

Status multibreed evaluation

May 2011 - Jan Lassen

Work tasks for 2011

- 1) Updating the data editing for the multibreed model to be consistent with the data editing for the new yield evaluation model and giving the status of the data pre-processing routines to Faba, MTT and DC. This consists of:
 - a) Streamlining the data editing programs.
 - b) Report statistics for breed proportions, degree of heterozygosity and recombination within "colour * country group for the new, the old multibreed model and the new routine model.
 - c) Compare the Mix99 input data for the multibreed model and insure that allocation to model effects for HF and RDC cows is identical with the allocation in the new HF and RDC models.
- 2) Run the new multibreed model and validation the model by comparing EBV's with those from the Holstein and the Red Cattle routine evaluation. This consists of:
 - a) Run the full setup for the multibreed model incl. heterogen variance correction.
 - b) Compute genetic trends and make comparisons with corresponding trends from the new HF and RDC model.
 - c) Compute correlations between EBV's from the multibreed model and the new HF and RDC models.

Since last meeting

Since the last meeting I have worked on part 1b, 1c, 2a, 2b and 2c of the work plan. For point 2a, 2b and 2c though using a model without HV correction. I have merged the HOL, RDC and RDCxHOL datasets into one and used this dataset for the multibreed evaluation.

Results

Heterozygosity from the merged data set.

TABLE 1 Breed proportions and degrees of heterozygosity in the merged data set with HOL, RDC and HOLxRDC within country. Heterozygosity in bold are used in the model for each country

----- country=DNK -----					
Variable	N	Mean	Std Dev	Minimum	Maximum
bw	3708876	0.1329587	0.1389202	0	1.0000000
rw	3708876	0.0053150	0.0496834	0	1.0000000
hf	3708876	0.7343832	0.2897624	0	1.0000000
rdm	3708876	0.0663185	0.1777081	0	1.0000000
abs	3708876	0.0455164	0.1262140	0	1.0000000
srb	3708876	0.0080521	0.0457887	0	0.7812500
fay	3708876	0.0018325	0.0191408	0	1.0000000
nrf	3708876	0.0021147	0.0165603	0	1.0000000
cay	3708876	0.000515019	0.0142651	0	1.0000000
other	3708876	0.0029939	0.0218803	0	1.0000000
bwxf	3708876	0.2207344	0.1858417	0	1.0000000

rwxf	3708876	0.0059735	0.0494910	0	1.0000000
rdmhol	3708876	0.0145322	0.0544210	0	1.0000000
absxhol	3708876	0.0105306	0.0439904	0	1.0000000
srbxhol	3708876	0.0034050	0.0234679	0	0.8750000
aiyxhol	3708876	0.000986938	0.0120465	0	0.9687500
nrfxhol	3708876	0.0010114	0.0086140	0	0.8125000
redxhol	3708876	0.0048381	0.0329242	0	1.0000000
rdmxsrb	3708876	0.0051386	0.0310733	0	0.7324219
absxsrb	3708876	0.0043787	0.0275197	0	0.7812500
rdmxabs	3708876	0.0436467	0.1304875	0	1.0000000
fayxsrb	3708876	0.000390080	0.0059563	0	0.7080078
fayxnrf	3708876	0.000159122	0.0039654	0	0.5000000
srbxnrf	3708876	0.0013232	0.0106292	0	0.6875000
fayxcay	3708876	0.000034340	0.0022254	0	0.7187500
srbcay	3708876	0.000147619	0.0056812	0	0.6562500

----- country=FIN -----

Variable	N	Mean	Std Dev	Minimum	Maximum
bw	2044172	0.1172696	0.2318112	0	1.0000000
rw	2044172	0	0	0	0
hf	2044172	0.1368441	0.2621759	0	1.0000000
rdm	2044172	0.000155794	0.0030807	0	0.1250000
abs	2044172	0.0022903	0.0113699	0	0.2500000
srb	2044172	0.0384899	0.0720873	0	0.6562500
fay	2044172	0.5902486	0.3568015	0	1.0000000
nrf	2044172	0.0947000	0.0740946	0	0.6250000
cay	2044172	0.0100388	0.0490447	0	1.0000000
other	2044172	0.0099628	0.0924416	0	1.0000000
bwxf	2044172	0.1033075	0.1978746	0	1.0000000
rwxf	2044172	1.5287363E-8	0.000021857	0	0.0312500
rdmhol	2044172	4.4242585E-6	0.000491622	0	0.1250000
absxhol	2044172	0.000075018	0.0021223	0	0.2500000
srbxhol	2044172	0.0011359	0.0131175	0	0.7187500
aiyxhol	2044172	0.0256506	0.1184415	0	1.0000000
nrfxhol	2044172	0.0032930	0.0202648	0	0.6562500
redxhol	2044172	0.0019926	0.0354330	0	1.0000000
rdmxsrb	2044172	0.000043098	0.0010565	0	0.0996094
absxsrb	2044172	0.000474665	0.0031438	0	0.1875000
rdmxabs	2044172	2.46031E-6	0.000134755	0	0.0292969
fayxsrb	2044172	0.0601319	0.1061751	0	0.9062500
fayxnrf	2044172	0.1551074	0.1228044	0	1.0000000
srbxnrf	2044172	0.000730219	0.0034361	0	0.1875000
fayxcay	2044172	0.0157709	0.0674937	0	1.0000000
srbcay	2044172	0.0017429	0.0132972	0	0.6962891

