



IT-Solutions for
Animal Production

INTERBEEF R & D – PROJECT:

International GE for Fertility Traits

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Genetic Evaluation Unit

Vereinigte Informationssysteme Tierhaltung w.V. (**vit**), Verden

Database

- Participating countries, Charolais (5)
 - CHE, DEU, DFS, FRA, IRL

- Participating countries, Limousin (6)
 - CHE, DEU, DFS, FRA, GBR, IRL

- Traits
 - Traits without extra data collection
 - All traits can be derived and verified from birth and calving dates
 - Age at 1st Calving
 - Calving Intervall
 - Number of Calvings
 - Number of calvings along cow career → Longevity
 - Number of calvings at a target age → Reproductive Efficiency



Data files

- 603 Parameter file
- 604 ET file
- 606 Performance file
 - Information belongs to the cow, e.g. birthdate or culling date
 - Information belongs to each known calving, from 1st to last calving
 - Trait code (FCODE): AFC
 - One record for each cow for all calvings
- Pedigree Files
 - The numerical part in the IDs (IBID19) is renumbered





Charolais data base – descriptive statistics

Charolais

606 - IBID19 (Anzahl Saetze) * Land													
	1		2		3		4		5		Summe		
	CHE		DEU		DFS		FRA		IRL				
	0	11	0.2	121	0.3	5	0.0	260	0.0	563	1.0	960	0.1
	1	6703	99.8	37162	99.7	62535	100.0	1583070	100.0	57882	99.0	1747352	99.9
Summe		6714	0.4	37283	2.1	62540	3.6	1583330	90.6	58445	3.3	1748312	

→ 1,748,312 animals with performance

→ 960 duplicate records in the dataset

→ ~ 90 % of data from France



Charolais data base – by birthyear of cow

606 - Geburtsjahr * Land

		1		2		3		4		5		Summe	
		CHE		DEU		DFS		FRA		IRL			
GebJa	2013	4	0.1	3	0.0	0	0.0	14	0.0	13	0.0	34	0.0
GebJa	2012	111	1.7	382	1.0	1093	1.7	11442	0.7	981	1.7	14009	0.8
GebJa	2011	261	3.9	1286	3.4	1681	2.7	73508	4.6	2250	3.8	78986	4.5
GebJa	2010	330	4.9	1485	4.0	1957	3.1	89236	5.6	2579	4.4	95587	5.5
GebJa	2009	303	4.5	1545	4.1	2244	3.6	87169	5.5	2686	4.6	93947	5.4
GebJa	2008	335	5.0	1596	4.3	2362	3.8	88156	5.6	2919	5.0	95368	5.5
GebJa	2007	320	4.8	1565	4.2	2409	3.9	89285	5.6	2733	4.7	96312	5.5
GebJa	2006	267	4.0	1615	4.3	2647	4.2	88092	5.6	3086	5.3	95707	5.5
GebJa	2005	285	4.2	1584	4.2	2607	4.2	84566	5.3	3286	5.6	92328	5.3
GebJa	2004	264	3.9	1449	3.9	2439	3.9	79343	5.0	3140	5.4	86635	5.0
GebJa	2003	200	3.0	1353	3.6	2226	3.6	75920	4.8	3026	5.2	82725	4.7
GebJa	2002	197	2.9	1346	3.6	2221	3.6	72879	4.6	3254	5.6	79897	4.6
GebJa	2001	230	3.4	1358	3.6	2365	3.8	68459	4.3	3243	5.5	75655	4.3
GebJa	2000	153	2.3	1412	3.8	2282	3.6	67498	4.3	2946	5.0	74291	4.2
GebJa	1999	147	2.2	1340	3.6	2415	3.9	66957	4.2	2402	4.1	73261	4.2
GebJa	1998	108	1.6	1382	3.7	2411	3.9	67011	4.2	2415	4.1	73327	4.2
GebJa	1997	80	1.2	1336	3.6	2521	4.0	65178	4.1	2229	3.8	71344	4.1
GebJa	1996	70	1.0	1298	3.5	2471	4.0	61374	3.9	2001	3.4	67214	3.8
GebJa	1995	59	0.9	1232	3.3	2297	3.7	51892	3.3	1762	3.0	57242	3.3
GebJa	1994	40	0.6	1219	3.3	2164	3.5	47291	3.0	1603	2.7	52317	3.0
GebJa	1993	19	0.3	1362	3.7	2119	3.4	45292	2.9	1372	2.3	50164	2.9
GebJa	1992	16	0.2	1260	3.4	2166	3.5	42249	2.7	1254	2.1	46945	2.7
GebJa	1991	13	0.2	1163	3.1	2053	3.3	36770	2.3	1079	1.8	41078	2.3
GebJa	1990	7	0.1	7712	20.7	13390	21.4	123749	7.8	6186	10.6	151044	8.6
GebJa	1917	2895	43.1	0	0.0	0	0.0	0	0.0	0	0.0	2895	0.2
Summe		6714	0.4	37283	2.1	62540	3.6	1583330	90.6	58445	3.3	1748312	

