STØTTET AF
Mælkeafgiftsfonden

Project on adapting "Golden Standard" to NAV evaluation of calving traits

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Content

Summary of note on “Golden Standard for calving traits”

Calving traits are stillbirth and calving ease. Stillbirth is defined as a birth in which an animal is born dead or dies during or within 48 hours after parturition *(In NAV countries the time limit for stillbirth is 24 hours).* Calving ease is defined as how easy/difficult the calving was. Both traits are seen from a direct (calf) and indirect (maternal) perspective.

Trait recording

Recording for stillbirth according to the Golden Standard requires ID’s of all calves born. From Identification & registration perspective all live animals should be identified within 48 hours, but regulations regarding born dead may differ between countries and in general registration is not mandatory. From an evaluation point of view an ID of all calves (liveborn and stillborn, females and males) must be included in the data base.

All calving trait data is collected by farmers. To achieve the Golden Standard a 100% registration of calving ease data would be ideal. Calving ease should be scored in 4 classes, as is the ICAR standard. The classes should be well defined and allow easy determination of the classes:

1. Unassisted/without pull
2. Easy pull
3. Hard pull, with or without veterinary aid
4. Caesarean/embryotomy

Sex has a strong influence on calving ease and the importance of including this in the evaluation model increases when sexed semen is used. This especially includes the sex of stillborn calves.

In general, the following data should be ensured for calving traits:

- Herd
- Cow id
- Parity of the dam
- Calving date
- Id of calf/calves – A “dummy” ID can be assigned to stillborn calves
- Full pedigree information on both calf and cow, including breed of sire of calf
- Embryo from OVUM pickup (yes/no). *Currently, OUP calves is seldom in NAV counties and they are not included in the evaluation.*
- Sex of calf/calves
- Dead/alive at birth or within 48 hours
- Calving ease.
- Twin information. *Currently, all twins/multiple births are omitted from evaluation in NAV countries*
- Size/weight

Current research shows that OPU (ovum pick-up) causes more dystocia. Therefore, if OPU is used as a routine part of the breeding program this need to be recorded. The original manuscript on Golden Standards included a detailed description of OPU recording.

Data edit

Countries should have a clear protocol that describes how to validate quality of the data from each farm.

Other points that need to be considered for data checks and editing are:

- Herdbook registration and availability of pedigree, i.e. sire and dam (maternal grandsire)
- Check gestation length as extremely long or short gestations might result in an abortion or misrecorded insemination information. In case of these calving traits, abortions should be removed.
- Calves coming from embryo transfer must be modelled correctly, as a direct effect is coming from the pedigree of the dam that provided the embryo, while the maternal effect (genetic and potentially permanent environment) is coming from the pedigree of the dam that carries the calf. Currently, ET-calves are omitted from the evaluation in NAV-counties.
- Heterosis and breed effects. If countries are using multi breed evaluation including beef breeds, the heterosis effect and effect of different beef breeds should be handled.
- Ensure that age at first lactation is known. First parities and later parities need to be regarded as separate traits with later parities as a repeated record.

At least the first five parities should be included regarding parity one and later parities as separate traits. Modeling later parities as repeated records do not impose any limit on the number of parities included as long as environmental effects associated with parity can be accurately estimated.

Preadjustments and method/model

The Golden Standard model for analyzing calving trait is a multivariate threshold model for stillbirth, calving ease and calf size considering both maternal and direct genetic effects. Such a model is not possible yet and further research would be necessary in order to develop it. In this research it should be checked whether it gives correct results based on first versus later lactations need to be modeled separately in the threshold model.

Even though the ideal model requires additional research, in many cases use of a linear multivariate model for these traits is possible with a small loss in reliability of resulting breeding values. In case of a linear model, an approximation to a normal distribution – using Snell scores – should be used. Currently, NAV data are standardized to same SD per country/region and 5-year period.

As a minimum first and later lactations must be treated as different traits since the correlation between them is less than 1. If needed more lactations can be regarded as different traits if this increases accuracy of predicted breeding values. The models used must include both direct and maternal effects for all calving traits

Environmental effects to consider

- Herd x season
- Sex of calf
- Parity
- Age 1. Calving
- Year x month
- OPU x year
- Heterosis and breed effects including beef breeds. If heterosis and breed effects are included, it must be ensured that realistic estimates can be obtained from the data included in the model.
- Permanent environmental effect of dam (for 2nd and later calvings)

Traits delivered to Interbull

Traits that should be delivered to Interbull to comply with the Golden Standard are:

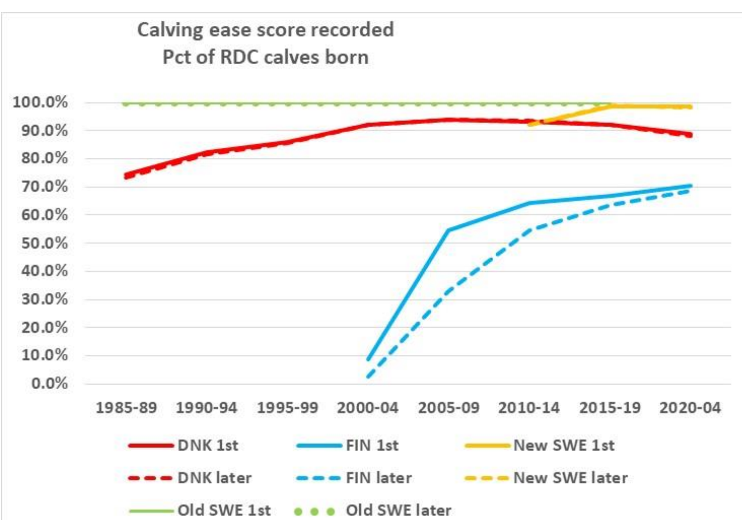
- Direct stillbirth parity 1
- Maternal stillbirth parity 1
- Direct calving ease parity 1

Adapting "Golden Standards" to NAV evaluation of calving traits

Items to be harmonized

- IDs on all calves in the registration system: That include especially ID on stillborn calves and in some countries on male calves. If calf ID is not known at least sire and dam of the calf must be identified.
- Calving ease recorded at 100% of calvings.
    - In DNK, it is voluntary for the farmer to register calving ease. In DNK calving ease is recorded at close to 90% of the calvings.
    - In FIN registration of calving ease started in 2004 and percent recorded have been steadily increasing and is now around 70%.
    - In SWE the percent calvings with recorded calving ease score is close to 100%. However, a 2-point scale have been used up to 2012-2015.
    - In Norwegian data Calving Ease is scored on a 3-point scale (Actual for HOL and Jersey data – also calf size is scored on a 3-point scale).
    - Below is some statistics on recorded calving ease scores with RDC as example (figure 1).
- ET-calves and OPU-calves: OPU-calves are not very common in the NAV countries. Besides, they are special - and will be treated special with respect to stillbirth and calving ease. Currently they are not recorded properly in the databases. That might be a project for the future.
- Maternal and direct heterosis. It is an important effect to include in the model. However, it has turned out that it is very difficult to separate maternal and direct heterosis in populations where there is heavy import of foreign breeds over time – or if systematic crossings systems are used. Also, if there is very large difference in frequencies (e.g. dairy x beef). The current evaluation model includes direct and maternal heterosis for RDC, but not for HOL and JER. In the new evaluation heterosis will not be included.

Figure 1: Recording of calving ease in RDC. Old SWE refer to the 2-point scale and new SWE to the 4-point scale



For this project 3 items are in focus:

- Use of Snell scores as input: The recommendation in the "Golden Standard" note was: "In case of a linear model, an approximation to a normal distribution – using Snell scores – should be used".
- Analysis of the effect of including inbreeding in the A-matrix when breeding values are estimated – and of adding a regression of inbreeding as an effect in the model.
- Include permanent environmental effect of dam for 2nd and later calvings in the model. Currently, this effect is not included in the evaluation model

The genetic parameters used in the current evaluation were estimated before 2010 and were based on DNK data. Therefore, re-estimation of all the genetic parameters was an essential part of this project.

Snell score

How Snell Score is calculated:

- Definition of groups (stratums). It was decided to use the current group definition. It is country (DNK, FIN, SWE and sometimes NOR and FRA), 5-year group and sex of calf.
- Frequency of observations per category is calculated:
  - Calf survival: Still born or liveborn
  - Calving ease (DNK, FIN, FRA Jersey and new SWE): 4 categories
  - Calving ease (old SWE data): 2 categories
  - Calving ease: Norwegian Jersey and Holstein data: 3 categories
  - Calf size (DNK and FRA Jersey): 4 categories
  - Calf size: NOR Holstein and Jersey: 3 categories
- Snell score for every category calculated assuming a truncated normal distribution. The procedure was developed by Freddy Fikse.

Phenotypic data

The survival rate and calving ease depends on parity, sex of the calf and country. Furthermore, there have been a positive trend over the years. The increase in use of sexed semen on heifers have had a positive effect on the calving ease and also the survival rate since female calves are often smaller and more easily born. Since difficult calvings are getting more seldom it also means that the standard deviation of calving ease has decreased in the latest years. For later parities there has been an increase in use of beef semen, and beef on dairy calves are not included in the evaluation, thus the number of registrations for later parities are decreasing.

HV correction

In the current evaluation model, the phenotypic standard deviation is standardized to same SD across countries and 5-year periods (but not sex of calves, because up to the resent years the sex ratio was 50:50).

However, the conversion to Snell Score will more or less eliminate the need for HV correction. The differences between countries, years and sex remaining after the conversion reflect the differences in heritability due to differences in frequencies.

Including inbreeding in the A-matrix and effect of inbreeding depression in the model

A second objective of this project was to analyse the effect of including inbreeding in the A-matrix and the effect of inbreeding depression. Coefficients of inbreeding was calculated by the RelaX2-program (RelaX2 Program for pedigree analysis by Ismo Standen). The average inbreeding level for calves has changed over years, and the current level of inbreeding is around 5%-6% for HOL and 3% for RDC for the latest birth year classes (table 1). The average inbreeding level for cows is around 4%-5% for HOL and 2% for RDC for the latest birth year classes (table 2). As expected, the coefficient of inbreeding is slightly higher for calves than for cows. That indicate a slight increase in inbreeding.

Table 1. Average inbreeding of calves

	HOL			RDC			JER
Birth year	**DNK**	**FIN**	**SWE**	**DNK**	**FIN**	**SWE**	**DNK**
1985-89	0.013	0.009	0.005	0.008	0.022	0.007	0.015
1990-94	0.022	0.012	0.012	0.012	0.025	0.011	0.020
1995-99	0.032	0.016	0.023	0.014	0.028	0.013	0.025
2000-04	0.041	0.020	0.034	0.012	0.029	0.015	0.034
2005-09	0.048	0.030	0.042	0.022	0.028	0.019	0.044
2010-14	0.050	0.040	0.045	0.022	0.027	0.022	0.054
2015-19	0.055	0.051	0.052	0.029	0.030	0.028	0.067

Table 2. Average inbreeding of cows

	HOL			RDC			JER
Birth year	**DNK**	**FIN**	**SWE**	**DNK**	**FIN**	**SWE**	**DNK**
1985-89	0.006	0.006	0.001	0.005	0.015	0.003	0.009
1990-94	0.013	0.008	0.005	0.007	0.020	0.007	0.015
1995-99	0.022	0.012	0.012	0.012	0.024	0.011	0.019
2000-04	0.032	0.015	0.024	0.011	0.027	0.013	0.025
2005-09	0.042	0.021	0.034	0.014	0.027	0.015	0.035
2010-14	0.047	0.031	0.040	0.022	0.027	0.020	0.045
2015-19	0.051	0.041	0.045	0.024	0.026	0.023	0.056

The Mix99-program have a facility to include the coefficients of inbreeding in the A-matrix. This version was compared to a "standard" model. This "standard" model included the following effects:

- Age * country (age in month/parity), fixed effect
- Year * month * country, fixed effect
- Herd * 5-year period, fixed effect
- Herd * Year (with 5-year period), random effect
- Permanent cow effect (only for later calvings), random effect
- Genetic effect of dam
- Genetic effect of calf
- Residual

Input was the 6 calving traits, all converted to Snell Score. The parameters used was the new estimates.

First step was a model that included inbreeding in the A-matrix. The next step was to include the coefficients of inbreeding as fixed regression effects of the model. The new model included a fixed regression effect of inbreeding of both calf and cow

Inbreeding models are compared to the new “standard” model.

- For the model with inbreeding included in the A-matrix the correlations differed from 1.00000 on the fifth decimal. No correlations are lower than 0.9999 and no sire indexes change more than one unit.
- For the model that include effect of dam and calf inbreeding as fixed regression effect the difference is slightly larger. The correlations differed from 1.00000 on the fourth decimal – and no correlations are smaller than 0.9992. No sire index changes by more than one unit.

Estimates of effect of inbreeding

Table 3 show the estimates of inbreeding. The estimates are the effect of 100% inbreeding – and the current level is 6%. In the table the estimates are converted to index units (new standardization) and they are also shown for the average level of inbreeding of 6% (Note: A sire – daughter mating gives 25% inbreeding – note also that mating of full cousins give 6,25% inbreeding)

Table 3. Effect of inbreeding, both calf and cow inbreeding are included in the model

	HOL		**RDC**		**JER**	
Trait	**Effect of calf inbreeding**	**Effect of cow inbreeding**	**Effect of calf inbreeding**	**Effect of cow inbreeding**	**Effect of calf inbreeding**	**Effect of cow inbreeding**
	Estimates on Snell Score scale (solutions)					
SB1	-0.1223	-0.0266	-0.1463	-0.1401	-0.3193	-0.0388
CE1	0.1395	-0.3154	0.1298	-0.3480	-0.0852	-0.1217
SB2	-0.0979	-0.0222	-0.1321	-0.0511	-0.1855	0.0016
CE2	0.0586	-0.2148	-0.0172	-0.2167	-0.0515	-0.0691
	Index units – after standardization to SD = 10 (a new standardization)					
SB1	-17	-3	-21	-25	-60	-8
CE1	8	-23	9	-31	-21	-23
SB2	-37	-9	-35	-19	-78	1
CE2	6	-30	-2	-32	-19	-26
	Index units for 6% inbreeding (current level of inbreeding)					
SB1	-0.1	0.0	-0.1	-0.2	-0.4	0.0
CE1	0.1	-0.1	0.1	-0.2	-0.1	-0.1
SB2	-0.2	-0.1	-0.2	-0.1	-0.5	0.0
CE2	0.0	-0.2	0.0	-0.2	-0.1	-0.2

The conclusion is that:

- Including inbreeding in the A-matrix do not change the results significantly
- Correction for inbreeding depression in calves and cows do not change the results significantly

Estimation of genetic parameters

The changes in model would require re-estimation of genetic parameters. We anticipated that:

- Change of input to Snell score would not change genetic parameters very much (heritability and correlations would not change very much – but of cause the size of genetic and environmental variance change due to change of scale
- We need to estimate genetic parameters for permanent effect at later calvings

The genetic parameters were estimated by the MCEM-method described by Lidauer et al. (2015) in "TECHNICAL REFERENCE GUIDE FOR MiX99 SOLVER". In order to reduce computing time, the input data was reduced by deleting data on calves born before 2005 and data from small herds. Additionally, data was deleted herdwise until manageable input datasets was obtained. The data was balanced such that each country contribute according to the total distribution of data on countries. All models include fixed effects, random herd x year effect, direct and maternal genetic effects and random cow effect for traits with more calvings (SB2 and CE2).

Estimates of heritabilities and genetic correlations

The results of the estimates of heritabilities and genetic correlations are show in table 4 – 6. The estimates are obtained both in single trait analyses and in 2-trait analyses. The results shown in table 4-6 is averages of all the estimates. The results are all compared to the current values. The variances and covariances will change due to the rescaling of input data to Snell score. Therefor it is most relevant to compare heritabilities and correlations.

The procedure was:

- All correlations between -0.05 and +0.05 was assumed to be equal zero, because standard error of the estimates indicated the correlations of that size was not significantly different from zero. Therefore, all correlations between direct and maternal traits were zero. Also, many of the correlations between CS1 and CS2 and the other traits were low in these analyses
- After these adjustments, the eigenvalues the variance-covariance matrices were calculated. If the eigenvalues turned out to be negative some manual adjustments were made

Table 4. Estimates of HOL heritabilities and genetic correlations. Heritabilities on diagonal, genetic correlations above diagonal. Upper number is the new estimates. Lower number is the values used in the current evaluation

	dSB1	dCE1	dCS1	dSB2	dCE2	dCS2	mSB1	mCE1	mCS1	mSB2	mCE2	mCS2
dSB1	**0.040** *0.049*	**0.709** *0.720*	**-0.523** *-0.550*	**0.617** *0.621*	**0.532** *0.550*	**-0.513** **-0.530**	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*
dCE1		**0.117** *0.101*	**-0.546** *-0.750*	**0.584** *0.600*	**0.608** *0.630*	**-0.534** *-0.700*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*
dCS1			**0.223** *0.247*	**-0.418** *-0.530*	**-0.464** *-0.770*	**0.600** *0.790*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*
dSB2				**0.011** *0.012*	**0.631** *0.649*	**-0.485** *-0.530*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*
dCE2					**0.077** *0.061*	**-0.518** *-0.750*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** **0.0**	**0.000** *0.0*	**0.000** *0.0*
dCS2						**0.206** *0.222*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*	**0.000** *0.0*
mSB1							**0.036** *0.043*	**0.591** *0.600*	**0.000** *-0.020*	**0.599** *0.604*	**0.329** *0.340*	**0.000** ***0.0***
mCE1								**0.090** *0.078*	**0.000** *-0.450*	**0.623** *0.643*	**0.716** *0.740*	**0.000** *-0.260*
mCS1									**0.059** *0.062*	**0.000** *-0.430*	**0.000** *-0.430*	**0.600** *0.700*
mSB2										**0.011** *0.012*	**0.582** *0.604*	**0.000** *-0.391*
mCE2											**0.047** *0.038*	**0.000** *-0.390*
mCS2												**0.057** *0.060*

Table 5. Estimates of RDC heritabilities and genetic correlations. Heritabilities on diagonal, genetic correlations above diagonal. Upper number is the new estimates. Lower number is the values used in the current evaluation

	dSB1	dCE1	dCS1	dSB2	dCE2	dCS2	mSB1	mCE1	mCS1	mSB2	mCE2	mCS2
dSB1	0.058	0.650	-0.550	0.729	0.485	-0.540	0.000	0.000	0.000	0.000	0.000	0.000
	0.042	0.750	-0.360	0.649	0.480	-0.380	0.0	0.0	0.0	0.0	0.0	0.0
dCE1		0.077	-0.500	0.435	0.500	-0.451	0.000	0.000	0.000	0.000	0.000	0.000
		0.074	-0.770	0.440	0.780	-0750	0.0	0.0	0.0	0.0	0.0	0.0
dCS1		-	0.247	-0.406	-0.576	0.500	0.000	0.000	0.000	0.000	0.000	0.000
			0.284	-0.400	-0.900	0.800	0.0	0.0	0.0	0.0	0.0	0.0
dSB2				0.021	0.600	-0.450	0.000	0.000	0.000	0.000	0.000	0.000
				0.012	0.650	-0.390	0.0	0.0	0.0	0.0	0.0	0.0
dCE2					0.035	-0.400	0.000	0.000	0.000	0.000	0.000	0.000
					0.024	-0.760	0.0	0.0	0.0	0.0	0.0	0.0
dCS2						0.234	0.000	0.000	0.000	0.000	0.000	0.000
						0.261	0.0	0.0	0.0	0.0	0.0	0.0
mSB1							0.038	0.400	0.000	0.600	0.337	0.000
							0.025	0.700	-0.140	0.598	0.341	0.050
mCE1								0.065	0.000	0.350	0.600	0.000
								0.051	-0.520	0.639	0.740	-0.260
mCS1									0.060	0.000	0.000	0.600
									0.065	-0.430	-0.430	0.700
mSB2										0.019	0.401	0.000
										0.012	0.701	-0.580
mCE2											0.035	0.000
											0.024	-0.540
mCS2												0.058
												0.070

Table 6. Estimates of JER heritabilities and genetic correlations. Heritabilities on diagonal, genetic correlations above diagonal. Upper number is the new estimates. Lower number is the values used in the current evaluation

	dSB1	dCE1	dCS1	dSB2	dCE2	dCS2	mSB1	mCE1	mCS1	mSB2	mCE2	mCS2
dSB1	**0.034**	**0.441**	**0.000**	**0.786**	**0.335**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
	0.036	*0.440*	*0.130*	*0.789*	*0.340*	*0.140*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
dCE1		**0.022**	**0.000**	**0.389**	**0.803**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
		0.012	*-0.670*	*0.389*	*0.811*	*-0.680*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
dCS1			**0.150**	**0.000**	**0.000**	**0.600**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
			0.134	*0.130*	*-0.620*	*0.910*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
dSB2				**0.016**	**0.443**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
				0.012	*0.449*	*0.040*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
dCE2					**0.026**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
					0.012	*-0.650*	*0.0*	*0.0*	*0.0*	**0.0**	*0.0*	*0.0*
dCS2						**0.150**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
						0.134	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
mSB1							**0.023**	**0.479**	**0.000**	**0.479**	**0.163**	**0.000**
							0.024	*0.589*	*0.100*	*0.480*	*0.169*	*-0.070*
mCE1								**0.043**	**0.000**	**0.238**	**0.512**	**0.000**
								0.024	*-0.340*	*0.239*	*0.529*	*-0.320*
mCS1									**0.040**	**0.000**	**0.000**	**0.500**
									0.041	*-0.020*	*-0.330*	*0.890*
mSB2										**0.016**	**0.481**	**0.000**
										0.012	*0.490*	*0.040*
mCE2											**0.026**	**0.000**
											0.012	*-0.291*
mCS2												**0.040**
												0.041

Table 7 show the estimates of the new direct and maternal genetic variances. They are not comparable to the values currently used, because the scales are changed

Table 7. Direct and maternal genetic variances

	Direct			Maternal		
Trait	**HOL**	**RDC**	**JER**	**HOL**	**RDC**	**JER**
SB1	**0.0108**	**0.0091**	**0.0074**	**0.0097**	**0.0058**	**0.0050**
CE1	**0.0538**	**0.0326**	**0.0042**	**0.0402**	**0.0270**	**0.0083**
CS1	**0.1365**	**0.1583**	**0.0937**	**0.0298**	**0.0306**	**0.0221**
SB2	**0.0017**	**0.0022**	**0.0017**	**0.0017**	**0.0020**	**0.0017**
CE2	**0.0252**	**0.0110**	**0.0026**	**0.0150**	**0.0108**	**0.0026**
CS2	**0.1197**	**0.1477**	**0.0957**	**0.0282**	**0.0297**	**0.0226**

The estimates of the HxY variances (within 5-year periods) are shown in table 8. The current values are shown as well, because the new results are substantially different from the current estimates. Currently, it is assumed that HxY variance is 18-20% of the residual variance. The new estimates are 1-2% of the residual variance for SB and 2-6% for CE.

Table 8. HxY variances – new and current

Trait	Residual variance		H x Y variance		H x Y pct of residual	
	Current	**New**	Current	**New**	Current	**New**
			HOL			
SB1	0.2170	**0.2573**	0.0420	**0.0012**	19.4%	0.5%
CE1	0.5183	**0.4077**	0.1095	**0.0482**	21.1%	11.8%
CS1	0.4697	**0.4764**	0.1155	**0.0306**	24.6%	6.4%
SB2	0.1411	**0.1530**	0.0255	**0.0005**	18.1%	0.3%
CE2	0.4312	**0.3035**	0.0840	**0.0011**	19.5%	0.4%
CS2	0.4725	**0.4616**	0.1125	**0.0277**	23.8%	6.0%
			RDC			
SB1	0.1483	**0.1483**	0.0300	**0.0014**	18.9%	0.9%
CE1	0.3897	**0.3897**	0.1035	**0.0213**	20.0%	5.5%
CS1	0.4829	**0.4829**	0.1200	**0.0173**	25.9%	3.6%
SB2	0.0959	**0.1045**	0.0255	**0.0012**	18.1%	1.1%
CE2	0.3021	**0.3021**	0.0825	**0.0093**	18.5%	3.1%
CS2	0.4829	**0.4829**	0.1185	**0.0143**	25.2%	3.0%
			JER			
SB1	0.2000	**0.2111**	0.0375	**0.0013**	18.8%	0.6%
CE1	0.3444	**0.1850**	0.0630	**0.0034**	18.3%	1.8%
CS1	0.5396	**0.5312**	0.1140	**0.0586**	21.1%	11.0%
SB2	0.1494	**0.1055**	0.0270	**0.0006**	18.1%	0.5%
CE2	0.2241	**0.0958**	0.0405	**0.0011**	18.1%	1.1%
CS2	0.5254	**0.5425**	0.1110	**0.0287**	21.1%	5.3%

The estimates of variance of the permanent cow effect is shown in table 9. This effect is not included in the current model, but the new estimates show that they is nearly of the same size at the maternal effect (table 7). Therefor it is important to include this effect in the model.

Table 9. Permanent cow variances – new and current

Trait	**Residual variance**		**Permanent cow variance**		**Pct of residual**	
	Current	**New**	Current	**New**	Current	**New**
			HOL			
SB2	0.1411	**0.1530**	0	**0.0030**	0.0%	1.9%
CE2	0.4312	**0.3035**	0	**0.0115**	0.0%	3.8%
CS2	0.4725	**0.4616**	0	**0.0098**	0.0%	2.1%
			RDC			
SB2	0.1411	**0.1045**	0	**0.0017**	0.0%	1.6%
CE2	0.4455	**0.3021**	0	**0.0108**	0.0%	3.6%
CS2	0.4701	**0.4829**	0	**0.0266**	0.0%	5.5%
			JER			
SB2	0.1494	**0.1055**	0	**0.0017**	0.0%	1.6%
CE2	0.2241	**0.0958**	0	**0.0022**	0.0%	2.2%
CS2	0.5254	**0.5425**	0	**0.0094**	0.0%	1.7%

Conclusion on random effects:

- The herd x year variance (within 5-year periods) was much smaller compared to total variance than assumed in the current evaluation. Actually, it was quite close to zero.
- The permanent cow variance was of the same size as the maternal variance. Therefore, it is important to include this effect in the model. It is not included in the current evaluation model.

