

Multi-Breed Genetic Evaluation for Docility in Irish Suckler Beef Cattle

INTERBULL Meeting, Barcelona, August 2009

**Ross Evans, Thierry Pabiou, Francis Kearney ICBF,
Herman Mulder ID-Lelystad**





Importance of docility

- **In 2005 612 on farm accidents due to temperamental beef cattle**
(McNamara et al., 2007)
 - **27 deaths between 1996 and 2007 due to cattle livestock incidents** *(Irish Health and Safety Authority – code of practice, 2007)*
 - **Average of 2.25/ year. 85% of these were attacks by bulls, cows, and weanlings** *(HSA, 2007)*



Current within breed evaluation

- **ICBF Trained Linear Scorers**
- **Limousine only breed currently publishing figures and using in a breeding program**
 - Breed average of 100, sd. of 10
- **~ 122,397 animals with docility**
 - LM, CH, SI, HE, smaller numbers of other breeds including commercials
 - scale 1 to 10

Animal welfare recording and breeding scheme



- **Launched in January 2008 by Dept. of Agriculture**
- **~ 60,000 herds, voluntary sign-up, monetary payment**
- **Adhere to certain welfare measures, weaning measures**
- **Recording of sire, calving ease, disbudding, meal feeding, weaning, docility and calf quality**

recordsource	% of total
ICBF_papersheets	83%
online_DEPT_website	12%
online_farmsoftware	2%
online_www.ICBF.com	4%

Paper based recording



N.I.D. No: IE3010353

Form No: 100268875

Suckler Cow Quality and Welfare Scheme Notification Form

Date: 17-Feb-2009

B.T.E. No: S1080080

		Section A	Section B	Section C	Section D	Section E	Section F	Section G	
		Date of Disbudding*	Date of Castration**	Date of Commencement of Meal Feeding	Date of Weaning	Calf Docility (near time of weaning)	Calf Quality (near time of weaning)	Animal Weight (if available)	
		Disbudding must be completed within 3 weeks of birth unless buds have not developed	Castration must be completed at least 4 weeks before weaning or at least 2 weeks after weaning	Meal Feeding must begin at least 4 weeks before weaning	Weaning must be completed at least 2 weeks before weanling can be sold	1 = Very Quiet 2 = Quiet 3 = Average 4 = Difficult 5 = Very Difficult (Ensure a number is circled)	1 = Very Poor 2 = Below Average 3 = Average 4 = Very Good 5 = Exceptional (Ensure a number is circled)	Do not attempt to guess the weights. Only complete this section if the scales are being used	
Calf Ear Tag Number	Date of Birth	Day/ Month * (Disbudding)	Day/ Month ** (Castration)	Day/ Month (Meal Feeding)	Day/ Month (Weaning)			Day/ Month (Weighing)	Weight (KGs)
1-0024 (F)	01/09/2008	12/09	FEMALE	25/11	dd/mm	1 2 3 4 5	1 2 3 4 5	dd/mm	
2-0025 (M)	23/09/2008	30/09	N/A	25/11	dd/mm	1 2 3 4 5	1 2 3 4 5	dd/mm	
3-0026 (M)	23/09/2008	30/09	N/A	25/11	dd/mm	1 2 3 4 5	1 2 3 4 5	dd/mm	
4-0027 (F)	25/09/2008	04/10	FEMALE	25/11	dd/mm	1 2 3 4 5	1 2 3 4 5	dd/mm	
5-0028 (M)	28/09/2008	04/10	N/A	25/11	dd/mm	1 2 3 4 5	1 2 3 4 5	dd/mm	

ICBF on-line recording

ICBF - Web Application - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites RSS Mail Print ICS Help

Address http://www.icbf.com/taurus/suckler/farmer_qual_doc_record.php Go Links

ICBF Web Application

JOHN WALSH
Logged in at : 17-Feb-2009 15:20

HOME - HerdPlus CONTACT SUPPORT LOG OUT

Record Calf Docility and Quality

Please enter the relevant scores for each animal using the scales presented below.

