2016	66	99.4	100.6	99.9	101.5	99.5	100.6
8	2017	65	100.0	100.5	100.3	101.0	100.0	100.3
9	2018	89	99.9	100.0	100.4	100.8	100.0	99.7
10	2019	60	97.3	98.4	97.9	99.4	96.7	97.4
11	2020	26	99.7	99.6	100.1	100.5	99.6	99.4

Standard deviations

Obs	BYR	_FREQ_	novSNP_		nov		nov	
			full_3_	reduc_3_	full_3_	reduc_3_	nov_full_	nov_reduc_
			StdDev	StdDev	StdDev	StdDev	3_StdDev	3_StdDev
1	2010	226	10.0	10.1	9.9	10.0	10.5	10.6
2	2011	167	10.1	9.9	9.9	9.7	10.5	10.5
3	2012	172	10.6	10.5	10.5	10.2	11.1	11.0
4	2013	120	9.7	8.3	9.6	8.2	10.1	9.2
5	2014	104	9.0	7.9	8.9	7.7	9.3	8.4
6	2015	80	10.8	9.1	10.8	8.6	11.1	10.0
7	2016	66	10.3	8.3	10.2	7.9	10.8	9.6
8	2017	65	9.8	8.2	9.5	7.7	10.6	9.5
9	2018	89	9.4	8.5	9.1	8.0	10.3	9.6
10	2019	60	8.3	7.2	8.3	6.9	9.1	8.1
11	2020	26	10.4	10.0	9.7	8.9	11.5	11.3

BV18

Correlations

Obs	BYR	novSNP_		novSNP2005_		nov_full_
		nov_full_	nov_full_	full_	full_reduc_	
		SNP_18	SNP2005_18	reduc_18	18	reduc_18
1	2010	0.995	0.991	0.992	0.991	0.989
2	2011	0.995	0.992	0.990	0.989	0.987
3	2012	0.996	0.994	0.991	0.989	0.988
4	2013	0.997	0.997	0.896	0.898	0.885
5	2014	0.997	0.994	0.855	0.846	0.853
6	2015	0.999	0.997	0.880	0.889	0.890
7	2016	0.998	0.996	0.846	0.853	0.837
8	2017	0.992	0.986	0.879	0.879	0.874
9	2018	0.993	0.989	0.927	0.916	0.912
10	2019	0.991	0.982	0.916	0.912	0.908
11	2020	0.991	0.983	0.970	0.959	0.963

Means

Obs	BYR	_FREQ_	novSNP_		nov		nov_full_	nov_reduc_
			full_18_	reduc_18_	full_18_	reduc_18_		
			mean	mean	mean	mean		
1	2010	226	99.0	99.3	98.4	98.7	99.0	99.3
2	2011	167	96.8	97.4	96.2	96.7	96.8	97.4

3	2012	172	100.2	100.9	99.3	99.9	100.2	101.1
4	2013	120	101.8	103.7	100.7	102.2	101.8	104.1
5	2014	104	102.1	104.2	100.9	102.4	101.9	104.1
6	2015	80	103.2	106.4	101.9	104.4	103.1	106.3
7	2016	66	104.0	106.9	102.5	104.5	103.8	106.9
8	2017	65	106.1	109.6	104.5	107.0	105.9	109.7
9	2018	89	107.2	109.4	105.4	106.9	107.2	109.6
10	2019	60	107.3	110.4	105.4	107.7	106.9	110.2
11	2020	26	109.7	111.5	108.4	109.3	110.0	112.0

Standard deviations

Obs	BYR	_FREQ_	novSNP_		nov		nov	
			full_18_	reduc_18_	full_18_	reduc_18_	nov_full_18_	nov_reduc_18_
			StdDev	StdDev	StdDev	StdDev	StdDev	StdDev
1	2010	226	8.7	8.6	8.7	8.5	9.2	9.2
2	2011	167	8.1	7.9	8.1	7.9	8.4	8.3
3	2012	172	8.7	8.8	8.7	8.8	9.1	9.3
4	2013	120	8.7	7.5	8.7	7.4	9.0	8.4
5	2014	104	9.3	8.0	9.2	8.0	9.5	8.6
6	2015	80	11.4	7.7	11.4	7.5	11.7	8.6
7	2016	66	11.1	9.1	11.0	9.0	11.3	9.9
8	2017	65	9.3	6.7	9.2	6.5	9.7	7.7
9	2018	89	9.6	7.8	9.5	7.6	10.2	9.2
10	2019	60	8.6	7.0	8.6	6.9	9.3	8.3
11	2020	26	8.2	6.0	8.0	5.8	9.3	7.1

BV20

Correlations

Obs	BYR	novSNP_		novSNP2005_	
		nov_full_	nov_full_	full_	full_reduc_
		SNP_20	SNP2005_20	reduc_20	20
1	2010	0.998	0.994	0.997	0.996
2	2011	0.997	0.993	0.996	0.995
3	2012	0.997	0.994	0.993	0.992
4	2013	0.997	0.993	0.903	0.892
5	2014	0.999	0.997	0.922	0.914
6	2015	0.999	0.997	0.895	0.885
7	2016	0.998	0.995	0.835	0.829
8	2017	0.995	0.987	0.925	0.920
9	2018	0.993	0.980	0.934	0.933

10	2019	0.992	0.982	0.950	0.954	0.948
11	2020	0.981	0.954	0.949	0.951	0.930

Means

Obs	BYR	_FREQ_	novSNP_	novSNP_	nov	nov	nov_full_20_mean	nov_reduc_20_mean
			full_20_	reduc_20_	SNP2005_	SNP2005_		
			mean	mean	full_20_	reduc_20_		
1	2010	226	94.6	94.9	93.9	94.1	94.9	95.2
2	2011	167	95.3	95.3	94.7	94.6	95.5	95.5
3	2012	172	97.3	96.8	96.4	95.8	97.5	97.0
4	2013	120	103.3	102.7	102.4	101.2	103.5	103.1
5	2014	104	104.7	104.0	103.7	102.2	105.0	104.6
6	2015	80	110.7	109.6	109.5	107.6	110.8	110.1
7	2016	66	109.9	110.1	108.7	107.7	110.2	111.0
8	2017	65	112.2	111.3	110.7	108.9	112.5	111.9
9	2018	89	113.2	112.2	112.0	110.0	113.7	113.0
10	2019	60	113.7	112.1	112.5	110.1	114.0	112.8
11	2020	26	110.3	108.9	109.5	107.2	110.9	109.6

Standard deviations

Obs	BYR	_FREQ_	novSNP_	novSNP_	nov	nov	nov_full_20_StdDev	nov_reduc_20_StdDev
			full_20_	reduc_20_	SNP2005_	SNP2005_		
			StdDev	StdDev	full_20_	reduc_20_		
1	2010	226	10.4	10.4	10.4	10.3	10.6	10.6
2	2011	167	9.4	9.4	9.4	9.4	9.7	9.7
3	2012	172	8.9	8.6	8.9	8.6	9.1	8.9
4	2013	120	9.1	7.9	9.1	7.8	9.4	8.4
5	2014	104	11.0	9.5	11.0	9.2	11.2	10.3
6	2015	80	11.4	9.4	11.4	9.2	11.6	10.3
7	2016	66	10.1	8.1	10.1	7.8	10.3	8.7
8	2017	65	10.0	9.0	9.8	8.8	10.6	10.0
9	2018	89	8.9	8.2	8.8	8.0	9.5	9.0
10	2019	60	9.0	7.9	9.1	8.0	9.6	8.7
11	2020	26	8.5	8.6	8.6	8.6	8.6	9.0