Description of new evaluation model

The same evaluation model is used in all three breed groups (HOL, RDC and JER). Compared to the current model there is no longer effect of heterozygoty included in the model for RDC, because estimates of direct and maternal effects were very unstable. However, the permanent environment effect of cow is now included for later calvings. Besides, Inbreeding is included in A-matrix and inbreeding is included as regression effect.

The input data is 6 calving traits converted to Snell score:

- SB1: Calf survival at 1st calving
- CE1: Calving ease at 1st calving
- CS1: Calf size at 1st calving
- SB2: Calf survival at 2nd to 5th calving
- CE2: Calving ease at 2nd to 5th calving
- SB2: Calf size at 2nd to 5th calving

The fixed effects of the model are:

- Inbreeding coefficient of the calf as linear regression
- Inbreeding coefficient of the cow as linear regression
- Age of the cow – at 1st calving age in month – at later calvings parity number
- Sex of calf x year x country
- Herd x 5-year groups (The 5-year groups are identical with the 5-year groups used in the stratums used in calculation of the Snell score

The random effects are:

- Herd x year (within 5-year groups)
- At later calvings: Permanent environmental effect of the cow
- Genetic effect of calf (relationships defined by an A-matrix with inbreeding included)
- Genetic effect of the cow (relationships defined by an A-matrix with inbreeding included)
- Environmental effect

For evaluation the MiX99 program is used (”MiX99 Solving Large Mixed Model Equations, Release VIII/2015” by Martin Lidauer, Kaarina Matilainen, Esa Mäntysaari, Timo Pitkänen, Matti Taskinen,

Ismo Strandén from Green Technology,Natural Resources Institute Finland (Luke), FI-31600 Jokioinen, Finland). The inbreeding is calculated by the RelaX2 program by Ismo Stranden, November 21, 2014

For calculation of reliabilities and EDCs APAX-program is used.

Economic weights of the calving traits

The economic weights for calculation of the birth and calving index in the current evaluation are based on the results described in “Review of Nordic Total Merit Index. Full Report. November 2018”. In this report the economic weights are given per unit of the original scale. However, the use of Snell score will change the scale of the solutions and therefore the current economic values cannot be used for the solution from the new evaluation model. The current economic weights need to be converted to fit the Snell score scale.

Table 10. Conversion of economic values from original scale to Snell score scale

Trait	SD on Original scale	SD on Snell score scale	Original /Snell score	Economic value on original scale	Economic values on Snell score scale
			HOL		
SB1	0.270	0.508	0.532	204.8	**108.9**
CE1	0.692	0.702	0.985	10.9	**10.7**
CS1	0.760	0.890	0.854	0.0	**0.0**
SB2	0.167	0.402	0.415	330.2	**137.0**
CE2	0.534	0.599	0.892	14.8	**13.2**
CS2	0.742	0.883	0.841	0.0	**0.0**
			RDC		
SB1	0.211	0.460	0.460	201.00	**92.5**
CE1	0.672	0.717	0.717	11.35	**8.1**
CS1	0.802	0.922	0.922	0.00	**0.0**
SB2	0.164	0.413	0.413	337.00	**139.2**
CE2	0.529	0.614	0.614	15.62	**9.6**
CS2	0.786	0.907	0.907	0.00	**0.0**
			JER		
SB1	0.245	0.485	0.506	79.00	**39.95**
CE1	0.406	0.483	0.840	15.70	**13.19**
CS1	0.745	0.902	0.826	0.00	**0.00**
SB2	0.164	0.361	0.455	146.00	**66.47**
CE2	0.264	0.365	0.723	33.70	**24.37**
CS2	0.717	0.877	0.818	0.00	**0.00**

For this conversion the following assumptions are used:

- The original economic values calculated in "Review of Nordic Total Merit Index. Full Report. November 2018" should remain unchanged
- The value of one SD of the new Snell score phenotypes should be equal to the value of one SD of original phenotypes

For the calculation of the conversion factors a relatively new set of data was selected (calves born 2015-2019.

At first sight, these results shown that the value of the survival traits (SB1 and SB2) become much smaller. However, when it comes to the value of an index unit the change is minor because the reduction is counteracted by the standardization factors used in the new model (In theory, they should be equal, but difference in model, parameters and the sample used for standardization there is a minor difference).

Effects on breeding values

The breeding values for new evaluation is compared with the breeding values for the current evaluation. The results are based on the August 2022 evaluation. The breeding values are directSB1, directSB2, directCE1, directCE2, directCS1, dicrectCS2, maternalSB1, maternalSB2, maternalCE1, maternalCE2, maternalCS1, maternalCS2 and the two combined traits "calv" and "birth".

The results describe statistics for these groups:

- Nordic AI bulls born >=2010
- Nordic non genotyped females, born >= 2015, with own record for direct traits, and with progeny record for maternal traits.
- Nordic genotyped females, born >=2015, with own record for direct traits, and with progeny record for maternal traits.
- Nordic genotyped females, born >=2019, without own record for direct traits, and without progeny record for maternal traits.

The appendix contains the statistics (calculated by birth year):

- Mean and standard deviation of snell score breeding value
- Mean and standard deviation of current breeding value
- Mean and standard deviation of difference between snell score and current breeding value
- Correlations between snell score and current breeding value
- For the combined traits birth and calv the distribution of differences is shown both as tables and as plot

Distribution of index change for Nordic AI bulls for combined traits "birth" and "calv".

Overall, the distribution of index changes for AI bulls are distributed around zero as expected. For the bulls having at least 15 offspring the distribution is more widely distributed than for young bulls with no offspring. RDC bulls distributed more widely than the other breeds. This means that some RDC bulls will have big changes in breeding values when changing to snell score model.

Table 11: Distribution of differences for “birth” and “calv” for Nordic AI Holstein Bulls

	With >= 15 offspring, born 2010-2019				With <1 offspring born 2019-2021			
	Number of bulls		% of bulls		Number of bulls		% of bulls	
diff	birth	calv	birth	calv	birth	calv	birth	calv
-8	1		0					
-6	1		0					
-5	2		0					
-4	8	7	1	1	1		2	
-3	29	32	3	3	1		2	
-2	80	135	7	13	3	5	7	4
-1	239	295	21	29	3	25	7	20
0	425	339	37	33	19	69	44	54
1	280	147	25	14	9	23	21	18
2	53	56	5	5	4	6	9	5
3	14	9	1	1	1		2	
4	6	5	1	0	1		2	
5	2	2	0	0	1		2	

Figure 2: Distribution (in %) of index change for Nordic AI HOL bulls with >= 15 offspring, born 2010-2019 (left) and with 0 offspring, born 2019-2021 (right)

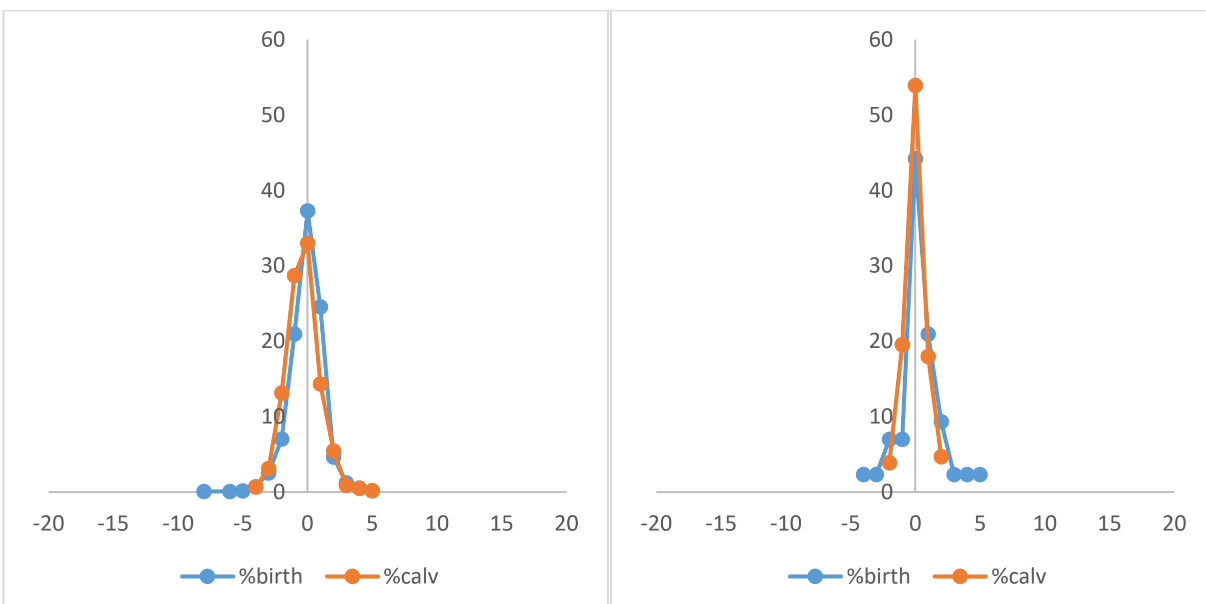


Table 12: Distribution of differences for "birth" and "calv" for Nordic AI RDC Bulls

	With >= 15 offspring, born 2010-2019				With <1 offspring born 2019-2021			
	Number of bulls		% of bulls		Number of bulls		% of bulls	
diff	birth	calv	birth	calv	birth	calv	birth	calv
-14		2		0				
-11		1		0				
-10		3		0				
-9	1	6	0	1				
-8	2	9	0	1				
-7	3	9	0	1				
-6	4	18	0	2				
-5	20	49	2	5		1		1
-4	29	49	3	5		2		1
-3	75	67	7	7	2	4	3	3
-2	117	81	12	9	6	23	9	16
-1	204	115	20	12	21	19	33	13
0	226	72	22	8	21	43	33	30
1	159	103	16	11	10	22	16	15
2	80	113	8	12	3	20	5	14
3	58	79	6	9	1	6	2	4
4	18	43	2	5		0		0
5	10	42	1	5		2		1
6	6	23	1	2		0		0
7	1	13	0	1		1		1
8	2	12	0	1				
9	1	7	0	1				
10		3		0				
11		2		0				
12		1		0				
13		1		0				
14		1		0				

Figure 3: Distribution (in %) of index change for Nordic AI RDC Bulls with >= 15 offspring, born 2010-2019 (left) and with 0 offspring, born 2019-2021 (right)

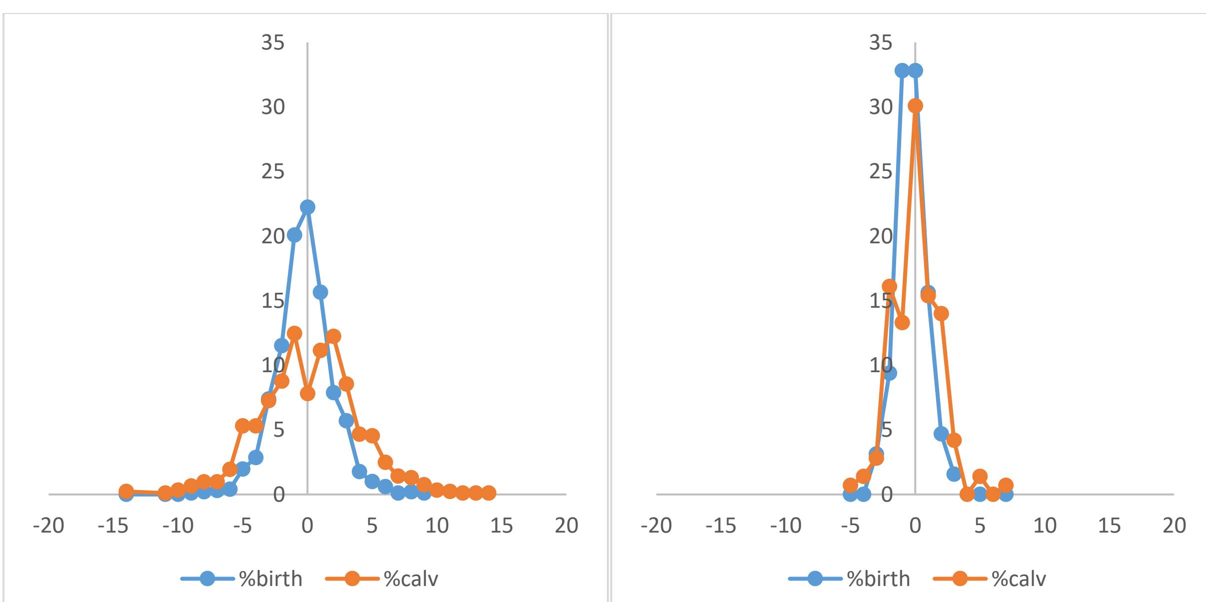
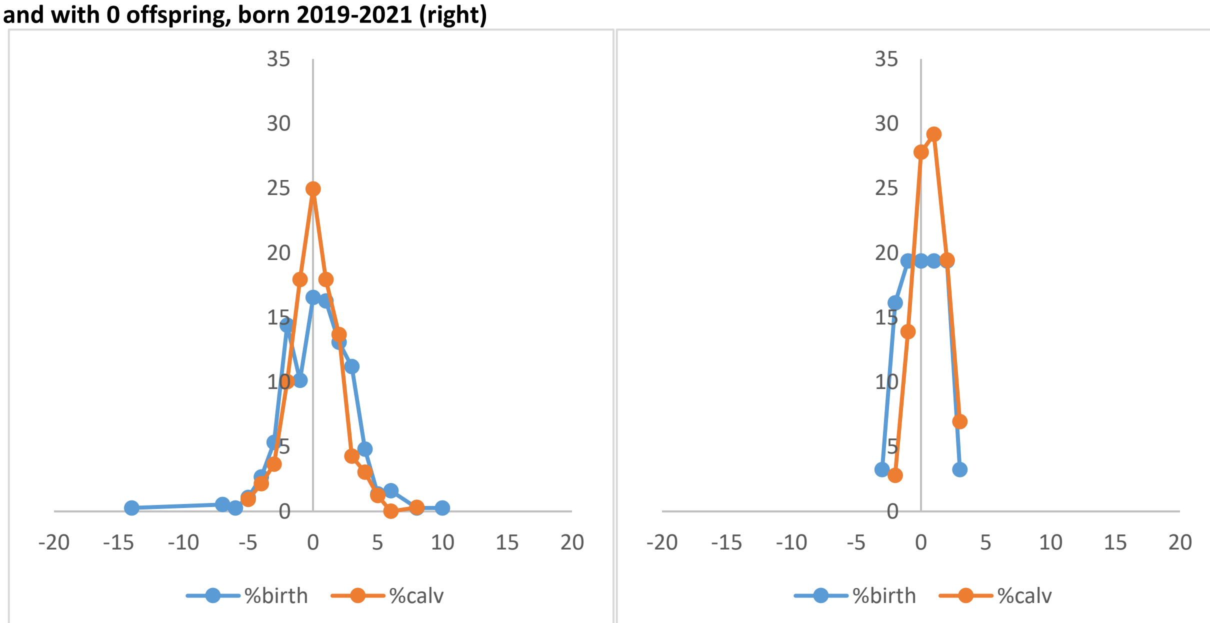


Table 13: Distribution of differences for “birth” and “calv” for Nordic AI Jersey Bulls

	With >= 15 offspring, born 2010-2019				With <1 offspring born 2019-2021			
	Number of bulls		% of bulls		Number of bulls		% of bulls	
diff	birth	calv	birth	calv	birth	calv	birth	calv
-14	1		0					
-7	2		1					
-6	1		0					
-5	4	3	1	1				
-4	10	7	3	2				
-3	20	12	5	4	1		3	
-2	54	33	14	10	5	2	16	3
-1	38	59	10	18	6	10	19	14
0	62	82	17	25	6	20	19	28
1	61	59	16	18	6	21	19	29
2	49	45	13	14	6	14	19	19
3	42	14	11	4	1	5	3	7
4	18	10	5	3				
5	5	4	1	1				
6	6		2	0				
8	1	1	0	0				
10	1		0					

Figure 4: Distribution (in %) of index change for Nordic AI JER bulls with >= 15 offspring, born 2010-2019 (left) and with 0 offspring, born 2019-2021 (right)



Final conclusions

Upgrading of calving evaluation

In November 2022 calving evaluation has been upgraded to follow the defined European Golden standards for Jersey, RDC and Holstein by:

- Improved handling of heterogenous variance by applying the snell score method
- Updating the genetic parameters
- Correction for inbreeding
- Including permanent cow effect in the model
- Excluding heterosis in the RDC model
- Deleting Danish Jersey bull calves born after 1st January 2022

The purpose of reviewing and optimizing the genetic evaluation for calving traits is to be able to calculate more accurate breeding values and fulfill common European guidelines also called Golden standard. Below is described the most important changes and the effect on breeding values for AI bulls and females.

Handling of heterogenous variance and editing of data

Still birth, calving ease and size of calf is not normally distributed like for instance milk yield, but the registration take place in a few classes e.g., alive, or dead etc. This is handled by transforming data by a method called Snell score. Furthermore, calving records from Danish Jersey bull calves born in 2022 and onwards are deleted. This is because killing of newborn calves has stopped from 1. January 2022 and there has been an unexpected increase in registered still born bull calves in 2022.

Genetic parameters

Based on data from improved editing and handling of heterogeneous variance new genetic parameters have been calculated on recent data. Results showed that heritability's for most traits and genetic correlations between traits in general were quite like the previously used, but a few parameters related to maternal traits for cows for RDC were somewhat different from earlier used estimates.

Improvements of genetic model

The genetic model was improved by removing heterosis for RDC, making it like the model for Holstein and Jersey. This is done because analysis showed that it is not possible to separate maternal and direct heterosis in breeds where there has been intensive import from foreign breeds over time.

Further a correction for inbreeding is included in the model to consider that inbreeding is expected to affect the robustness in the fetus. Another addition to the model is an effect that makes it possible to take care of the permanent environment of the individual cow affecting all her calving's.

Changes for AI bulls

We have compared indices from an evaluation with previous parameters and model with an evaluation using updated parameters and model for both AI bulls and females. For all three breeds the estimated genetic trends are almost the same from the new and the old model. For Holstein and Jersey bulls the correlations are high for both proven- and young bulls (table 14). This means that 80-95% of the bulls change less than 3 index units for calving or birth. So, in practice you will only see minor changes. For RDC the correlation is high for birth where 80-95% of the AI bulls change less than 3 index units. For calving the correlations are a lower – especially for proven bulls. This means that 45% of the proven bulls change more than 2 index units (table 15).

Table 14. Effect on EBV comparing new birth index to the previous birth index shown as frequency (%) of changes in EBV Based on 2982 RDC bulls, 4272 Holstein bulls, and 831 Jersey AI bulls

Change in EBV index units	Distribution of changes, %		
	Holstein	RDC	Jersey
≤ -6		2	
≥ -5 and < -3	4	7	3
≥ -3 and < -1	23	21	16
≥ -1 and ≤ 1	65	50	45
> 1 and ≤ 3	6	14	23
> 3 and ≤ 5	2	4	9
≥ 6		1	4

Table 15. Effect on EBV comparing new calving index to the previous birth index shown as frequency (%) of changes in EBV Based on 2857 RDC bull, 4121 Holstein bulls, and 774 Jersey AI bulls

Change in EBV index units	Distribution of changes, %		
	Holstein	RDC	Jersey
≤ -6		7	1
≥ -5 and < -3	2	11	7
≥ -3 and < -1	18	16	23
≥ -1 and ≤ 1	68	32	53
> 1 and ≤ 3	11	16	13
> 3 and ≤ 5	1	9	2
≥ 6		9	1

Changes for females

For Holstein and Jersey females the correlations are high for heifers and cows with or without a genomic test. More than 95% of the females change less than 3 index units for both calving and birth.

For RDC females more than 95% change less than 3 index units for birth index, while it is 80-90% for calving index. Change for RDC female are therefore smaller than for proven RDC AI bulls.

Appendix

HOL summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2010	dSB1	124	1337	3612	99.9	100.4	7.1	7.7	-0.4	1.5	0.98
2	2011	dSB1	124	562	1201	99.6	99.7	6.9	7.6	-0.1	1.5	0.98
3	2012	dSB1	141	879	1468	99.0	99.2	8.3	8.6	-0.2	1.3	0.99
4	2013	dSB1	114	996	1663	102.1	102.2	7.5	7.6	-0.1	1.3	0.99
5	2014	dSB1	92	1489	1644	101.5	101.5	7.4	7.3	0.0	1.2	0.99
6	2015	dSB1	78	1952	2401	102.9	102.5	7.6	7.6	0.4	0.9	0.99
7	2016	dSB1	64	1645	2144	100.5	100.4	7.8	7.6	0.1	0.8	1.00
8	2017	dSB1	61	1943	2353	101.7	101.2	8.0	7.8	0.5	0.9	0.99
9	2018	dSB1	67	1671	2349	101.5	101.3	6.9	6.8	0.2	0.8	0.99
10	2019	dSB1	43	1334	1838	103.0	102.4	6.6	6.5	0.5	0.6	1.00
11	2010	dCE1	94	1516	3605	99.2	99.8	6.4	7.4	-0.6	1.6	0.99
12	2011	dCE1	105	560	1130	98.5	98.7	6.8	7.9	-0.2	2.0	0.98
13	2012	dCE1	122	868	1363	99.9	100.5	7.4	8.3	-0.6	1.5	0.99
14	2013	dCE1	100	986	1562	102.8	103.5	6.2	7.1	-0.8	1.5	0.98
15	2014	dCE1	88	1383	1496	101.4	101.5	7.1	7.9	-0.2	1.2	0.99
16	2015	dCE1	74	1823	2181	102.7	103.0	4.7	5.3	-0.3	0.9	0.99
17	2016	dCE1	64	1454	1916	101.9	102.3	5.7	6.3	-0.3	1.3	0.98
18	2017	dCE1	59	1765	2101	102.5	103.0	5.5	5.9	-0.5	1.0	0.99
19	2018	dCE1	64	1526	2096	102.4	102.7	4.8	5.3	-0.3	0.9	0.99
20	2019	dCE1	41	1225	1643	104.3	104.6	4.0	4.5	-0.3	0.8	0.99
21	2010	dCS1	47	1973	3223	102.0	101.8	8.7	8.7	0.2	0.8	1.00
22	2011	dCS1	44	767	1100	100.0	99.7	8.1	8.1	0.3	0.9	0.99
23	2012	dCS1	73	933	1102	98.4	98.3	7.7	7.5	0.2	0.7	1.00
24	2013	dCS1	50	1232	1244	96.8	96.6	7.4	7.3	0.1	0.5	1.00
25	2014	dCS1	68	1292	1187	97.6	97.7	8.5	8.3	-0.1	0.7	1.00
26	2015	dCS1	58	1610	1704	96.2	96.4	6.9	6.7	-0.2	0.7	1.00
27	2016	dCS1	42	1471	1540	97.9	97.7	7.4	7.3	0.2	0.6	1.00
28	2017	dCS1	44	1607	1701	94.8	95.1	7.5	7.2	-0.3	0.5	1.00
29	2018	dCS1	46	1456	1672	95.6	95.6	6.9	6.4	0.0	0.8	0.99
30	2019	dCS1	32	1100	1247	94.7	94.5	6.5	6.0	0.2	0.8	0.99
31	2010	dSB2	193	1338	3634	99.4	99.7	7.4	8.1	-0.4	2.1	0.97
32	2011	dSB2	155	982	1904	99.4	99.2	7.1	7.3	0.2	1.8	0.97
33	2012	dSB2	170	1370	2303	99.3	99.1	8.0	8.2	0.2	1.7	0.98
34	2013	dSB2	151	1355	2289	100.4	100.3	6.6	6.6	0.1	1.7	0.97
35	2014	dSB2	111	1962	2234	101.2	101.2	6.6	6.3	0.1	1.6	0.97
36	2015	dSB2	82	2817	3095	101.2	101.2	6.1	5.4	0.1	1.3	0.98

