



IRISH CATTLE BREEDING FEDERATION

Including Xbred records in Interbeef GE Interbeef WG - May2014



ICBF genetic team / InterBeef



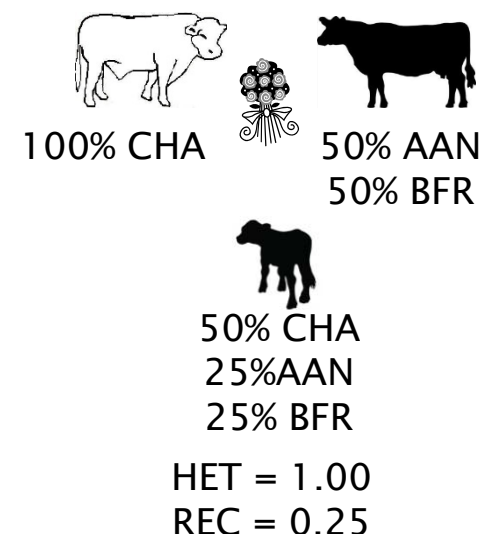
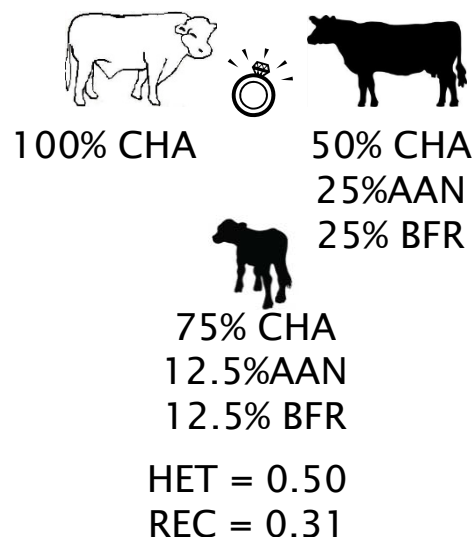
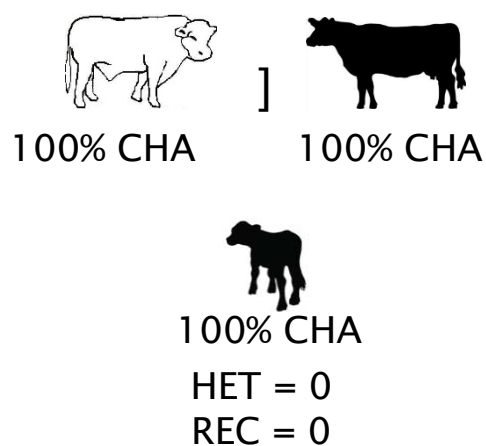
Background

- TC Prague : presentation first analysis of Xbred data in Interbeef context
 - Importance of Xbred records in IRL
 - Challenges in accounting for breed composition in GE
 - Using fake ancestors to re-build breed composition
- TC Uppsala: update on uploading pedigree to IDEAtest