→ 2.895 records with missing birthyear for CHE



Charolais data base – number of calvings

606 - Anzahl Kalbungen je Tier * Land (Originaldaten)

		1		2		3		4		5		Summe	
		CHE		DEU		DFS		FRA		IRL			
AnzKal	1	1611	24.0	7882	21.1	15966	25.5	435670	27.5	10837	18.5	471966	27.0
AnzKal	2	1064	15.8	5630	15.1	11223	17.9	302848	19.1	6807	11.6	327572	18.7
AnzKal	3	848	12.6	4684	12.6	8390	13.4	216094	13.6	7284	12.5	237300	13.6
AnzKal	4	818	12.2	4185	11.2	6925	11.1	167543	10.6	6446	11.0	185917	10.6
AnzKal	5	714	10.6	3596	9.6	5572	8.9	134990	8.5	5766	9.9	150638	8.6
AnzKal	6	561	8.4	3130	8.4	4560	7.3	107830	6.8	5187	8.9	121268	6.9
AnzKal	7	413	6.2	2533	6.8	3334	5.3	83350	5.3	4472	7.7	94102	5.4
AnzKal	8	319	4.8	1955	5.2	2550	4.1	58413	3.7	3543	6.1	66780	3.8
AnzKal	9	184	2.7	1383	3.7	1698	2.7	37366	2.4	2660	4.6	43291	2.5
AnzKal	10	114	1.7	959	2.6	1097	1.8	21282	1.3	2109	3.6	25561	1.5
AnzKal	11	39	0.6	672	1.8	642	1.0	10646	0.7	1376	2.4	13375	0.8
AnzKal	12	17	0.3	355	1.0	324	0.5	4777	0.3	934	1.6	6407	0.4
AnzKal	13	7	0.1	172	0.5	162	0.3	1750	0.1	511	0.9	2602	0.1
AnzKal	14	3	0.0	99	0.3	60	0.1	578	0.0	288	0.5	1028	0.1
AnzKal	15	1	0.0	33	0.1	28	0.0	153	0.0	146	0.2	361	0.0
AnzKal	16	1	0.0	10	0.0	8	0.0	37	0.0	79	0.1	135	0.0
AnzKal	17	0	0.0	4	0.0	1	0.0	2	0.0	0	0.0	7	0.0
AnzKal	18	0	0.0	1	0.0	0	0.0	1	0.0	0	0.0	2	0.0
Summe		6714	0.4	37283	2.1	62540	3.6	1583330	90.6	58445	3.3	1748312	

→ ~ 70 % with less than 4 calvings



Charolais data base – number of calvings per year

606 - Kalbejahr * Land (alle Kalbungen - tatsaechlich gemeldet)