HOL summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2016	dSB2	65	2677	3094	100.7	100.8	6.4	5.9	-0.1	1.4	0.98
38	2017	dSB2	66	2699	2740	101.0	100.8	7.1	6.7	0.2	1.2	0.99
39	2018	dSB2	77	2425	2834	100.9	100.7	5.6	5.2	0.1	1.2	0.98
40	2019	dSB2	50	1863	2427	101.0	100.9	5.7	5.3	0.1	1.2	0.98
41	2010	dCE2	190	1180	3200	98.3	99.0	7.2	8.1	-0.7	2.3	0.96
42	2011	dCE2	155	855	1664	97.8	98.2	5.9	7.0	-0.4	2.2	0.95
43	2012	dCE2	168	1194	2013	99.1	99.5	6.8	7.6	-0.4	2.1	0.96
44	2013	dCE2	151	1181	2024	100.1	100.4	6.0	6.9	-0.2	2.3	0.95
45	2014	dCE2	109	1757	1986	101.0	101.2	5.7	6.1	-0.2	1.6	0.97
46	2015	dCE2	82	2476	2726	102.1	102.8	4.2	4.3	-0.7	1.6	0.93
47	2016	dCE2	65	2348	2713	101.6	102.3	4.6	4.8	-0.8	1.4	0.96
48	2017	dCE2	65	2401	2386	101.3	102.1	4.8	5.6	-0.8	1.4	0.97
49	2018	dCE2	77	2113	2470	101.3	101.8	4.3	4.9	-0.5	1.4	0.96
50	2019	dCE2	49	1656	2129	103.7	104.0	4.7	4.8	-0.3	1.3	0.96
51	2010	dCS2	141	1042	2311	101.0	100.7	8.4	8.5	0.3	0.8	1.00
52	2011	dCS2	114	766	1296	100.3	100.1	8.3	8.2	0.2	0.7	1.00
53	2012	dCS2	135	991	1432	100.1	99.9	7.9	7.8	0.2	0.7	1.00
54	2013	dCS2	111	1044	1504	98.6	98.5	7.3	7.2	0.1	0.6	1.00
55	2014	dCS2	99	1360	1427	98.3	98.2	7.6	7.6	0.0	0.7	1.00
56	2015	dCS2	76	1799	1879	97.0	96.9	6.5	6.4	0.1	0.5	1.00
57	2016	dCS2	61	1653	1829	97.3	97.0	7.3	7.2	0.3	0.5	1.00
58	2017	dCS2	64	1628	1575	95.6	95.4	7.6	7.4	0.2	0.5	1.00
59	2018	dCS2	74	1488	1689	96.2	96.4	7.5	7.4	-0.2	0.6	1.00
60	2019	dCS2	45	1269	1464	94.2	94.1	7.1	6.7	0.1	0.9	0.99
61	2010	mSB1	172	985	2866	97.6	97.5	7.8	8.4	0.2	1.6	0.98
62	2011	mSB1	150	556	1140	97.4	97.5	7.9	8.4	-0.1	1.5	0.98
63	2012	mSB1	164	803	1380	97.9	97.9	7.2	7.4	0.1	1.2	0.99
64	2013	mSB1	144	824	1434	99.5	99.5	6.4	6.8	0.0	1.3	0.98
65	2014	mSB1	100	1325	1428	98.6	98.9	9.3	9.5	-0.3	1.3	0.99
66	2015	mSB1	81	1772	2136	101.7	102.0	6.7	7.3	-0.3	1.3	0.99
67	2016	mSB1	63	1705	2052	101.3	102.0	6.6	6.7	-0.6	0.9	0.99
68	2017	mSB1	59	1364	1495	103.6	104.5	6.4	6.3	-0.9	1.0	0.99
69	2018	mSB1	17	543	632	103.2	104.4	6.1	6.1	-1.2	1.2	0.98
70	2010	mCE1	149	984	2716	97.8	97.4	7.5	8.0	0.3	1.3	0.99
71	2011	mCE1	147	501	1029	98.1	97.8	7.2	7.5	0.3	1.4	0.98
72	2012	mCE1	157	740	1251	98.0	98.0	6.4	6.7	0.0	1.2	0.98

HOL summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

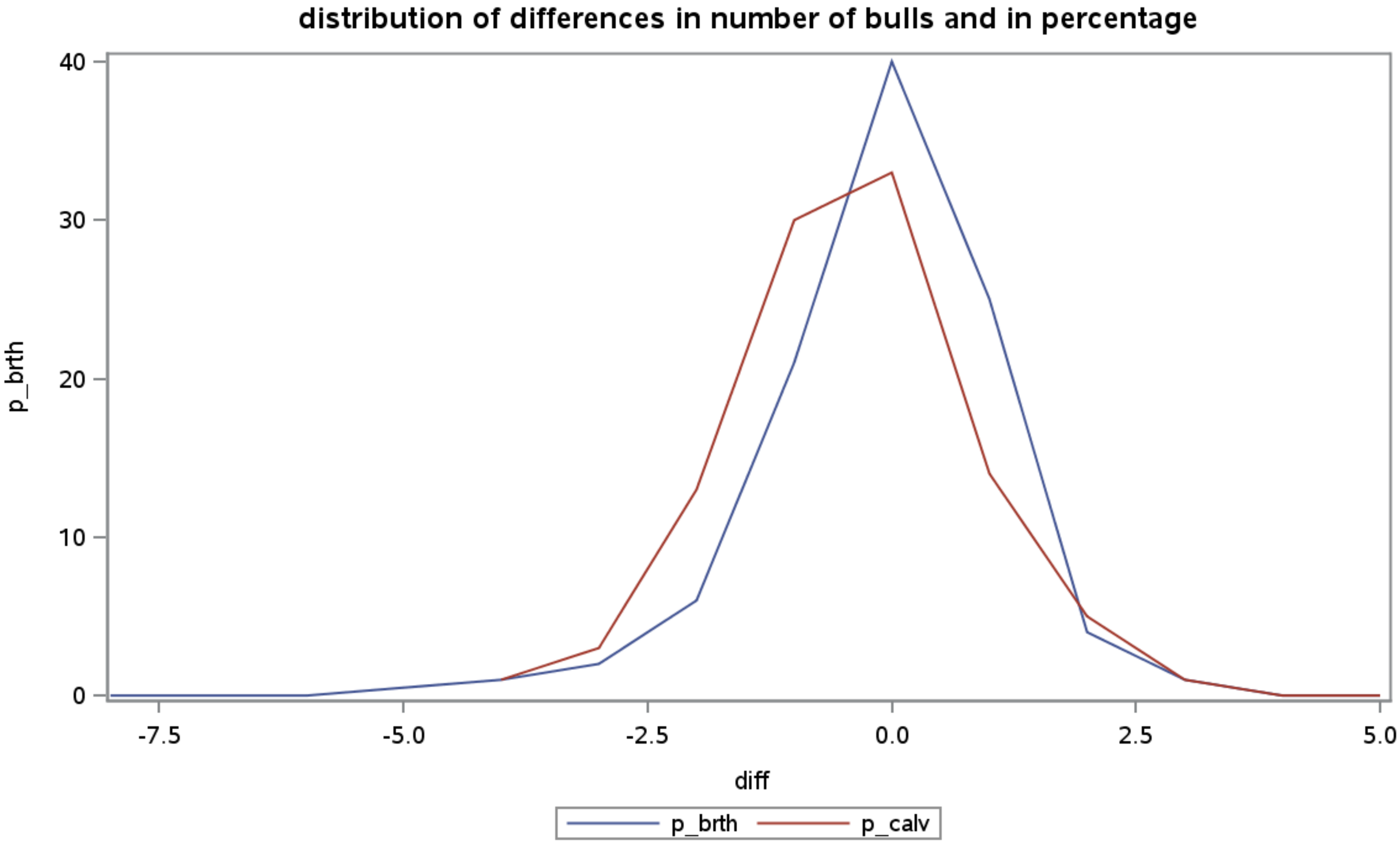
Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
73	2013	mCE1	137	762	1300	99.7	99.7	6.0	6.3	0.0	1.2	0.98
74	2014	mCE1	98	1191	1274	100.2	100.3	7.8	8.1	0.0	1.0	0.99
75	2015	mCE1	80	1575	1888	102.8	102.7	5.4	5.8	0.1	1.1	0.98
76	2016	mCE1	63	1493	1803	103.0	102.6	5.6	5.9	0.3	1.0	0.99
77	2017	mCE1	58	1216	1321	105.3	105.1	6.3	6.6	0.2	1.0	0.99
78	2018	mCE1	16	498	566	104.9	105.2	5.9	5.9	-0.3	1.2	0.98
79	2010	mCS1	104	928	2086	97.1	97.7	10.5	9.9	-0.6	1.7	0.99
80	2011	mCS1	105	459	814	98.0	98.4	11.9	11.2	-0.4	1.7	0.99
81	2012	mCS1	118	651	925	96.8	97.2	9.1	8.9	-0.4	1.5	0.99
82	2013	mCS1	95	697	962	98.0	98.1	10.8	10.2	-0.1	1.7	0.99
83	2014	mCS1	84	971	920	100.4	100.1	9.9	9.6	0.4	1.6	0.99
84	2015	mCS1	70	1195	1342	100.9	100.2	9.0	8.5	0.7	1.3	0.99
85	2016	mCS1	56	1124	1274	98.5	98.3	10.5	10.1	0.2	1.5	0.99
86	2017	mCS1	55	942	1045	104.0	102.5	9.4	9.1	1.5	1.5	0.99
87	2018	mCS1	14	457	458	107.4	106.2	9.6	9.4	1.2	1.2	0.99
88	2010	mSB2	184	1307	3997	95.3	96.8	7.7	7.8	-1.5	2.9	0.93
89	2011	mSB2	152	786	1688	97.1	98.5	8.0	8.1	-1.3	3.0	0.93
90	2012	mSB2	167	1113	1894	97.8	99.5	7.1	7.2	-1.7	2.7	0.93
91	2013	mSB2	151	1055	1785	97.3	98.9	7.6	7.1	-1.6	3.1	0.91
92	2014	mSB2	107	1548	1832	100.7	101.4	7.2	7.4	-0.7	2.6	0.94
93	2015	mSB2	81	1597	1950	102.1	101.9	7.2	6.4	0.1	2.4	0.94
94	2016	mSB2	55	903	1073	102.9	102.4	5.6	5.3	0.6	2.7	0.88
95	2010	mCE2	179	1178	3577	96.0	95.6	7.8	8.2	0.5	2.1	0.97
96	2011	mCE2	152	696	1492	98.1	98.1	7.2	7.5	0.0	1.9	0.97
97	2012	mCE2	166	985	1680	98.3	98.3	5.8	6.2	0.0	1.9	0.95
98	2013	mCE2	149	938	1591	98.5	98.7	6.7	6.6	-0.2	2.3	0.94
99	2014	mCE2	104	1387	1619	101.6	101.9	6.5	6.5	-0.2	1.7	0.97
100	2015	mCE2	79	1421	1708	103.3	103.1	5.6	6.0	0.2	1.4	0.97
101	2016	mCE2	55	787	940	104.5	103.8	5.2	5.5	0.6	1.6	0.96
102	2010	mCS2	129	1058	2624	94.9	95.5	9.8	9.6	-0.6	1.1	0.99
103	2011	mCS2	112	602	1133	96.2	96.8	10.3	10.1	-0.6	1.1	0.99
104	2012	mCS2	126	840	1213	96.9	97.3	9.5	9.2	-0.5	1.4	0.99
105	2013	mCS2	108	810	1163	97.4	97.7	10.0	9.9	-0.3	1.2	0.99
106	2014	mCS2	90	1115	1170	98.8	98.6	9.9	9.7	0.2	1.3	0.99
107	2015	mCS2	70	1076	1184	101.2	100.7	9.1	8.7	0.5	1.1	0.99
108	2016	mCS2	41	745	737	99.3	99.4	10.4	10.3	-0.2	1.3	0.99

HOL summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
109	2010	brth	124	1337	3612	99.7	100.2	6.6	7.3	-0.5	1.4	0.98
110	2011	brth	124	562	1201	99.4	99.6	6.2	6.8	-0.1	1.4	0.98
111	2012	brth	141	879	1468	99.2	99.4	7.6	8.0	-0.1	1.1	0.99
112	2013	brth	114	996	1663	101.7	101.8	6.5	6.8	-0.1	1.2	0.98
113	2014	brth	92	1489	1644	101.6	101.7	6.5	6.4	-0.1	1.0	0.99
114	2015	brth	78	1952	2401	102.6	102.4	6.1	6.0	0.3	0.8	0.99
115	2016	brth	64	1645	2144	100.9	100.9	6.5	6.4	0.0	0.8	0.99
116	2017	brth	61	1943	2353	101.7	101.4	7.1	7.1	0.3	0.7	1.00
117	2018	brth	67	1671	2349	101.6	101.4	6.0	5.9	0.2	0.6	0.99
118	2019	brth	43	1334	1838	103.0	102.6	5.1	4.9	0.4	0.5	0.99
119	2010	calv	172	985	2866	96.8	97.0	7.7	8.1	-0.1	1.3	0.99
120	2011	calv	150	556	1140	97.2	97.7	7.7	8.0	-0.4	1.3	0.99
121	2012	calv	164	803	1380	97.8	98.2	6.9	7.1	-0.5	1.1	0.99
122	2013	calv	144	824	1434	99.0	99.3	6.3	6.4	-0.4	1.1	0.99
123	2014	calv	100	1325	1428	99.3	99.8	8.6	8.6	-0.5	1.0	0.99
124	2015	calv	81	1772	2136	102.0	102.1	6.6	6.9	-0.1	1.0	0.99
125	2016	calv	63	1705	2052	102.1	102.4	6.1	5.9	-0.3	1.0	0.99
126	2017	calv	59	1364	1495	104.2	104.7	6.1	6.2	-0.5	1.3	0.98
127	2018	calv	17	543	632	103.9	104.4	6.3	6.4	-0.5	1.5	0.97

distribution of differences in number of bulls and in percentage

Obs	diff	d_brth	d_calv	p_brth	p_calv
1	-8	1	.	0	.
2	-6	1	.	0	.
3	-4	5	6	1	1
4	-3	21	26	2	3
5	-2	55	124	6	13
6	-1	188	281	21	30
7	0	362	316	40	33
8	1	229	135	25	14
9	2	35	49	4	5
10	3	10	8	1	1
11	4	3	3	0	0
12	5	2	2	0	0

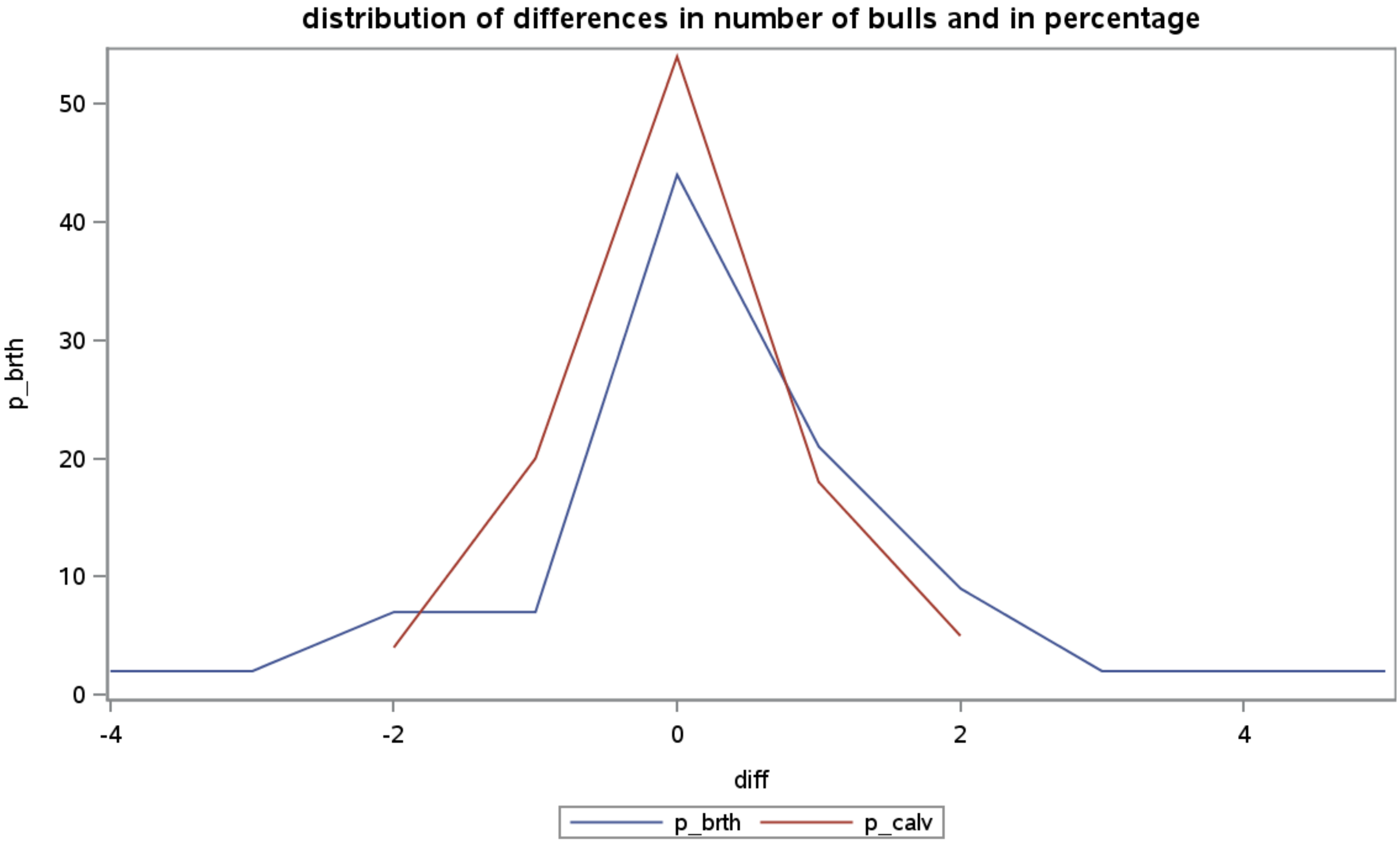

distribution of differences in number of bulls and in percentage
40
30
20
10
0
p_brth
-7.5
-5.0
-2.5
0.0
2.5
5.0
diff
p_brth
p_calv

HOL summery stastistics for snell and current breeding value for nordic AI bulls with no offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2020	dSB1	17	-82	39	103.0	102.8	4.7	5.6	0.2	1.7	0.96
2	2021	dSB1	21	-99	0	102.8	102.6	4.3	4.4	0.3	1.1	0.97
3	2020	dCE1	17	-82	39	103.4	104.0	4.5	5.5	-0.6	1.4	0.98
4	2021	dCE1	21	-99	0	102.9	103.0	3.2	4.2	-0.1	1.4	0.97
5	2020	dCS1	19	-73	45	95.3	95.3	6.7	6.9	0.0	1.5	0.98
6	2021	dCS1	21	-99	0	98.0	97.7	6.0	6.0	0.2	1.0	0.99
7	2020	dSB2	15	-92	26	101.8	101.2	5.0	6.5	0.6	2.5	0.94
8	2021	dSB2	21	-99	0	101.8	101.4	3.1	3.4	0.3	1.7	0.86
9	2020	dCE2	15	-92	26	102.4	102.7	4.2	5.8	-0.4	2.1	0.96
10	2021	dCE2	21	-99	0	102.4	102.8	3.0	4.0	-0.4	1.9	0.89
11	2020	dCS2	18	-77	42	95.1	95.2	6.5	7.2	-0.1	1.7	0.97
12	2021	dCS2	21	-99	0	96.7	96.7	5.8	6.1	0.0	0.7	0.99
13	2019	mSB1	63	-6	24	102.1	102.3	2.9	3.1	-0.2	0.7	0.98
14	2020	mSB1	44	-32	47	101.0	101.6	3.2	3.4	-0.5	0.9	0.97
15	2021	mSB1	21	-99	0	101.2	101.4	2.2	2.4	-0.2	0.5	0.98
16	2019	mCE1	63	-6	24	103.2	103.1	3.8	4.1	0.1	1.0	0.97
17	2020	mCE1	44	-32	47	102.8	102.5	2.6	2.6	0.3	1.0	0.92
18	2021	mCE1	21	-99	0	103.3	103.4	2.9	3.0	-0.1	0.8	0.96
19	2019	mCS1	63	-6	24	103.6	102.7	6.3	6.0	0.9	1.3	0.98
20	2020	mCS1	44	-32	47	105.4	104.3	6.0	5.7	1.1	1.1	0.98
21	2021	mCS1	21	-99	0	101.8	101.0	5.0	4.7	0.8	1.0	0.98
22	2019	mSB2	63	-6	24	101.8	101.6	3.0	3.7	0.2	2.7	0.70
23	2020	mSB2	44	-32	47	101.6	100.3	3.0	3.2	1.3	2.4	0.71
24	2021	mSB2	21	-99	0	101.1	101.7	2.2	2.6	-0.6	2.3	0.54
25	2019	mCE2	63	-6	24	103.6	103.5	3.8	3.9	0.2	1.4	0.94
26	2020	mCE2	44	-32	47	103.1	102.4	2.5	2.4	0.7	1.3	0.86
27	2021	mCE2	21	-99	0	103.5	103.6	3.8	3.2	-0.1	1.5	0.92
28	2019	mCS2	63	-6	24	102.0	101.5	5.5	5.4	0.5	1.1	0.98
29	2020	mCS2	44	-32	47	103.5	103.0	5.1	5.3	0.6	0.8	0.99
30	2021	mCS2	21	-99	0	100.6	100.0	4.8	4.6	0.7	0.8	0.99
31	2020	brth	17	-82	39	102.9	102.8	4.7	5.8	0.1	1.9	0.96
32	2021	brth	21	-99	0	102.7	102.4	3.6	3.9	0.3	1.2	0.95
33	2019	calv	63	-6	24	102.4	102.4	2.9	3.1	0.0	0.9	0.96
34	2020	calv	44	-32	47	101.6	101.5	3.1	3.0	0.1	0.8	0.97
35	2021	calv	21	-99	0	101.6	101.9	2.2	2.4	-0.3	0.7	0.96

distribution of differences in number of bulls and in percentage

Obs	diff	d_brth	d_calv	p_brth	p_calv
1	-4	1	.	2	.
2	-3	1	.	2	.
3	-2	3	5	7	4
4	-1	3	25	7	20
5	0	19	69	44	54
6	1	9	23	21	18
7	2	4	6	9	5
8	3	1	.	2	.
9	4	1	.	2	.
10	5	1	.	2	.


distribution of differences in number of bulls and in percentage
50
40
30
20
10
0
p_brth
-4
-2
0
2
4
diff
p_brth
p_calv

RDC summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2010	dSB1	113	321	627	97.6	98.2	8.9	9.2	-0.6	3.1	0.94
2	2011	dSB1	125	412	732	99.7	99.8	8.4	9.1	-0.1	3.2	0.94
3	2012	dSB1	116	415	647	99.9	99.8	8.0	8.3	0.1	2.6	0.95
4	2013	dSB1	87	536	794	99.9	100.5	7.9	7.9	-0.6	2.0	0.97
5	2014	dSB1	71	709	917	100.3	100.7	8.2	8.5	-0.4	2.2	0.97
6	2015	dSB1	60	750	874	101.1	101.1	6.0	6.0	0.1	1.9	0.95
7	2016	dSB1	58	708	821	101.7	102.0	6.8	7.1	-0.3	2.4	0.94
8	2017	dSB1	48	836	810	101.3	101.8	6.6	6.5	-0.5	1.8	0.96
9	2018	dSB1	39	870	990	101.7	101.8	5.3	4.8	-0.2	2.0	0.93
10	2019	dSB1	36	509	493	101.1	101.4	9.6	9.4	-0.4	1.8	0.98
11	2010	dCE1	74	335	580	99.5	99.4	8.8	9.0	0.1	1.7	0.98
12	2011	dCE1	101	397	674	101.2	101.6	10.0	9.9	-0.3	2.0	0.98
13	2012	dCE1	79	450	608	101.7	102.1	8.2	8.4	-0.4	1.8	0.98
14	2013	dCE1	63	580	779	100.7	100.9	10.0	9.5	-0.1	1.6	0.99
15	2014	dCE1	63	658	825	101.2	101.0	9.8	9.1	0.2	1.6	0.99
16	2015	dCE1	53	689	790	101.4	101.7	8.1	6.9	-0.3	1.8	0.98
17	2016	dCE1	53	641	720	102.8	102.7	8.2	7.8	0.1	1.6	0.98
18	2017	dCE1	44	749	686	102.5	102.2	8.7	7.9	0.3	1.4	0.99
19	2018	dCE1	36	793	881	103.8	103.3	6.0	5.7	0.5	1.3	0.97
20	2019	dCE1	34	443	430	102.5	102.4	7.8	7.2	0.0	1.4	0.99
21	2011	dCS1	10	271	181	102.2	102.0	11.1	10.7	0.3	1.2	0.99
22	2012	dCS1	14	405	253	98.3	98.3	13.3	11.7	-0.1	1.9	1.00
23	2013	dCS1	16	454	260	103.3	102.5	10.1	8.8	0.8	1.9	0.99
24	2014	dCS1	18	453	279	100.0	99.6	13.4	11.6	0.4	1.9	1.00
25	2015	dCS1	19	447	265	97.3	97.1	11.2	9.9	0.2	1.6	1.00
26	2016	dCS1	19	369	223	97.3	97.6	7.8	7.4	-0.3	1.2	0.99
27	2017	dCS1	18	427	248	98.5	97.9	12.8	11.5	0.6	1.6	1.00
28	2018	dCS1	10	460	292	95.7	95.2	10.8	9.2	0.6	1.8	1.00
29	2019	dCS1	16	255	176	98.3	97.0	10.7	8.8	1.3	2.1	0.99
30	2010	dSB2	154	415	806	96.5	96.3	8.4	8.8	0.1	2.9	0.94
31	2011	dSB2	153	597	1187	100.2	100.5	8.5	8.8	-0.3	2.6	0.96
32	2012	dSB2	154	561	917	99.9	100.0	7.6	7.9	-0.1	2.5	0.95
33	2013	dSB2	109	755	1145	99.0	99.3	9.5	9.3	-0.3	2.3	0.97
34	2014	dSB2	81	1054	1360	100.2	99.9	7.0	7.3	0.3	2.0	0.96
35	2015	dSB2	67	1085	1173	99.9	100.2	7.5	7.6	-0.3	2.0	0.97
36	2016	dSB2	67	1107	1499	100.7	100.9	7.7	7.8	-0.2	2.1	0.97