Total: 13 animals

Calf Tag	DOB	Dam Tag	Calf Docility	Calf Quality
IE301035310024	01-Sep-2008	IE251255310217	2: Quiet	
IE301035320025	23-Sep-2008	IE361133140052	4: Difficult	
IE301035330026	23-Sep-2008	IE301054670191	3: Average	
IE301035340027	25-Sep-2008	IE311226350087	2: Quiet	
IE301035350028	28-Sep-2008	IE251320940364		
IE301035360029	06-Oct-2008	IE201064610013		
IE301035380030	01-Nov-2008	IE201150920348		
IE301035390031	01-Nov-2008	IE141609790568		
IE301035310032	08-Nov-2008	IE201157810112		
IE301035320033	17-Nov-2008	IE251118530150		
IE301035330034	25-Dec-2008	IE251071860556		
IE301035340035	06-Jan-2009	IE221107130336		

Step 1: Select Docility and Calf Quality Score

Step 2: Save Data

Save Data

Total: 13 animals

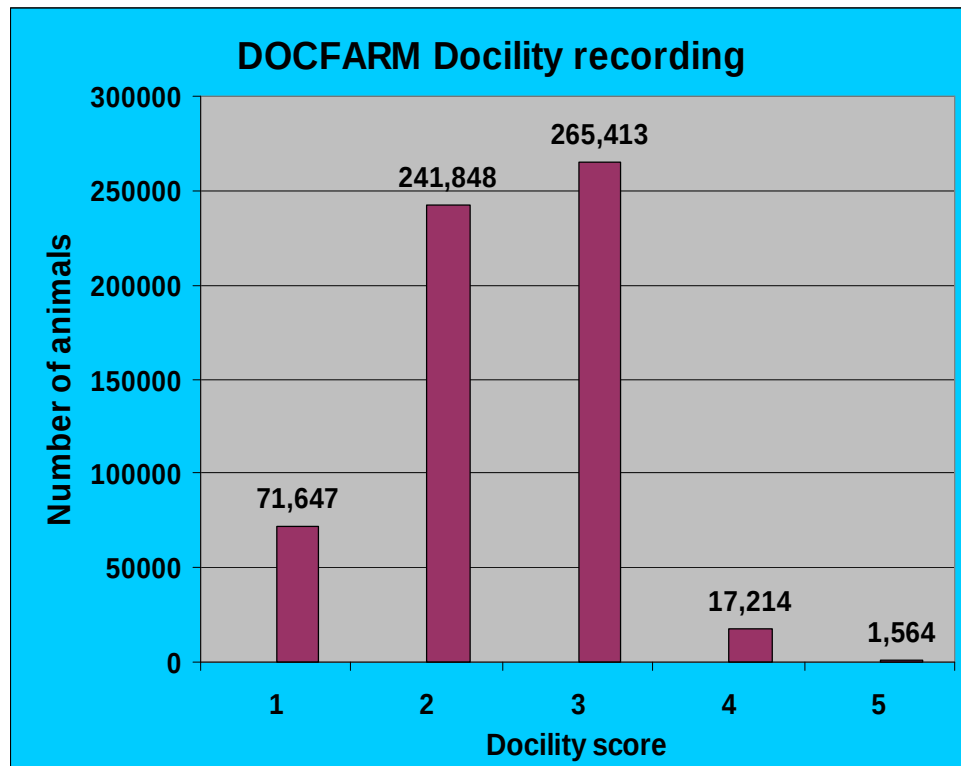
Top Of Page | Contact Support | Disclaimer