Cows

BV3

Correlations

				novSNP_	novSNP2005_	
		nov_full_	nov_full_	full_	full_reduc_	nov_full_
Obs	BYR	SNP_3	SNP2005_3	reduc_3	3	reduc_3
1	2010	0.992	0.974	0.993	0.989	0.990
2	2011	0.992	0.974	0.992	0.988	0.988
3	2012	0.990	0.972	0.991	0.986	0.987
4	2013	0.991	0.976	0.991	0.987	0.988
5	2014	0.991	0.974	0.989	0.985	0.985
6	2015	0.990	0.973	0.974	0.967	0.971
7	2016	0.990	0.973	0.929	0.916	0.934
8	2017	0.989	0.973	0.927	0.914	0.930
9	2018	0.990	0.974	0.909	0.904	0.913
10	2019	0.989	0.973	0.908	0.898	0.914
11	2020	0.985	0.965	0.941	0.932	0.942
12	2021	0.985	0.964	0.949	0.939	0.948

Means

Obs	BYR	_FREQ_	nov		nov		nov_full_	nov_reduc_
			novSNP_	novSNP_	SNP2005_	SNP2005_		
			full_3_	reduc_	full_3_	reduc_		
			mean	3_mean	mean	3_mean		
1	2010	1713	102.1	102.2	102.5	102.5	102.1	102.1
2	2011	3389	102.4	102.4	102.8	102.7	102.3	102.3
3	2012	5332	102.7	102.6	103.0	103.0	102.6	102.5
4	2013	8921	102.3	102.4	102.6	102.7	102.2	102.2
5	2014	10437	102.1	102.5	102.4	102.7	101.9	102.3
6	2015	13066	101.4	102.1	101.7	102.4	101.3	102.0
7	2016	20130	101.5	102.3	101.8	102.7	101.3	102.1
8	2017	30045	100.5	101.4	100.8	101.9	100.3	101.2
9	2018	42274	100.5	101.0	100.8	101.6	100.3	100.8
10	2019	47428	99.7	100.7	100.1	101.5	99.5	100.3
11	2020	52259	100.0	101.0	100.3	101.5	99.8	100.6
12	2021	5139	99.5	100.4	99.9	101.2	99.1	99.8

Standard deviations

					nov	nov		
			novSNP_	novSNP_	SNP2005_	SNP2005_		
			full_3_	reduc_3_	full_3_	reduc_3_	nov_full_	nov_reduc_
Obs	BYR	_FREQ_	StdDev	StdDev	StdDev	StdDev	3_StdDev	3_StdDev
1	2010	1713	9.4	9.3	9.2	9.0	10.2	10.0
2	2011	3389	9.2	9.1	9.0	8.7	10.0	9.9
3	2012	5332	8.9	8.7	8.7	8.4	9.8	9.6

4	2013	8921	9.4	9.2	9.1	8.8	10.2	10.1
5	2014	10437	9.0	8.8	8.7	8.4	9.8	9.7
6	2015	13066	8.8	8.5	8.6	8.1	9.7	9.5
7	2016	20130	8.6	8.1	8.4	7.6	9.5	9.1
8	2017	30045	8.7	8.0	8.5	7.5	9.6	9.1
9	2018	42274	9.1	8.1	8.9	7.5	9.9	9.3
10	2019	47428	9.0	7.8	8.7	7.2	9.9	9.0
11	2020	52259	8.4	7.7	8.1	7.2	9.4	8.9
12	2021	5139	8.1	7.6	7.8	7.0	9.1	8.8

BV18

Correlations

Obs	BYR	nov_full_	nov_full_	novSNP_	novSNP2005_	nov_full_
		SNP_18	SNP2005_18	full_	full_reduc_	
				reduc_18	18	reduc_18
1	2010	0.989	0.979	0.983	0.980	0.975
2	2011	0.988	0.978	0.983	0.980	0.976
3	2012	0.988	0.980	0.984	0.980	0.977
4	2013	0.986	0.977	0.979	0.975	0.970
5	2014	0.987	0.980	0.982	0.979	0.975
6	2015	0.988	0.981	0.968	0.964	0.960
7	2016	0.987	0.980	0.930	0.927	0.922
8	2017	0.988	0.981	0.906	0.905	0.910
9	2018	0.988	0.982	0.900	0.901	0.898
10	2019	0.987	0.980	0.891	0.886	0.891
11	2020	0.983	0.975	0.923	0.919	0.917
12	2021	0.982	0.973	0.928	0.918	0.920

Means

Obs	BYR	_FREQ_	novSNP_	novSNP_	nov	nov	nov_full_	nov_reduc_
			full_18_	reduc_18_	SNP2005_	SNP2005_		
			mean	mean	full_18_	reduc_18_	18_mean	18_mean
1	2010	1713	99.2	99.4	98.6	98.7	99.5	99.7
2	2011	3389	97.6	97.9	97.0	97.2	97.8	98.1
3	2012	5332	98.9	99.1	98.2	98.3	99.0	99.3
4	2013	8921	99.5	100.0	98.7	99.1	99.7	100.2
5	2014	10437	100.2	100.8	99.3	99.7	100.3	101.1
6	2015	13066	101.3	102.2	100.2	100.9	101.4	102.5
7	2016	20130	100.7	102.1	99.6	100.5	100.8	102.3
8	2017	30045	102.5	104.4	101.2	102.5	102.7	104.6
9	2018	42274	102.5	105.1	101.1	102.9	102.7	105.3

10	2019	47428	105.2	107.3	103.6	104.9	105.3	107.7
11	2020	52259	105.0	107.6	103.3	105.2	105.3	107.9
12	2021	5139	105.9	108.1	104.3	105.9	106.2	108.5

Standard deviations

Obs	BYR	_FREQ_	novSNP_	novSNP_	nov	nov	nov_full_18_StdDev	nov_reduc_18_StdDev
			full_18_	reduc_18_	SNP2005_	SNP2005_		
			StdDev	StdDev	full_18_StdDev	reduc_18_StdDev		
1	2010	1713	7.8	7.6	7.7	7.4	8.5	8.4
2	2011	3389	8.0	7.8	7.9	7.6	8.8	8.6
3	2012	5332	8.5	8.2	8.3	8.0	9.2	9.1
4	2013	8921	7.8	7.6	7.7	7.4	8.6	8.4
5	2014	10437	8.7	8.4	8.6	8.2	9.4	9.2
6	2015	13066	8.4	7.9	8.3	7.7	9.1	8.7
7	2016	20130	8.4	7.4	8.3	7.2	9.1	8.4
8	2017	30045	8.5	7.0	8.4	6.8	9.3	8.0
9	2018	42274	8.9	6.9	8.8	6.7	9.6	8.0
10	2019	47428	8.5	6.6	8.4	6.4	9.3	7.7
11	2020	52259	8.0	6.5	7.9	6.3	8.9	7.7
12	2021	5139	7.8	6.5	7.6	6.3	8.7	7.8

BV20

Correlations

Obs	BYR	nov_full_	nov_full_	novSNP_	novSNP2005_	nov_full_
		SNP_20	SNP2005_20	full_reduc_20	full_reduc_20	
1	2010	0.995	0.986	0.995	0.993	0.994
2	2011	0.994	0.985	0.994	0.992	0.992
3	2012	0.992	0.983	0.993	0.991	0.992
4	2013	0.993	0.985	0.993	0.991	0.992
5	2014	0.992	0.984	0.992	0.990	0.990
6	2015	0.992	0.984	0.985	0.982	0.984
7	2016	0.991	0.983	0.960	0.954	0.961
8	2017	0.992	0.984	0.954	0.951	0.955
9	2018	0.990	0.982	0.942	0.934	0.942
10	2019	0.990	0.981	0.940	0.935	0.943
11	2020	0.986	0.973	0.964	0.959	0.963
12	2021	0.986	0.973	0.969	0.965	0.967