		1		2		3		4		5		Summe	
		CHE		DEU		DFS		FRA		IRL			
KaJa	2015	0	0.0	0	0.0	0	0.0	0	0.0	2005	0.9	2005	0.0
KaJa	2014	1930	7.6	5928	4.0	6474	2.8	290164	5.3	11631	5.1	316127	5.2
KaJa	2013	2387	9.4	6873	4.6	7809	3.4	338538	6.2	11702	5.1	367309	6.0
KaJa	2012	2331	9.1	6907	4.7	8836	3.8	345053	6.3	13629	6.0	376756	6.2
KaJa	2011	2346	9.2	7029	4.7	9379	4.1	339291	6.2	13265	5.8	371310	6.1
KaJa	2010	2350	9.2	6959	4.7	9349	4.0	331944	6.0	12806	5.6	363408	5.9
KaJa	2009	2179	8.5	6879	4.6	9593	4.2	314856	5.7	13158	5.8	346665	5.7
KaJa	2008	1963	7.7	6786	4.6	9654	4.2	316917	5.8	15194	6.7	350514	5.7
KaJa	2007	1805	7.1	6644	4.5	9261	4.0	308390	5.6	11011	4.8	337111	5.5
KaJa	2006	1432	5.6	6395	4.3	8977	3.9	288411	5.3	11293	5.0	316508	5.2
KaJa	2005	1218	4.8	6191	4.2	8669	3.8	274272	5.0	11235	4.9	301585	4.9
KaJa	2004	1019	4.0	6231	4.2	9049	3.9	255326	4.7	10961	4.8	282586	4.6
KaJa	2003	807	3.2	5943	4.0	8853	3.8	246929	4.5	9700	4.3	272232	4.4
KaJa	2002	767	3.0	5931	4.0	8842	3.8	236401	4.3	10020	4.4	261961	4.3
KaJa	2001	740	2.9	5879	4.0	9222	4.0	228375	4.2	9324	4.1	253540	4.1
KaJa	2000	568	2.2	5820	3.9	9298	4.0	217951	4.0	8257	3.6	241894	4.0
KaJa	1999	521	2.0	5546	3.7	9222	4.0	197939	3.6	6951	3.1	220179	3.6
KaJa	1998	387	1.5	5194	3.5	8898	3.9	175534	3.2	6660	2.9	196673	3.2
KaJa	1997	274	1.1	5287	3.6	8386	3.6	154661	2.8	5705	2.5	174313	2.8
KaJa	1996	249	1.0	4895	3.3	8170	3.5	145138	2.6	5244	2.3	163696	2.7
KaJa	1995	172	0.7	4607	3.1	7837	3.4	126563	2.3	4514	2.0	143693	2.3
KaJa	1994	80	0.3	4181	2.8	7720	3.3	107147	2.0	3762	1.7	122890	2.0
KaJa	1993	0	0.0	3793	2.6	7579	3.3	89007	1.6	3195	1.4	103574	1.7
KaJa	1992	0	0.0	3253	2.2	6992	3.0	73630	1.3	2725	1.2	86600	1.4
KaJa	1991	0	0.0	2661	1.8	6288	2.7	50974	0.9	2214	1.0	62137	1.0
KaJa	1990	0	0.0	12718	8.6	26596	11.5	36342	0.7	11386	5.0	87042	1.4
Summe		25525	0.4	148530	2.4	230953	3.8	5489753	89.7	227547	3.7	6122308	



Charolais data base

„No. of calvings“ – „No. of delivered single calvings“



Verteilung	Anzahl Kalbungen original (nkal/eingelesen) *								Anzahl Kalbungen NEU (nkaln/ausgezaehlt)										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	2	471964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	487	327085	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	106	2519	234675	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	264	905	2065	182683	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	41	520	1197	1753	147127	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	36	173	730	1203	1539	117587	0	0	0	0	0	0	0	0	0	0	0	0
7	0	26	103	327	766	1051	1331	90498	0	0	0	0	0	0	0	0	0	0	0
8	0	21	26	123	358	662	909	1013	63668	0	0	0	0	0	0	0	0	0	0
9	0	16	10	36	144	333	562	696	754	40740	0	0	0	0	0	0	0	0	0
10	0	5	11	29	67	157	282	439	550	547	23474	0	0	0	0	0	0	0	0
11	0	4	5	16	18	50	133	213	315	332	354	11935	0	0	0	0	0	0	0
12	0	3	2	6	12	32	50	111	174	210	207	207	5393	0	0	0	0	0	0
13	0	1	2	2	10	8	24	32	64	82	120	115	104	2038	0	0	0	0	0
14	0	1	1	0	4	4	8	20	31	45	47	60	52	49	706	0	0	0	0
15	0	1	1	1	4	2	2	12	12	12	26	22	15	27	20	204	0	0	0
16	0	0	0	0	4	0	3	6	11	17	7	11	11	10	0	3	52	0	0
17	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0
18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1

Comparison of „No. of calvings“ (field 14) with following information of calvings

→ Missing calvings: i.e. (7 out of 11), 1, 2, 3, 6, 7, 10, 11



Charolais data base – pedigree information

- 1.747.352 animals with performance (Y)
- 2.311.043 animals with pedigree information

Sex	Y	#	Mean # Prog.*	SD # Prog.*	Min # Prog.	Max # Prog.	# Countries
Female	No	243,284	1.62	1.01	1	35**	1 - 3
Female	Yes	1,747,346	0.65	1.04	0	29**	1 - 5
Male	No	103,104	14.14	134.7	1	10,719	1 - 5

*) Progeny with performance

***) Embryos!



Charolais: # bulls (by country) with progeny in # countries

# countries	CHE	DEU	DFS	FRA	IRL
1	430	4,435	6,951	84,159	5,135
2	21	118	41	1,443	76
3	-	10	3	172	10
4	-	-	1	62	4
5	-	-	-	33	-