Done Internet

Two Forms of Docility

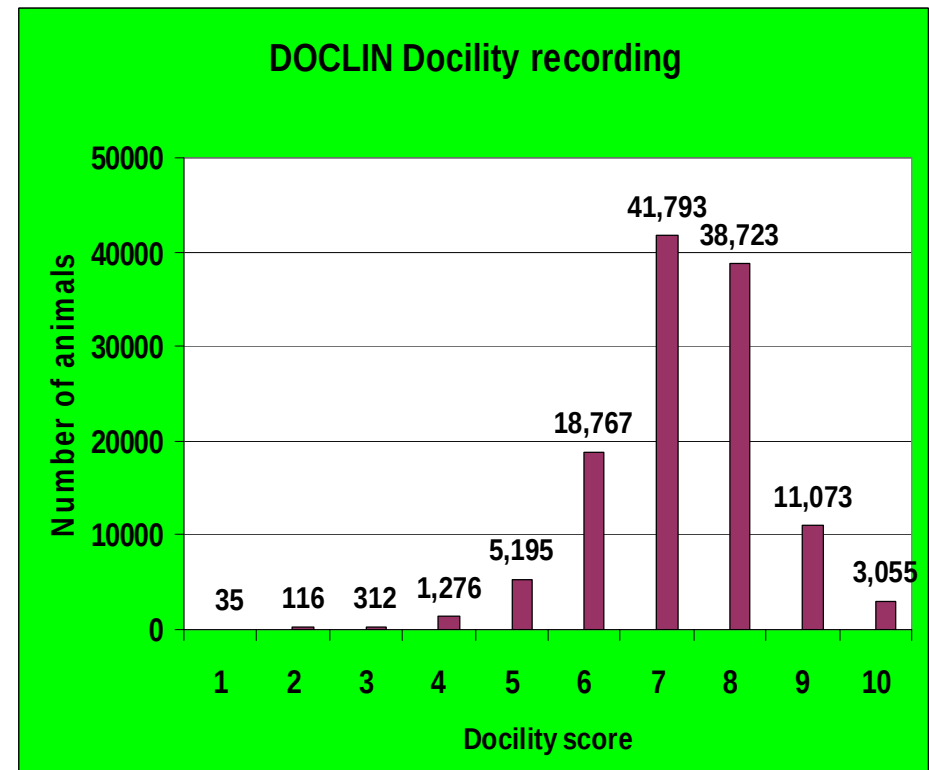
Farmer (DOCFARM)

n = 597,686



Technician (DOCLIN)

n = 122,397



Two Forms of Docility

Farmer (DOCFARM)

Breed	N-Obs	% com	% female
Angus	43,641	94	49
Aubrac	2,119	78	48
Blonde D'A	5,972	96	49
Belgian Blue	26,780	99	49
Charolais	246,811	97	49
Hereford	19,087	91	49
Limousine	190,973	97	49
Piemontese	920	89	48
Parthenaise	997	91	49
Saler	6,332	92	50
Shorthorn	7,011	89	52
Simmental	39,096	95	49

Technician (DOCLIN)

Breed	N-Obs	% com	% female
Angus	2,570	34	51
Aubrac	1,031	12	64
Blonde D'A	1,033	46	51
Belgian Blue	2,874	92	50
Charolais	28,903	21	51
Hereford	3,040	7	49
Limousine	69,287	10	51
Piemontese	322	15	52
Parthenaise	247	38	55
Saler	1,029	13	62
Shorthorn	356	49	71
Simmental	9,220	21	51

Genetic Parameter Estimation

- **Edits**
 - Animals recorded prior to sale **DOCFARM**
 - Animals scored between 150-300 days for both traits *DOCFARM (-59k), DOCLIN (-80k)*
 - Herds with variation in contemporary group (at least 3 scores) *DOCFARM (-170k), DOCLIN (1k)*
 - CGs with at least 3 different sires (*DOCFARM -225k*), 2+ different sires (*DOCLIN -5k*)
 - Only contemporary groups with >10 animals (*DOCFARM -7k*), >5 animals *DOCLIN (-10k)*
 - Remaining *DOCFARM = 73,827, DOCLIN =18,310*

Genetic Parameter Estimation

-DMU (Madsen & Jensen)

5 generation pedigree,

Animal model, no maternal effects

DOCFARM: CG of score date, sex, age, parity of dam, heterosis and recombination, meal feed

DOCLIN: CG of score date, sex, age, parity of dam, scorer, heterosis and recombination

Trait	N-Obs	N-Obs with both	-2LogL	h^2	r_g	r_p
DOCFARM	73,827			0.44		
DOCLIN (150-300 day)	18,310	1,238	24449	0.25	-0.68	-0.19
DOCLIN (150-600 day)	72,228	2,304	72468	0.24	-0.40	-0.16

Genetic Parameter Estimation

Fixed Effect	DOCFARM	DOCLIN
Age	Older more docile	Older more docile
Sex	Females slightly less docile	Females slightly less docile
Heterosis	Crossbreds less docile	Crossbreds less docile
Meal Feeding	More docile with longer days on meal	
Parity	Animals from 1st parity cows less docile	No significant difference

Genetic Parameter Estimation

Maternal Effects: tested on smaller dataset

Model	-2LogL	h^2_d (DOCLIN)	h^2_m (DOCLIN)	mat env (DOCLIN)	r_{gm} (DOCLIN)
Genetic effects only	32331	0.28			
Genetic & maternal envionment	32312	0.28		0.03	
Genetic & maternal genetic	32276	0.24	0.04		-0.47
Genetic & maternal genetic & maternal envionment	32255	0.28	0.03	0.03	-0.69