Means

Obs	BYR	_FREQ_	novSNP_		nov		nov	
			full_20_	reduc_20_	SNP2005_	SNP2005_	nov_full_	nov_reduc_
			mean	mean	full_20_	reduc_20_	20_mean	20_mean
					mean	mean		
1	2010	1713	89.5	89.6	88.6	88.7	89.6	89.7
2	2011	3389	90.2	90.4	89.3	89.5	90.3	90.6
3	2012	5332	91.5	91.8	90.7	90.8	91.7	91.9
4	2013	8921	94.6	94.7	93.7	93.7	94.8	94.9
5	2014	10437	95.3	95.2	94.3	94.1	95.5	95.4
6	2015	13066	97.9	97.5	96.9	96.3	98.1	97.8
7	2016	20130	99.4	99.1	98.3	97.5	99.7	99.6
8	2017	30045	103.1	102.6	101.9	100.6	103.5	103.3
9	2018	42274	104.8	104.4	103.5	102.2	105.2	105.2
10	2019	47428	105.7	105.0	104.2	102.6	106.1	105.9
11	2020	52259	107.2	106.5	105.6	104.1	107.6	107.3
12	2021	5139	107.8	107.0	106.3	104.7	108.4	107.9

Standard deviations

Obs	BYR	_FREQ_	novSNP_		nov		nov	
			full_20_	reduc_20_	SNP2005_	SNP2005_	nov_full_	nov_reduc_
			StdDev	StdDev	full_20_	reduc_20_	20_StdDev	20_StdDev
					StdDev	StdDev		
1	2010	1713	10.2	10.1	10.2	9.9	10.8	10.7
2	2011	3389	10.0	9.8	9.9	9.6	10.6	10.5
3	2012	5332	9.9	9.8	9.8	9.5	10.6	10.5
4	2013	8921	10.3	10.1	10.2	9.8	10.9	10.8
5	2014	10437	10.0	9.8	9.9	9.6	10.7	10.6
6	2015	13066	10.2	9.8	10.1	9.6	10.8	10.6
7	2016	20130	9.9	9.2	9.8	8.8	10.5	10.1
8	2017	30045	10.2	9.4	10.1	9.1	10.9	10.3
9	2018	42274	9.7	8.9	9.6	8.5	10.4	9.8
10	2019	47428	9.6	8.7	9.5	8.4	10.3	9.6
11	2020	52259	9.2	8.5	9.0	8.1	9.9	9.5
12	2021	5139	9.2	8.6	9.0	8.3	10.0	9.6

RDC

Bulls

Correlations to EBV and singlestep full

	BV3			BV18			BV20		
	EBV SNP_full	EBV SNP2005_full	EBV curr_full	EBV SNP_full	EBV SNP2005_full	EBV curr_full	EBV SNP_full	EBV SNP2005_full	EBV curr_full
2010	0.921	0.928	0.890	0.956	0.957	0.941	0.926	0.929	0.904
2011	0.924	0.930	0.900	0.913	0.908	0.875	0.897	0.901	0.879
2012	0.945	0.950	0.924	0.954	0.955	0.939	0.951	0.954	0.943
2013	0.912	0.922	0.878	0.951	0.949	0.925	0.887	0.890	0.854
2014	0.940	0.946	0.895	0.895	0.907	0.852	0.949	0.951	0.932
2015	0.957	0.962	0.920	0.945	0.944	0.902	0.899	0.893	0.881
2016	0.940	0.938	0.916	0.963	0.962	0.943	0.954	0.957	0.931
2017	0.847	0.844	0.786	0.798	0.787	0.763	0.840	0.836	0.810
2018	0.861	0.868	0.793	0.810	0.793	0.719	0.761	0.738	0.692
2019	0.742	0.745	0.652	0.700	0.699	0.646	0.552	0.574	0.502
2020	0.685	0.724	0.515	0.516	0.537	0.414	0.622	0.592	0.573

Correlations to EBV and singlestep reduc

	BV3			BV18			BV20		
	EBV SNP_reduc	EBV SNP2005_reduc	EBV curr_reduc	EBV SNP_reduc	EBV SNP2005_reduc	EBV curr_reduc	EBV SNP_reduc	EBV SNP2005_reduc	EBV curr_reduc
2010	0.937	0.946	0.923	0.938	0.942	0.923	0.929	0.937	0.921
2011	0.931	0.939	0.925	0.934	0.942	0.914	0.938	0.946	0.922
2012	0.908	0.917	0.902	0.944	0.948	0.927	0.923	0.931	0.909
2013	0.724	0.727	0.726	0.816	0.818	0.794	0.820	0.816	0.812
2014	0.744	0.707	0.761	0.799	0.794	0.785	0.875	0.869	0.884
2015	0.731	0.747	0.723	0.798	0.819	0.807	0.853	0.840	0.858
2016	0.720	0.720	0.737	0.779	0.795	0.766	0.762	0.756	0.757
2017	0.492	0.502	0.472	0.681	0.684	0.641	0.709	0.720	0.695
2018	0.516	0.511	0.507	0.716	0.722	0.663	0.505	0.519	0.482
2019	0.491	0.479	0.459	0.649	0.700	0.630	0.557	0.619	0.517
2020	0.461	0.377	0.472	0.840	0.836	0.818	0.269	0.337	0.173

BV3

Correlations

			augfull_ nov	augfull_nov SNP2005full_ 3	novSNP_ full_ reduc_3	novSNP2005_ full_reduc_ 3	aug_full_ reduc_3
	Obs	BYR	SNPfull_3	3	reduc_3	3	reduc_3
	1	2010	0.987	0.979	0.991	0.990	0.986
	2	2011	0.989	0.983	0.991	0.989	0.985
	3	2012	0.987	0.983	0.989	0.987	0.983
	4	2013	0.987	0.982	0.893	0.890	0.897
	5	2014	0.984	0.977	0.892	0.888	0.903
	6	2015	0.988	0.985	0.883	0.862	0.887
	7	2016	0.990	0.989	0.836	0.834	0.843
	8	2017	0.967	0.961	0.871	0.848	0.899
	9	2018	0.973	0.966	0.889	0.886	0.894
	10	2019	0.960	0.947	0.867	0.841	0.882
	11	2020	0.958	0.927	0.862	0.857	0.818

Means

Obs	BYR	_FREQ_	nov		nov		aug_full_3_mean	aug_reduc_3_mean
			novSNP_full_3_mean	novSNP_reduc_3_mean	SNP2005_full_3_mean	SNP2005_reduc_3_mean		
1	2010	230	101.5	101.5	101.9	101.8	101.0	101.0
2	2011	214	104.7	104.7	104.9	105.0	104.4	104.5
3	2012	151	101.1	101.2	101.5	101.6	100.9	101.1
4	2013	119	100.0	100.8	100.4	101.2	99.6	100.7
5	2014	73	101.3	102.1	101.7	102.4	101.2	102.2
6	2015	50	99.9	100.0	100.3	100.4	100.3	99.8
7	2016	47	100.2	100.0	100.8	100.8	99.6	99.7
8	2017	79	100.6	100.8	101.3	101.7	99.7	100.1
9	2018	63	101.6	101.5	102.1	102.0	101.0	101.3
10	2019	49	99.3	98.8	100.1	99.9	98.4	97.7
11	2020	29	102.9	103.4	103.0	103.6	101.6	103.1

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_3_StdDev	aug_reduc_3_StdDev
			novSNP_full_3_StdDev	novSNP_reduc_3_StdDev	SNP2005_full_3_StdDev	SNP2005_reduc_3_StdDev		
1	2010	230	9.8	9.7	9.7	9.5	10.6	10.5
2	2011	214	9.7	9.4	9.5	9.1	10.5	10.4
3	2012	151	10.4	10.2	10.2	9.8	11.2	10.9
4	2013	119	10.2	8.9	10.1	8.7	10.9	10.0
5	2014	73	10.6	8.4	10.5	8.4	11.2	8.9
6	2015	50	12.2	7.9	12.1	7.6	12.8	9.8
7	2016	47	11.2	8.3	11.1	8.1	11.5	9.7
8	2017	79	8.7	6.5	8.5	6.3	9.6	8.2
9	2018	63	8.0	6.3	7.8	6.1	8.8	7.7
10	2019	49	7.4	6.5	7.2	6.1	8.5	8.2
11	2020	29	5.9	4.9	5.9	4.8	7.3	6.3