→ Most bulls have progeny in only one country

→ Connections via French bulls/sires



Charolais: # comon bulls with progeny in # countries

	CHE	DEU	DFS	FRA	IRL
CHE	430	52	9	117	-
DEU		4,435	36	507	5
DFS			6,951	33	9
FRA				84,159	937
IRL					5,135

→ e.g. 507 bulls with progeny in DEU and FRA



Charolais: Pedigree information

country of animal	combination sire x dam - country			other
CHE	CHE*CHE 34%	FRA*CHE 34%	FRA*FRA 9%	7%
DEU	DEU*DEU 79%	FRA*DEU 12%	FRA*FRA 4%	5%
DNK	DNK*DNK 75%	FRA*DNK 16%	SWE*DNK 4%	5%
FIN	FIN*FIN 72%	SWE*FIN 10%	FRA*FIN 6%	12%
FRA	FRA*FRA 99,9%			0,1%
IRL	IRL*IRL 28%	FRA*IRL 64%	FRA*FRA 4%	4%
SWE	SWE*SWE 91%	CAN*SWE 4%	DNK*SWE 2%	3%

→ Connections between countries mostly via French sires

→ Sweden !?





Limousin data base – descriptive statistics

Limousin

606 - IBID19 (Anzahl Saetze) * Land															
	1		2		3		4		5		6		Summe		
	CHE		DEU		DFS		FRA		GBR		IRL				
	0	0	0.0	353	1.1	75	0.1	187	0.0	18	0.0	740	1.6	1373	0.1
	1	39058	100.0	31372	98.9	59544	99.9	840240	100.0	69098	100.0	44674	98.4	1083986	99.9
Summe		39058	3.6	31725	2.9	59619	5.5	840427	77.4	69116	6.4	45414	4.2	1085359	

→ 1,085,359 animals with performance

→ 1,373 duplicate records in the dataset

→ ~77% of data from France



Limousin data base – by birthyear cow

606 - Geburtsjahr * Land

		1		2		3		4		5		6		Summe	
		CHE		DEU		DFS		FRA		GBR		IRL			
GebJa	2013	6	0.0	1	0.0	0	0.0	9	0.0	0	0.0	6	0.0	22	0.0
GebJa	2012	415	1.1	445	1.4	846	1.4	7766	0.9	317	0.5	1016	2.2	10805	1.0
GebJa	2011	1163	3.0	1589	5.0	2076	3.5	49392	5.9	2939	4.3	2444	5.4	59603	5.5
GebJa	2010	1246	3.2	1681	5.3	2718	4.6	52586	6.3	3252	4.7	2716	6.0	64199	5.9
GebJa	2009	1192	3.1	1727	5.4	2990	5.0	50882	6.1	3145	4.6	2816	6.2	62752	5.8
GebJa	2008	1220	3.1	1830	5.8	3242	5.4	51389	6.1	3093	4.5	3171	7.0	63945	5.9
GebJa	2007	1204	3.1	1865	5.9	3118	5.2	52572	6.3	3021	4.4	3001	6.6	64781	6.0
GebJa	2006	1048	2.7	1843	5.8	3462	5.8	51560	6.1	2682	3.9	3017	6.6	63612	5.9
GebJa	2005	853	2.2	1775	5.6	3386	5.7	49077	5.8	2755	4.0	2989	6.6	60835	5.6
GebJa	2004	766	2.0	1447	4.6	2854	4.8	45044	5.4	2708	3.9	2772	6.1	55591	5.1
GebJa	2003	579	1.5	1254	4.0	2416	4.1	41163	4.9	2915	4.2	2651	5.8	50978	4.7
GebJa	2002	514	1.3	1333	4.2	2501	4.2	38349	4.6	2917	4.2	2494	5.5	48108	4.4
GebJa	2001	506	1.3	1455	4.6	2672	4.5	34976	4.2	2868	4.1	2201	4.8	44678	4.1
GebJa	2000	322	0.8	1384	4.4	2522	4.2	34161	4.1	2855	4.1	2026	4.5	43270	4.0
GebJa	1999	302	0.8	1348	4.2	2923	4.9	32577	3.9	2558	3.7	1606	3.5	41314	3.8
GebJa	1998	264	0.7	1262	4.0	2180	3.7	31861	3.8	2568	3.7	1398	3.1	39533	3.6
GebJa	1997	257	0.7	1236	3.9	2421	4.1	29659	3.5	2592	3.8	1221	2.7	37386	3.4
GebJa	1996	223	0.6	1138	3.6	2448	4.1	27365	3.3	2543	3.7	1104	2.4	34821	3.2
GebJa	1995	157	0.4	975	3.1	1883	3.2	24564	2.9	2495	3.6	936	2.1	31010	2.9
GebJa	1994	124	0.3	885	2.8	1484	2.5	22821	2.7	2342	3.4	832	1.8	28488	2.6
GebJa	1993	71	0.2	928	2.9	1571	2.6	21120	2.5	2171	3.1	652	1.4	26513	2.4
GebJa	1992	32	0.1	867	2.7	1487	2.5	19724	2.3	2164	3.1	579	1.3	24853	2.3
GebJa	1991	20	0.1	869	2.7	1357	2.3	17484	2.1	1842	2.7	540	1.2	22112	2.0
GebJa	1990	55	0.1	2588	8.2	7062	11.8	54326	6.5	12001	17.4	3226	7.1	79258	7.3
GebJa	1917	26519	67.9	0	0.0	0	0.0	0	0.0	373	0.5	0	0.0	26892	2.5
Summe		39058	3.6	31725	2.9	59619	5.5	840427	77.4	69116	6.4	45414	4.2	1085359	