Results: similar to Beckman et al., (2007) on US Limousines

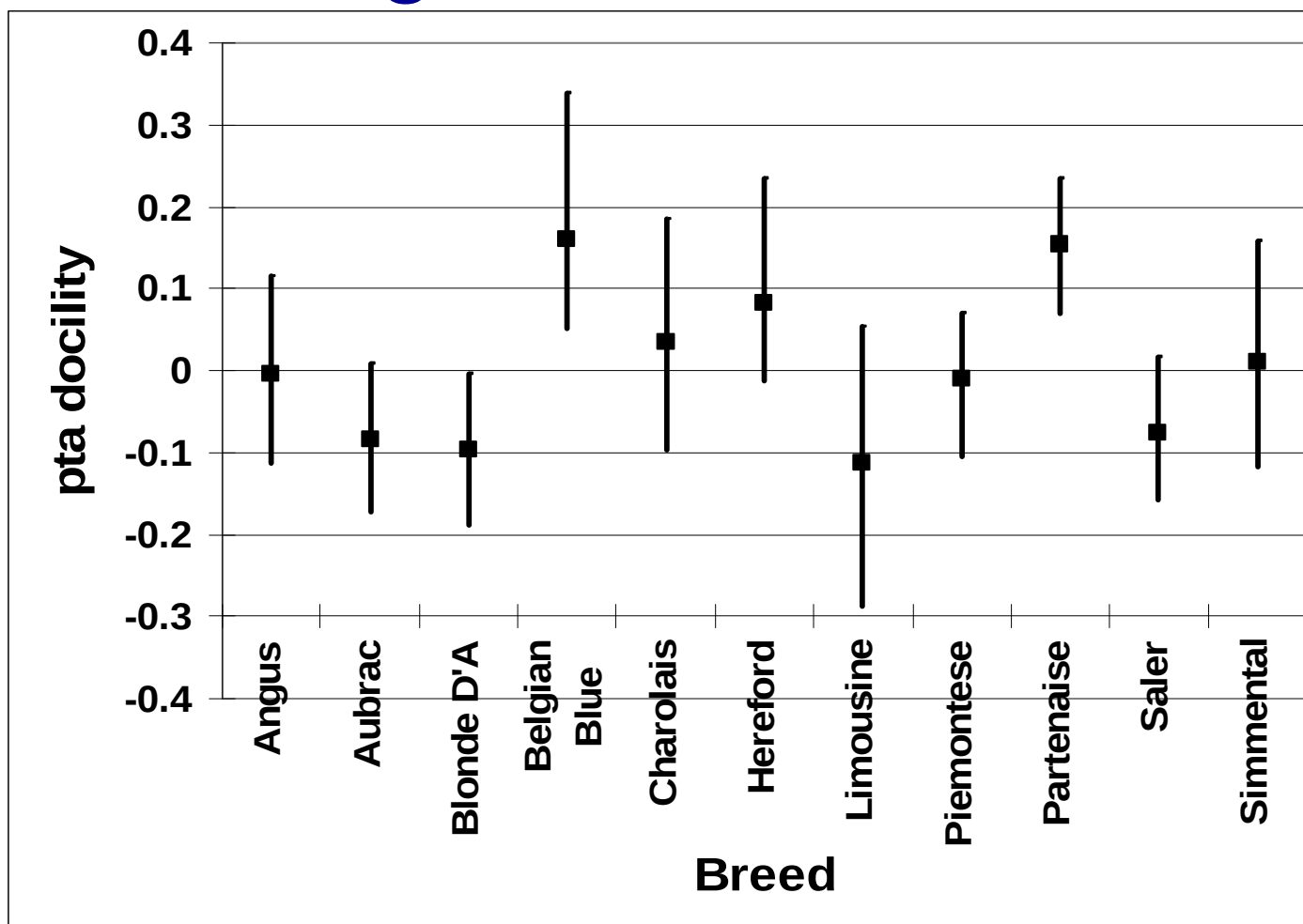
Follow up study conclusion: bias in herds due to selective recording, not all poor phenotypes recorded