RDC summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2017	dSB2	62	1115	1361	101.1	101.5	6.7	6.6	-0.4	1.8	0.96
38	2018	dSB2	51	1183	1500	101.2	101.3	5.1	5.6	-0.1	1.9	0.94
39	2019	dSB2	41	741	774	100.5	101.7	7.8	8.0	-1.2	2.0	0.97
40	2010	dCE2	131	339	639	98.1	98.3	10.8	10.3	-0.2	3.1	0.96
41	2011	dCE2	149	482	1004	101.7	101.9	10.1	10.3	-0.2	3.2	0.95
42	2012	dCE2	142	458	748	100.9	101.5	9.7	9.6	-0.7	3.1	0.95
43	2013	dCE2	101	630	990	100.0	100.7	10.9	9.9	-0.7	3.1	0.96
44	2014	dCE2	78	890	1177	99.8	99.8	8.9	9.3	0.0	2.3	0.97
45	2015	dCE2	66	866	975	101.6	102.1	7.9	7.7	-0.5	2.7	0.94
46	2016	dCE2	64	955	1273	101.6	101.8	7.9	8.1	-0.2	2.9	0.93
47	2017	dCE2	58	965	1142	102.2	102.0	8.1	8.4	0.1	2.5	0.95
48	2018	dCE2	51	991	1280	102.7	103.3	6.7	7.0	-0.6	2.3	0.94
49	2019	dCE2	39	637	668	102.3	102.7	8.1	7.7	-0.4	3.0	0.93
50	2010	dCS2	24	304	333	106.2	105.2	17.2	14.9	1.0	2.4	1.00
51	2011	dCS2	26	256	204	102.1	101.4	14.9	13.2	0.7	2.0	1.00
52	2012	dCS2	26	382	329	100.3	100.6	11.6	10.2	-0.3	1.6	1.00
53	2013	dCS2	25	414	333	100.4	100.9	11.1	9.6	-0.5	1.7	1.00
54	2014	dCS2	26	447	299	98.6	99.1	11.5	10.4	-0.5	1.5	1.00
55	2015	dCS2	27	438	340	98.5	98.3	13.0	11.4	0.2	1.9	1.00
56	2016	dCS2	25	487	342	98.0	98.2	11.7	10.3	-0.1	1.6	1.00
57	2017	dCS2	25	445	284	100.2	99.8	12.7	10.9	0.4	2.0	1.00
58	2018	dCS2	26	330	233	96.6	96.2	10.7	9.2	0.3	1.8	1.00
59	2019	dCS2	21	334	182	99.6	98.7	11.0	9.6	0.9	1.6	1.00
60	2010	mSB1	74	403	745	99.0	98.4	9.8	9.4	0.5	3.8	0.92
61	2011	mSB1	96	397	678	97.7	97.4	7.8	8.0	0.2	3.1	0.92
62	2012	mSB1	74	473	601	99.6	100.0	6.0	6.8	-0.4	3.0	0.90
63	2013	mSB1	58	644	715	101.2	101.9	7.2	7.7	-0.7	3.1	0.91
64	2014	mSB1	61	691	823	100.1	100.1	8.4	8.5	0.0	2.8	0.94
65	2015	mSB1	55	676	709	100.0	99.9	7.8	8.2	0.1	2.7	0.94
66	2016	mSB1	54	639	797	99.9	100.2	7.8	8.1	-0.2	3.2	0.92
67	2017	mSB1	36	569	523	101.8	101.9	7.1	7.2	-0.1	3.1	0.91
68	2010	mCE1	41	522	763	101.4	102.1	7.6	7.3	-0.7	1.7	0.97
69	2011	mCE1	61	470	703	97.7	98.0	9.2	9.4	-0.3	2.3	0.97
70	2012	mCE1	51	531	559	99.9	99.9	9.7	9.0	0.0	1.8	0.98
71	2013	mCE1	46	668	662	103.0	102.8	9.0	9.2	0.2	1.5	0.99
72	2014	mCE1	50	696	753	102.4	102.1	7.4	7.8	0.3	1.8	0.97

RDC summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

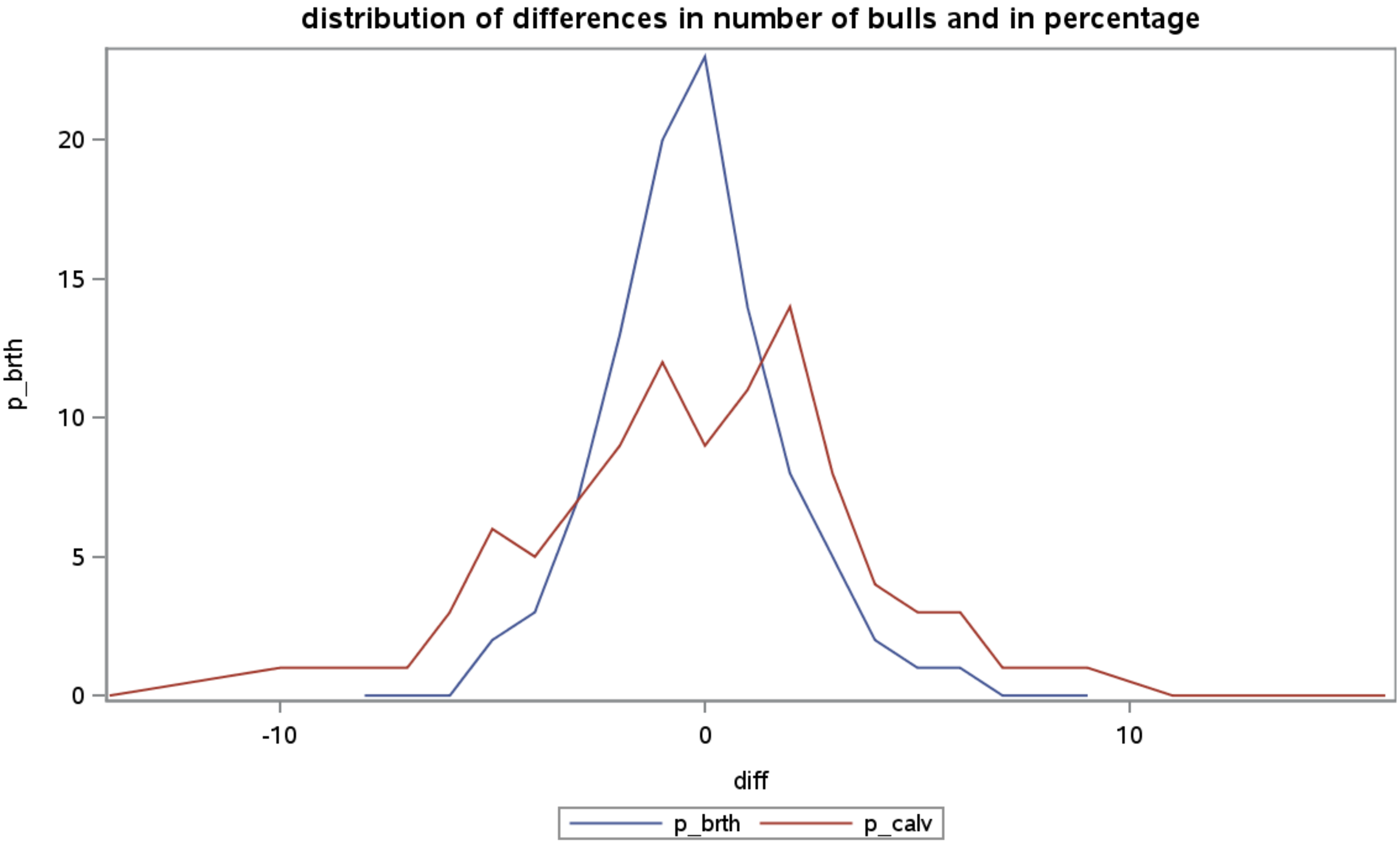
Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
73	2015	mCE1	50	614	621	99.7	98.9	8.7	8.8	0.7	1.5	0.99
74	2016	mCE1	50	575	687	102.0	101.8	7.9	7.9	0.2	1.5	0.98
75	2017	mCE1	33	516	447	103.1	102.4	8.8	9.3	0.7	1.6	0.99
76	2011	mCS1	12	228	126	104.6	102.7	10.6	11.7	1.9	4.0	0.94
77	2012	mCS1	16	299	199	105.1	103.3	13.6	12.6	1.9	3.4	0.97
78	2013	mCS1	17	347	218	102.5	100.2	13.8	13.6	2.3	2.4	0.98
79	2014	mCS1	17	399	207	97.7	96.6	15.0	14.6	1.1	1.8	0.99
80	2015	mCS1	20	298	183	97.9	97.7	15.2	14.1	0.2	3.4	0.98
81	2016	mCS1	17	324	186	103.8	101.7	16.1	14.7	2.1	2.8	0.99
82	2017	mCS1	17	264	134	97.7	97.4	10.3	10.7	0.3	2.7	0.97
83	2010	mSB2	105	424	931	100.5	99.6	9.6	9.3	0.9	6.0	0.80
84	2011	mSB2	119	433	801	98.2	98.0	8.0	8.3	0.2	5.5	0.78
85	2012	mSB2	102	487	707	100.2	100.3	7.6	7.5	-0.1	5.0	0.78
86	2013	mSB2	85	608	841	102.5	101.5	7.5	7.1	1.0	5.3	0.74
87	2014	mSB2	67	691	861	101.4	101.3	7.8	8.1	0.1	4.8	0.82
88	2015	mSB2	53	599	591	99.8	100.4	8.5	8.9	-0.6	4.4	0.87
89	2016	mSB2	33	403	453	99.0	99.4	8.7	7.0	-0.4	5.5	0.77
90	2010	mCE2	63	507	955	100.0	100.6	7.8	8.1	-0.6	2.2	0.96
91	2011	mCE2	91	442	769	98.7	98.6	8.3	8.6	0.1	2.4	0.96
92	2012	mCE2	80	489	637	100.6	100.5	7.2	8.0	0.1	2.7	0.94
93	2013	mCE2	66	641	798	101.1	101.3	7.3	7.7	-0.3	2.3	0.95
94	2014	mCE2	55	687	771	101.9	101.8	6.1	7.0	0.0	2.1	0.96
95	2015	mCE2	47	551	510	100.2	99.6	8.0	8.6	0.5	2.8	0.95
96	2016	mCE2	26	403	402	102.4	102.2	7.8	7.6	0.2	2.1	0.96
97	2010	mCS2	11	456	363	100.3	99.1	8.7	9.8	1.1	2.8	0.96
98	2011	mCS2	13	270	140	103.9	104.1	10.4	10.4	-0.2	2.3	0.98
99	2012	mCS2	18	382	262	102.9	102.2	9.2	9.0	0.8	2.3	0.97
100	2013	mCS2	20	406	298	102.2	101.7	11.2	11.2	0.5	2.4	0.98
101	2014	mCS2	17	414	217	96.6	95.9	13.4	13.4	0.7	1.7	0.99
102	2015	mCS2	16	317	145	97.9	96.9	11.3	14.0	1.0	3.6	0.98
103	2016	mCS2	10	251	109	101.9	101.8	13.5	14.7	0.0	2.3	0.99
104	2010	brth	113	321	627	97.2	97.5	8.8	9.1	-0.3	2.8	0.95
105	2011	brth	125	412	732	100.3	100.5	8.5	9.1	-0.2	2.5	0.96
106	2012	brth	116	415	647	100.1	100.3	8.2	8.6	-0.2	2.3	0.96
107	2013	brth	87	536	794	99.6	100.1	8.8	8.6	-0.6	2.0	0.97
108	2014	brth	71	709	917	100.5	100.7	7.7	7.9	-0.1	1.7	0.98

RDC summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
109	2015	brth	60	750	874	100.9	101.2	6.3	6.2	-0.3	1.5	0.97
110	2016	brth	58	708	821	101.8	102.1	7.1	7.3	-0.3	1.7	0.97
111	2017	brth	48	836	810	101.5	102.0	7.0	6.9	-0.5	1.3	0.98
112	2018	brth	39	870	990	102.2	102.4	4.7	4.5	-0.1	1.4	0.95
113	2019	brth	36	509	493	100.9	101.7	8.9	8.7	-0.7	1.5	0.99
114	2010	calv	74	403	745	100.0	99.2	9.3	8.9	0.8	4.3	0.89
115	2011	calv	96	397	678	97.7	97.6	7.7	8.0	0.1	3.6	0.89
116	2012	calv	74	473	601	99.8	100.4	6.7	7.4	-0.6	3.3	0.90
117	2013	calv	58	644	715	102.0	102.1	7.2	7.4	-0.1	3.5	0.89
118	2014	calv	61	691	823	100.7	100.7	7.7	7.8	0.0	3.1	0.92
119	2015	calv	55	676	709	100.0	100.0	8.0	8.3	0.0	2.8	0.94
120	2016	calv	54	639	797	100.1	100.4	7.7	8.1	-0.3	4.0	0.87
121	2017	calv	36	569	523	102.4	102.2	7.2	8.5	0.2	4.0	0.88

distribution of differences in number of bulls and in percentage

Obs	diff	d_brth	d_calv	p_brth	p_calv
1	-14	.	1	.	0
2	-10	.	3	.	1
3	-9	.	3	.	1
4	-8	2	7	0	1
5	-7	2	5	0	1
6	-6	3	13	0	3
7	-5	15	28	2	6
8	-4	24	24	3	5
9	-3	50	34	7	7
10	-2	100	46	13	9
11	-1	153	60	20	12
12	0	173	46	23	9
13	1	107	55	14	11
14	2	61	73	8	14
15	3	36	43	5	8
16	4	14	20	2	4
17	5	6	15	1	3
18	6	5	14	1	3
19	7	1	7	0	1
20	8	2	6	0	1
21	9	1	4	0	1
22	11	.	1	.	0
23	16	.	1	.	0


distribution of differences in number of bulls and in percentage
p_brth
20
15
10
5
0
-10
0
10
diff
p_brth
p_calv

RDC summery stastistics for snell and current breeding value for nordic AI bulls with no offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	dSB1	15	-79	41	101.0	101.3	2.9	2.8	-0.3	1.3	0.90
2	2020	dSB1	23	-95	21	102.0	102.4	3.3	3.1	-0.3	1.5	0.90
3	2021	dSB1	26	-99	0	100.2	100.1	6.1	6.2	0.1	1.1	0.98
4	2019	dCE1	15	-79	41	99.8	100.1	4.2	3.9	-0.2	1.9	0.89
5	2020	dCE1	23	-95	21	102.0	101.7	4.0	3.9	0.2	1.0	0.97
6	2021	dCE1	26	-99	0	101.1	101.0	4.7	4.5	0.1	1.4	0.95
7	2019	dCS1	24	-50	51	99.8	99.0	6.3	5.7	0.8	2.6	0.91
8	2020	dCS1	36	-61	49	96.7	96.1	6.1	5.7	0.7	2.0	0.95
9	2021	dCS1	26	-99	0	100.2	99.4	5.7	5.4	0.8	1.7	0.96
10	2019	dSB2	14	-85	36	101.7	101.8	3.6	3.8	-0.1	1.2	0.95
11	2020	dSB2	24	-91	28	102.0	102.6	3.6	4.1	-0.6	1.7	0.91
12	2021	dSB2	26	-99	0	101.2	101.6	4.3	5.1	-0.4	1.7	0.95
13	2019	dCE2	16	-74	44	100.0	100.8	4.4	4.6	-0.8	1.9	0.91
14	2020	dCE2	26	-84	36	102.0	102.2	4.7	4.1	-0.2	1.7	0.93
15	2021	dCE2	26	-99	0	101.8	101.7	4.5	4.6	0.1	2.1	0.89
16	2019	dCS2	22	-54	50	100.0	99.3	6.3	5.5	0.7	2.8	0.89
17	2020	dCS2	33	-66	47	97.8	97.0	5.1	4.8	0.8	1.8	0.93
18	2021	dCS2	26	-99	0	98.6	98.7	6.0	5.8	-0.1	1.4	0.97
19	2019	mSB1	66	-18	38	100.8	100.9	4.4	4.6	-0.2	1.4	0.95
20	2020	mSB1	51	-43	50	98.6	99.0	8.3	8.5	-0.4	1.9	0.98
21	2021	mSB1	26	-99	0	100.0	100.4	3.9	4.1	-0.3	1.2	0.96
22	2019	mCE1	66	-18	38	101.1	100.8	4.2	4.2	0.3	1.2	0.96
23	2020	mCE1	51	-43	50	100.4	100.4	7.4	7.0	0.1	1.6	0.98
24	2021	mCE1	26	-99	0	101.7	101.1	3.7	3.9	0.5	1.0	0.97
25	2019	mCS1	66	-18	38	102.5	101.7	6.5	6.4	0.8	1.9	0.96
26	2020	mCS1	51	-43	50	101.7	101.2	5.7	5.3	0.6	2.3	0.92
27	2021	mCS1	26	-99	0	102.9	101.7	4.8	5.2	1.2	1.9	0.93
28	2019	mSB2	66	-18	38	101.4	101.0	4.9	4.9	0.3	3.0	0.80
29	2020	mSB2	51	-43	50	99.4	99.0	5.9	7.1	0.3	2.9	0.92
30	2021	mSB2	26	-99	0	101.3	100.6	3.4	3.9	0.7	2.5	0.78
31	2019	mCE2	66	-18	38	101.5	101.5	3.7	4.0	0.1	1.8	0.89
32	2020	mCE2	51	-43	50	100.4	100.6	5.8	6.0	-0.2	1.5	0.97
33	2021	mCE2	26	-99	0	101.2	101.5	3.3	3.8	-0.2	1.2	0.95
34	2019	mCS2	66	-18	38	101.6	101.4	4.6	5.5	0.2	2.4	0.91
35	2020	mCS2	51	-43	50	101.9	102.1	4.9	5.2	-0.2	1.5	0.96
36	2021	mCS2	26	-99	0	102.1	101.7	3.6	4.9	0.4	1.8	0.96

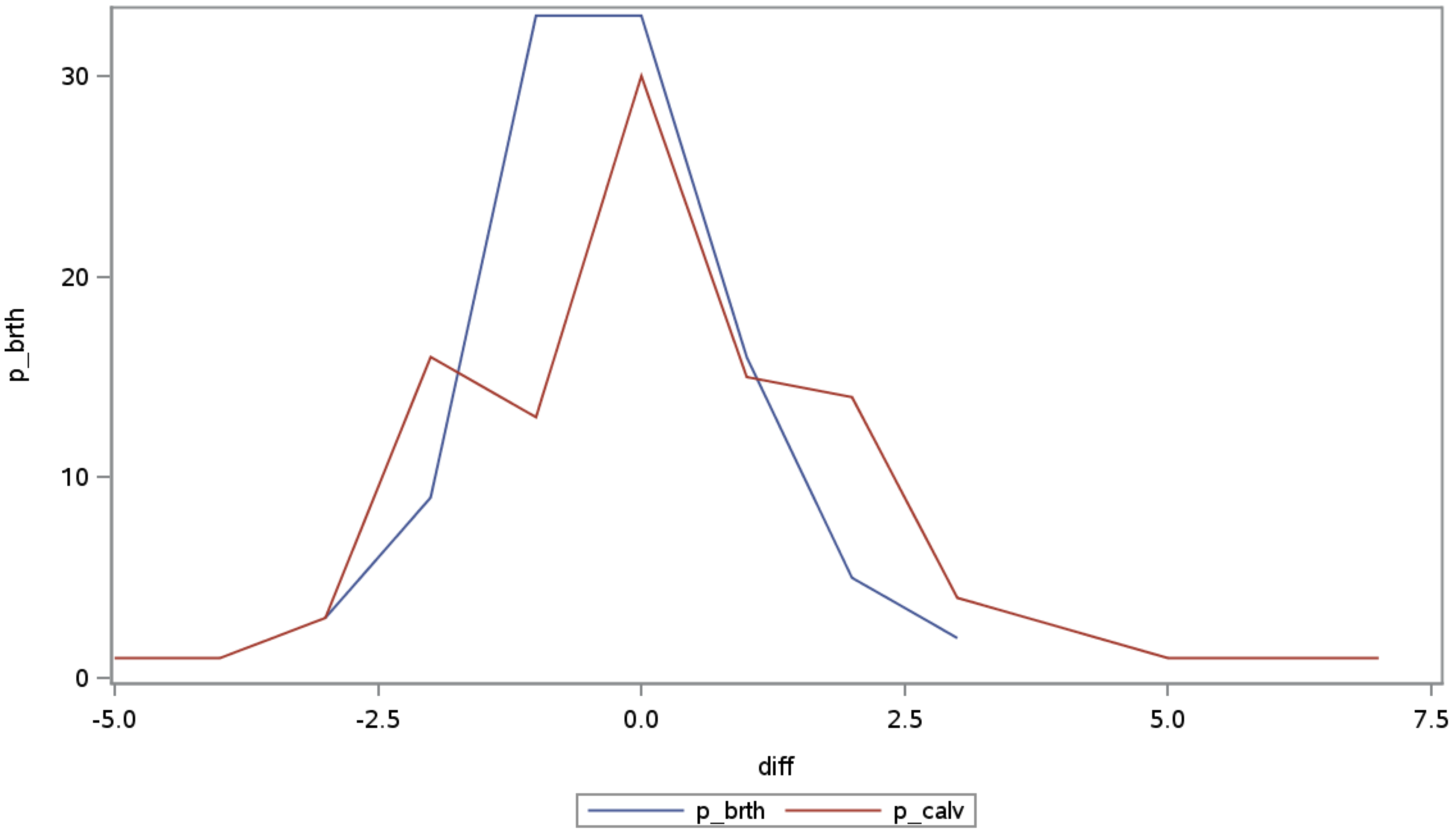
RDC summery stastistics for snell and current breeding value for nordic AI bulls with no offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	brth	15	-79	41	101.2	101.4	3.1	3.3	-0.2	1.1	0.94
38	2020	brth	23	-95	21	102.3	102.7	3.4	3.3	-0.4	0.9	0.97
39	2021	brth	26	-99	0	100.8	100.9	5.3	5.7	-0.1	1.1	0.98
40	2019	calv	66	-18	38	101.2	101.1	4.6	4.6	0.1	1.8	0.93
41	2020	calv	51	-43	50	99.1	99.2	7.9	8.2	-0.1	1.9	0.97
42	2021	calv	26	-99	0	100.8	100.7	3.8	3.9	0.1	1.5	0.92

distribution of differences in number of bulls and in percentage

Obs	diff	d_brth	d_calv	p_brth	p_calv
1	-5	.	1	.	1
2	-4	.	2	.	1
3	-3	2	4	3	3
4	-2	6	23	9	16
5	-1	21	19	33	13
6	0	21	43	33	30
7	1	10	22	16	15
8	2	3	20	5	14
9	3	1	6	2	4
10	5	.	2	.	1
11	7	.	1	.	1

distribution of differences in number of bulls and in percentage



JER summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2010	dSB1	17	376	224	101.2	102.0	5.0	5.4	-0.8	1.8	0.94
2	2011	dSB1	16	293	201	102.2	102.2	8.7	10.0	0.0	2.5	0.98
3	2012	dSB1	12	908	753	99.5	98.5	6.5	7.7	1.0	2.5	0.95
4	2013	dSB1	11	851	826	102.9	102.5	5.2	6.1	0.3	2.2	0.94
5	2014	dSB1	15	883	593	101.8	101.6	9.0	10.3	0.2	2.1	0.99
6	2015	dSB1	24	1087	847	99.7	98.5	6.6	7.3	1.1	1.8	0.97
7	2016	dSB1	16	819	572	101.6	102.8	8.5	9.1	-1.2	1.7	0.98
8	2017	dSB1	25	1103	773	101.4	100.8	9.7	11.2	0.6	2.3	0.99
9	2019	dSB1	23	872	573	99.9	98.6	12.7	14.2	1.4	1.9	1.00
10	2010	dCE1	17	369	217	100.2	101.7	8.0	6.8	-1.5	4.7	0.81
11	2011	dCE1	14	318	214	101.2	101.6	8.6	7.9	-0.4	5.1	0.81
12	2012	dCE1	12	882	747	101.9	102.5	8.2	7.4	-0.5	1.7	0.98
13	2013	dCE1	11	825	810	99.4	98.5	7.1	5.8	0.9	4.0	0.83
14	2014	dCE1	15	856	580	104.2	102.6	8.2	7.5	1.5	4.3	0.85
15	2015	dCE1	23	1088	816	100.7	100.7	9.1	7.6	0.1	2.7	0.96
16	2016	dCE1	16	777	548	98.4	98.3	6.9	6.9	0.1	3.5	0.87
17	2017	dCE1	24	1087	710	99.3	97.4	8.6	7.6	1.9	3.3	0.92
18	2019	dCE1	23	820	538	96.0	97.5	7.2	6.0	-1.5	3.9	0.84
19	2010	dCS1	14	318	170	97.5	98.1	7.9	7.5	-0.7	1.1	0.99
20	2011	dCS1	14	247	144	98.4	98.6	8.3	8.4	-0.2	1.2	0.99
21	2012	dCS1	12	737	607	96.3	96.0	7.5	7.7	0.4	0.6	1.00
22	2013	dCS1	11	727	672	103.7	103.6	5.5	5.6	0.1	0.9	0.99
23	2014	dCS1	15	749	488	98.7	98.5	8.2	8.5	0.3	0.8	1.00
24	2015	dCS1	22	963	654	100.0	99.4	6.1	6.2	0.6	0.8	0.99
25	2016	dCS1	16	721	504	102.6	102.3	5.6	5.5	0.3	0.9	0.99
26	2017	dCS1	24	956	637	103.4	103.1	6.0	6.0	0.3	0.9	0.99
27	2019	dCS1	23	765	492	103.2	102.5	4.4	4.6	0.6	0.7	0.99
28	2010	dSB2	55	406	396	102.0	101.4	7.2	8.5	0.6	2.9	0.95
29	2011	dSB2	47	336	266	100.4	99.5	7.5	9.2	0.9	3.3	0.94
30	2012	dSB2	47	606	990	100.8	99.9	7.2	8.8	0.9	3.2	0.94
31	2013	dSB2	49	486	711	98.5	98.2	8.4	9.7	0.2	3.2	0.95
32	2014	dSB2	36	786	839	100.2	99.6	6.0	7.1	0.5	2.4	0.95
33	2015	dSB2	30	1682	1438	101.0	99.9	6.1	6.5	1.0	2.7	0.91
34	2016	dSB2	24	1187	991	99.3	100.4	8.7	10.1	-1.1	2.8	0.96
35	2017	dSB2	29	1654	1187	103.6	102.7	8.4	9.8	0.9	2.5	0.98
36	2018	dSB2	19	953	1038	105.0	105.1	8.4	10.2	-0.1	2.9	0.97