Limousin data base – number of calvings

606 - Anzahl Kalbungen je Tier * Land (Originaldaten)

		1		2		3		4		5		6		Summe	
		CHE		DEU		DFS		FRA		GBR		IRL			
AnzKal	1	8700	22.3	6993	22.0	16365	27.4	198122	23.6	16534	23.9	8635	19.0	255349	23.5
AnzKal	2	6281	16.1	4723	14.9	10946	18.4	137636	16.4	10932	15.8	5990	13.2	176508	16.3
AnzKal	3	4976	12.7	3739	11.8	7804	13.1	101137	12.0	8351	12.1	5843	12.9	131850	12.1
AnzKal	4	4490	11.5	3541	11.2	6037	10.1	82989	9.9	6533	9.5	4969	10.9	108559	10.0
AnzKal	5	3975	10.2	2937	9.3	4846	8.1	70664	8.4	6247	9.0	4482	9.9	93151	8.6
AnzKal	6	3435	8.8	2450	7.7	3836	6.4	61948	7.4	20519	29.7	3779	8.3	95967	8.8
AnzKal	7	2563	6.6	2076	6.5	2936	4.9	52414	6.2	0	0.0	3156	6.9	63145	5.8
AnzKal	8	1933	4.9	1605	5.1	2206	3.7	43367	5.2	0	0.0	2448	5.4	51559	4.8
AnzKal	9	1310	3.4	1231	3.9	1679	2.8	33701	4.0	0	0.0	1870	4.1	39791	3.7
AnzKal	10	653	1.7	913	2.9	1154	1.9	24463	2.9	0	0.0	1426	3.1	28609	2.6
AnzKal	11	324	0.8	641	2.0	787	1.3	15987	1.9	0	0.0	1031	2.3	18770	1.7
AnzKal	12	219	0.6	415	1.3	485	0.8	9693	1.2	0	0.0	700	1.5	11512	1.1
AnzKal	13	103	0.3	245	0.8	268	0.4	5038	0.6	0	0.0	456	1.0	6110	0.6
AnzKal	14	52	0.1	117	0.4	152	0.3	2235	0.3	0	0.0	315	0.7	2871	0.3
AnzKal	15	26	0.1	60	0.2	86	0.1	778	0.1	0	0.0	182	0.4	1132	0.1
AnzKal	16	16	0.0	29	0.1	25	0.0	215	0.0	0	0.0	132	0.3	417	0.0
AnzKal	17	2	0.0	7	0.0	6	0.0	38	0.0	0	0.0	0	0.0	53	0.0
AnzKal	18	0	0.0	2	0.0	1	0.0	2	0.0	0	0.0	0	0.0	5	0.0
AnzKal	19	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
Summe		39058	3.6	31725	2.9	59619	5.5	840427	77.4	69116	6.4	45414	4.2	1085359	

→ ~ 61 % with less than 4 calvings

→ GBR: calving numbers greater than 6 → 6 ?



Limousin data base – number of calvings per year

606 - Kalbejahr * Land (alle Kalbungen - tatsaechlich gemeldet)