Breeding Value Estimation

- **Performed in MIX99 software (Lidauer et al., 2006)**
- **Dataset**
 - **Relaxed restriction on contemporary groups with at least 3 different sires represented**
 - **% Crossbreds DOCFARM (96%) DOCLIN (39%)**

Trait	N-obs	Animals with both	Average score	S.D.
AWRBS	302,065	3,816	2.4	0.76
linear scores	23,721		7.3	1.14

Average PTA Breed effects

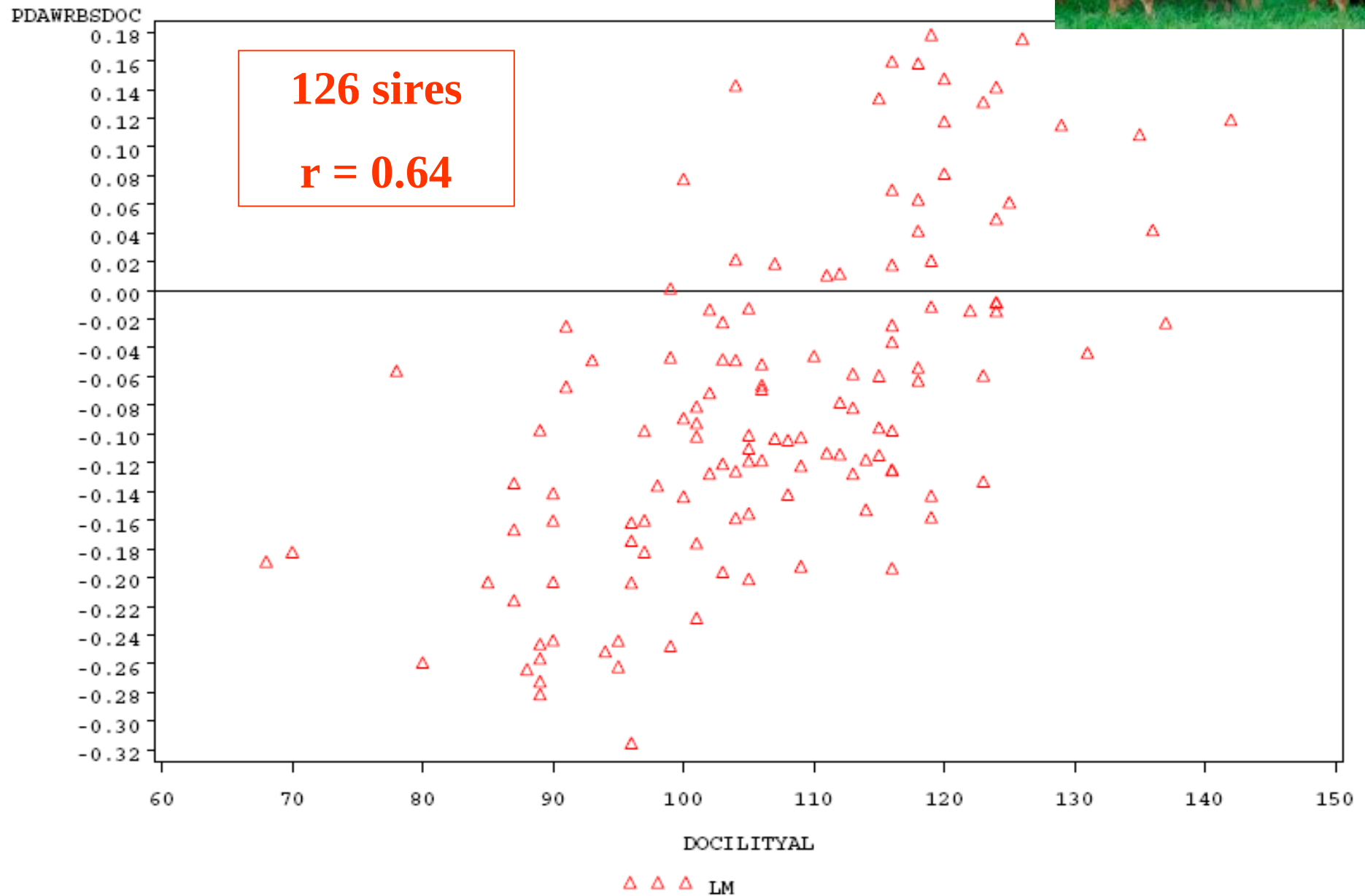


Belgian Blue highest average docility, Limousine lowest