BV18

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 18	novSNP_ full_ reduc_18	novSNP2005_ full_reduc_ 18	aug_full_ reduc_18
		SNPfull_18				
1	2010	0.994	0.990	0.993	0.992	0.989
2	2011	0.989	0.986	0.987	0.985	0.981
3	2012	0.992	0.989	0.987	0.987	0.983
4	2013	0.990	0.985	0.898	0.901	0.900
5	2014	0.989	0.981	0.901	0.892	0.902
6	2015	0.985	0.981	0.750	0.747	0.790
7	2016	0.985	0.984	0.783	0.772	0.791
8	2017	0.963	0.950	0.826	0.806	0.877
9	2018	0.972	0.957	0.834	0.791	0.859
10	2019	0.967	0.957	0.896	0.873	0.882
11	2020	0.968	0.941	0.862	0.852	0.876

---Means

Obs	BYR	_FREQ_	novSNP_ full_18_ mean	novSNP_ reduc_18_ mean	nov SNP2005_ full_18_ mean	nov SNP2005_ reduc_18_ mean	aug_full_ 18_mean	aug_reduc_ 18_mean
1	2010	230	100.6	100.9	100.3	100.6	101.1	101.5
2	2011	214	98.7	99.1	98.1	98.3	99.3	99.8
3	2012	151	101.4	101.7	100.6	100.8	102.2	102.6
4	2013	119	101.0	102.2	100.0	100.8	102.0	103.2
5	2014	73	101.2	102.6	100.0	101.0	102.1	104.0
6	2015	50	103.5	106.6	102.1	104.2	104.2	108.6
7	2016	47	104.4	108.2	102.7	105.4	105.5	110.4
8	2017	79	107.3	109.2	105.5	106.5	109.0	111.8
9	2018	63	107.3	109.6	105.7	106.9	108.7	112.4
10	2019	49	109.1	111.2	106.8	107.6	111.4	114.7
11	2020	29	110.9	112.4	108.9	109.0	113.7	116.4

---Standard deviations

Obs	BYR	_FREQ_	novSNP_ full_18_ StdDev	novSNP_ reduc_18_ StdDev	nov SNP2005_ full_18_ StdDev	nov SNP2005_ reduc_18_ StdDev	aug_full_ 18_StdDev	aug_reduc_ 18_StdDev
1	2010	230	10.2	10.2	10.2	10.2	10.8	10.8
2	2011	214	8.3	8.2	8.3	8.1	8.9	8.8
3	2012	151	8.1	8.2	8.1	8.2	8.6	8.9
4	2013	119	8.3	7.7	8.3	7.5	9.1	8.8
5	2014	73	7.7	7.1	7.6	6.9	8.2	8.3
6	2015	50	8.5	6.1	8.6	6.2	9.2	7.5
7	2016	47	8.9	6.5	8.8	6.7	9.6	7.8

8	2017	79	7.3	6.4	7.0	5.9	8.0	8.0
9	2018	63	6.6	5.8	6.2	5.3	7.4	6.8
10	2019	49	6.8	5.3	6.6	5.1	7.8	6.9
11	2020	29	5.9	5.9	5.8	5.5	7.4	7.4

BV20

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 20	novSNP_ full_ reduc_20	novSNP2005_ full_reduc_ 20	aug_full_ reduc_20
		SNPfull_20				
1	2010	0.992	0.990	0.994	0.993	0.988
2	2011	0.991	0.985	0.994	0.992	0.986
3	2012	0.994	0.993	0.993	0.992	0.989
4	2013	0.989	0.985	0.878	0.871	0.880
5	2014	0.993	0.990	0.887	0.872	0.903
6	2015	0.991	0.989	0.732	0.752	0.754
7	2016	0.987	0.984	0.837	0.843	0.873
8	2017	0.965	0.959	0.872	0.850	0.912
9	2018	0.977	0.968	0.904	0.881	0.900
10	2019	0.943	0.928	0.760	0.740	0.816
11	2020	0.974	0.964	0.873	0.861	0.869

Means

Obs	BYR	_FREQ_	novSNP_ full_20_	novSNP_ reduc_20_	nov SNP2005_ full_20_	nov SNP2005_ reduc_20_	aug_full_ 20_mean	aug_reduc_ 20_mean
			mean	mean	mean	mean		
1	2010	230	95.3	95.4	94.9	95.1	95.9	95.9
2	2011	214	94.7	94.8	94.1	94.2	95.5	95.5
3	2012	151	97.8	97.6	97.1	96.7	98.7	98.3
4	2013	119	97.8	97.7	97.0	96.5	99.0	98.7
5	2014	73	101.3	100.5	100.3	99.0	102.0	101.8
6	2015	50	106.1	106.8	104.8	104.4	107.2	109.1
7	2016	47	106.7	105.7	105.4	103.1	108.1	108.6
8	2017	79	106.6	106.1	105.0	103.3	108.0	108.8
9	2018	63	105.3	104.7	103.9	102.3	106.8	106.9
10	2019	49	109.8	109.6	107.7	106.1	112.4	113.2
11	2020	29	110.0	109.0	108.7	106.6	112.3	112.3

Standard deviations

novSNP_ novSNP_	nov SNP2005_ SNP2005_
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Obs	BYR	_FREQ_	full_20_	reduc_20_	full_20_	reduc_20_	aug_full_	aug_reduc_
			StdDev	StdDev	StdDev	StdDev	20_StdDev	20_StdDev
1	2010	230	9.2	9.0	9.1	8.9	9.6	9.7
2	2011	214	8.1	7.9	8.0	7.8	8.6	8.6
3	2012	151	9.2	9.0	9.2	9.0	9.8	9.7
4	2013	119	8.0	6.7	8.0	6.6	8.7	7.6
5	2014	73	9.3	7.5	9.3	7.5	9.7	8.8
6	2015	50	8.2	6.0	8.3	5.5	8.6	7.3
7	2016	47	9.2	6.6	9.2	6.2	9.7	8.5
8	2017	79	8.4	6.9	8.1	6.5	9.6	8.8
9	2018	63	7.0	6.2	6.6	5.6	7.8	7.4
10	2019	49	6.1	6.2	6.0	6.1	7.6	8.0
11	2020	29	6.0	5.2	5.9	5.0	6.9	6.8

Cows

BV3

Correlations

Obs	BYR	augfull_	augfull_nov	novSNP_	novSNP2005_	aug_full_
		nov	SNP2005full_	full_	full_reduc_	
		SNPfull_3	3	reduc_3	3	
1	2010	0.979	0.967	0.990	0.989	0.980
2	2011	0.977	0.965	0.989	0.987	0.977
3	2012	0.978	0.966	0.989	0.986	0.977
4	2013	0.978	0.966	0.986	0.983	0.973
5	2014	0.978	0.968	0.986	0.983	0.973
6	2015	0.979	0.969	0.959	0.955	0.953
7	2016	0.978	0.968	0.894	0.887	0.898
8	2017	0.976	0.965	0.863	0.840	0.885
9	2018	0.976	0.966	0.884	0.871	0.894
10	2019	0.963	0.950	0.869	0.853	0.887
11	2020	0.963	0.949	0.921	0.907	0.910
12	2021	0.970	0.957	0.918	0.908	0.915

Means

Obs	BYR	_FREQ_	novSNP_	novSNP_	nov	nov	aug_full_	aug_reduc_
			full_3_	reduc_	SNP2005_	SNP2005_		
			mean	3_mean	mean	3_mean		
1	2010	3705	102.3	102.3	102.7	102.7	102.1	102.1
2	2011	6480	102.4	102.4	102.8	102.7	102.1	102.1