		1		2		3		4		5		6		Summe	
		CHE		DEU		DFS		FRA		GBR		IRL			
KaJa	2015	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1976	1.1	1976	0.0
KaJa	2014	18115	11.7	7355	5.6	6982	3.2	233875	6.7	8784	3.6	13904	7.6	289015	6.5
KaJa	2013	19864	12.8	8106	6.2	10742	4.9	238912	6.8	10678	4.4	13576	7.4	301878	6.8
KaJa	2012	18576	12.0	8279	6.3	12445	5.7	238484	6.8	10964	4.5	15419	8.4	304167	6.9
KaJa	2011	17407	11.2	8308	6.3	12835	5.8	233550	6.7	11053	4.5	14147	7.7	297300	6.7
KaJa	2010	16040	10.3	8191	6.2	12823	5.8	228778	6.5	10855	4.5	12776	7.0	289463	6.5
KaJa	2009	14309	9.2	8014	6.1	12491	5.7	216426	6.2	10475	4.3	12151	6.6	273866	6.2
KaJa	2008	12111	7.8	7783	5.9	12616	5.7	209084	6.0	10447	4.3	13287	7.3	265328	6.0
KaJa	2007	10059	6.5	7281	5.5	11457	5.2	200650	5.7	10341	4.2	9957	5.4	249745	5.6
KaJa	2006	7293	4.7	6814	5.2	10053	4.6	184595	5.3	10325	4.2	9465	5.2	228545	5.2
KaJa	2005	4837	3.1	6386	4.8	9537	4.3	171526	4.9	10649	4.4	8700	4.8	211635	4.8
KaJa	2004	3479	2.2	6396	4.9	9884	4.5	158671	4.5	10493	4.3	7727	4.2	196650	4.4
KaJa	2003	2697	1.7	5939	4.5	9590	4.4	149149	4.3	10242	4.2	6565	3.6	184182	4.2
KaJa	2002	2165	1.4	5654	4.3	9183	4.2	142004	4.1	9596	3.9	6045	3.3	174647	3.9
KaJa	2001	1818	1.2	5564	4.2	9212	4.2	134037	3.8	9246	3.8	5449	3.0	165326	3.7
KaJa	2000	1635	1.1	5213	4.0	8474	3.9	126334	3.6	9608	3.9	4699	2.6	155963	3.5
KaJa	1999	1459	0.9	4511	3.4	8132	3.7	113652	3.2	9041	3.7	3839	2.1	140634	3.2
KaJa	1998	1187	0.8	3983	3.0	6900	3.1	100505	2.9	8886	3.6	3445	1.9	124906	2.8
KaJa	1997	893	0.6	3599	2.7	5767	2.6	89252	2.5	8505	3.5	2986	1.6	111002	2.5
KaJa	1996	637	0.4	3327	2.5	5748	2.6	81390	2.3	7857	3.2	2551	1.4	101510	2.3
KaJa	1995	423	0.3	2938	2.2	5584	2.5	69315	2.0	7342	3.0	2146	1.2	87748	2.0
KaJa	1994	295	0.2	2392	1.8	5061	2.3	57041	1.6	6605	2.7	1963	1.1	73357	1.7
KaJa	1993	0	0.0	1857	1.4	4670	2.1	45516	1.3	5923	2.4	1641	0.9	59607	1.3
KaJa	1992	0	0.0	1263	1.0	4063	1.8	35865	1.0	5330	2.2	1434	0.8	47955	1.1
KaJa	1991	0	0.0	735	0.6	3339	1.5	23638	0.7	4803	2.0	1181	0.6	33696	0.8
KaJa	1990	0	0.0	1796	1.4	12225	5.6	18032	0.5	25884	10.6	5906	3.2	63843	1.4
Summe		155299	3.5	131684	3.0	219813	5.0	3500281	78.9	243932	5.5	182935	4.1	4433944	



Limousin data base

„No. of calvings“ – „No. of delivered single calvings“

Verteilung	Anzahl Kalbungen original (nkal/eingelesen) *										Anzahl Kalbungen NEU (nkaln/ausgezaehlt)								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	255349	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	273	176235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	60	1349	130441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	145	366	1194	106854	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	18	251	618	1086	91178	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	17	94	312	579	995	93970	0	0	0	0	0	0	0	0	0	0	0	0
7	0	9	55	134	320	506	892	61229	0	0	0	0	0	0	0	0	0	0	0
8	0	7	16	53	135	312	484	763	49789	0	0	0	0	0	0	0	0	0	0
9	0	5	12	23	62	150	289	399	529	38322	0	0	0	0	0	0	0	0	0
10	0	1	4	11	26	68	133	242	361	425	27338	0	0	0	0	0	0	0	0
11	0	4	5	12	13	33	66	114	212	252	324	17735	0	0	0	0	0	0	0
12	0	1	5	8	13	12	13	50	113	141	178	215	10763	0	0	0	0	0	0
13	0	0	1	2	1	8	12	21	56	69	97	129	99	5615	0	0	0	0	0
14	0	0	1	1	1	3	8	5	23	30	58	66	67	75	2533	0	0	0	0
15	0	0	0	1	1	1	3	5	7	15	16	39	36	38	40	930	0	0	0
16	0	1	2	1	2	0	2	2	6	11	20	23	26	22	13	7	279	0	0
17	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	50	0
18	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0

Comparison of „No. of calvings“ (field 14) with following information of calvings

→ Missing calvings: i.e. (7 out of 11), 1, 2, 3, 6, 7, 10, 11



Limousin data base – pedigree information

- 1.085.359 animals with performance (Y)
- 1.386.085 animals with pedigree information