JER summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dSB2	26	1094	794	96.6	95.4	16.2	17.5	1.2	2.4	0.99
38	2010	dCE2	55	393	398	102.2	102.6	8.2	6.9	-0.5	5.4	0.76
39	2011	dCE2	47	324	279	100.3	99.7	7.8	7.5	0.6	5.8	0.71
40	2012	dCE2	47	584	982	101.3	100.2	7.6	7.4	1.1	4.9	0.79
41	2013	dCE2	49	463	697	98.1	99.5	8.2	7.4	-1.4	6.6	0.65
42	2014	dCE2	36	747	803	101.5	103.1	6.6	6.1	-1.6	5.4	0.65
43	2015	dCE2	30	1610	1405	102.2	102.0	6.7	6.5	0.2	2.7	0.92
44	2016	dCE2	24	1120	949	98.9	98.4	6.9	7.4	0.5	4.0	0.85
45	2017	dCE2	29	1574	1128	100.1	99.1	9.6	8.1	1.1	4.8	0.87
46	2018	dCE2	19	899	997	99.7	100.6	9.1	6.0	-0.9	5.1	0.85
47	2019	dCE2	25	1054	738	96.5	97.8	10.0	8.5	-1.3	4.9	0.87
48	2010	dCS2	54	311	295	99.3	99.0	6.1	5.9	0.3	1.2	0.98
49	2011	dCS2	46	261	181	100.8	100.6	7.3	7.1	0.3	1.1	0.99
50	2012	dCS2	47	493	793	99.9	99.6	7.2	7.2	0.3	1.0	0.99
51	2013	dCS2	49	417	589	100.7	100.5	6.8	6.6	0.2	1.1	0.99
52	2014	dCS2	36	676	705	98.1	97.6	7.1	6.9	0.5	0.8	0.99
53	2015	dCS2	30	1378	1133	99.2	98.7	6.4	6.2	0.5	0.9	0.99
54	2016	dCS2	24	1047	875	101.5	101.5	6.0	5.9	0.0	0.5	1.00
55	2017	dCS2	29	1376	979	102.3	101.9	6.5	6.5	0.4	0.4	1.00
56	2018	dCS2	19	832	932	99.7	99.8	4.5	4.5	-0.1	0.8	0.98
57	2019	dCS2	24	1005	654	102.4	102.0	5.1	5.0	0.5	0.7	0.99
58	2010	mSB1	25	306	230	96.1	96.6	9.5	10.2	-0.5	2.0	0.98
59	2011	mSB1	20	260	209	93.7	94.3	8.7	9.5	-0.7	1.9	0.98
60	2012	mSB1	16	762	782	96.1	95.5	15.5	16.9	0.5	2.7	0.99
61	2013	mSB1	14	695	724	100.8	100.9	7.2	8.7	-0.1	2.1	0.98
62	2014	mSB1	17	814	558	95.8	95.5	12.0	13.0	0.3	1.9	0.99
63	2015	mSB1	26	1123	969	102.0	101.8	7.8	7.7	0.3	1.7	0.98
64	2016	mSB1	20	852	698	100.3	100.0	7.3	7.8	0.4	1.8	0.97
65	2017	mSB1	26	780	559	98.6	97.7	9.4	10.4	0.9	1.8	0.99
66	2010	mCE1	19	357	221	94.1	93.7	11.2	11.7	0.4	3.0	0.97
67	2011	mCE1	18	270	220	100.2	98.6	10.2	10.1	1.7	3.0	0.96
68	2012	mCE1	16	728	751	97.5	96.5	11.1	13.4	1.0	3.8	0.97
69	2013	mCE1	13	704	704	100.1	101.6	9.4	9.2	-1.5	3.0	0.95
70	2014	mCE1	16	812	519	97.0	96.3	9.3	11.3	0.8	3.2	0.97
71	2015	mCE1	26	1069	936	103.7	103.2	6.2	6.8	0.4	1.9	0.96
72	2016	mCE1	20	806	662	100.0	99.0	6.5	6.8	1.1	2.7	0.92

JER summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

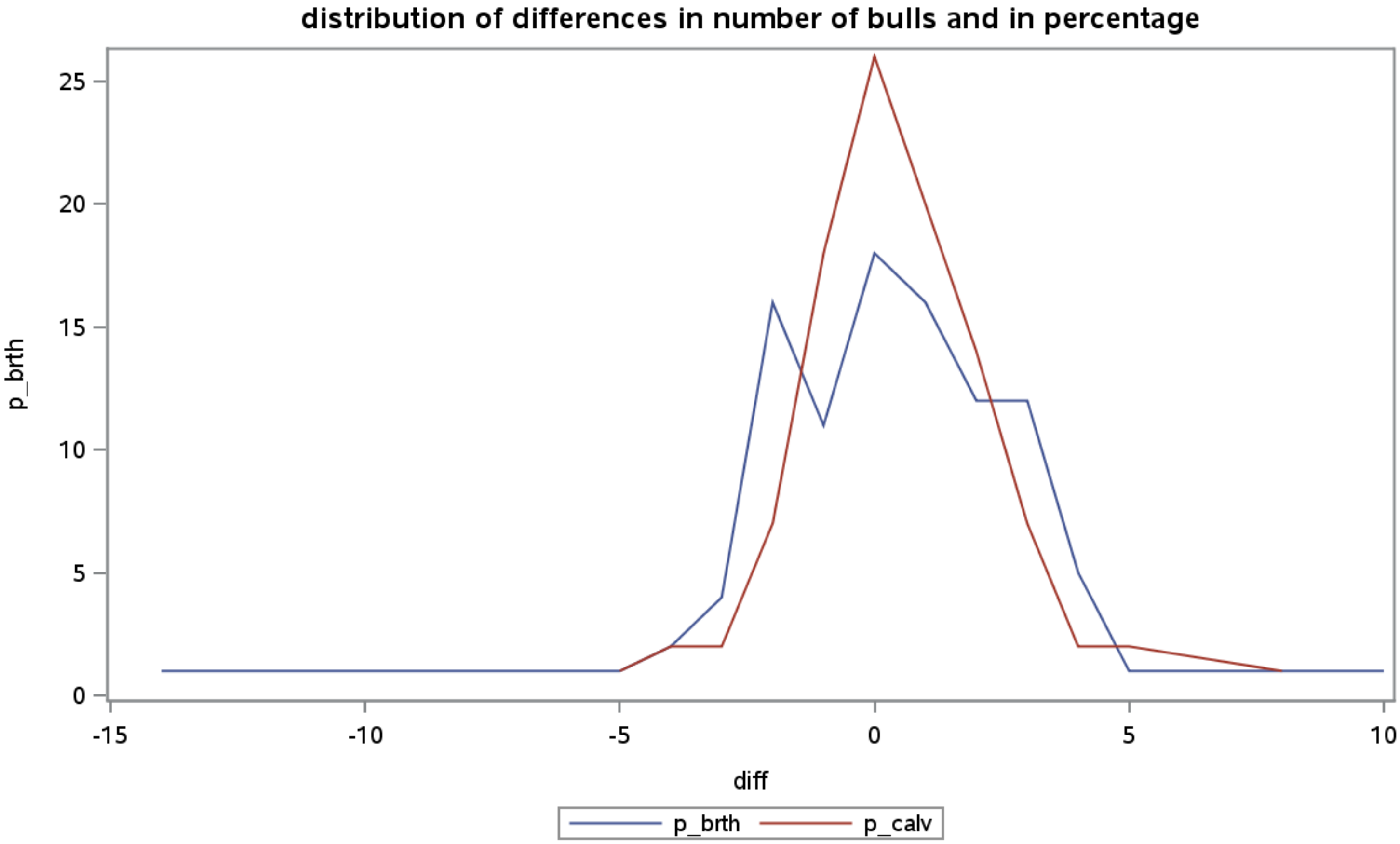
Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
73	2017	mCE1	26	730	523	101.7	101.2	7.6	7.5	0.5	3.3	0.90
74	2010	mCS1	17	316	190	100.8	99.8	5.0	6.3	1.0	2.2	0.95
75	2011	mCS1	16	243	158	97.4	96.2	10.5	10.1	1.2	3.3	0.95
76	2012	mCS1	15	667	643	101.0	100.9	9.3	8.3	0.1	2.5	0.97
77	2013	mCS1	12	658	568	96.5	95.9	7.3	6.9	0.7	1.9	0.97
78	2014	mCS1	16	722	442	101.0	101.5	9.2	8.0	-0.5	2.2	0.98
79	2015	mCS1	26	946	794	101.8	101.9	7.6	6.7	-0.1	2.0	0.97
80	2016	mCS1	19	800	627	102.8	103.4	6.0	6.2	-0.6	1.8	0.96
81	2017	mCS1	25	719	494	99.5	98.7	7.9	7.3	0.8	1.8	0.97
82	2010	mSB2	47	318	317	97.5	97.9	7.8	8.2	-0.4	1.7	0.98
83	2011	mSB2	40	274	273	96.7	96.2	8.2	8.5	0.5	1.8	0.98
84	2012	mSB2	40	482	705	98.4	98.3	8.5	9.2	0.1	2.7	0.96
85	2013	mSB2	28	552	747	99.0	98.3	7.6	8.2	0.7	2.0	0.97
86	2014	mSB2	23	833	769	97.5	97.7	9.1	9.6	-0.2	1.8	0.98
87	2015	mSB2	26	987	735	98.6	98.2	9.8	10.6	0.4	1.9	0.99
88	2016	mSB2	16	534	377	98.2	97.9	10.2	11.6	0.3	2.9	0.97
89	2010	mCE2	44	318	307	97.7	99.2	7.4	8.2	-1.5	3.1	0.92
90	2011	mCE2	34	290	290	99.1	98.9	7.1	8.6	0.2	3.8	0.90
91	2012	mCE2	37	484	692	97.2	97.0	9.0	9.0	0.3	3.5	0.93
92	2013	mCE2	27	539	722	99.8	100.2	8.0	7.7	-0.5	3.7	0.89
93	2014	mCE2	21	854	731	99.1	98.8	9.1	9.5	0.3	4.1	0.91
94	2015	mCE2	25	966	692	101.1	100.3	7.2	8.4	0.8	2.5	0.96
95	2016	mCE2	15	525	346	96.5	96.0	9.8	9.5	0.6	4.1	0.91
96	2010	mCS2	37	312	278	97.9	98.4	6.4	6.4	-0.5	1.8	0.96
97	2011	mCS2	31	265	216	95.7	96.8	9.4	9.5	-1.0	2.2	0.97
98	2012	mCS2	34	459	609	99.8	100.1	6.7	7.4	-0.3	2.1	0.96
99	2013	mCS2	25	509	621	97.1	97.6	6.7	6.5	-0.4	2.0	0.96
100	2014	mCS2	19	844	648	101.1	101.8	7.6	7.9	-0.8	2.1	0.96
101	2015	mCS2	25	872	599	102.2	102.1	6.6	6.1	0.2	2.4	0.93
102	2016	mCS2	15	503	332	104.8	104.1	7.5	6.9	0.8	1.6	0.98
103	2010	brth	17	376	224	101.6	102.5	5.0	5.6	-0.8	1.8	0.95
104	2011	brth	16	293	201	101.6	101.5	8.3	9.4	0.1	2.1	0.98
105	2012	brth	12	908	753	102.0	101.4	5.8	6.8	0.7	1.9	0.97
106	2013	brth	11	851	826	101.8	102.0	5.4	6.5	-0.3	2.3	0.94
107	2014	brth	15	883	593	101.8	101.6	7.3	8.7	0.2	1.7	0.99
108	2015	brth	24	1087	847	100.4	99.3	6.3	7.1	1.0	1.5	0.98

JER summery stastistics for snell and current breeding value for nordic AI bulls with minimum 100 offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
109	2016	brth	16	819	572	100.8	101.6	7.1	8.4	-0.9	2.3	0.97
110	2017	brth	25	1103	773	102.1	100.8	9.7	11.4	1.3	2.1	0.99
111	2019	brth	23	872	573	98.5	97.6	12.8	14.6	0.8	2.5	0.99
112	2010	calv	25	306	230	96.3	96.8	9.1	9.6	-0.5	1.1	0.99
113	2011	calv	20	260	209	95.1	94.6	9.1	9.5	0.5	1.1	0.99
114	2012	calv	16	762	782	96.2	95.7	12.9	15.1	0.5	2.9	0.99
115	2013	calv	14	695	724	100.2	100.4	6.8	7.2	-0.2	1.4	0.98
116	2014	calv	17	814	558	96.3	96.0	11.4	12.0	0.3	1.2	1.00
117	2015	calv	26	1123	969	101.4	100.8	7.9	8.3	0.6	1.1	0.99
118	2016	calv	20	852	698	98.9	98.2	7.6	8.7	0.7	1.8	0.98
119	2017	calv	26	780	559	99.4	98.1	8.7	10.0	1.3	2.5	0.97

distribution of differences in number of bulls and in percentage

Obs	diff	d_brth	d_calv	p_brth	p_calv
1	-14	1	.	1	.
2	-5	2	1	1	1
3	-4	4	3	2	2
4	-3	7	3	4	2
5	-2	27	11	16	7
6	-1	19	31	11	18
7	0	31	44	18	26
8	1	27	33	16	20
9	2	20	24	12	14
10	3	20	11	12	7
11	4	9	3	5	2
12	5	2	4	1	2
13	6	1	.	1	.
14	8	.	1	.	1
15	10	1	.	1	.

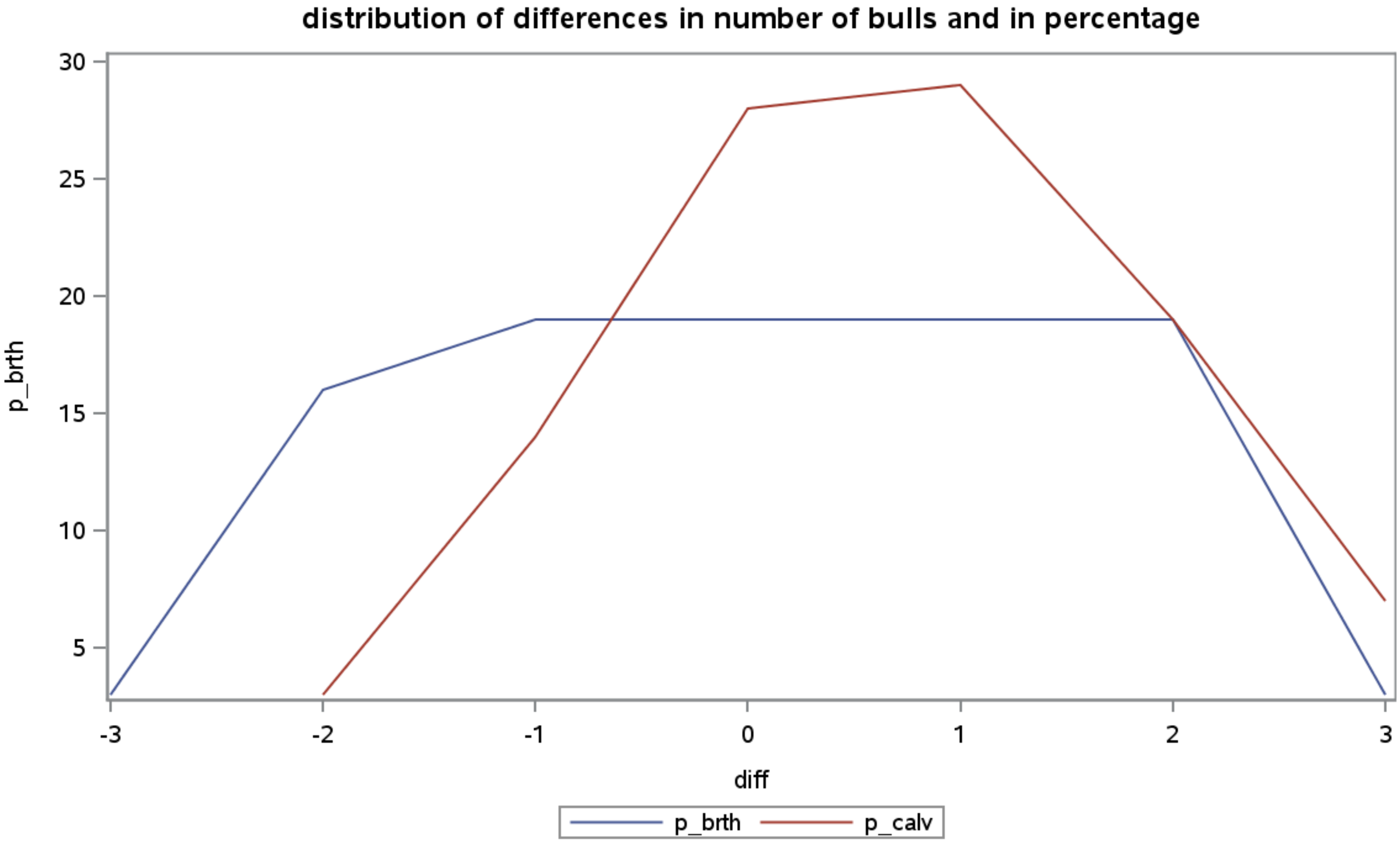

distribution of differences in number of bulls and in percentage
25
20
15
10
5
0
p_brth
-15
-10
-5
0
5
10
diff
p_brth
p_calv

JER summery stastistics for snell and current breeding value for nordic AI bulls with no offspring, by birth year

Obs	BYR	name	no	mean_sn_no	std_sn_no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	dSB1	12	-99	0	99.7	99.3	5.9	7.0	0.4	1.3	0.99
2	2020	dSB1	12	-83	39	101.9	102.5	3.8	3.9	-0.6	0.9	0.97
3	2019	dCE1	12	-99	0	99.7	99.0	4.1	5.1	0.7	3.3	0.76
4	2020	dCE1	12	-83	39	98.4	98.5	4.7	5.9	-0.1	2.9	0.87
5	2019	dCS1	12	-99	0	101.1	100.9	5.0	5.3	0.2	0.6	0.99
6	2020	dCS1	13	-76	43	101.6	102.0	4.2	4.4	-0.4	0.8	0.98
7	2019	dSB2	12	-99	0	100.3	99.8	5.9	7.1	0.4	1.6	0.99
8	2020	dSB2	12	-83	39	102.6	102.6	3.9	4.7	0.0	1.3	0.97
9	2019	dCE2	12	-99	0	100.1	99.3	4.3	5.9	0.8	4.7	0.62
10	2020	dCE2	12	-83	39	97.9	97.8	4.5	5.6	0.1	4.3	0.66
11	2019	dCS2	12	-99	0	101.2	101.0	4.0	4.4	0.1	1.1	0.97
12	2020	dCS2	12	-83	39	101.4	101.9	4.7	5.1	-0.4	1.0	0.98
13	2019	mSB1	43	-28	45	100.0	99.6	4.4	4.7	0.4	0.7	0.99
14	2020	mSB1	22	-45	50	100.1	98.7	4.2	4.9	1.4	1.2	0.98
15	2019	mCE1	43	-28	45	101.4	101.2	5.1	5.0	0.2	1.8	0.94
16	2020	mCE1	22	-45	50	96.6	97.1	4.2	3.4	-0.5	2.2	0.86
17	2019	mCS1	43	-28	45	101.5	101.0	3.3	3.4	0.5	1.3	0.92
18	2020	mCS1	22	-45	50	100.5	101.2	4.1	4.3	-0.6	1.0	0.97
19	2019	mSB2	44	-27	45	98.7	97.8	4.4	4.8	0.9	2.2	0.89
20	2020	mSB2	22	-45	50	98.1	98.2	4.4	4.6	-0.1	1.0	0.98
21	2019	mCE2	44	-27	45	101.1	100.9	4.9	5.1	0.3	2.1	0.91
22	2020	mCE2	22	-45	50	96.2	96.4	4.4	3.9	-0.2	1.9	0.90
23	2019	mCS2	44	-27	45	101.0	100.9	3.8	3.4	0.1	2.1	0.84
24	2020	mCS2	22	-45	50	102.3	101.3	3.0	3.6	1.0	2.2	0.78
25	2019	brth	12	-99	0	99.9	99.3	5.8	7.0	0.6	1.4	0.99
26	2020	brth	12	-83	39	101.7	102.1	3.9	4.9	-0.4	1.5	0.97
27	2019	calv	43	-28	45	99.9	99.2	4.1	4.7	0.7	1.3	0.96
28	2020	calv	22	-45	50	98.1	97.7	4.5	4.8	0.4	1.0	0.98

distribution of differences in number of bulls and in percentage

Obs	diff	d_brth	d_calv	p_brth	p_calv
1	-3	1	.	3	.
2	-2	5	2	16	3
3	-1	6	10	19	14
4	0	6	20	19	28
5	1	6	21	19	29
6	2	6	14	19	19
7	3	1	5	3	7


distribution of differences in number of bulls and in percentage
30
25
20
15
10
5
p_brth
-3
-2
-1
0
1
2
3
diff
p_brth
p_calv

HOL summery stastistics for snell and current breeding value for genotyped females without own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	dSB1	2842	99.5	99.6	5.4	5.3	-0.1	1.4	0.97
2	2020	dSB1	1058	100.3	100.2	4.8	4.8	0.1	1.2	0.97
3	2019	dCE1	2842	99.8	99.9	4.3	4.7	-0.1	1.1	0.98
4	2020	dCE1	1058	100.2	100.4	3.9	4.3	-0.2	1.0	0.97
5	2019	dCS1	2842	99.9	99.8	5.4	5.5	0.1	0.9	0.99
6	2020	dCS1	1058	99.3	99.3	5.1	5.0	0.0	1.0	0.98
7	2019	dSB2	2842	98.9	99.2	5.1	4.6	-0.3	2.1	0.91
8	2020	dSB2	1058	99.3	99.5	4.4	4.1	-0.1	1.9	0.90
9	2019	dCE2	2842	99.5	99.7	3.8	4.4	-0.2	1.5	0.94
10	2020	dCE2	1058	100.0	100.2	3.4	4.1	-0.2	1.5	0.94
11	2019	dCS2	2842	99.7	99.7	5.5	5.6	0.0	1.0	0.98
12	2020	dCS2	1058	99.2	99.2	5.1	5.2	0.0	0.9	0.98
13	2019	brth	2842	99.4	99.5	5.0	4.9	-0.1	1.5	0.96
14	2020	brth	1058	100.0	100.0	4.4	4.5	0.0	1.4	0.95

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-19	1	0
2	-18	1	0
3	-16	2	0
4	-15	1	0
5	-10	3	0
6	-9	2	0
7	-8	2	0
8	-7	7	0
9	-5	4	0
10	-4	35	1
11	-3	79	2
12	-2	226	6
13	-1	808	21
14	0	1628	42
15	1	800	21
16	2	203	5
17	3	68	2
18	4	20	1
19	5	8	0
20	6	2	0

HOL summery stastistics for snell and current breeding value for genotyped females without progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	mSB1	11976	100.9	101.0	4.1	4.2	-0.2	0.6	0.99
2	2020	mSB1	39544	101.5	101.8	3.8	4.0	-0.3	0.7	0.99
3	2021	mSB1	52881	100.6	100.8	3.1	3.3	-0.2	0.6	0.98
4	2022	mSB1	13556	101.2	101.4	2.7	2.9	-0.3	0.6	0.98
5	2019	mCE1	11976	101.3	101.3	3.8	3.9	0.1	0.6	0.99
6	2020	mCE1	39544	102.1	102.0	3.6	3.7	0.1	0.8	0.98
7	2021	mCE1	52881	101.8	101.7	3.0	3.1	0.1	0.7	0.97
8	2022	mCE1	13556	102.3	102.2	2.9	3.0	0.0	0.7	0.97
9	2019	mCS1	11976	100.3	100.0	6.1	5.8	0.2	1.1	0.98
10	2020	mCS1	39544	103.0	102.5	6.3	6.0	0.6	1.2	0.98
11	2021	mCS1	52881	102.2	101.7	4.7	4.5	0.5	1.1	0.98
12	2022	mCS1	13556	102.8	102.2	4.4	4.2	0.6	1.0	0.97
13	2019	mSB2	11976	100.9	101.0	3.6	3.5	-0.2	1.9	0.86
14	2020	mSB2	39544	101.7	101.0	3.7	3.8	0.7	2.7	0.74
15	2021	mSB2	52881	100.8	100.6	3.1	3.0	0.2	1.9	0.81
16	2022	mSB2	13556	101.0	100.7	2.8	2.9	0.3	1.8	0.80
17	2019	mCE2	11976	101.6	101.6	3.6	3.7	0.1	1.0	0.96
18	2020	mCE2	39544	101.8	101.7	3.4	3.6	0.2	1.2	0.94
19	2021	mCE2	52881	102.3	102.0	3.1	3.1	0.3	1.1	0.94
20	2022	mCE2	13556	102.3	102.1	2.9	2.9	0.2	1.0	0.94
21	2019	mCS2	11976	99.5	99.5	5.4	5.4	0.0	1.0	0.98
22	2020	mCS2	39544	102.1	102.0	5.5	5.7	0.1	1.1	0.98
23	2021	mCS2	52881	101.3	101.0	4.3	4.3	0.3	0.8	0.98
24	2022	mCS2	13556	102.0	101.6	4.0	4.0	0.4	0.8	0.98
25	2019	calv	11976	101.1	101.2	3.8	3.8	-0.1	0.7	0.98
26	2020	calv	39544	101.8	101.8	3.7	3.7	0.0	0.9	0.97
27	2021	calv	52881	100.9	100.9	3.1	3.1	0.0	0.6	0.98
28	2022	calv	13556	101.4	101.4	2.7	2.8	0.0	0.6	0.97