3	2012	7294	102.2	102.2	102.6	102.5	102.0	102.0
4	2013	7700	102.9	103.0	103.2	103.3	102.7	102.8
5	2014	8577	102.8	103.0	103.1	103.3	102.4	102.7
6	2015	11219	100.9	101.5	101.3	101.9	100.5	101.0
7	2016	15540	101.4	101.8	101.8	102.2	100.9	101.4
8	2017	18558	100.4	100.9	100.9	101.4	100.0	100.3
9	2018	20835	100.9	101.3	101.4	101.7	100.4	100.8
10	2019	20943	100.5	100.8	101.1	101.4	100.0	100.2
11	2020	21775	102.7	102.1	103.3	102.7	101.9	101.6
12	2021	2287	103.5	102.6	104.0	103.1	102.9	102.6

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_ 3_StdDev	aug_reduc_ 3_StdDev
			novSNP_ full_3_ StdDev	novSNP_ reduc_3_ StdDev	SNP2005_ full_3_ StdDev	SNP2005_ reduc_3_ StdDev		
1	2010	3705	9.5	9.3	9.4	9.1	10.4	10.3
2	2011	6480	9.1	8.9	8.9	8.6	10.0	9.8
3	2012	7294	9.3	9.2	9.2	9.0	10.2	10.1
4	2013	7700	9.1	8.8	8.9	8.6	10.1	9.8
5	2014	8577	9.3	9.1	9.1	8.8	10.3	10.1
6	2015	11219	9.2	8.3	9.0	8.0	10.2	9.6
7	2016	15540	8.8	7.8	8.6	7.6	9.9	9.1
8	2017	18558	8.7	6.9	8.5	6.6	9.8	8.3
9	2018	20835	9.1	7.0	8.9	6.8	10.1	8.6
10	2019	20943	8.0	6.3	7.7	6.0	9.1	8.0
11	2020	21775	7.9	6.6	7.6	6.3	9.0	8.3
12	2021	2287	8.1	6.6	7.8	6.3	9.5	8.6

BV18

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 18	novSNP_ full_ reduc_18	novSNP2005_ full_reduc_ 18	aug_full_ reduc_18
		SNPfull_18				
1	2010	0.984	0.977	0.989	0.987	0.981
2	2011	0.983	0.975	0.987	0.985	0.978
3	2012	0.983	0.975	0.986	0.984	0.976
4	2013	0.982	0.975	0.984	0.982	0.974
5	2014	0.981	0.974	0.982	0.980	0.971
6	2015	0.981	0.973	0.953	0.952	0.941
7	2016	0.980	0.973	0.906	0.902	0.904
8	2017	0.979	0.972	0.874	0.861	0.877

9	2018	0.975	0.967	0.824	0.821	0.844
10	2019	0.961	0.952	0.843	0.823	0.864
11	2020	0.966	0.952	0.887	0.880	0.885
12	2021	0.966	0.950	0.880	0.873	0.878

Means

Obs	BYR	_FREQ_	nov		nov		aug_full_18_mean	aug_reduc_18_mean
			novSNP_full_18_	novSNP_reduc_18_	SNP2005_full_18_	SNP2005_reduc_18_		
			mean	mean	mean	mean		
1	2010	3705	98.6	98.9	98.0	98.2	99.2	99.6
2	2011	6480	99.9	100.1	99.2	99.4	100.6	101.0
3	2012	7294	99.7	100.0	99.0	99.2	100.5	100.9
4	2013	7700	100.9	101.4	100.1	100.5	101.7	102.3
5	2014	8577	100.7	101.2	99.7	100.1	101.6	102.3
6	2015	11219	101.9	102.8	100.8	101.4	102.9	104.0
7	2016	15540	102.4	103.6	101.2	101.9	103.4	105.1
8	2017	18558	103.2	104.9	101.8	102.9	104.3	106.8
9	2018	20835	103.9	105.9	102.4	103.6	105.1	108.1
10	2019	20943	105.7	107.8	103.8	105.1	107.2	110.5
11	2020	21775	106.2	107.6	104.2	104.6	108.0	110.1
12	2021	2287	106.7	108.3	104.8	105.5	108.6	111.2

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_18_StdDev	aug_reduc_18_StdDev
			novSNP_full_18_	novSNP_reduc_18_	SNP2005_full_18_	SNP2005_reduc_18_		
			StdDev	StdDev	StdDev	StdDev		
1	2010	3705	8.8	8.7	8.7	8.6	9.6	9.6
2	2011	6480	8.4	8.2	8.4	8.1	9.3	9.1
3	2012	7294	8.2	8.0	8.1	7.9	9.1	9.0
4	2013	7700	8.4	8.2	8.3	8.1	9.3	9.1
5	2014	8577	8.1	7.9	8.1	7.8	9.0	8.9
6	2015	11219	7.8	7.4	7.8	7.3	8.8	8.5
7	2016	15540	7.8	6.7	7.8	6.6	8.8	8.0
8	2017	18558	7.5	6.3	7.4	6.1	8.5	7.6
9	2018	20835	7.2	5.8	7.1	5.7	8.2	7.2
10	2019	20943	7.2	5.9	7.1	5.8	8.1	7.3
11	2020	21775	6.3	5.4	6.2	5.3	7.4	6.9
12	2021	2287	6.0	5.0	6.0	4.9	7.3	6.5

BV20

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 20	novSNP_ full_ reduc_20	novSNP2005_ full_reduc_ 20	aug_full_ reduc_20
		SNPfull_20	20	reduc_20	20	reduc_20
1	2010	0.986	0.982	0.993	0.991	0.983
2	2011	0.985	0.979	0.991	0.989	0.980
3	2012	0.983	0.978	0.988	0.986	0.976
4	2013	0.982	0.978	0.986	0.983	0.973
5	2014	0.982	0.979	0.984	0.981	0.972
6	2015	0.982	0.979	0.959	0.953	0.943
7	2016	0.980	0.977	0.918	0.907	0.909
8	2017	0.981	0.978	0.853	0.845	0.868
9	2018	0.975	0.972	0.879	0.876	0.875
10	2019	0.964	0.959	0.862	0.858	0.891
11	2020	0.967	0.962	0.878	0.869	0.900
12	2021	0.969	0.964	0.902	0.894	0.901

Means

Obs	BYR	_FREQ_	novSNP_ full_20_	novSNP_ reduc_20_	nov SNP2005_ full_20_	nov SNP2005_ reduc_20_	aug_full_ 20_mean	aug_reduc_ 20_mean
			mean	mean	mean	mean		
1	2010	3705	93.2	93.3	92.5	92.6	93.7	93.7
2	2011	6480	93.9	94.0	93.2	93.3	94.6	94.6
3	2012	7294	94.2	94.3	93.4	93.6	94.8	94.9
4	2013	7700	95.5	95.6	94.6	94.7	96.1	96.2
5	2014	8577	96.6	96.6	95.7	95.6	97.4	97.4
6	2015	11219	98.6	98.4	97.5	97.1	99.4	99.4
7	2016	15540	100.9	100.4	99.8	98.8	101.8	101.9
8	2017	18558	102.4	101.7	101.1	99.6	103.4	103.7
9	2018	20835	103.6	103.3	102.2	101.1	104.8	105.6
10	2019	20943	104.9	104.4	103.2	101.6	106.6	107.1
11	2020	21775	105.8	105.6	104.0	102.7	107.5	108.6
12	2021	2287	105.3	104.6	103.6	101.8	106.9	107.1

Standard deviations

Obs	BYR	_FREQ_	novSNP_ full_20_	novSNP_ reduc_20_	nov SNP2005_ full_20_	nov SNP2005_ reduc_20_	aug_full_ 20_StdDev	aug_reduc_ 20_StdDev
			StdDev	StdDev	StdDev	StdDev		