Sex	Y	#	Mean # Prog.*	SD # Prog.*	Min # Prog.	Max # Prog.	# Countries
Female	No	152,128	1.61	1.03	1	30**	1 – 4
Female	Yes	1,083,359	0.68	1.11	0	28**	1 – 5
Male	No	63,977	14.40	121.9	1	19,383	1 – 6

*) Progeny with performance

***) Embryos!



Limousin: # bulls (by country) with progeny in # countries

# countries	CHE	DEU	DFS	FRA	GBR	IRL
1	2,388	3,292	5,649	40,075	6,972	3,082
2	51	161	41	1,450	187	108
3	7	17	5	262	27	25
4	-	3	-	86	5	5
5	-	-	3	41	-	6
6	-	-	-	24	1	3

→ most bulls have progeny in only one country

→ Connections via french bulls/sires



Limousin: # common bulls with progeny in # countries

	CHE	DEU	DFS	FRA	GBR	IRL
CHE	2,388	108	8	452	2	0
DEU		3,292	36	396	2	5
DFS			5,649	48	19	7
FRA				40,075	128	590
GBR					6,972	197
IRL						3,082

→ Only combinations between two countries are analysed

→ e.g. 396 bulls with progeny in DEU and FRA



Limousin: Pedigree information

country of animal	combination sire x dam			other
CHE	CHE*CHE 77%	FRA*CHE 10%	FRA*FRA 4%	9%
DEU	DEU*DEU 74%	FRA*DEU 13%	FRA*FRA 4%	9%
DNK	DNK*DNK 82%	FRA*DNK 14%	FRA*FRA 1%	3%
FIN	FIN*FIN 77%	DNK*FIN 9%	FRA*FIN 6%	8%
FRA	FRA*FRA 99,8%			0,2%
GBR	GBR*GBR 72%	FRA*GBR 19%	FRA*FRA 4%	5%
IRL	FRA*IRL 59%	IRL*IRL 32%	FRA*FRA 4%	5%
SWE	SWE*SWE 83%	DNK*SWE 7%	FRA*SWE 6%	4%

→ Connections between countries mostly via French sires



Conclusion & next steps in Germany

- First data preparation and analysis ✓
- Issues with delivered data (format, content) were solved directly with Interbull/Interbeef Center ✓
 - considered in the next data call

- Plausibility checks within breeds
 - Age at 1st calving Range: [549 days – 1678 days?]
 - Calving Intervall Range: [270 days – 1460 days?]
 - Number of Calvings [depending on trait definition]
- Preparing data for estimation of the variance components
 - Using different software?
 - PEST VCE
 - DMU
- Model development (for/with MIX99)
 - Univariate within traits between countries



Model development – effects in the models

■ Age at 1st Calving

- Herd x year
- Calving year
- ...

■ Calving Intervall

- Herd x year
- Calving year
- Permanent effect of cow
- ...

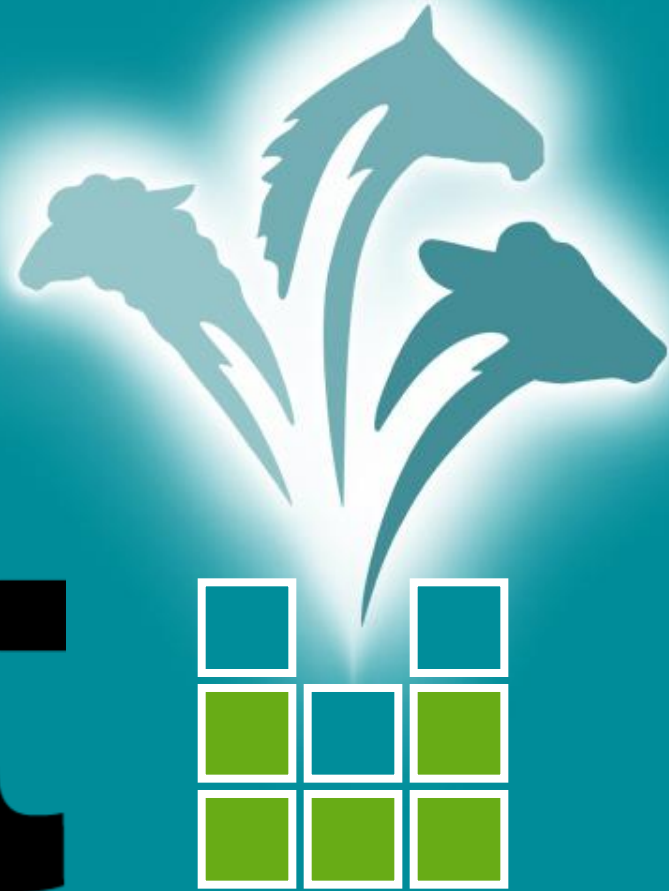
Bull !? (NS, AI)