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-6	1	0
2	-5	1	0
3	-4	3	0
4	-3	108	0
5	-2	2504	2
6	-1	23016	20
7	0	67825	57
8	1	20522	17
9	2	3618	3
10	3	303	0
11	4	49	0
12	5	3	0
13	6	1	0
14	13	1	0
15	14	2	0

RDC summery stastistics for snell and current breeding value for genotyped females without own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	dSB1	1933	100.3	100.5	4.0	4.0	-0.3	1.2	0.95
2	2020	dSB1	660	101.0	101.1	4.2	4.1	-0.1	1.1	0.96
3	2019	dCE1	1933	101.0	100.7	4.9	4.5	0.2	1.0	0.98
4	2020	dCE1	660	101.1	101.0	5.7	5.3	0.1	0.9	0.99
5	2019	dCS1	1933	100.3	99.9	5.5	5.2	0.4	1.6	0.96
6	2020	dCS1	660	99.9	99.4	6.3	5.9	0.5	1.4	0.97
7	2019	dSB2	1933	100.7	100.8	4.2	4.3	-0.1	1.2	0.96
8	2020	dSB2	660	101.2	101.5	4.2	4.4	-0.3	1.1	0.97
9	2019	dCE2	1933	101.1	100.9	4.7	4.7	0.2	1.5	0.95
10	2020	dCE2	660	101.7	101.4	5.8	5.7	0.3	1.4	0.97
11	2019	dCS2	1933	99.9	99.7	6.3	5.6	0.2	1.7	0.97
12	2020	dCS2	660	98.6	98.6	6.8	6.1	0.1	1.7	0.97
13	2019	brth	1933	100.6	100.7	4.0	4.1	-0.1	0.9	0.97
14	2020	brth	660	101.2	101.4	4.4	4.5	-0.2	0.9	0.98

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-4	3	0
2	-3	16	1
3	-2	136	5
4	-1	731	28
5	0	1168	45
6	1	435	17
7	2	78	3
8	3	19	1
9	4	5	0
10	5	1	0
11	7	1	0

RDC summery stastistics for snell and current breeding value for genotyped females without progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	mSB1	6891	100.5	100.4	3.9	4.4	0.1	1.5	0.94
2	2020	mSB1	15194	100.6	101.0	4.6	4.9	-0.4	1.4	0.96
3	2021	mSB1	18109	100.8	101.0	3.7	4.0	-0.2	1.2	0.95
4	2022	mSB1	4747	101.0	101.1	3.4	3.6	-0.1	1.2	0.95
5	2019	mCE1	6891	100.4	100.3	5.0	5.0	0.2	1.0	0.98
6	2020	mCE1	15194	101.6	101.6	5.2	5.5	0.0	1.3	0.97
7	2021	mCE1	18109	101.4	101.2	4.1	4.2	0.2	1.0	0.97
8	2022	mCE1	4747	101.5	101.3	3.8	3.8	0.3	0.9	0.97
9	2019	mCS1	6891	101.6	101.2	7.0	6.8	0.4	2.5	0.93
10	2020	mCS1	15194	100.2	99.6	6.4	6.5	0.5	2.3	0.94
11	2021	mCS1	18109	102.0	101.3	5.3	5.2	0.8	2.1	0.92
12	2022	mCS1	4747	101.3	100.8	5.1	4.9	0.6	1.9	0.93
13	2019	mSB2	6891	100.7	100.2	4.5	4.6	0.4	2.9	0.79
14	2020	mSB2	15194	100.5	100.5	4.7	5.4	0.0	2.8	0.85
15	2021	mSB2	18109	100.7	100.3	3.8	4.1	0.4	2.4	0.82
16	2022	mSB2	4747	101.3	100.8	3.5	3.8	0.4	2.4	0.79
17	2019	mCE2	6891	100.5	100.4	4.1	4.4	0.1	1.5	0.94
18	2020	mCE2	15194	100.9	101.2	4.5	5.1	-0.3	1.5	0.96
19	2021	mCE2	18109	100.8	100.9	3.8	4.1	-0.1	1.2	0.95
20	2022	mCE2	4747	101.1	101.2	3.4	3.6	-0.1	1.1	0.95
21	2019	mCS2	6891	101.2	101.1	5.0	5.6	0.1	2.2	0.92
22	2020	mCS2	15194	100.3	100.6	4.9	5.6	-0.3	2.0	0.94
23	2021	mCS2	18109	101.5	101.7	4.3	4.8	-0.1	1.6	0.94
24	2022	mCS2	4747	101.1	101.1	3.9	4.4	0.0	1.5	0.94
25	2019	calv	6891	100.6	100.4	4.0	4.4	0.3	1.8	0.91
26	2020	calv	15194	100.8	101.0	4.8	5.3	-0.2	1.8	0.94
27	2021	calv	18109	100.9	100.8	3.8	4.1	0.1	1.5	0.93
28	2022	calv	4747	101.3	101.1	3.5	3.7	0.1	1.4	0.92

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-7	7	0
2	-6	38	0
3	-5	181	0
4	-4	590	1
5	-3	1735	4
6	-2	4781	11
7	-1	8918	20
8	0	11237	25
9	1	9890	22
10	2	4892	11
11	3	1804	4
12	4	610	1
13	5	171	0
14	6	47	0
15	7	20	0
16	8	11	0
17	9	7	0
18	10	1	0
19	13	1	0

JER summery stastistics for snell and current breeding value for genotyped females without own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	dSB1	713	100.7	100.5	5.2	5.8	0.2	1.4	0.97
2	2020	dSB1	300	100.8	100.6	5.7	6.4	0.1	1.4	0.98
3	2019	dCE1	713	100.1	99.7	4.5	4.3	0.4	2.5	0.84
4	2020	dCE1	300	100.8	100.0	4.4	4.3	0.8	2.7	0.81
5	2019	dCS1	713	100.4	100.4	4.0	4.0	0.0	0.7	0.98
6	2020	dCS1	300	100.2	100.3	4.0	4.0	-0.1	0.9	0.98
7	2019	dSB2	713	101.5	101.3	5.0	5.6	0.2	1.7	0.95
8	2020	dSB2	300	102.1	101.8	4.9	5.7	0.3	1.7	0.96
9	2019	dCE2	713	101.0	100.3	4.5	4.5	0.7	3.0	0.78
10	2020	dCE2	300	101.8	100.8	4.3	4.0	1.0	3.1	0.73
11	2019	dCS2	713	100.5	100.5	3.7	3.7	0.0	0.7	0.98
12	2020	dCS2	300	100.5	100.5	4.0	4.0	0.0	0.7	0.98
13	2019	brth	713	101.1	100.8	5.1	5.8	0.3	1.4	0.98
14	2020	brth	300	101.5	101.2	5.2	6.0	0.4	1.4	0.98

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-5	1	0
2	-4	3	0
3	-3	7	1
4	-2	82	8
5	-1	176	17
6	0	294	29
7	1	266	26
8	2	131	13
9	3	37	4
10	4	9	1
11	5	5	0
12	6	2	0

JER summery stastistics for snell and current breeding value for genotyped females without progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2019	mSB1	4519	98.5	98.1	5.0	5.4	0.4	0.9	0.99
2	2020	mSB1	10160	100.1	99.5	5.3	5.9	0.5	1.2	0.98
3	2021	mSB1	12462	99.3	98.8	3.7	3.9	0.5	0.8	0.98
4	2022	mSB1	2887	100.0	99.6	3.4	3.7	0.4	0.7	0.98
5	2019	mCE1	4519	100.1	99.7	4.3	4.7	0.4	1.6	0.94
6	2020	mCE1	10160	99.9	99.7	4.3	4.2	0.2	1.8	0.91
7	2021	mCE1	12462	100.3	99.9	3.4	3.3	0.4	1.4	0.91
8	2022	mCE1	2887	100.1	100.3	3.3	3.0	-0.1	1.5	0.89
9	2019	mCS1	4519	99.9	99.6	4.3	4.2	0.4	1.2	0.96
10	2020	mCS1	10160	101.0	100.9	4.8	4.7	0.1	1.1	0.97
11	2021	mCS1	12462	100.8	100.3	3.4	3.5	0.4	1.0	0.96
12	2022	mCS1	2887	100.7	100.3	2.9	3.1	0.4	0.9	0.95
13	2019	mSB2	4519	99.2	98.2	4.5	4.8	1.0	1.9	0.92
14	2020	mSB2	10160	99.0	98.8	4.7	4.8	0.2	1.8	0.93
15	2021	mSB2	12462	99.9	98.9	3.3	3.5	1.0	1.4	0.92
16	2022	mSB2	2887	99.7	99.1	3.0	3.3	0.6	1.4	0.91
17	2019	mCE2	4519	99.8	99.6	5.5	5.3	0.2	2.2	0.92
18	2020	mCE2	10160	99.6	99.3	4.5	4.0	0.2	2.2	0.88
19	2021	mCE2	12462	100.6	100.2	3.9	3.7	0.4	1.7	0.90
20	2022	mCE2	2887	100.8	100.7	3.3	3.2	0.0	1.6	0.88
21	2019	mCS2	4519	99.7	99.8	4.6	4.2	-0.1	1.7	0.93
22	2020	mCS2	10160	101.3	101.0	4.2	4.3	0.3	1.8	0.91
23	2021	mCS2	12462	100.4	100.4	3.1	3.2	0.0	1.4	0.90
24	2022	mCS2	2887	100.3	100.1	3.1	3.0	0.2	1.3	0.91
25	2019	calv	4519	98.9	98.2	4.5	5.0	0.7	1.2	0.97
26	2020	calv	10160	99.6	99.2	4.8	5.2	0.4	1.2	0.97
27	2021	calv	12462	99.8	98.9	3.3	3.6	0.8	0.9	0.97
28	2022	calv	2887	100.1	99.6	2.9	3.3	0.5	1.0	0.96

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-8	1	0
2	-6	1	0
3	-5	2	0
4	-4	5	0
5	-3	100	0
6	-2	896	3
7	-1	3420	11
8	0	8307	28
9	1	11243	37
10	2	4733	16
11	3	1241	4
12	4	72	0
13	5	7	0

HOL summery stastistics for snell and current breeding value for genotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	dSB1	11925	99.5	99.8	5.1	5.5	-0.2	1.3	0.97
2	2016	dSB1	18824	100.6	100.7	5.4	5.7	-0.1	1.3	0.98
3	2017	dSB1	28370	101.0	100.9	5.5	5.7	0.1	1.2	0.98
4	2018	dSB1	39661	100.7	100.6	5.0	5.3	0.0	1.2	0.97
5	2019	dSB1	44276	100.8	100.6	5.3	5.4	0.1	1.2	0.98
6	2020	dSB1	52863	101.6	101.4	4.5	4.8	0.2	1.1	0.97
7	2021	dSB1	52878	101.7	101.5	4.2	4.5	0.2	1.0	0.97
8	2022	dSB1	13546	101.9	101.5	4.3	4.5	0.3	1.0	0.98
9	2015	dCE1	11925	99.3	99.5	4.9	5.5	-0.2	1.3	0.97
10	2016	dCE1	18824	100.3	100.5	4.9	5.6	-0.2	1.3	0.98
11	2017	dCE1	28370	100.6	100.7	4.7	5.3	-0.1	1.2	0.98
12	2018	dCE1	39661	100.6	100.7	4.5	5.0	-0.1	1.2	0.98
13	2019	dCE1	44276	100.9	101.0	4.3	4.8	-0.1	1.1	0.98
14	2020	dCE1	52863	101.5	101.7	3.9	4.4	-0.2	1.1	0.97
15	2021	dCE1	52878	102.2	102.4	3.6	4.1	-0.2	1.0	0.97
16	2022	dCE1	13546	102.5	102.7	3.6	4.1	-0.2	1.0	0.98
17	2015	dCS1	11925	100.4	100.3	6.0	6.4	0.1	1.1	0.99
18	2016	dCS1	18824	99.7	99.6	6.0	6.3	0.1	1.1	0.98
19	2017	dCS1	28370	99.3	99.3	5.7	6.0	0.0	1.0	0.99
20	2018	dCS1	39661	99.2	99.2	5.7	5.9	0.1	1.0	0.99
21	2019	dCS1	44276	99.0	98.9	5.5	5.7	0.0	0.9	0.99
22	2020	dCS1	52863	97.9	98.0	5.3	5.5	0.0	0.9	0.99
23	2021	dCS1	52878	97.2	97.1	5.0	5.1	0.0	0.9	0.99
24	2022	dCS1	13546	97.0	97.0	4.9	5.0	0.0	1.0	0.98
25	2015	dSB2	11925	99.6	99.6	4.5	5.2	0.0	1.9	0.93
26	2016	dSB2	18824	100.5	100.4	4.5	5.1	0.1	1.9	0.93
27	2017	dSB2	28370	100.6	100.6	4.6	5.0	0.1	1.9	0.93
28	2018	dSB2	39661	100.8	100.6	4.4	4.8	0.2	1.8	0.92
29	2019	dSB2	44276	100.5	100.4	4.2	4.6	0.1	1.8	0.92
30	2020	dSB2	52863	101.0	100.9	4.0	4.3	0.1	1.7	0.92
31	2021	dSB2	52878	100.8	100.7	3.8	4.2	0.2	1.6	0.93
32	2022	dSB2	13546	100.8	100.6	3.8	4.2	0.2	1.5	0.93
33	2015	dCE2	11925	98.8	99.0	4.4	5.3	-0.2	2.0	0.94
34	2016	dCE2	18824	99.6	99.8	4.3	5.2	-0.2	2.0	0.93
35	2017	dCE2	28370	100.3	100.5	4.1	5.0	-0.2	1.9	0.93
36	2018	dCE2	39661	100.5	100.7	4.0	4.8	-0.2	1.9	0.93

HOL summery stastistics for snell and current breeding value for genotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dCE2	44276	100.5	100.7	3.8	4.6	-0.3	1.8	0.93
38	2020	dCE2	52863	101.2	101.5	3.5	4.4	-0.3	1.7	0.93
39	2021	dCE2	52878	101.7	102.1	3.3	4.1	-0.4	1.6	0.93
40	2022	dCE2	13546	102.0	102.3	3.1	4.0	-0.3	1.6	0.93
41	2015	dCS2	11925	100.3	100.3	6.0	6.4	0.1	1.1	0.99
42	2016	dCS2	18824	99.8	99.7	5.9	6.3	0.1	1.1	0.99
43	2017	dCS2	28370	99.3	99.3	5.7	6.0	0.0	1.0	0.99
44	2018	dCS2	39661	99.4	99.3	5.6	5.9	0.1	1.0	0.99
45	2019	dCS2	44276	98.7	98.6	5.6	5.9	0.1	1.0	0.99
46	2020	dCS2	52863	97.6	97.6	5.4	5.6	0.1	0.9	0.99
47	2021	dCS2	52878	96.4	96.4	5.0	5.2	0.0	0.9	0.99
48	2022	dCS2	13546	96.0	96.1	5.0	5.3	-0.1	0.9	0.98
49	2015	brth	11925	99.4	99.6	4.7	5.3	-0.2	1.5	0.96
50	2016	brth	18824	100.5	100.6	4.9	5.4	-0.1	1.5	0.97
51	2017	brth	28370	100.8	100.8	4.9	5.4	0.0	1.4	0.97
52	2018	brth	39661	100.7	100.7	4.6	5.0	0.1	1.4	0.96
53	2019	brth	44276	100.7	100.6	4.7	5.1	0.1	1.3	0.97
54	2020	brth	52863	101.5	101.4	4.2	4.6	0.1	1.3	0.96
55	2021	brth	52878	101.7	101.5	3.9	4.3	0.2	1.2	0.96
56	2022	brth	13546	101.8	101.5	3.9	4.3	0.3	1.2	0.96

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-57	1	0
2	-55	1	0
3	-54	1	0
4	-48	1	0
5	-22	1	0
6	-16	1	0
7	-15	2	0
8	-14	3	0
9	-13	2	0
10	-12	2	0
11	-11	3	0
12	-10	6	0
13	-9	6	0
14	-8	17	0
15	-7	83	0
16	-6	233	0
17	-5	737	0
18	-4	2125	1
19	-3	5418	2
20	-2	14264	5
21	-1	45011	17
22	0	106995	41
23	1	58750	22
24	2	19685	8
25	3	6564	3
26	4	1645	1
27	5	461	0
28	6	175	0
29	7	63	0
30	8	27	0
31	9	16	0
32	10	26	0
33	11	12	0
34	12	5	0
35	14	1	0

HOL summery stastistics for snell and current breeding value for genotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	mSB1	11269	97.6	97.4	5.0	5.3	0.3	1.1	0.98
2	2016	mSB1	16891	98.6	98.5	4.8	5.1	0.1	1.1	0.98
3	2017	mSB1	24214	99.3	99.2	5.0	5.3	0.0	1.0	0.98
4	2018	mSB1	33531	100.3	100.4	4.7	5.0	-0.1	0.9	0.98
5	2019	mSB1	35244	100.8	101.0	4.3	4.6	-0.2	0.9	0.98
6	2020	mSB1	14187	101.9	102.3	4.0	4.3	-0.4	0.9	0.98
7	2015	mCE1	11269	97.3	97.2	5.1	5.2	0.1	1.0	0.98
8	2016	mCE1	16891	98.3	98.2	4.8	4.9	0.0	1.0	0.98
9	2017	mCE1	24214	99.3	99.3	4.8	4.9	0.0	0.9	0.98
10	2018	mCE1	33531	100.1	100.1	4.4	4.5	0.0	0.9	0.98
11	2019	mCE1	35244	101.3	101.3	4.3	4.4	0.0	0.8	0.98
12	2020	mCE1	14187	102.4	102.3	4.2	4.3	0.1	0.8	0.98
13	2015	mCS1	11269	98.7	99.3	6.0	5.9	-0.6	1.8	0.95
14	2016	mCS1	16891	99.0	99.4	6.3	6.2	-0.4	1.7	0.96
15	2017	mCS1	24214	100.1	100.1	5.8	5.7	0.0	1.6	0.96
16	2018	mCS1	33531	99.7	99.7	5.9	5.7	0.0	1.5	0.97
17	2019	mCS1	35244	100.6	100.4	6.3	6.0	0.3	1.5	0.97
18	2020	mCS1	14187	103.3	102.6	6.3	6.1	0.6	1.5	0.97
19	2015	mSB2	11269	96.4	97.3	5.0	5.1	-0.9	2.1	0.91
20	2016	mSB2	16891	97.8	98.4	4.8	4.8	-0.6	2.1	0.91
21	2017	mSB2	24214	99.2	99.4	4.6	4.6	-0.2	2.0	0.91
22	2018	mSB2	33531	100.5	100.5	4.3	4.3	0.0	2.0	0.89
23	2019	mSB2	35244	100.9	101.0	4.1	4.2	-0.1	2.1	0.87
24	2020	mSB2	14187	101.9	101.3	4.0	4.4	0.6	2.8	0.79
25	2015	mCE2	11269	96.7	96.6	5.0	5.2	0.1	1.5	0.96
26	2016	mCE2	16891	98.0	97.9	4.7	4.8	0.1	1.5	0.95
27	2017	mCE2	24214	99.1	99.1	4.3	4.5	0.0	1.3	0.96
28	2018	mCE2	33531	100.4	100.4	4.2	4.3	0.0	1.3	0.95
29	2019	mCE2	35244	101.8	101.7	4.0	4.2	0.1	1.2	0.96
30	2020	mCE2	14187	101.8	101.8	3.8	4.2	0.1	1.3	0.95
31	2015	mCS2	11269	98.3	98.7	6.2	6.1	-0.4	1.3	0.98
32	2016	mCS2	16891	98.5	98.9	6.0	5.9	-0.3	1.3	0.98
33	2017	mCS2	24214	99.9	99.8	5.8	5.7	0.1	1.2	0.98
34	2018	mCS2	33531	100.2	100.2	6.0	6.0	0.0	1.1	0.98
35	2019	mCS2	35244	99.8	99.8	5.5	5.5	0.0	1.1	0.98
36	2020	mCS2	14187	102.2	102.0	5.4	5.6	0.1	1.2	0.98

HOL summery stastistics for snell and current breeding value for genotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2015	calv	11269	97.0	97.0	4.9	5.2	0.0	1.0	0.98
38	2016	calv	16891	98.2	98.3	4.7	4.9	-0.1	1.0	0.98
39	2017	calv	24214	99.2	99.2	4.8	4.9	0.0	0.9	0.98
40	2018	calv	33531	100.4	100.4	4.5	4.6	-0.1	0.9	0.98
41	2019	calv	35244	101.0	101.2	4.2	4.4	-0.1	0.9	0.98
42	2020	calv	14187	102.2	102.2	4.0	4.2	0.0	1.0	0.97

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-5	2	0
2	-4	19	0
3	-3	286	0
4	-2	4315	3
5	-1	35106	26
6	0	70022	52
7	1	19891	15
8	2	3551	3
9	3	1113	1
10	4	509	0
11	5	250	0
12	6	160	0
13	7	73	0
14	8	26	0
15	9	12	0
16	13	1	0

RDC summery stastistics for snell and current breeding value for genotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	dSB1	9418	99.7	99.6	4.4	4.6	0.1	1.3	0.96
2	2016	dSB1	13290	99.5	99.4	4.4	4.7	0.1	1.3	0.96
3	2017	dSB1	15330	99.7	99.5	4.2	4.4	0.2	1.3	0.96
4	2018	dSB1	17530	100.6	100.6	3.8	4.1	0.0	1.3	0.95
5	2019	dSB1	17284	100.6	100.6	4.1	4.2	-0.1	1.2	0.96
6	2020	dSB1	18941	101.1	101.1	3.7	3.8	0.0	1.0	0.96
7	2021	dSB1	18109	100.2	100.4	4.0	4.0	-0.1	1.0	0.97
8	2022	dSB1	4747	100.2	100.4	5.1	5.0	-0.1	1.1	0.98
9	2015	dCE1	9418	99.6	99.6	5.9	5.8	0.0	1.3	0.98
10	2016	dCE1	13290	99.2	99.2	5.9	5.7	0.0	1.1	0.98
11	2017	dCE1	15330	99.3	99.4	5.5	5.3	-0.1	1.2	0.98
12	2018	dCE1	17530	100.4	100.4	5.6	5.3	0.0	1.3	0.98
13	2019	dCE1	17284	100.8	100.5	5.0	4.8	0.2	1.1	0.97
14	2020	dCE1	18941	100.4	100.3	5.4	5.2	0.1	1.1	0.98
15	2021	dCE1	18109	101.0	100.8	4.8	4.6	0.2	1.0	0.98
16	2022	dCE1	4747	101.0	100.8	5.1	4.9	0.2	1.1	0.98
17	2015	dCS1	9418	100.1	100.2	6.5	6.4	-0.1	1.7	0.96
18	2016	dCS1	13290	101.1	101.2	6.8	6.6	-0.1	1.7	0.97
19	2017	dCS1	15330	100.6	100.4	6.2	6.0	0.2	1.6	0.97
20	2018	dCS1	17530	100.0	100.0	5.8	5.7	0.0	1.5	0.97
21	2019	dCS1	17284	100.0	99.8	6.1	5.8	0.1	1.6	0.96
22	2020	dCS1	18941	100.1	99.8	6.8	6.4	0.2	1.5	0.97
23	2021	dCS1	18109	100.2	99.6	6.3	5.8	0.6	1.5	0.97
24	2022	dCS1	4747	100.1	99.5	6.5	5.9	0.5	1.6	0.97
25	2015	dSB2	9418	99.8	99.7	4.8	5.1	0.0	1.4	0.96
26	2016	dSB2	13290	99.8	99.7	4.7	5.0	0.1	1.4	0.96
27	2017	dSB2	15330	99.8	99.9	4.7	4.9	-0.1	1.4	0.96
28	2018	dSB2	17530	100.6	100.6	4.2	4.5	0.1	1.4	0.95
29	2019	dSB2	17284	100.5	100.4	4.0	4.4	0.0	1.3	0.95
30	2020	dSB2	18941	101.2	101.3	3.9	4.3	-0.1	1.3	0.96
31	2021	dSB2	18109	101.0	101.1	3.4	3.8	-0.1	1.2	0.95
32	2022	dSB2	4747	100.4	100.7	4.1	4.5	-0.2	1.3	0.96
33	2015	dCE2	9418	99.7	99.7	6.0	6.2	-0.1	1.9	0.95
34	2016	dCE2	13290	99.3	99.2	5.7	6.0	0.1	1.7	0.96
35	2017	dCE2	15330	99.7	99.7	5.2	5.4	0.0	1.7	0.95
36	2018	dCE2	17530	100.2	100.3	5.2	5.4	-0.1	1.7	0.95