1	2010	3705	9.3	9.1	9.3	9.0	10.1	10.1
2	2011	6480	8.6	8.4	8.6	8.3	9.4	9.3
3	2012	7294	8.0	7.8	8.0	7.6	8.9	8.8
4	2013	7700	7.9	7.6	7.8	7.4	8.9	8.7
5	2014	8577	7.9	7.5	7.8	7.4	8.8	8.6
6	2015	11219	8.0	7.4	7.9	7.2	8.9	8.6
7	2016	15540	7.7	6.7	7.6	6.5	8.7	8.1
8	2017	18558	8.1	6.8	8.1	6.6	9.0	8.3
9	2018	20835	7.5	6.3	7.4	6.0	8.4	7.8
10	2019	20943	7.5	6.2	7.5	6.0	8.5	7.8
11	2020	21775	7.0	6.0	6.9	5.7	8.0	7.6
12	2021	2287	6.9	5.9	6.8	5.6	8.0	7.5

JER

Bulls

Correlations to EBV and singlestep full

	BV3			BV18			BV20		
	EBV SNP_full	EBV SNP2005_full	EBV curr_full	EBV SNP_full	EBV SNP2005_full	EBV curr_full	EBV SNP_full	EBV SNP2005_full	EBV curr_full
2010	0.960	0.961	0.937	0.936	0.942	0.918	0.956	0.956	0.929
2011	0.934	0.938	0.900	0.923	0.925	0.891	0.899	0.900	0.863
2012	0.943	0.944	0.920	0.972	0.973	0.957	0.969	0.970	0.965
2013	0.961	0.960	0.947	0.951	0.950	0.923	0.941	0.946	0.921
2014	0.943	0.947	0.895	0.941	0.946	0.919	0.911	0.917	0.881
2015	0.926	0.934	0.895	0.893	0.900	0.848	0.952	0.953	0.935
2016	0.945	0.951	0.908	0.982	0.984	0.959	0.969	0.966	0.949
2017	0.911	0.899	0.902	0.702	0.720	0.711	0.835	0.832	0.879
2018	0.701	0.720	0.592	0.849	0.864	0.776	0.845	0.843	0.821
2019	0.685	0.682	0.610	0.668	0.671	0.638	0.739	0.753	0.696
2020	0.380	0.397	0.283	0.760	0.750	0.680	0.879	0.877	0.882

Correlations to EBV and singlestep reduc

	BV3			BV18			BV20		
	EBV SNP_reduc	EBV SNP2005_reduc	EBV curr_reduc	EBV SNP_reduc	EBV SNP2005_reduc	EBV curr_reduc	EBV SNP_reduc	EBV SNP2005_reduc	EBV curr_reduc
2010	0.937	0.946	0.923	0.938	0.942	0.923	0.929	0.937	0.921
2011	0.931	0.939	0.925	0.934	0.942	0.914	0.938	0.946	0.922
2012	0.908	0.917	0.902	0.944	0.948	0.927	0.923	0.931	0.909
2013	0.724	0.727	0.726	0.816	0.818	0.794	0.820	0.816	0.812
2014	0.744	0.707	0.761	0.799	0.794	0.785	0.875	0.869	0.884
2015	0.731	0.747	0.723	0.798	0.819	0.807	0.853	0.840	0.858
2016	0.720	0.720	0.737	0.779	0.795	0.766	0.762	0.756	0.757
2017	0.492	0.502	0.472	0.681	0.684	0.641	0.709	0.720	0.695
2018	0.516	0.511	0.507	0.716	0.722	0.663	0.505	0.519	0.482
2019	0.491	0.479	0.459	0.649	0.700	0.630	0.557	0.619	0.517
2020	0.461	0.377	0.472	0.840	0.836	0.818	0.269	0.337	0.173

BV3

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 3	novSNP_ full_ reduc_3	novSNP2005_ full_reduc_ 3	aug_full_ reduc_3
		SNPfull_3				
1	2010	0.991	0.989	0.994	0.993	0.991
2	2011	0.989	0.985	0.987	0.985	0.982
3	2012	0.992	0.990	0.991	0.990	0.988
4	2013	0.991	0.988	0.824	0.819	0.842
5	2014	0.983	0.979	0.877	0.868	0.874
6	2015	0.986	0.981	0.740	0.755	0.810
7	2016	0.983	0.982	0.701	0.664	0.803
8	2017	0.952	0.948	0.872	0.861	0.871
9	2018	0.955	0.949	0.763	0.767	0.859
10	2019	0.946	0.935	0.864	0.839	0.901
11	2020	0.967	0.968	0.776	0.788	0.887

Means

Obs	BYR	_FREQ_	novSNP_ full_3_ mean	novSNP_ reduc_ 3_mean	nov SNP2005_ full_3_ mean	nov SNP2005_ reduc_ 3_mean	aug_full_ 3_mean	aug_reduc_ 3_mean
1	2010	73	101.3	101.8	101.2	101.7	101.7	102.2
2	2011	75	101.5	101.7	101.2	101.4	102.2	102.2
3	2012	58	100.6	101.4	100.4	101.2	101.0	101.9
4	2013	67	101.0	100.4	100.8	100.2	101.5	100.9
5	2014	64	98.5	99.2	98.1	98.8	99.2	100.4
6	2015	52	100.9	102.1	100.7	101.9	101.8	102.9
7	2016	32	101.3	99.7	100.9	99.2	102.6	101.0
8	2017	38	99.4	101.6	99.1	101.1	100.1	102.7
9	2018	24	99.4	99.6	99.3	99.5	100.9	101.2
10	2019	51	99.0	101.1	98.4	100.4	100.1	102.9
11	2020	14	100.7	100.6	100.5	100.3	101.6	102.7

Standard deviations

Obs	BYR	_FREQ_	novSNP_ full_3_ StdDev	novSNP_ reduc_3_ StdDev	nov SNP2005_ full_3_ StdDev	nov SNP2005_ reduc_3_ StdDev	aug_full_ 3_StdDev	aug_reduc_ 3_StdDev

1	2010	73	11.6	11.2	11.5	11.0	12.9	12.8
2	2011	75	11.0	11.0	10.8	10.7	12.3	12.6
3	2012	58	12.0	11.9	11.8	11.7	13.3	13.4
4	2013	67	11.0	8.3	10.9	8.1	12.0	9.8
5	2014	64	11.6	9.3	11.5	9.2	12.7	11.0
6	2015	52	10.5	7.4	10.4	7.2	11.8	9.1
7	2016	32	11.3	8.0	11.0	7.3	12.1	10.3
8	2017	38	10.8	6.6	10.6	6.5	11.2	8.7
9	2018	24	7.7	5.9	7.8	5.8	9.9	8.4
10	2019	51	7.7	5.4	7.4	5.0	10.0	8.5
11	2020	14	6.4	5.5	6.8	5.4	8.0	7.9

BV18

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 18	novSNP_ full_ reduc_18	novSNP2005_ full_reduc_ 18	aug_full_ reduc_18
		SNPfull_18				
1	2010	0.994	0.991	0.990	0.990	0.987
2	2011	0.988	0.982	0.987	0.986	0.982
3	2012	0.994	0.993	0.992	0.992	0.989
4	2013	0.991	0.986	0.870	0.861	0.868
5	2014	0.991	0.988	0.844	0.843	0.859
6	2015	0.992	0.987	0.879	0.879	0.904
7	2016	0.988	0.985	0.834	0.836	0.858
8	2017	0.935	0.930	0.819	0.825	0.837
9	2018	0.974	0.957	0.854	0.866	0.884
10	2019	0.962	0.960	0.872	0.868	0.883
11	2020	0.981	0.975	0.796	0.808	0.807