■ Number of Calvings

- Number of calvings (censored/uncensored) → ~ Longevity (Survival Kit)
 - 1 – x calvings
- Number of calvings at a target age → Reproductive Efficiency (France)
 - 78 months: 6,5 years: opportunity of 4 calvings (1st at 3 years)
 - 150 months: 12,5 years: opportunity of 10 calvings



vit



IT-Solutions for Animal Production

Charolais database – number of calvings new counted and continuous

Verteilung	Anzahl Kalbungen NEU (nkaln/ausgezaehlt) *						Anzahl fortlaufende Kalbungen (icn innerhal nkaln)												
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	0	329	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	471643	19	30	82	228	469	781	1098	1078	898	459	179	84	20	5	0	0	0
2	0	463	327058	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	113	2538	234608	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2	269	903	2108	182606	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	38	510	1210	1801	147063	1	0	0	0	0	0	0	0	0	0	0	0	0
6	0	38	174	730	1221	1572	117536	0	0	0	0	0	0	0	0	0	0	0	0
7	0	28	99	333	771	1073	1368	90470	0	0	0	0	0	0	0	0	0	0	0
8	0	22	30	126	359	669	911	1038	63632	0	0	0	0	0	0	0	0	0	0
9	0	16	10	37	147	334	568	699	787	40720	0	0	0	0	0	0	0	0	0
10	0	7	7	10	13	9	23	31	23	125	23219	0	0	0	0	0	0	0	0
11	0	4	5	7	7	9	9	9	21	35	94	11821	0	0	0	0	0	0	0
12	0	3	4	3	5	5	2	5	11	19	8	52	5367	0	0	0	0	0	0
13	0	1	1	2	5	2	2	3	3	5	12	10	25	2024	0	0	0	0	0
14	0	1	1	0	3	1	1	3	2	2	2	6	3	15	703	0	0	0	0
15	0	1	0	0	2	0	1	0	1	0	2	2	1	1	3	201	0	0	0
16	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	1	52	0	0
17	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0
18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1

→ Comparison of the numbers of calvings new counted with the consecutive number of calving are not identical

→ Missing data (calvings)



Charolais data base – pedigree information

- 1.747.352 animals with performance (P)
- 2.311.043 animals with pedigree information

Sex	P	Variable	Obs.	Mean	Std.	Min	Max
Female	No	EL	243.284	0,00	0,00	0	0
		nNK	243.284	1,62	1,01	1	35
		# countries	243.284	1,00	0,06	1	3
Female	Yes	EL	1.747.346	1,00	0,00	1	1
		nNK	1.747.346	0,65	1,04	0	29*
		# countries	1.747.346	1,36	0,49	1	5
Male	No	EL	103.104	0,00	0,00	0	0
		nNK	103.104	14,14	134,7	1	10.719
		# countries	103.104	2,02	0,19	1	5

*) Embryos!



Limousin database – number of calvings new counted and continuous

Verteilung	Anzahl Kalbungen NEU (nkaln/ausgezaehlt) *	Anzahl fortlaufende Kalbungen (icn innerhal nkaln)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0	
0	0	426	10	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
1	0	254075	21	19	37	112	216	398	711	790	933	552	239	136	55	4	0	0	0	0	
2	0	751	175474	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	177	1775	129779	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	223	464	1619	106273	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	72	319	711	1463	90614	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	70	161	370	682	1378	93469	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	44	98	169	360	619	1260	60854	1	0	0	0	0	0	0	0	0	0	0	0	
8	0	30	41	77	173	353	570	1060	49545	0	0	0	0	0	0	0	0	0	0	0	
9	0	14	22	35	70	169	327	462	721	38195	0	0	0	0	0	0	0	0	0	0	
10	0	3	5	15	19	7	15	36	60	216	26941	0	0	0	0	0	0	0	0	0	
11	0	4	2	6	5	9	6	9	37	38	120	17559	0	0	0	0	0	0	0	0	
12	0	1	2	3	7	2	2	4	13	19	22	72	10691	0	0	0	0	0	0	0	
13	0	0	0	1	2	1	3	6	4	5	12	17	46	5587	0	0	0	0	0	0	
14	0	0	2	0	0	1	3	0	3	2	3	5	11	20	2516	0	0	0	0	0	
15	0	0	0	1	1	0	0	1	1	0	0	1	4	5	13	924	0	0	0	0	
16	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	9	275	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	5	50	0	0	
18	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	

→ Comparison of the numbers of calvings new counted with the consecutive number of calving are not identical

→ Missing data (calvings)