RDC summery stastistics for snell and current breeding value for genotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dCE2	17284	100.7	100.6	4.8	5.1	0.1	1.7	0.94
38	2020	dCE2	18941	100.6	100.5	5.5	5.8	0.1	1.6	0.96
39	2021	dCE2	18109	101.2	101.1	4.5	4.9	0.1	1.5	0.95
40	2022	dCE2	4747	101.1	101.0	5.0	5.1	0.1	1.7	0.95
41	2015	dCS2	9418	100.2	100.4	7.1	6.7	-0.2	1.8	0.97
42	2016	dCS2	13290	100.5	100.8	7.1	6.6	-0.3	1.8	0.97
43	2017	dCS2	15330	100.6	100.5	6.4	6.0	0.0	1.7	0.96
44	2018	dCS2	17530	99.5	99.6	6.4	6.0	-0.1	1.5	0.97
45	2019	dCS2	17284	100.0	99.9	6.7	6.2	0.1	1.7	0.97
46	2020	dCS2	18941	98.8	98.9	6.9	6.4	-0.2	1.6	0.97
47	2021	dCS2	18109	99.2	99.0	6.8	6.2	0.2	1.5	0.98
48	2022	dCS2	4747	99.2	99.0	6.8	6.2	0.2	1.5	0.98
49	2015	brth	9418	99.7	99.6	4.7	5.0	0.0	1.2	0.97
50	2016	brth	13290	99.6	99.4	4.6	4.9	0.1	1.1	0.97
51	2017	brth	15330	99.7	99.6	4.3	4.5	0.1	1.1	0.97
52	2018	brth	17530	100.6	100.6	4.0	4.3	0.0	1.0	0.97
53	2019	brth	17284	100.6	100.6	4.0	4.3	0.0	1.0	0.97
54	2020	brth	18941	101.1	101.2	3.9	4.2	0.0	1.0	0.98
55	2021	brth	18109	100.7	100.8	3.7	4.0	-0.1	0.9	0.97
56	2022	brth	4747	100.5	100.6	4.7	4.9	-0.2	1.0	0.98

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-12	1	0
2	-8	2	0
3	-7	5	0
4	-6	6	0
5	-5	49	0
6	-4	268	0
7	-3	1057	1
8	-2	5526	5
9	-1	25592	22
10	0	50612	44
11	1	24051	21
12	2	5746	5
13	3	1320	1
14	4	250	0
15	5	94	0
16	6	48	0
17	7	9	0
18	8	3	0
19	9	8	0
20	10	1	0
21	12	1	0

RDC summery stastistics for snell and current breeding value for genotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	mSB1	8294	99.7	99.5	4.6	5.0	0.2	2.0	0.92
2	2016	mSB1	11168	99.7	99.8	4.9	5.2	-0.1	2.0	0.92
3	2017	mSB1	12729	99.5	99.4	5.1	5.3	0.1	1.9	0.93
4	2018	mSB1	14010	100.2	100.2	4.8	5.3	0.0	1.9	0.94
5	2019	mSB1	12318	100.5	100.5	4.4	4.8	0.1	1.9	0.92
6	2020	mSB1	4384	101.0	101.3	4.9	5.2	-0.2	1.8	0.94
7	2015	mCE1	8294	98.4	98.5	6.2	6.1	-0.1	1.3	0.98
8	2016	mCE1	11168	100.1	100.2	5.7	5.9	-0.1	1.3	0.97
9	2017	mCE1	12729	98.9	98.7	5.4	5.4	0.1	1.3	0.97
10	2018	mCE1	14010	100.8	100.8	5.7	5.6	-0.1	1.2	0.98
11	2019	mCE1	12318	100.6	100.4	5.3	5.3	0.2	1.2	0.98
12	2020	mCE1	4384	101.9	101.7	5.8	6.0	0.2	1.4	0.97
13	2015	mCS1	8294	100.4	100.9	7.5	7.7	-0.5	3.1	0.91
14	2016	mCS1	11168	99.4	99.3	7.2	7.4	0.1	2.8	0.93
15	2017	mCS1	12729	100.8	101.0	7.8	7.5	-0.3	2.8	0.93
16	2018	mCS1	14010	99.7	99.4	8.2	7.9	0.4	2.8	0.94
17	2019	mCS1	12318	101.9	101.5	7.3	7.2	0.4	2.7	0.93
18	2020	mCS1	4384	99.6	99.3	7.2	7.5	0.4	2.5	0.94
19	2015	mSB2	8294	100.1	99.3	5.1	5.1	0.7	3.2	0.80
20	2016	mSB2	11168	99.9	99.7	5.0	5.1	0.1	3.4	0.77
21	2017	mSB2	12729	99.9	99.6	5.1	5.1	0.3	3.3	0.79
22	2018	mSB2	14010	100.2	100.2	5.2	5.2	-0.1	3.4	0.79
23	2019	mSB2	12318	100.7	100.2	4.9	5.1	0.5	3.3	0.78
24	2020	mSB2	4384	101.4	101.2	5.1	5.9	0.2	3.6	0.80
25	2015	mCE2	8294	98.3	98.4	5.2	5.5	-0.1	1.7	0.95
26	2016	mCE2	11168	99.1	99.4	4.9	5.2	-0.3	1.6	0.95
27	2017	mCE2	12729	99.1	99.0	4.8	5.0	0.0	1.7	0.94
28	2018	mCE2	14010	100.9	100.9	5.2	5.3	0.0	1.5	0.96
29	2019	mCE2	12318	100.6	100.5	4.3	4.7	0.1	1.6	0.94
30	2020	mCE2	4384	101.3	101.5	4.7	5.4	-0.2	1.7	0.95
31	2015	mCS2	8294	100.0	100.5	6.3	6.5	-0.4	2.5	0.93
32	2016	mCS2	11168	99.7	99.9	6.4	6.5	-0.3	2.4	0.93
33	2017	mCS2	12729	100.1	100.3	6.3	6.8	-0.2	2.5	0.93
34	2018	mCS2	14010	100.0	100.0	6.5	7.3	0.0	2.4	0.94
35	2019	mCS2	12318	101.7	101.6	5.3	6.1	0.1	2.3	0.92
36	2020	mCS2	4384	100.2	100.3	5.3	6.1	-0.1	2.3	0.93

RDC summery stastistics for snell and current breeding value for genotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2015	calv	8294	99.6	99.2	4.8	5.1	0.4	2.2	0.91
38	2016	calv	11168	99.7	99.7	4.9	5.1	0.0	2.2	0.90
39	2017	calv	12729	99.5	99.3	4.8	5.0	0.2	2.1	0.91
40	2018	calv	14010	100.3	100.4	4.9	5.2	-0.1	2.1	0.92
41	2019	calv	12318	100.7	100.4	4.5	4.9	0.3	2.1	0.90
42	2020	calv	4384	101.4	101.4	5.1	5.7	0.0	2.3	0.92

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-10	3	0
2	-9	8	0
3	-8	32	0
4	-7	86	0
5	-6	264	0
6	-5	632	1
7	-4	1612	3
8	-3	3678	6
9	-2	6719	11
10	-1	10318	16
11	0	12967	21
12	1	11998	19
13	2	7627	12
14	3	3678	6
15	4	1683	3
16	5	774	1
17	6	362	1
18	7	189	0
19	8	118	0
20	9	66	0
21	10	42	0
22	11	23	0
23	12	10	0
24	13	7	0
25	14	1	0
26	15	1	0
27	16	3	0
28	17	1	0
29	20	1	0

JER summery stastistics for snell and current breeding value for genotyped females with own record, by birth year

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Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	dSB1	5250	100.5	100.2	4.6	5.1	0.3	1.5	0.96
2	2016	dSB1	6203	101.0	100.6	4.9	5.5	0.4	1.6	0.96
3	2017	dSB1	7648	100.0	99.6	4.5	5.1	0.4	1.5	0.96
4	2018	dSB1	9371	100.8	100.9	4.3	4.8	-0.1	1.4	0.96
5	2019	dSB1	11296	101.1	101.0	5.1	5.7	0.1	1.4	0.97
6	2020	dSB1	13571	101.0	100.8	5.2	5.9	0.2	1.5	0.97
7	2021	dSB1	12462	102.7	102.4	5.9	6.5	0.3	1.3	0.98
8	2022	dSB1	2887	100.4	99.9	5.5	6.2	0.5	1.6	0.97
9	2015	dCE1	5250	100.7	100.9	4.7	5.4	-0.2	3.8	0.72
10	2016	dCE1	6203	102.1	102.0	4.9	5.0	0.1	3.8	0.70
11	2017	dCE1	7648	100.8	100.8	5.5	5.5	0.0	3.5	0.80
12	2018	dCE1	9371	101.1	101.0	4.0	4.4	0.1	3.3	0.69
13	2019	dCE1	11296	100.3	100.0	4.5	4.7	0.3	3.1	0.77
14	2020	dCE1	13571	100.9	100.3	4.4	4.6	0.6	3.3	0.74
15	2021	dCE1	12462	100.3	100.4	4.4	4.4	-0.1	3.1	0.76
16	2022	dCE1	2887	99.5	99.7	4.1	3.9	-0.2	3.5	0.63
17	2015	dCS1	5250	99.1	99.4	6.2	6.4	-0.3	1.3	0.98
18	2016	dCS1	6203	98.3	98.4	5.2	5.5	-0.1	1.2	0.98
19	2017	dCS1	7648	99.0	99.1	5.1	5.3	0.0	1.1	0.98
20	2018	dCS1	9371	99.9	99.8	4.4	4.5	0.1	1.0	0.97
21	2019	dCS1	11296	100.5	100.4	4.3	4.4	0.1	1.0	0.98
22	2020	dCS1	13571	100.3	100.1	4.1	4.3	0.1	1.0	0.97
23	2021	dCS1	12462	101.0	100.8	3.7	3.9	0.2	0.9	0.98
24	2022	dCS1	2887	100.9	100.5	3.6	3.8	0.4	0.9	0.97
25	2015	dSB2	5250	101.5	101.2	4.1	4.6	0.3	1.7	0.93
26	2016	dSB2	6203	100.4	100.2	3.8	4.4	0.2	1.6	0.93
27	2017	dSB2	7648	100.1	99.6	4.1	4.4	0.5	1.6	0.94
28	2018	dSB2	9371	101.2	101.2	3.5	4.0	0.0	1.5	0.93
29	2019	dSB2	11296	101.4	101.3	5.1	5.7	0.1	1.7	0.95
30	2020	dSB2	13571	102.5	102.2	4.7	5.4	0.3	1.7	0.95
31	2021	dSB2	12462	102.9	102.6	6.0	6.6	0.3	1.6	0.97
32	2022	dSB2	2887	100.3	99.9	6.1	6.7	0.4	1.8	0.96
33	2015	dCE2	5250	101.6	101.8	4.0	5.3	-0.2	4.4	0.59
34	2016	dCE2	6203	102.4	102.6	3.9	4.9	-0.2	4.2	0.56
35	2017	dCE2	7648	101.6	101.5	4.2	5.2	0.2	4.0	0.66
36	2018	dCE2	9371	100.9	100.9	3.5	4.5	0.0	3.9	0.56

JER summery stastistics for snell and current breeding value for genotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dCE2	11296	100.8	100.4	4.5	5.0	0.4	3.7	0.70
38	2020	dCE2	13571	101.4	100.7	4.3	4.6	0.6	3.8	0.64
39	2021	dCE2	12462	100.6	100.6	4.4	4.6	0.0	3.6	0.68
40	2022	dCE2	2887	100.3	100.4	4.3	4.5	-0.1	4.0	0.59
41	2015	dCS2	5250	99.0	99.2	6.4	6.4	-0.2	1.1	0.99
42	2016	dCS2	6203	98.1	98.1	5.5	5.6	0.1	1.0	0.98
43	2017	dCS2	7648	99.4	99.2	5.1	5.2	0.1	1.0	0.98
44	2018	dCS2	9371	99.7	99.7	4.5	4.5	0.1	0.9	0.98
45	2019	dCS2	11296	100.6	100.5	4.2	4.3	0.1	0.8	0.98
46	2020	dCS2	13571	100.3	100.2	4.2	4.3	0.1	0.9	0.98
47	2021	dCS2	12462	100.9	100.7	4.0	4.0	0.2	0.8	0.98
48	2022	dCS2	2887	100.6	100.4	3.9	3.9	0.2	0.8	0.98
49	2015	brth	5250	101.1	101.0	4.3	4.6	0.1	1.2	0.97
50	2016	brth	6203	101.3	101.2	4.3	4.8	0.1	1.2	0.97
51	2017	brth	7648	100.4	100.0	4.3	4.8	0.4	1.2	0.97
52	2018	brth	9371	101.1	101.2	3.7	4.3	-0.1	1.2	0.96
53	2019	brth	11296	101.2	101.1	5.1	5.8	0.1	1.3	0.98
54	2020	brth	13571	101.8	101.4	5.0	5.7	0.3	1.4	0.98
55	2021	brth	12462	102.6	102.4	5.9	6.6	0.2	1.3	0.99
56	2022	brth	2887	100.3	99.9	5.5	6.3	0.4	1.6	0.97

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-13	1	0
2	-9	1	0
3	-8	5	0
4	-7	12	0
5	-6	37	0
6	-5	74	0
7	-4	309	0
8	-3	1164	2
9	-2	4438	6
10	-1	13464	20
11	0	22057	32
12	1	17136	25
13	2	7625	11
14	3	2005	3
15	4	303	0
16	5	37	0
17	6	16	0
18	7	1	0
19	8	1	0
20	10	1	0
21	15	1	0

JER summery stastistics for snell and current breeding value for genotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	mSB1	3704	97.9	98.0	5.9	6.2	-0.1	1.1	0.99
2	2016	mSB1	4033	96.7	96.8	6.4	6.8	-0.2	1.1	0.99
3	2017	mSB1	5327	98.4	98.4	5.8	6.1	0.0	1.1	0.98
4	2018	mSB1	6760	100.2	100.0	4.9	5.3	0.2	1.1	0.98
5	2019	mSB1	7484	98.7	98.3	5.4	5.8	0.4	1.0	0.99
6	2020	mSB1	3583	99.2	98.6	6.1	6.7	0.6	1.2	0.99
7	2015	mCE1	3704	98.1	98.5	5.7	6.1	-0.4	2.4	0.92
8	2016	mCE1	4033	97.2	97.3	5.8	6.3	-0.1	2.4	0.93
9	2017	mCE1	5327	99.8	99.8	5.3	5.6	0.1	2.2	0.92
10	2018	mCE1	6760	99.7	99.6	4.8	5.2	0.1	2.1	0.92
11	2019	mCE1	7484	100.1	99.7	4.8	5.1	0.4	2.1	0.92
12	2020	mCE1	3583	100.1	99.8	5.1	4.8	0.3	2.2	0.90
13	2015	mCS1	3704	100.0	99.3	4.7	5.1	0.6	1.7	0.94
14	2016	mCS1	4033	99.9	99.7	4.6	4.7	0.2	1.6	0.94
15	2017	mCS1	5327	100.3	100.2	5.0	5.0	0.1	1.6	0.95
16	2018	mCS1	6760	100.0	100.1	5.0	5.0	-0.2	1.3	0.96
17	2019	mCS1	7484	100.4	100.0	4.5	4.6	0.3	1.3	0.96
18	2020	mCS1	3583	100.2	100.0	5.2	5.1	0.3	1.2	0.97
19	2015	mSB2	3704	99.2	99.1	4.8	4.6	0.1	1.1	0.97
20	2016	mSB2	4033	98.3	98.1	5.2	5.3	0.1	1.2	0.97
21	2017	mSB2	5327	98.0	97.7	5.5	5.8	0.3	1.3	0.98
22	2018	mSB2	6760	99.4	99.6	4.5	4.9	-0.2	1.4	0.96
23	2019	mSB2	7484	99.1	98.3	4.7	5.1	0.9	2.0	0.92
24	2020	mSB2	3583	98.1	97.7	5.1	5.5	0.5	2.1	0.92
25	2015	mCE2	3704	99.2	99.8	4.8	5.2	-0.7	2.7	0.85
26	2016	mCE2	4033	99.0	99.1	5.1	5.5	-0.1	2.7	0.88
27	2017	mCE2	5327	99.7	99.5	5.1	5.5	0.3	2.5	0.89
28	2018	mCE2	6760	99.7	99.6	5.4	5.7	0.1	2.4	0.91
29	2019	mCE2	7484	99.9	99.6	5.6	5.5	0.3	2.5	0.90
30	2020	mCE2	3583	100.1	99.8	5.0	4.4	0.3	2.6	0.86
31	2015	mCS2	3704	98.4	98.8	4.8	5.0	-0.4	1.4	0.96
32	2016	mCS2	4033	99.1	99.8	4.1	4.4	-0.6	1.4	0.95
33	2017	mCS2	5327	99.9	100.1	4.8	4.9	-0.2	1.5	0.95
34	2018	mCS2	6760	100.0	100.0	5.0	4.9	0.0	1.4	0.96
35	2019	mCS2	7484	100.2	100.2	4.7	4.5	-0.1	1.8	0.92
36	2020	mCS2	3583	100.3	100.1	4.7	4.7	0.2	1.9	0.92

JER summery stastistics for snell and current breeding value for genotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2015	calv	3704	98.2	98.4	5.5	5.6	-0.2	1.1	0.98
38	2016	calv	4033	97.0	97.1	6.0	6.3	-0.1	1.2	0.98
39	2017	calv	5327	98.4	98.2	5.5	5.8	0.2	1.1	0.98
40	2018	calv	6760	99.8	99.7	4.8	5.2	0.1	1.1	0.98
41	2019	calv	7484	99.0	98.3	4.8	5.4	0.7	1.4	0.97
42	2020	calv	3583	98.9	98.3	5.4	6.0	0.6	1.5	0.97

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-14	1	0
2	-10	1	0
3	-8	1	0
4	-7	2	0
5	-6	10	0
6	-5	28	0
7	-4	107	0
8	-3	462	1
9	-2	1783	6
10	-1	5527	18
11	0	10412	34
12	1	7970	26
13	2	3188	10
14	3	1136	4
15	4	215	1
16	5	45	0
17	6	2	0
18	8	1	0

HOL summery stastistics for snell and current breeding value for nongenotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	dSB1	256488	98.4	98.6	5.5	5.9	-0.3	1.4	0.97
2	2016	dSB1	249074	99.6	99.7	5.6	5.9	-0.1	1.4	0.97
3	2017	dSB1	226708	99.9	99.8	5.7	6.0	0.0	1.4	0.97
4	2018	dSB1	214828	99.6	99.6	5.3	5.6	0.1	1.3	0.97
5	2019	dSB1	205594	99.6	99.5	5.5	5.7	0.1	1.3	0.97
6	2020	dSB1	205855	100.4	100.2	5.0	5.2	0.2	1.3	0.97
7	2021	dSB1	209108	100.5	100.3	4.7	5.0	0.2	1.2	0.97
8	2022	dSB1	94195	100.8	100.5	4.8	5.0	0.3	1.2	0.97
9	2015	dCE1	256488	98.2	98.2	5.0	5.7	-0.1	1.4	0.97
10	2016	dCE1	249074	99.2	99.3	5.1	5.7	-0.1	1.4	0.97
11	2017	dCE1	226708	99.6	99.6	5.0	5.6	0.0	1.4	0.97
12	2018	dCE1	214828	99.7	99.7	4.7	5.3	0.0	1.3	0.97
13	2019	dCE1	205594	99.8	99.8	4.6	5.1	0.0	1.3	0.97
14	2020	dCE1	205855	100.4	100.4	4.4	4.9	-0.1	1.2	0.97
15	2021	dCE1	209108	100.9	101.0	4.2	4.7	-0.1	1.2	0.97
16	2022	dCE1	94195	101.4	101.5	4.2	4.7	-0.1	1.2	0.97
17	2015	dCS1	256488	101.6	101.5	6.1	6.4	0.1	1.2	0.98
18	2016	dCS1	249074	100.8	100.7	6.1	6.3	0.1	1.2	0.98
19	2017	dCS1	226708	100.3	100.3	6.0	6.2	0.0	1.2	0.98
20	2018	dCS1	214828	100.2	100.2	5.9	6.1	0.0	1.2	0.98
21	2019	dCS1	205594	100.2	100.2	5.7	5.9	0.0	1.2	0.98
22	2020	dCS1	205855	99.4	99.5	5.7	5.8	0.0	1.1	0.98
23	2021	dCS1	209108	98.9	98.8	5.5	5.6	0.1	1.1	0.98
24	2022	dCS1	94195	98.5	98.4	5.6	5.7	0.1	1.2	0.98
25	2015	dSB2	256488	98.7	98.8	4.8	5.4	-0.1	2.1	0.93
26	2016	dSB2	249074	99.5	99.5	4.9	5.4	0.1	2.0	0.93
27	2017	dSB2	226708	99.6	99.6	4.9	5.3	-0.1	2.0	0.93
28	2018	dSB2	214828	99.8	99.7	4.8	5.2	0.1	2.0	0.92
29	2019	dSB2	205594	99.6	99.5	4.6	5.0	0.1	1.9	0.92
30	2020	dSB2	205855	99.9	99.8	4.5	4.8	0.1	1.9	0.92
31	2021	dSB2	209108	99.9	99.8	4.3	4.6	0.1	1.8	0.92
32	2022	dSB2	94195	100.1	100.0	4.3	4.6	0.1	1.8	0.92
33	2015	dCE2	256488	98.0	98.0	4.5	5.5	0.0	2.1	0.93
34	2016	dCE2	249074	98.8	98.8	4.5	5.4	0.0	2.1	0.93
35	2017	dCE2	226708	99.4	99.4	4.4	5.3	0.0	2.0	0.93
36	2018	dCE2	214828	99.8	99.7	4.3	5.1	0.0	2.0	0.92

HOL summery stastistics for snell and current breeding value for nongenotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dCE2	205594	99.6	99.7	4.0	4.9	-0.1	2.0	0.92
38	2020	dCE2	205855	100.2	100.3	4.0	4.8	-0.1	1.9	0.93
39	2021	dCE2	209108	100.7	100.8	3.8	4.6	-0.1	1.8	0.92
40	2022	dCE2	94195	101.1	101.3	3.7	4.5	-0.2	1.8	0.92
41	2015	dCS2	256488	101.7	101.7	6.2	6.4	0.0	1.3	0.98
42	2016	dCS2	249074	100.9	100.8	6.0	6.3	0.1	1.2	0.98
43	2017	dCS2	226708	100.4	100.4	6.0	6.2	-0.1	1.2	0.98
44	2018	dCS2	214828	100.3	100.3	5.8	6.0	0.0	1.2	0.98
45	2019	dCS2	205594	99.9	99.9	5.7	6.0	0.0	1.2	0.98
46	2020	dCS2	205855	99.1	99.1	5.6	5.9	0.0	1.1	0.98
47	2021	dCS2	209108	98.2	98.3	5.5	5.8	-0.1	1.1	0.98
48	2022	dCS2	94195	97.6	97.7	5.6	5.9	-0.1	1.2	0.98
49	2015	brth	256488	98.3	98.5	5.0	5.6	-0.2	1.6	0.96
50	2016	brth	249074	99.4	99.5	5.1	5.7	-0.1	1.6	0.96
51	2017	brth	226708	99.7	99.7	5.2	5.6	0.0	1.5	0.96
52	2018	brth	214828	99.7	99.6	4.9	5.4	0.1	1.5	0.96
53	2019	brth	205594	99.6	99.5	5.0	5.4	0.1	1.5	0.96
54	2020	brth	205855	100.3	100.1	4.7	5.0	0.1	1.4	0.96
55	2021	brth	209108	100.4	100.3	4.4	4.8	0.2	1.4	0.96
56	2022	brth	94195	100.8	100.5	4.4	4.8	0.2	1.4	0.96

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-62	3	0
2	-61	1	0
3	-60	1	0
4	-58	1	0
5	-57	1	0
6	-56	1	0
7	-55	1	0
8	-54	1	0
9	-49	1	0
10	-32	1	0
11	-31	4	0
12	-30	3	0
13	-29	4	0
14	-28	1	0
15	-27	1	0
16	-25	1	0
17	-22	1	0
18	-21	1	0
19	-20	2	0
20	-18	1	0
21	-17	7	0
22	-16	19	0
23	-15	39	0
24	-14	25	0
25	-13	33	0
26	-12	66	0
27	-11	65	0
28	-10	102	0
29	-9	188	0
30	-8	448	0
31	-7	914	0
32	-6	2573	0
33	-5	7230	0
34	-4	18156	1
35	-3	45350	3
36	-2	121018	7
37	-1	322498	19

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
38	0	578395	35
39	1	358452	22
40	2	136677	8
41	3	45934	3
42	4	14004	1
43	5	4810	0
44	6	2085	0
45	7	1100	0
46	8	502	0
47	9	402	0
48	10	350	0
49	11	215	0
50	12	93	0
51	13	43	0
52	14	16	0
53	15	5	0
54	16	1	0
55	17	1	0
56	18	1	0
57	19	1	0
58	21	1	0