Means

Obs	BYR	_FREQ_	nov		nov		aug_full_18_mean	aug_reduc_18_mean
			novSNP_full_18_mean	novSNP_reduc_18_mean	SNP2005_full_18_mean	SNP2005_reduc_18_mean		
			mean	mean	mean	mean		
1	2010	73	99.1	99.3	98.8	99.0	99.7	99.9
2	2011	75	100.8	101.1	100.2	100.6	101.6	101.9
3	2012	58	100.4	100.6	99.7	100.0	101.5	101.6
4	2013	67	102.4	102.1	101.7	101.2	103.8	103.6
5	2014	64	101.8	102.3	100.9	101.3	103.3	104.0
6	2015	52	102.9	103.0	101.9	101.9	104.6	104.9
7	2016	32	102.4	100.8	101.4	99.4	104.7	102.7
8	2017	38	104.3	104.8	103.2	103.4	106.7	107.8
9	2018	24	110.0	106.6	108.7	104.9	112.9	110.1
10	2019	51	105.4	105.7	104.1	103.8	109.2	109.6
11	2020	14	106.1	105.8	104.9	104.3	109.3	109.5

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_18_StdDev	aug_reduc_18_StdDev
			novSNP_full_18_StdDev	novSNP_reduc_18_StdDev	SNP2005_full_18_StdDev	SNP2005_reduc_18_StdDev		
			StdDev	StdDev	StdDev	StdDev		
1	2010	73	8.1	8.0	8.0	8.0	8.4	8.5
2	2011	75	7.2	7.0	7.2	6.9	7.9	7.7
3	2012	58	9.4	9.4	9.3	9.3	9.7	9.8
4	2013	67	8.4	6.7	8.2	6.4	9.1	7.9
5	2014	64	9.7	7.6	9.5	7.3	10.2	8.6
6	2015	52	9.8	7.6	9.6	7.3	11.1	9.5
7	2016	32	9.0	6.1	8.9	5.9	9.9	7.8
8	2017	38	7.5	5.8	7.5	5.9	8.8	7.7
9	2018	24	7.3	5.2	7.1	5.0	8.2	7.3
10	2019	51	6.9	5.4	6.8	5.1	8.9	7.8
11	2020	14	5.7	4.7	5.7	4.1	7.5	6.5

BV20

Correlations

Obs	BYR	augfull_nov	augfull_nov	novSNP_full_	novSNP2005_full_reduc_	aug_full_reduc_
		SNPfull_20	SNP2005full_20	full_reduc_20	full_reduc_20	full_reduc_20
		SNPfull_20	20	reduc_20	20	reduc_20
1	2010	0.991	0.988	0.996	0.996	0.994
2	2011	0.990	0.988	0.992	0.992	0.991

3	2012	0.994	0.994	0.993	0.993	0.992
4	2013	0.992	0.990	0.872	0.863	0.888
5	2014	0.985	0.982	0.849	0.853	0.869
6	2015	0.994	0.993	0.908	0.901	0.917
7	2016	0.988	0.989	0.868	0.859	0.865
8	2017	0.956	0.954	0.894	0.884	0.885
9	2018	0.953	0.955	0.920	0.913	0.919
10	2019	0.974	0.971	0.910	0.901	0.921
11	2020	0.994	0.993	0.907	0.900	0.880

Means

Obs	BYR	_FREQ_	nov		nov		aug_full_20_mean	aug_reduc_20_mean
			novSNP_full_20_	novSNP_reduc_20_	SNP2005_full_20_	SNP2005_reduc_20_		
			mean	mean	mean	mean		
1	2010	73	93.1	92.9	92.7	92.6	93.9	94.1
2	2011	75	96.9	96.7	96.3	96.2	98.1	98.1
3	2012	58	98.5	97.5	97.7	96.7	99.5	98.6
4	2013	67	96.1	96.5	95.2	95.3	97.0	97.8
5	2014	64	98.2	98.3	97.3	97.1	99.3	99.9
6	2015	52	105.2	103.9	104.1	102.4	106.3	106.5
7	2016	32	102.5	103.6	101.3	101.9	104.4	107.1
8	2017	38	109.8	108.2	108.4	106.3	111.7	112.4
9	2018	24	102.7	103.4	101.3	101.5	104.2	107.0
10	2019	51	111.1	109.2	109.7	107.2	114.0	114.2
11	2020	14	109.4	108.6	108.1	106.8	112.2	114.0

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_20_StdDev	aug_reduc_20_StdDev
			novSNP_full_20_	novSNP_reduc_20_	SNP2005_full_20_	SNP2005_reduc_20_		
			StdDev	StdDev	StdDev	StdDev		
1	2010	73	10.7	10.4	10.6	10.3	11.4	11.4
2	2011	75	10.0	9.7	9.9	9.5	11.1	11.0
3	2012	58	10.8	10.5	10.8	10.5	11.6	11.3
4	2013	67	8.8	7.4	8.8	7.5	9.3	8.5
5	2014	64	8.6	7.1	8.6	7.1	9.3	8.4
6	2015	52	10.8	8.7	10.8	8.4	11.4	10.5
7	2016	32	9.8	7.8	9.8	7.8	10.3	9.2
8	2017	38	10.5	6.8	10.4	6.4	11.3	8.6
9	2018	24	7.3	6.7	7.2	6.5	8.7	8.3
10	2019	51	9.5	7.4	9.5	7.2	10.8	9.5

11	2020	14	8.9	6.2	8.9	6.0	9.5	8.0
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Cows

BV3

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 3	novSNP_ full_ reduc_3	novSNP2005_ full_reduc_ 3	aug_full_ reduc_3
		SNPfull_3				
1	2010	0.974	0.963	0.987	0.986	0.974
2	2011	0.977	0.967	0.987	0.986	0.976
3	2012	0.976	0.967	0.986	0.984	0.974
4	2013	0.976	0.967	0.981	0.980	0.970
5	2014	0.975	0.966	0.981	0.979	0.969
6	2015	0.974	0.967	0.963	0.960	0.956
7	2016	0.974	0.967	0.881	0.874	0.891
8	2017	0.972	0.964	0.823	0.824	0.845
9	2018	0.969	0.960	0.828	0.827	0.881
10	2019	0.953	0.943	0.853	0.844	0.884
11	2020	0.951	0.940	0.858	0.853	0.895
12	2021	0.956	0.944	0.858	0.850	0.893

Means

Obs	BYR	_FREQ_	novSNP_ full_3_ mean	novSNP_ reduc_ 3_mean	nov SNP2005_ full_3_ mean	nov SNP2005_ reduc_ 3_mean	aug_full_ 3_mean	aug_reduc_ 3_mean
1	2010	2324	101.0	101.0	100.9	101.0	101.1	101.2
2	2011	4278	100.6	100.7	100.4	100.7	100.7	101.0
3	2012	4921	101.5	101.7	101.3	101.5	101.6	101.8
4	2013	3844	100.8	101.0	100.7	101.0	100.9	101.2
5	2014	4813	99.4	99.8	99.2	99.7	99.6	100.2
6	2015	5673	101.7	102.4	101.5	102.2	102.0	102.7
7	2016	6616	100.7	100.7	100.5	100.5	101.2	101.6
8	2017	8327	101.1	101.6	100.8	101.3	101.7	102.5
9	2018	10209	101.3	100.3	101.0	100.1	101.9	101.4
10	2019	12407	100.0	101.2	99.7	100.8	100.5	102.1
11	2020	12997	100.3	100.7	100.1	100.4	101.3	101.9
12	2021	1232	100.6	101.6	100.3	101.2	101.5	103.0

