

Research on development of international beef genetic evaluations for calving traits

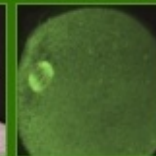
Czech Research Team

*Interbeef Working Group Meeting
Prague, Czech Republic, 21st November 2013*

VÚŽV, v.v.i.



INSTITUTE OF ANIMAL SCIENCE
PRAHA UHŘÍNĚVES

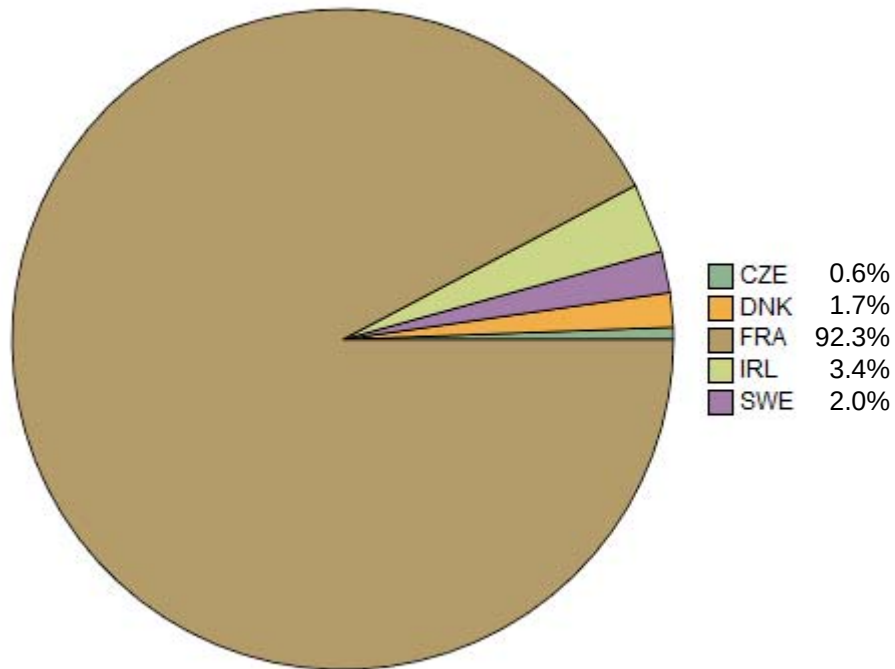


Current situation in research

- We start with calving ease
- What has been done
 - Loading and checking of datasets
 - Basic statistical characteristics
 - Connectedness between countries
 - Creating datasets for genetic parameters estimation

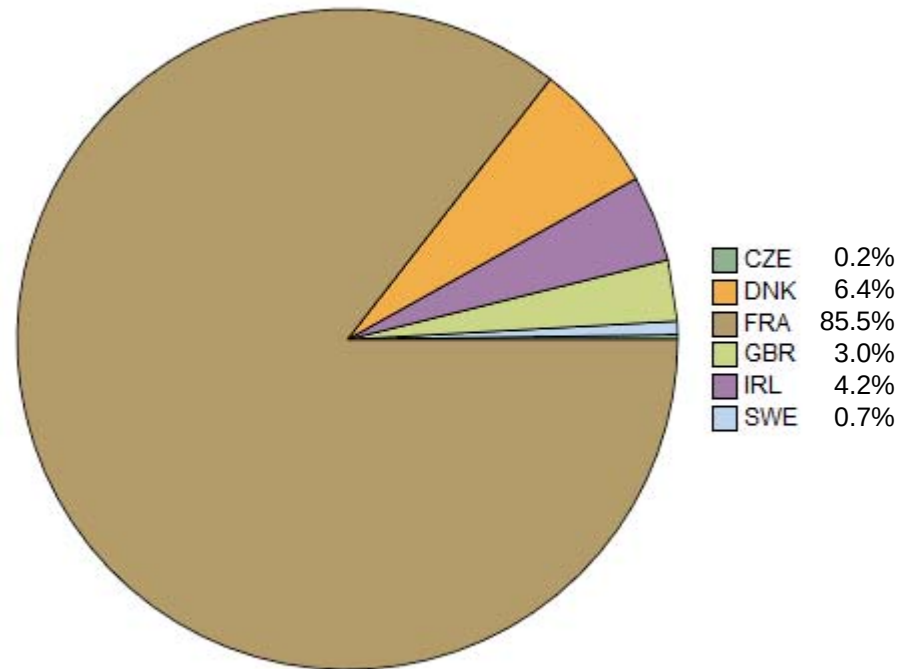
Calving ease - Participating countries

CHA



n = 6 775 318

LIM



n = 4 055 485

Basic statistical characteristics

- Presented at the Interbull meeting and the Interbeef Technical Committee in Nantes (August 2013)

Connectedness

- Across-country connection
- Important for estimation of genetic correlations

Origin of sires

CHAROLAIS						
	Country of first registration of sire					
	CZE	DNK	FRA	IRL	SWE	Other
CZE	616	6	358		2	75
DNK		2833	181		62	35
FRA		3	140963		1	33
IRL		2	2844	11965		135
SWE		30	55		5079	53

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LIMOUSINE							
	Country of first registration of sire						
	CZE	DNK	FRA	GBR	IRL	SWE	Other
CZE	177	10	179	4		1	33
DNK		5892	205	11		9	42
FRA		5	61242	6	2	1	46
GBR			797	5861	65		
IRL		2	1202	65	8967		6
SWE		41	54			957	14