----- country=SWE -----

Variable	N	Mean	Std Dev	Minimum	Maximum
bw	1745901	0.1162589	0.1751356	0	1.0000000
rw	1745901	8.0903785E-6	0.000506078	0	0.0937500
hf	1745901	0.3731540	0.3986106	0	1.0000000
rdm	1745901	0.0050540	0.0245889	0	0.5937500
abs	1745901	0.0105442	0.0334198	0	0.5000000
srb	1745901	0.2893043	0.2954439	0	1.0000000
fay	1745901	0.1265988	0.1520686	0	0.9375000
nrf	1745901	0.0547317	0.0768387	0	0.9375000
cay	1745901	0.0221754	0.0681791	0	1.0000000
other	1745901	0.0021707	0.0195443	0	0.7812500
bwxf	1745901	0.1717217	0.2283074	0	1.0000000
rwxf	1745901	0.000022510	0.000983661	0	0.1640625
rdmxf	1745901	0.000123956	0.0029219	0	0.3750000
absxf	1745901	0.000280484	0.0042113	0	0.4687500
srxf	1745901	0.0159279	0.0625326	0	1.0000000
aixf	1745901	0.0053409	0.0263975	0	0.8437500
nrfxf	1745901	0.0015603	0.0099640	0	0.8437500
redxf	1745901	0.0029859	0.0314474	0	1.0000000
rdmxfsr	1745901	0.0061454	0.0289796	0	0.7187500
absxfsr	1745901	0.0125662	0.0395938	0	0.7500000
rdmxfabs	1745901	0.000249174	0.0034511	0	0.3388672
fayxfsr	1745901	0.1382071	0.1624643	0	1.0000000
fayxfnrf	1745901	0.0295005	0.0450368	0	0.7109375
srxfnrf	1745901	0.0026760	0.0097685	0	0.4101563
fayxfcay	1745901	0.0121198	0.0391370	0	0.9375000
srxfcay	1745901	0.0255454	0.0699906	0	1.0000000

Genetic trends

I have made genetic trends with help from Jukka – using his setup. I have compared them with trends from the new model in 4 excelsheets – HOLcows, HOLbulls, RDC cows and RDCbulls. The trends from the multibreed model is without HV correction, which makes comparison a little difficult. The trends from the multibreed model and the new model though seem to follow same patterns and the difference there is could be explained by the lack of HV correction. This picture is the same for all four comparisons. Also SD for all traits follows similar patterns for all traits for both cows and bulls, so the change in the routine model from year to year is also found in the multibreed model. I have calculated standardization factors from the multibreed model, but used those from Jukkas singlebreed models since there was very little difference in the numbers.

Correlations

I have made correlations within year and country between breeding values from the multibreed model and the singlebreed RDC and HOL model, respectively. Correlations are in excel file "correlations". I have made correlations for bulls with more than 50 daughters with 100DIM. Correlations are all high and in general +,99 for Holstein bulls and +,98 for RDC bulls. For Holstein cows correlations are also high often +,98. For RDC cows, though correlations are a bit lower (0,93-0,95).

Heterosis

Heterosis estimates are in excel file "heterosis". In general the heterosis estimates are between 1 and 6%. Only a few are negative, and close to zero – these are all combinations with CAY. Recombination loss effects are generally lower than what has been shown earlier. For Holstein combinations heterosis estimates are also between 1 and 6%.

Problems

- The number of Danish Holstein cows from the multibreed model does not correspond to the number of cows from the new single breed model.
- The datafile is too big to be on scratch while merging

Future plans

Find the missing Danish Holstein cows...

Run model with multibreed standardization factors.

Incorporate HV correction into the model

Compare multibreed model without HV correction with new RDC and HOL model without HV correction (runned by Jukka now)