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_ 3_StdDev	aug_reduc_ 3_StdDev
			novSNP_ full_3_ StdDev	novSNP_ reduc_3_ StdDev	SNP2005_ full_3_ StdDev	SNP2005_ reduc_3_ StdDev		
1	2010	2324	9.7	9.3	9.6	9.1	11.3	11.2
2	2011	4278	10.1	9.8	10.0	9.6	11.8	11.7
3	2012	4921	9.8	9.5	9.8	9.3	11.6	11.5
4	2013	3844	9.7	9.3	9.6	9.2	11.4	11.2
5	2014	4813	9.7	9.3	9.6	9.1	11.5	11.2
6	2015	5673	9.9	9.3	9.8	9.1	11.6	11.1
7	2016	6616	10.3	8.2	10.1	8.0	11.9	10.4
8	2017	8327	9.2	7.2	9.1	7.0	11.0	9.6
9	2018	10209	8.5	6.7	8.4	6.5	10.3	9.2
10	2019	12407	8.4	6.5	8.3	6.3	10.0	9.1
11	2020	12997	8.5	6.2	8.3	6.0	10.2	9.1
12	2021	1232	7.5	6.0	7.4	5.8	9.6	8.8

BV18

Correlations

Obs	BYR	augfull_ nov	augfull_nov SNP2005full_ 18	novSNP_ full_ reduc_18	novSNP2005_ full_reduc_ 18	aug_full_ reduc_18
		SNPfull_18				
1	2010	0.979	0.967	0.985	0.983	0.977
2	2011	0.978	0.965	0.982	0.980	0.974
3	2012	0.977	0.966	0.982	0.981	0.974
4	2013	0.977	0.967	0.978	0.977	0.970
5	2014	0.979	0.971	0.981	0.979	0.972
6	2015	0.977	0.969	0.963	0.960	0.957
7	2016	0.977	0.970	0.861	0.855	0.879
8	2017	0.975	0.967	0.847	0.842	0.879
9	2018	0.975	0.968	0.875	0.870	0.891
10	2019	0.962	0.953	0.852	0.853	0.875
11	2020	0.966	0.958	0.901	0.890	0.905
12	2021	0.970	0.962	0.904	0.889	0.900

Means

Obs	BYR	_FREQ_	nov		nov		aug_full_ 18_mean	aug_reduc_ 18_mean
			novSNP_ full_18_ mean	novSNP_ reduc_18_ mean	SNP2005_ full_18_ mean	SNP2005_ reduc_18_ mean		
1	2010	2324	100.7	100.7	100.1	100.2	101.5	101.6

2	2011	4278	101.6	101.6	100.9	101.0	102.5	102.6
3	2012	4921	100.3	100.4	99.6	99.7	101.3	101.4
4	2013	3844	100.4	100.5	99.7	99.8	101.4	101.6
5	2014	4813	99.4	99.6	98.7	98.9	100.6	100.9
6	2015	5673	101.0	101.2	100.2	100.4	102.3	102.5
7	2016	6616	100.7	100.9	99.8	99.8	102.3	102.4
8	2017	8327	101.2	101.8	100.2	100.6	103.0	103.7
9	2018	10209	102.5	103.0	101.4	101.7	104.6	105.3
10	2019	12407	102.7	103.1	101.5	101.7	105.1	105.8
11	2020	12997	104.4	104.1	103.2	102.6	107.1	107.0
12	2021	1232	104.2	104.2	102.9	102.6	106.6	106.8

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_18_StdDev	aug_reduc_18_StdDev
			novSNP_full_18_StdDev	novSNP_reduc_18_StdDev	SNP2005_full_18_StdDev	SNP2005_reduc_18_StdDev		
1	2010	2324	7.2	6.9	7.1	6.8	8.4	8.2
2	2011	4278	6.8	6.4	6.7	6.2	8.0	7.7
3	2012	4921	6.9	6.5	6.9	6.4	8.2	7.9
4	2013	3844	6.8	6.4	6.7	6.3	8.1	7.8
5	2014	4813	7.7	7.2	7.6	7.1	8.8	8.5
6	2015	5673	7.3	6.8	7.2	6.7	8.5	8.1
7	2016	6616	7.8	5.9	7.6	5.8	8.8	7.4
8	2017	8327	7.3	5.5	7.2	5.4	8.6	7.3
9	2018	10209	7.1	5.6	7.0	5.5	8.3	7.4
10	2019	12407	7.1	5.3	6.9	5.2	8.3	7.2
11	2020	12997	6.8	5.5	6.7	5.3	8.5	7.4
12	2021	1232	6.7	5.3	6.4	5.0	8.3	7.3

BV20

Correlations

Obs	BYR	augfull_nov	augfull_nov	novSNP_nov	novSNP2005_nov	aug_full_nov
		nov	SNP2005full_20	full_reduc_20	full_reduc_20	reduc_20
		SNPfull_20				
1	2010	0.987	0.981	0.992	0.991	0.986
2	2011	0.987	0.982	0.992	0.991	0.986
3	2012	0.984	0.979	0.989	0.988	0.983
4	2013	0.985	0.980	0.987	0.986	0.982
5	2014	0.983	0.979	0.985	0.984	0.980
6	2015	0.984	0.979	0.969	0.967	0.965

7	2016	0.982	0.977	0.933	0.931	0.940
8	2017	0.981	0.977	0.907	0.896	0.929
9	2018	0.982	0.979	0.907	0.890	0.934
10	2019	0.970	0.965	0.906	0.893	0.920
11	2020	0.970	0.965	0.925	0.914	0.939
12	2021	0.964	0.961	0.936	0.926	0.939

Means

Obs	BYR	_FREQ_	nov		nov		aug_full_20_mean	aug_reduc_20_mean
			novSNP_full_20_	novSNP_reduc_20_	SNP2005_full_20_	SNP2005_reduc_20_		
			mean	mean	mean	mean		
1	2010	2324	93.0	92.9	92.0	91.9	94.3	94.4
2	2011	4278	94.4	94.4	93.4	93.3	95.7	95.8
3	2012	4921	95.5	95.4	94.5	94.4	96.8	96.9
4	2013	3844	97.1	96.9	96.0	95.9	98.5	98.6
5	2014	4813	97.0	96.6	95.9	95.5	98.5	98.4
6	2015	5673	98.5	98.0	97.4	96.8	100.0	99.7
7	2016	6616	98.1	98.4	96.9	96.9	99.6	100.5
8	2017	8327	103.2	101.9	101.9	100.2	104.6	105.1
9	2018	10209	103.0	102.0	101.6	100.1	104.6	105.2
10	2019	12407	105.8	104.9	104.2	102.9	107.8	108.9
11	2020	12997	104.9	104.1	103.3	101.9	107.2	108.0
12	2021	1232	105.3	104.7	103.8	102.8	107.8	108.7

Standard deviations

Obs	BYR	_FREQ_	nov		nov		aug_full_20_StdDev	aug_reduc_20_StdDev
			novSNP_full_20_	novSNP_reduc_20_	SNP2005_full_20_	SNP2005_reduc_20_		
			StdDev	StdDev	StdDev	StdDev		
1	2010	2324	9.1	8.7	9.0	8.6	10.3	10.2
2	2011	4278	9.5	9.1	9.4	9.0	10.8	10.6
3	2012	4921	8.6	8.2	8.5	8.1	10.0	9.8
4	2013	3844	8.7	8.3	8.6	8.1	10.1	9.9
5	2014	4813	8.6	8.2	8.6	8.1	10.0	9.8
6	2015	5673	8.6	7.9	8.5	7.8	9.9	9.5
7	2016	6616	8.4	7.3	8.4	7.2	9.9	9.1
8	2017	8327	9.0	7.4	9.0	7.2	10.3	9.5
9	2018	10209	9.4	7.4	9.4	7.3	10.7	9.4
10	2019	12407	9.6	7.4	9.5	7.2	10.8	9.5
11	2020	12997	8.6	7.0	8.6	6.8	10.0	9.0
12	2021	1232	8.0	6.8	8.0	6.6	9.5	8.9