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COMMON SIRES

CHAROLAIS

	CZE	DNK	FRA	GBR	IRL	SWE
CZE	1057	55 1.8%	240 0.2%		50 0.3%	36 0.7%
DNK	55 5.2%	3111	104 0.1%		63 0.4%	50 1.0%
FRA	240 22.7%	104 3.3%	141000		263 1.8%	48 0.9%
GBR						
IRL	50 4.7%	63 2.0%	263 0.2%		14946	27 0.5%
SWE	36 3.4%	50 1.6%	48 0.03%		27 0.2%	5217

LIMOUSINE

	CZE	DNK	FRA	GBR	IRL	SWE
CZE	404	41 0.7%	135 0.2%	42 0.6%	38 0.4%	23 2.2%
DNK	41 10.1%	6159	107 0.2%	65 1.0%	62 0.6%	66 6.2%
FRA	135 33.4%	107 1.7%	61302	290 4.3%	185 1.8%	41 3.8%
GBR	42 10.4%	65 1.0%	290 0.5%	6723	226 2.2%	27 2.5%
IRL	38 9.4%	62 1.0%	185 0.3%	226 3.4%	10242	21 2.0%
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NUMBER OF OFFSPRING (in thousands) OF COMMON SIREs						
CHAROLAIS						
	CZE	DNK	FRA	GBR	IRL	SWE
CZE	39.5	3.5 4.7%	942 16.0%		5.1 2.2%	1.2 0.9%
DNK	5.4 13.6%	74.0	546 9.3%		24 10.3%	36 2.6%
FRA	12 30.1%	5.2 7.0%	5889.8		50 21.8%	1.5 1.1%
GBR						
IRL	4.4 11.3%	3.9 5.3%	505 8.6%		229.0	0.8 0.6%
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FRA	2.8 29.4%	8.3 4.9%	3208.1	9.0 7.5%	40 23.7%	0.8 3.1%
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How many countries do the common sires connect?

CHAROLAIS		
COUNTRIES	BÝKŮ	%
1	164 126	99.69
2	401	0.24
3	73	0.04
4	26	0.02
5	16	0.01

LIMOUSINE		
COUNTRIES	SIRES	%
1	84 279	99.21
2	501	0.59
3	98	0.12
4	49	0.06
5	13	0.02
6	10	0.01

CHAROLAIS		
COUNTRIES	OFFSPRING	%
1	5 253 766	82.48
2	303 409	4.76
3	375 804	5.90
4	224 690	3.53
5	212 102	3.33

LIMOUSINE		
COUNTRIES	OFFSPRING	%
1	3 100 974	83.79
2	136 481	3.69
3	93 275	2.52
4	84 603	2.29
5	86 091	2.33
6	199 466	5.39

Creating datasets for genetic parameters estimation

- Connectedness of dataset between countries
- We used software from ICBF (Thierry Pabiou)
 - SAS

Creating datasets for genetic parameters estimation

- Basic principle:
 - Creating datasets based on connectedness across sires in 3 generations

Creating datasets for genetic parameters estimation

1. Assigning alternative IDs to calves without registration IDs
 - „UUUUUUUUUUUUUUUUUUUUUUUUUUUU“
 - CZE, DNK, SWE
 - Merging with pedigree
2. Exclusion of ETs
3. Exclusion of calves with unknown sire and MGS
4. Exclusion of CG smaller than 5

Creating datasets for genetic parameters estimation

5. Exclusion of performances < 1980

6. Running ICBF software

- Retrieve animals with performance linked to common ancestors
- Retrieve additional animals with performance present in the selected CGs

7. Build pedigree file

- Relationship matrix with genetic groups based on the country of origin

Current situation

- We start with estimation of genetic parameters for 2 x 2 country for LIM
- Software
 - REMLF90
 - AIREML1F90
 - GIBBSF90
 - THRGIBBS1F90 ?

Datasets for genetic parameters estimation

	DNK	FRA	GBR	IRL	SWE
CZE	32,945 4,559 CZE 28,386 DNK	240,754 5,981 CZE 234,773 FRA	26,074 4,966 CZE 21,108 GBR	51,566 4,951 CZE 46,615 IRL	10,209 3,608 CZE 6,601 SWE
DNK		224,963 30,400 DNK 194,563 FRA	62,658 28,648 DNK 34,010 GBR	73,911 22,651 DNK 51,260 IRL	56,146 40,265 DNK 15,881 SWE
FRA			406,998 360,026 FRA 46,962 GBR	301,748 245,177 FRA 56,571 IRL	85,447 78,186 FRA 7,261 SWE
GBR				105,225 44,646 GBR 60,579 IRL	14,100 8,067 GBR 6,033 IRL
IRL					46,495 41,037 IRL 5,458 SWE

Environmental effects

CZE	DNK	FRA	GBR	IRL	SWE
CG*	CG	CG	CG	CG	CG
	season	season			
birth year					
			birth month		
sex × twi	sex			sex	sex
	twi				
		parity × age	parity × sex	parity	parity
age	age			age**	age
			birth type		
			purebred status		

* random effect

** fixed regression

Current situation

- Testing various models...
 - Animal model
 - Sire model
 - Sire-MGS model
- and random effects taken into account
 - Direct genetic effect
 - Maternal genetic effect
 - Permanent environmental effect

Thank you for your attention



<http://www.vuzv.cz>
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