HOL summery stastistics for snell and current breeding value for nongenotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	mSB1	197709	97.1	96.7	5.2	5.5	0.4	1.1	0.98
2	2016	mSB1	189145	98.0	97.8	5.0	5.3	0.2	1.1	0.98
3	2017	mSB1	168161	98.6	98.4	5.2	5.5	0.2	1.1	0.98
4	2018	mSB1	159726	99.8	99.8	5.0	5.2	0.0	1.0	0.98
5	2019	mSB1	142266	100.2	100.3	4.6	4.9	-0.1	1.0	0.98
6	2020	mSB1	46909	101.1	101.3	4.6	4.9	-0.2	1.0	0.98
7	2015	mCE1	197709	96.5	96.4	4.9	5.1	0.1	1.1	0.98
8	2016	mCE1	189145	97.5	97.4	4.8	5.0	0.1	1.0	0.98
9	2017	mCE1	168161	98.5	98.4	4.9	5.0	0.0	1.0	0.98
10	2018	mCE1	159726	99.6	99.6	4.4	4.5	0.0	1.0	0.98
11	2019	mCE1	142266	100.6	100.6	4.4	4.5	0.0	0.9	0.98
12	2020	mCE1	46909	101.7	101.6	4.5	4.6	0.0	0.9	0.98
13	2015	mCS1	197709	97.8	98.7	5.8	5.7	-0.9	1.8	0.95
14	2016	mCS1	189145	98.4	99.0	6.1	5.9	-0.6	1.8	0.96
15	2017	mCS1	168161	99.7	99.9	5.8	5.6	-0.2	1.8	0.95
16	2018	mCS1	159726	99.7	99.8	5.8	5.5	-0.1	1.7	0.96
17	2019	mCS1	142266	100.7	100.6	6.0	5.7	0.2	1.7	0.96
18	2020	mCS1	46909	102.5	102.1	5.7	5.5	0.4	1.6	0.96
19	2015	mSB2	197709	95.8	96.8	5.3	5.1	-0.9	2.3	0.90
20	2016	mSB2	189145	97.2	97.8	5.2	5.0	-0.7	2.3	0.90
21	2017	mSB2	168161	98.5	98.7	5.1	4.9	-0.2	2.2	0.90
22	2018	mSB2	159726	99.8	99.8	5.0	4.7	0.0	2.2	0.90
23	2019	mSB2	142266	100.2	100.3	4.6	4.6	-0.1	2.2	0.89
24	2020	mSB2	46909	100.9	100.6	4.7	4.9	0.3	2.6	0.85
25	2015	mCE2	197709	95.7	95.6	4.9	5.0	0.1	1.7	0.94
26	2016	mCE2	189145	97.0	97.0	4.7	4.8	0.0	1.6	0.94
27	2017	mCE2	168161	98.1	98.2	4.5	4.6	-0.1	1.5	0.94
28	2018	mCE2	159726	99.4	99.4	4.4	4.5	-0.1	1.5	0.94
29	2019	mCE2	142266	100.6	100.6	4.4	4.5	0.0	1.4	0.95
30	2020	mCE2	46909	100.8	100.9	4.3	4.6	-0.1	1.5	0.95
31	2015	mCS2	197709	97.4	98.0	5.8	5.8	-0.6	1.3	0.97
32	2016	mCS2	189145	97.8	98.3	5.7	5.7	-0.5	1.3	0.97
33	2017	mCS2	168161	99.3	99.3	5.7	5.6	-0.1	1.3	0.97
34	2018	mCS2	159726	100.0	100.1	5.7	5.6	-0.1	1.3	0.98
35	2019	mCS2	142266	99.9	99.9	5.3	5.3	0.0	1.3	0.97
36	2020	mCS2	46909	101.6	101.4	5.0	5.2	0.2	1.3	0.97

HOL summery stastistics for snell and current breeding value for nongenotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2015	calv	197709	96.3	96.3	5.1	5.3	0.0	1.1	0.98
38	2016	calv	189145	97.5	97.5	4.9	5.1	0.0	1.1	0.98
39	2017	calv	168161	98.4	98.3	5.1	5.2	0.0	1.0	0.98
40	2018	calv	159726	99.7	99.7	4.8	4.9	0.0	1.0	0.98
41	2019	calv	142266	100.3	100.4	4.6	4.7	-0.1	0.9	0.98
42	2020	calv	46909	101.2	101.3	4.7	4.9	0.0	1.0	0.98

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-9	1	0
2	-8	2	0
3	-7	5	0
4	-6	7	0
5	-5	38	0
6	-4	282	0
7	-3	3115	0
8	-2	32962	4
9	-1	222715	25
10	0	438828	49
11	1	151425	17
12	2	33117	4
13	3	11596	1
14	4	5336	1
15	5	2333	0
16	6	1184	0
17	7	541	0
18	8	277	0
19	9	91	0
20	10	26	0
21	11	16	0
22	12	6	0
23	13	4	0
24	14	4	0
25	15	2	0
26	16	2	0
27	17	1	0

RDC summery stastistics for snell and current breeding value for nongenotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	dSB1	79789	98.9	99.0	4.9	4.9	-0.1	1.4	0.96
2	2016	dSB1	68539	99.0	99.1	4.8	4.9	0.0	1.4	0.96
3	2017	dSB1	56194	98.9	98.9	4.7	4.8	0.0	1.4	0.96
4	2018	dSB1	49476	99.7	99.8	4.5	4.5	-0.1	1.4	0.95
5	2019	dSB1	42570	99.8	99.9	4.7	4.7	-0.1	1.3	0.96
6	2020	dSB1	37753	100.1	100.2	4.5	4.5	-0.1	1.2	0.96
7	2021	dSB1	33724	99.6	99.8	4.5	4.5	-0.2	1.2	0.96
8	2022	dSB1	14541	99.7	99.8	5.2	5.1	-0.1	1.2	0.97
9	2015	dCE1	79789	99.7	99.7	5.9	5.8	0.0	1.3	0.98
10	2016	dCE1	68539	99.1	99.1	5.9	5.8	0.0	1.2	0.98
11	2017	dCE1	56194	99.2	99.3	5.6	5.4	-0.1	1.2	0.98
12	2018	dCE1	49476	100.0	100.0	5.7	5.4	-0.1	1.3	0.98
13	2019	dCE1	42570	100.4	100.2	5.2	5.0	0.2	1.2	0.98
14	2020	dCE1	37753	99.9	99.9	5.6	5.4	0.0	1.1	0.98
15	2021	dCE1	33724	100.4	100.3	5.2	5.0	0.1	1.1	0.98
16	2022	dCE1	14541	100.5	100.4	5.4	5.1	0.1	1.2	0.97
17	2015	dCS1	79789	99.8	99.9	6.4	6.3	-0.1	1.9	0.95
18	2016	dCS1	68539	100.9	100.9	6.8	6.6	-0.1	1.8	0.96
19	2017	dCS1	56194	100.3	100.2	6.2	5.9	0.1	1.8	0.96
20	2018	dCS1	49476	99.9	99.9	5.8	5.7	0.0	1.7	0.95
21	2019	dCS1	42570	99.8	99.8	6.0	5.7	0.1	1.8	0.95
22	2020	dCS1	37753	99.9	99.8	6.6	6.3	0.2	1.8	0.96
23	2021	dCS1	33724	100.0	99.6	6.2	5.8	0.5	1.7	0.96
24	2022	dCS1	14541	100.0	99.5	6.4	5.9	0.5	1.8	0.96
25	2015	dSB2	79789	99.0	99.1	5.2	5.4	0.0	1.5	0.96
26	2016	dSB2	68539	99.2	99.2	5.0	5.3	0.1	1.5	0.96
27	2017	dSB2	56194	99.2	99.3	5.0	5.1	-0.1	1.4	0.96
28	2018	dSB2	49476	99.8	99.8	4.8	4.9	0.0	1.4	0.96
29	2019	dSB2	42570	99.7	99.7	4.5	4.7	0.0	1.3	0.96
30	2020	dSB2	37753	100.3	100.4	4.5	4.8	-0.1	1.3	0.96
31	2021	dSB2	33724	100.3	100.4	4.0	4.4	-0.1	1.3	0.95
32	2022	dSB2	14541	99.9	100.2	4.3	4.7	-0.3	1.4	0.96
33	2015	dCE2	79789	99.7	99.8	6.0	6.1	-0.1	1.9	0.95
34	2016	dCE2	68539	99.2	99.0	5.9	6.2	0.1	1.8	0.96
35	2017	dCE2	56194	99.6	99.5	5.3	5.5	0.1	1.7	0.95
36	2018	dCE2	49476	99.9	100.0	5.4	5.6	-0.1	1.8	0.95

RDC summery stastistics for snell and current breeding value for nongenotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dCE2	42570	100.4	100.2	5.1	5.3	0.2	1.7	0.95
38	2020	dCE2	37753	100.1	100.0	5.7	5.9	0.1	1.7	0.96
39	2021	dCE2	33724	100.6	100.6	5.0	5.3	0.0	1.7	0.95
40	2022	dCE2	14541	100.7	100.6	5.2	5.4	0.1	1.8	0.94
41	2015	dCS2	79789	100.1	100.1	7.0	6.6	0.1	2.1	0.95
42	2016	dCS2	68539	100.6	100.8	7.1	6.6	-0.1	1.9	0.96
43	2017	dCS2	56194	100.6	100.5	6.4	6.0	0.1	1.9	0.95
44	2018	dCS2	49476	99.9	99.9	6.5	6.0	0.0	1.8	0.96
45	2019	dCS2	42570	100.2	100.0	6.7	6.1	0.1	1.9	0.96
46	2020	dCS2	37753	99.4	99.4	6.9	6.4	0.0	1.9	0.96
47	2021	dCS2	33724	99.6	99.3	6.8	6.3	0.2	1.8	0.97
48	2022	dCS2	14541	99.5	99.2	6.8	6.3	0.3	1.8	0.96
49	2015	brth	79789	99.0	99.1	5.1	5.3	-0.1	1.3	0.97
50	2016	brth	68539	99.0	99.0	4.9	5.1	0.0	1.2	0.97
51	2017	brth	56194	99.0	99.1	4.8	4.9	0.0	1.2	0.97
52	2018	brth	49476	99.8	99.8	4.6	4.8	-0.1	1.1	0.97
53	2019	brth	42570	99.9	99.9	4.6	4.8	0.0	1.1	0.97
54	2020	brth	37753	100.2	100.2	4.6	4.9	-0.1	1.1	0.97
55	2021	brth	33724	100.0	100.1	4.4	4.5	-0.1	1.1	0.97
56	2022	brth	14541	99.9	100.1	5.0	5.1	-0.2	1.1	0.98

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-11	1	0
2	-10	2	0
3	-9	4	0
4	-8	22	0
5	-7	51	0
6	-6	194	0
7	-5	815	0
8	-4	2769	1
9	-3	6629	2
10	-2	22439	6
11	-1	87472	23
12	0	155260	41
13	1	79257	21
14	2	20732	5
15	3	4834	1
16	4	1263	0
17	5	439	0
18	6	232	0
19	7	73	0
20	8	35	0
21	9	28	0
22	10	25	0
23	11	7	0
24	12	2	0
25	14	1	0

RDC summery stastistics for snell and current breeding value for nongenotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	mSB1	53291	99.1	98.9	5.0	5.3	0.2	2.1	0.92
2	2016	mSB1	45915	99.7	99.7	5.1	5.3	-0.1	2.0	0.93
3	2017	mSB1	37973	99.2	99.1	5.3	5.4	0.2	1.9	0.94
4	2018	mSB1	31861	99.7	99.6	5.3	5.7	0.0	2.0	0.94
5	2019	mSB1	23348	100.2	100.1	4.8	5.1	0.1	2.0	0.92
6	2020	mSB1	5906	100.7	100.8	4.9	5.2	-0.1	1.9	0.93
7	2015	mCE1	53291	97.3	97.5	6.4	6.3	-0.2	1.4	0.98
8	2016	mCE1	45915	99.1	99.3	6.0	6.1	-0.2	1.3	0.98
9	2017	mCE1	37973	98.0	97.9	5.5	5.5	0.1	1.2	0.97
10	2018	mCE1	31861	99.5	99.5	6.1	5.9	0.0	1.2	0.98
11	2019	mCE1	23348	99.7	99.5	5.9	5.8	0.2	1.2	0.98
12	2020	mCE1	5906	100.5	100.4	6.2	6.2	0.2	1.3	0.98
13	2015	mCS1	53291	99.8	101.0	7.1	7.3	-1.2	3.4	0.89
14	2016	mCS1	45915	98.9	99.5	6.8	7.0	-0.5	3.1	0.90
15	2017	mCS1	37973	100.1	101.0	7.4	7.2	-0.9	3.0	0.92
16	2018	mCS1	31861	99.3	99.7	8.0	7.7	-0.4	3.2	0.92
17	2019	mCS1	23348	101.0	101.2	7.2	7.0	-0.2	3.3	0.89
18	2020	mCS1	5906	99.2	99.5	6.8	7.0	-0.4	3.1	0.90
19	2015	mSB2	53291	99.7	98.9	5.4	5.2	0.7	3.2	0.82
20	2016	mSB2	45915	99.8	99.5	5.2	5.1	0.2	3.3	0.79
21	2017	mSB2	37973	99.7	99.2	5.2	5.1	0.4	3.2	0.81
22	2018	mSB2	31861	99.7	99.8	5.3	5.3	-0.1	3.3	0.80
23	2019	mSB2	23348	100.3	99.9	4.9	5.2	0.4	3.2	0.80
24	2020	mSB2	5906	101.0	100.8	5.0	5.6	0.2	3.5	0.79
25	2015	mCE2	53291	97.2	97.3	5.7	5.8	-0.1	1.6	0.96
26	2016	mCE2	45915	98.1	98.4	5.3	5.5	-0.3	1.6	0.96
27	2017	mCE2	37973	97.9	97.9	5.1	5.2	0.0	1.6	0.95
28	2018	mCE2	31861	99.4	99.4	5.7	5.7	0.0	1.5	0.96
29	2019	mCE2	23348	99.5	99.4	5.1	5.3	0.0	1.6	0.95
30	2020	mCE2	5906	99.9	100.0	5.3	5.8	-0.2	1.7	0.96
31	2015	mCS2	53291	99.7	100.2	5.9	6.1	-0.5	2.7	0.90
32	2016	mCS2	45915	99.4	99.8	6.1	6.3	-0.3	2.5	0.92
33	2017	mCS2	37973	99.8	100.0	6.1	6.5	-0.3	2.6	0.92
34	2018	mCS2	31861	99.5	99.5	6.5	7.2	0.0	2.6	0.93
35	2019	mCS2	23348	101.0	100.9	5.4	6.1	0.1	2.5	0.91
36	2020	mCS2	5906	99.9	100.0	5.2	5.9	0.0	2.5	0.91

RDC summery stastistics for snell and current breeding value for nongenotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2015	calv	53291	98.9	98.5	5.2	5.4	0.4	2.2	0.91
38	2016	calv	45915	99.5	99.5	5.1	5.2	0.1	2.2	0.91
39	2017	calv	37973	99.1	98.8	5.1	5.1	0.3	2.1	0.92
40	2018	calv	31861	99.6	99.6	5.2	5.4	0.0	2.2	0.92
41	2019	calv	23348	100.2	99.9	4.8	5.2	0.3	2.2	0.91
42	2020	calv	5906	100.8	100.8	5.0	5.5	0.1	2.3	0.91

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-15	1	0
2	-14	1	0
3	-13	3	0
4	-12	3	0
5	-11	8	0
6	-10	28	0
7	-9	52	0
8	-8	155	0
9	-7	359	0
10	-6	911	0
11	-5	2147	1
12	-4	5057	3
13	-3	10659	5
14	-2	19380	10
15	-1	31879	16
16	0	40832	21
17	1	38671	20
18	2	24950	13
19	3	12233	6
20	4	5598	3
21	5	2599	1
22	6	1258	1
23	7	626	0
24	8	402	0
25	9	221	0
26	10	114	0
27	11	64	0
28	12	39	0
29	13	24	0
30	14	12	0
31	15	3	0
32	16	4	0
33	20	1	0

JER summery stastistics for snell and current breeding value for nongenotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	dSB1	26979	99.7	99.4	5.1	5.5	0.3	1.6	0.96
2	2016	dSB1	26004	100.3	100.0	5.2	5.7	0.4	1.6	0.96
3	2017	dSB1	23559	99.6	99.1	4.9	5.5	0.5	1.6	0.96
4	2018	dSB1	25462	100.2	100.2	4.7	5.2	0.0	1.6	0.96
5	2019	dSB1	24919	100.4	100.3	5.4	6.0	0.1	1.6	0.97
6	2020	dSB1	27449	100.7	100.3	5.5	6.2	0.3	1.6	0.97
7	2021	dSB1	28863	101.9	101.6	6.1	6.8	0.3	1.6	0.98
8	2022	dSB1	14948	99.4	98.9	6.1	7.0	0.5	1.9	0.97
9	2015	dCE1	26979	100.3	100.5	5.0	5.2	-0.3	3.7	0.74
10	2016	dCE1	26004	101.4	101.4	5.0	4.9	0.0	3.8	0.71
11	2017	dCE1	23559	100.3	100.5	5.8	5.5	-0.1	3.6	0.80
12	2018	dCE1	25462	100.6	100.7	4.3	4.5	-0.1	3.4	0.71
13	2019	dCE1	24919	99.9	99.7	4.7	4.8	0.2	3.3	0.76
14	2020	dCE1	27449	100.6	100.1	4.5	4.6	0.6	3.3	0.73
15	2021	dCE1	28863	100.0	100.1	4.7	4.4	-0.1	3.3	0.74
16	2022	dCE1	14948	99.2	99.2	4.5	4.1	0.0	3.5	0.67
17	2015	dCS1	26979	99.0	99.4	5.8	6.0	-0.3	1.2	0.98
18	2016	dCS1	26004	98.5	98.6	5.1	5.3	-0.2	1.1	0.98
19	2017	dCS1	23559	99.0	99.0	5.0	5.3	0.0	1.1	0.98
20	2018	dCS1	25462	99.8	99.7	4.2	4.4	0.0	1.1	0.97
21	2019	dCS1	24919	100.6	100.5	4.4	4.5	0.1	1.1	0.97
22	2020	dCS1	27449	100.2	100.1	4.1	4.3	0.1	1.0	0.97
23	2021	dCS1	28863	100.9	100.7	3.7	3.9	0.2	1.0	0.97
24	2022	dCS1	14948	101.0	100.7	3.6	3.8	0.3	1.1	0.96
25	2015	dSB2	26979	100.5	100.2	4.8	5.2	0.3	1.8	0.94
26	2016	dSB2	26004	99.8	99.6	4.4	4.9	0.2	1.7	0.94
27	2017	dSB2	23559	99.5	99.0	4.7	5.0	0.5	1.8	0.94
28	2018	dSB2	25462	100.4	100.4	4.2	4.6	0.0	1.7	0.93
29	2019	dSB2	24919	100.5	100.4	5.6	6.1	0.0	1.9	0.95
30	2020	dSB2	27449	102.0	101.6	5.2	5.9	0.4	1.8	0.95
31	2021	dSB2	28863	102.3	102.1	6.2	6.8	0.2	1.9	0.96
32	2022	dSB2	14948	99.2	99.0	6.8	7.6	0.2	2.3	0.96
33	2015	dCE2	26979	101.1	101.2	4.5	5.3	-0.1	4.2	0.63
34	2016	dCE2	26004	101.7	101.9	4.4	5.0	-0.2	4.3	0.60
35	2017	dCE2	23559	101.3	101.3	4.6	5.3	0.0	4.0	0.68
36	2018	dCE2	25462	100.5	100.6	4.1	4.7	-0.1	3.9	0.62

JER summery stastistics for snell and current breeding value for nongenotyped females with own record, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2019	dCE2	24919	100.2	99.9	4.9	5.3	0.3	3.9	0.70
38	2020	dCE2	27449	101.1	100.4	4.7	4.7	0.6	3.9	0.66
39	2021	dCE2	28863	100.1	100.2	4.8	4.7	-0.1	3.9	0.68
40	2022	dCE2	14948	99.8	99.8	4.9	4.8	0.0	4.1	0.64
41	2015	dCS2	26979	99.0	99.2	6.0	6.0	-0.2	0.9	0.99
42	2016	dCS2	26004	98.4	98.4	5.3	5.4	0.0	0.9	0.98
43	2017	dCS2	23559	99.3	99.1	5.0	5.1	0.1	1.0	0.98
44	2018	dCS2	25462	99.6	99.6	4.4	4.5	0.0	0.9	0.98
45	2019	dCS2	24919	100.5	100.5	4.3	4.4	0.1	0.9	0.98
46	2020	dCS2	27449	100.2	100.1	4.1	4.3	0.1	0.9	0.98
47	2021	dCS2	28863	100.7	100.6	3.9	4.0	0.1	0.9	0.97
48	2022	dCS2	14948	100.7	100.5	3.8	3.9	0.1	1.1	0.96
49	2015	brth	26979	100.2	100.1	4.9	5.2	0.1	1.4	0.97
50	2016	brth	26004	100.5	100.4	4.8	5.2	0.1	1.3	0.97
51	2017	brth	23559	99.9	99.5	4.8	5.3	0.4	1.3	0.97
52	2018	brth	25462	100.4	100.5	4.3	4.8	-0.1	1.4	0.96
53	2019	brth	24919	100.4	100.3	5.5	6.1	0.1	1.4	0.98
54	2020	brth	27449	101.3	100.9	5.3	6.1	0.4	1.5	0.98
55	2021	brth	28863	101.8	101.7	6.1	6.8	0.1	1.5	0.98
56	2022	brth	14948	99.3	98.9	6.2	7.1	0.4	1.9	0.97

distribution of differences in number of females and in percentage

Obs	diff	d_brth	p_brth
1	-26	1	0
2	-18	2	0
3	-16	3	0
4	-15	2	0
5	-14	2	0
6	-13	3	0
7	-11	1	0
8	-10	2	0
9	-9	9	0
10	-8	28	0
11	-7	121	0
12	-6	228	0
13	-5	515	0
14	-4	1329	1
15	-3	3942	2
16	-2	12932	7
17	-1	38424	19
18	0	60433	30
19	1	47832	24
20	2	22325	11
21	3	7138	4
22	4	1984	1
23	5	635	0
24	6	220	0
25	7	38	0
26	8	13	0
27	9	3	0
28	11	2	0
29	12	5	0
30	13	2	0
31	14	2	0
32	16	1	0
33	17	1	0
34	18	2	0
35	20	1	0
36	25	2	0

JER summery stastistics for snell and current breeding value for nongenotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
1	2015	mSB1	17023	97.3	97.4	6.1	6.5	-0.1	1.1	0.99
2	2016	mSB1	15718	96.5	96.7	6.3	6.7	-0.2	1.1	0.99
3	2017	mSB1	14493	97.8	97.8	6.1	6.4	0.0	1.1	0.99
4	2018	mSB1	15377	99.9	99.7	5.1	5.4	0.2	1.1	0.98
5	2019	mSB1	14283	98.8	98.4	5.3	5.7	0.3	1.0	0.99
6	2020	mSB1	6090	98.8	98.2	6.0	6.5	0.5	1.1	0.99
7	2015	mCE1	17023	97.6	97.9	5.7	6.2	-0.3	2.4	0.93
8	2016	mCE1	15718	96.9	96.9	5.8	6.4	-0.1	2.4	0.93
9	2017	mCE1	14493	99.1	99.0	5.7	6.1	0.1	2.2	0.94
10	2018	mCE1	15377	99.4	99.2	4.9	5.3	0.1	2.1	0.92
11	2019	mCE1	14283	99.9	99.4	4.9	5.2	0.4	2.0	0.92
12	2020	mCE1	6090	99.9	99.6	4.9	4.9	0.3	2.1	0.91
13	2015	mCS1	17023	99.6	99.1	4.6	4.8	0.5	1.5	0.95
14	2016	mCS1	15718	99.9	99.7	4.6	4.7	0.2	1.5	0.95
15	2017	mCS1	14493	100.3	100.2	4.8	4.8	0.1	1.5	0.95
16	2018	mCS1	15377	100.0	100.2	4.8	4.9	-0.2	1.4	0.96
17	2019	mCS1	14283	100.4	100.1	4.5	4.5	0.3	1.3	0.96
18	2020	mCS1	6090	100.1	99.8	4.9	4.9	0.3	1.2	0.97
19	2015	mSB2	17023	99.2	99.1	5.2	4.9	0.1	1.2	0.97
20	2016	mSB2	15718	98.7	98.5	5.4	5.4	0.1	1.2	0.98
21	2017	mSB2	14493	98.0	97.7	5.6	5.8	0.3	1.3	0.98
22	2018	mSB2	15377	99.7	99.8	4.9	5.1	-0.1	1.4	0.96
23	2019	mSB2	14283	99.3	98.4	5.0	5.3	0.8	2.0	0.93
24	2020	mSB2	6090	98.2	97.6	5.2	5.5	0.6	2.2	0.92
25	2015	mCE2	17023	98.9	99.5	4.9	5.2	-0.6	2.7	0.86
26	2016	mCE2	15718	98.9	99.1	5.1	5.5	-0.2	2.7	0.87
27	2017	mCE2	14493	99.5	99.3	5.2	5.6	0.2	2.6	0.89
28	2018	mCE2	15377	99.8	99.7	5.4	5.7	0.1	2.5	0.90
29	2019	mCE2	14283	99.8	99.5	5.9	5.8	0.3	2.5	0.91
30	2020	mCE2	6090	100.0	99.9	5.2	4.8	0.1	2.4	0.88
31	2015	mCS2	17023	98.2	98.7	4.7	4.7	-0.5	1.2	0.97
32	2016	mCS2	15718	99.0	99.7	4.2	4.5	-0.7	1.3	0.96
33	2017	mCS2	14493	99.8	100.0	4.5	4.6	-0.3	1.5	0.95
34	2018	mCS2	15377	99.9	100.0	4.8	4.7	-0.1	1.4	0.96
35	2019	mCS2	14283	100.1	100.2	4.7	4.5	-0.1	1.8	0.93
36	2020	mCS2	6090	100.0	99.9	4.8	4.6	0.1	1.9	0.91

JER summery stastistics for snell and current breeding value for nongenotyped females with progeny, by birth year

Obs	BYR	name	no	mean_sn	mean_cu	std_sn	std_cu	mean_dif	std_dif	corr_sn_cu
37	2015	calv	17023	97.7	97.9	5.8	6.0	-0.2	1.1	0.98
38	2016	calv	15718	97.0	97.1	6.0	6.4	-0.1	1.2	0.98
39	2017	calv	14493	97.9	97.7	5.8	6.0	0.2	1.1	0.98
40	2018	calv	15377	99.7	99.6	5.1	5.4	0.1	1.2	0.98
41	2019	calv	14283	99.0	98.4	5.0	5.4	0.6	1.3	0.97
42	2020	calv	6090	98.7	98.1	5.2	5.9	0.6	1.5	0.97

distribution of differences in number of females and in percentage

Obs	diff	d_calv	p_calv
1	-13	1	0
2	-11	1	0
3	-9	2	0
4	-8	1	0
5	-7	7	0
6	-6	33	0
7	-5	77	0
8	-4	337	0
9	-3	1336	2
10	-2	5075	6
11	-1	16553	20
12	0	28975	35
13	1	20400	25
14	2	7431	9
15	3	2221	3
16	4	441	1
17	5	78	0
18	6	15	0