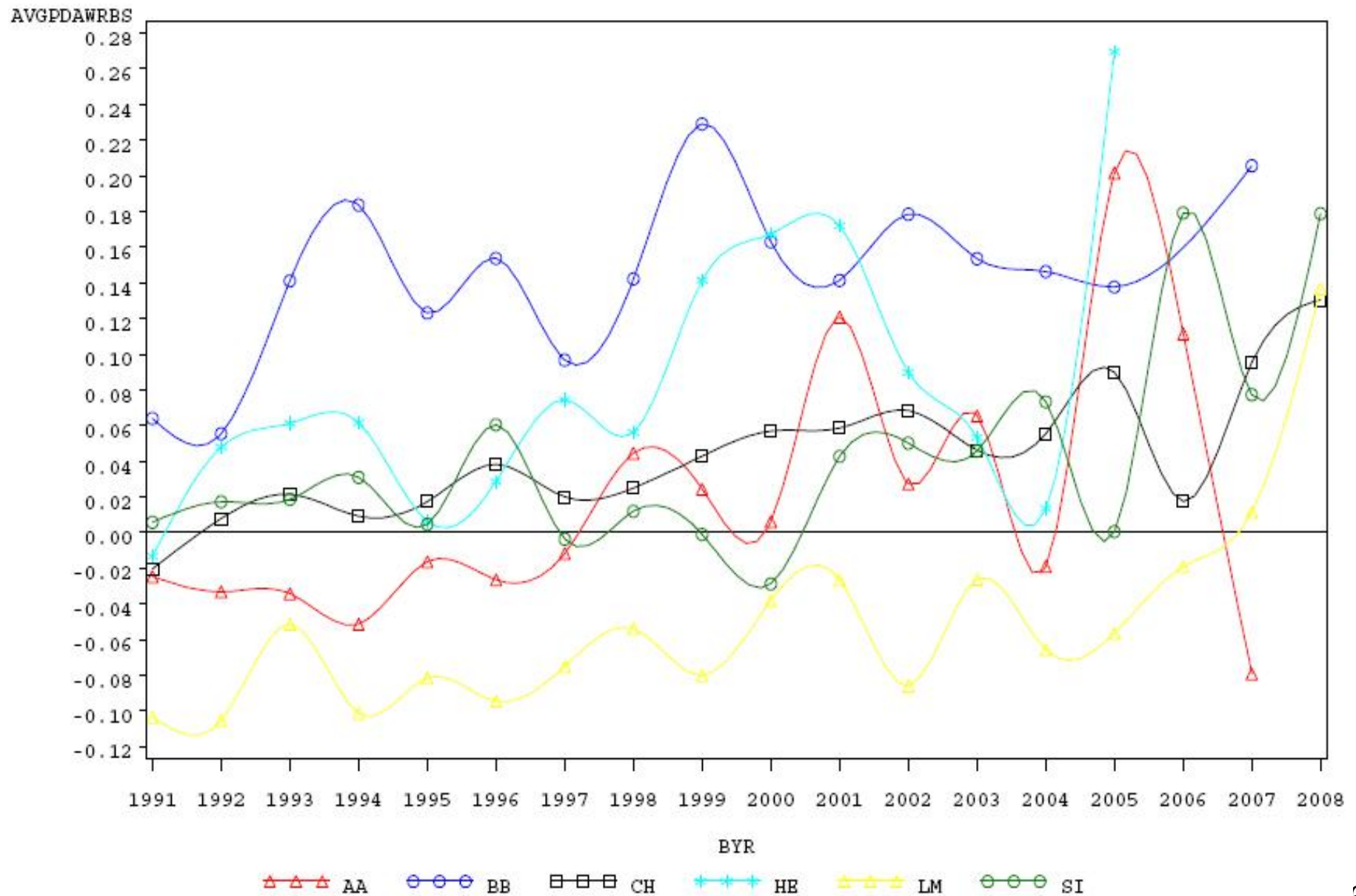
But 2 breed highest within breed deviation in PTA

Bottom 20% of sires across breeds : 8% increase in unfavourable scores

DOCFARM PTA v Current official Limousine



Alsires trends in docility by birth year





Further work

- **Across breed DOCFARM proofs released in Spring 2009 for Active AI sires**
- **2009 DOCFARM data available soon**
- **Investigate maternal environment effects further for both traits**
- **Release of proofs for natural service sires and cows**