Status on routine evaluation in NAV and Interbull

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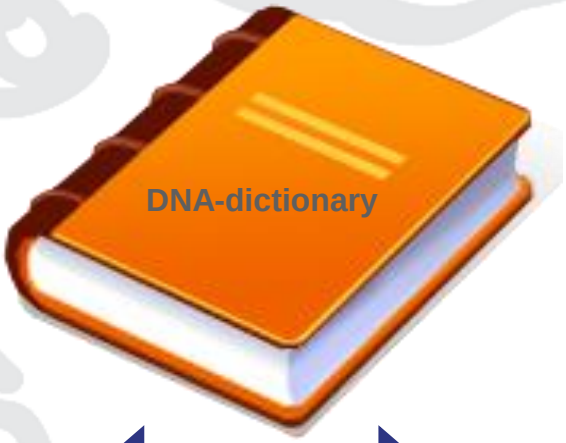
Guidelines I have got

- where did we start from
- what different ideas did we investigate
- what were the main results of these investigations
- what has ended up being implemented
- what do we see as the main challenges now
- where do we go from here

Genomic prdiction



SNP’s

EBVs for proven bulls and cows

A few headlines - genomic prediction

2009 Unofficial DGVs calculated by AU

2010 Exchange of Hol ref.

2011 First official NAV evaluation, exchange RDC ref.

2012 Interbull validation of GEBVs,

2014 Exchange Jer ref., GMACE, Cows in reference population

Referencepopulation

	Reference population			
	2009	2015		2016+
	Bulls	Bulls	Cows	
Holstein	4000	27500[a)]	8400	Cows++
RDC	3500	8150[b)]	12700	Cows++
Jersey	1000	2450[c)]	8550	Cows++

a) Including NLD, FRA, DEU, ESP ref bulls;
b) Including NO ref bulls;
c) Including US ref bulls

Imputation and genotypes

	2009	2015	Future
All breeds	54K no imputation	10K and 54 K Imputation with Fimpute and Beagle (RDC)	Near future Fimpute also RDC – Beagle too slow for routine

Dependent variable

	2009	2015	Future
All breeds	NAV EBVs (genotyped animals)	DRPs (genotyped animals) from NAV EBVs and MACE EBVs	DRP (all animals) (one step) from NAV EBVs and MACE EBVS

As long foreign reference bulls are important dependent variable has to be DRP

Traits

	2009	2015	Future
All breeds	Combined NTM traits used as single traits	Single traits combined across lactations – Interbull traits	Near future - follow Interbull

Trait definitions have to follow Interbull traits e.g. combined across lactation - as long foreign reference bulls are important.

Method

	2009	2015	Future
All breeds	Bayesian without polygenetic effect	GBLUP without polygenetic effect	SNPBLUP + take SNP carrying ”additional information into account” + reconsider polygenetic effect

Research have shown that adding polygenetic effect reduce validation reliability a little, but reduce also bias

Validation

	2009	2015	Future
All breeds	Cross validation applied	Validation based om last birth years – Interbull standard	Apply international standard

Validation reliabilities (increase in reliability next to pedigree)

	2009	Exchange ref bulls	Cows in ref	Future
HOL	+20-30%	+12%	+2%	+?
RDC	+10-20%	+1-2%	+3-7%	+?
Jer	+0-10%	+3-4%	+5-10%	+?

Increased reliability in future require more cows in ref and/or improved methods

Handling of inflation of DGVs

	2009	2015	Future
All breeds	Not handled	DGVs standardised to fulfill valdidation	Reconsider adding polygenetic effect

Overevalaution of highest ranking animals?

	2015	Future
All breeds	Tendency in all countries	??

Impact of biased records?

	2014	Future
All breeds	Hardly any impact by adding cows to ref	Has to be studied in more details

Number of routine evaluation pr year

	2009	2015	Future
All breeds	4	12	Aim 52

Interbull

<2009	2012	2014	Future
MACE			Still important for ref bulls
	Genomic validation		Important to prove quality of prediction
		GMACE - Holstein	More breeds? Important for interbull countries having no genomic prediction
			International standard for reliabilities
			Exchange of genotypes?

Implementation plan GEBV 2015

Taks
“Transition from GEBV to EBV”
Weekly evaluations – from GBLUP to SNP BLUP
Official GEBV reliabilities
Cows in ref for more traits – fertility, claw health
All type traits at each evaluation – GEBV for females
GEBV Young stock survival

Future development GEBV 2015+

Task
One step – based on DRP
Handling SNP carrying extra information
????

To follow carefully

Task
Risk of over prediction of highest ranking animals
Potential effect of biased records

Extra reliability
– in addition to pedigree information for RDC

	Reference population	
	Bulls	Bulls and cows
Yield	0,13	**0,18**
Growth	0,13	**0,14**
Fertility	0,14	0,14
Birth	0,18	0,18
Calving	0,02	0,02
Udder health	0,17	**0,23**
Other diseases	0,14	0,14
Frame	0,24	**0,29**
Feet&Legs	0,24	**0,33**
Udder	0,23	**0,30**
Milking speed	0,17	**0,22**
Temperament	0,18	0,21
Longevity	0,07	0,07
Claw health	0,11	0,11

Extra reliability
– in addition to pedigree information for HOL

	Reference population	
	Bulls	Bulls and cows
Yield	0,33	**0,35**
Growth	0,24	0,24
Fertility	0,32	0,32
Birth	0,31	0,31
Calving	0,22	0,22
Udder health	0,39	**0,41**
Other diseases	0,06	0,06
Frame	0,36	**0,36**
Feet&Legs	-	-
Udder	0,52	**0,52**
Milking speed	0,46	**0.46**
Temperament	0,14	0.14
Longevity	0,21	0.21
Claw health	(0,00)	(0,00)

Extra reliability
– in addition to pedigree information for JER

	Reference population	
	Bulls	Bulls and cows
Yield	0,16	**0,22**
Fertility	0,17	0,17
Birth	0,00	0,00
Calving	0,00	0,00
Udder health	0,09	**0,16**
Other diseases	0,00	0,00
Frame	0,19	**0,30**
Feet&Legs	0,05	**0,13**
Udder	0,26	**0,29**
Milking speed	0,15	**0,34**
Temperament	0,00	0,00
Longevity	0,11	0,11