Xbred specificities

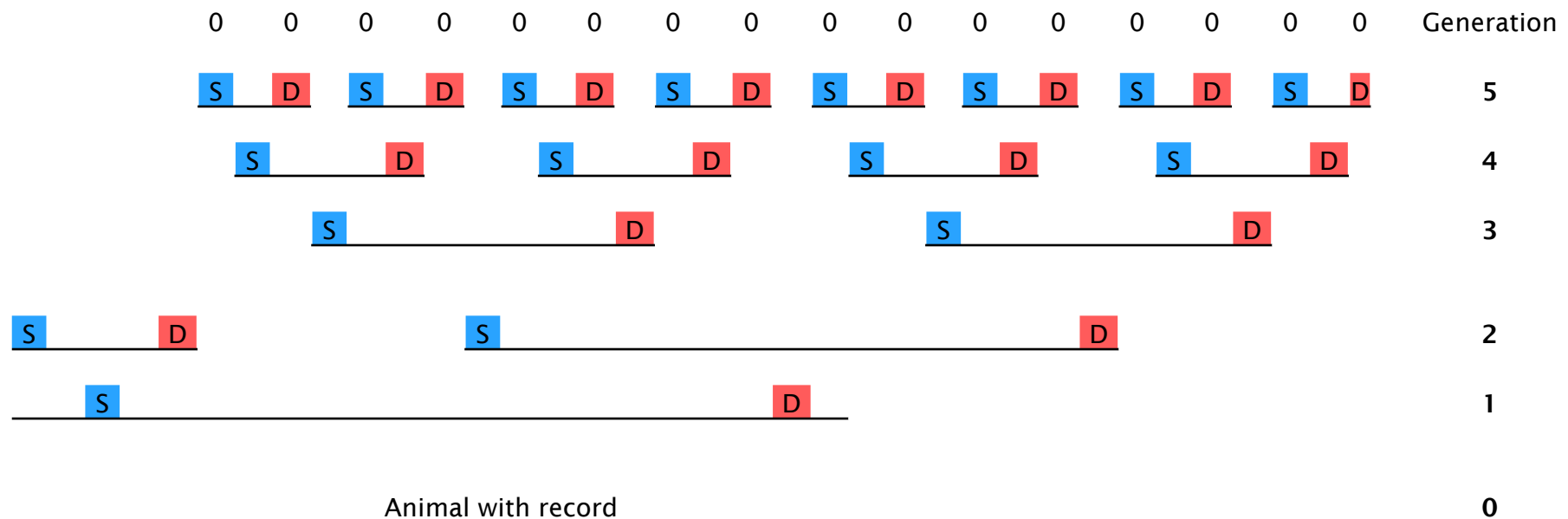
- Genetic evaluation

- Account for breed composition
- Account for non-transmissible effects : HET & REC
- Pre-process necessary



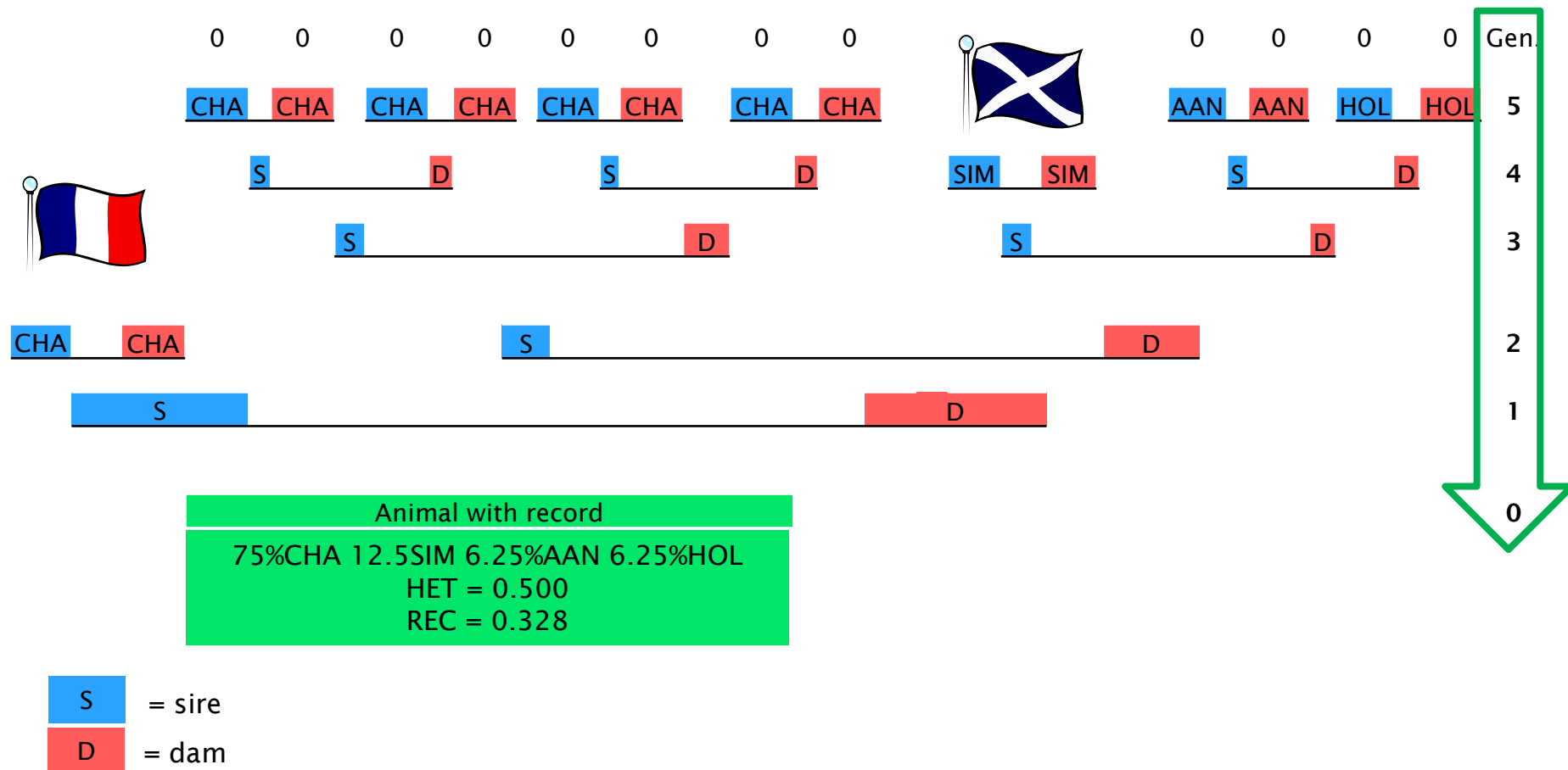
Deriving breed composition

- On a very small pedigree...



Deriving breed composition

- Best case scenario

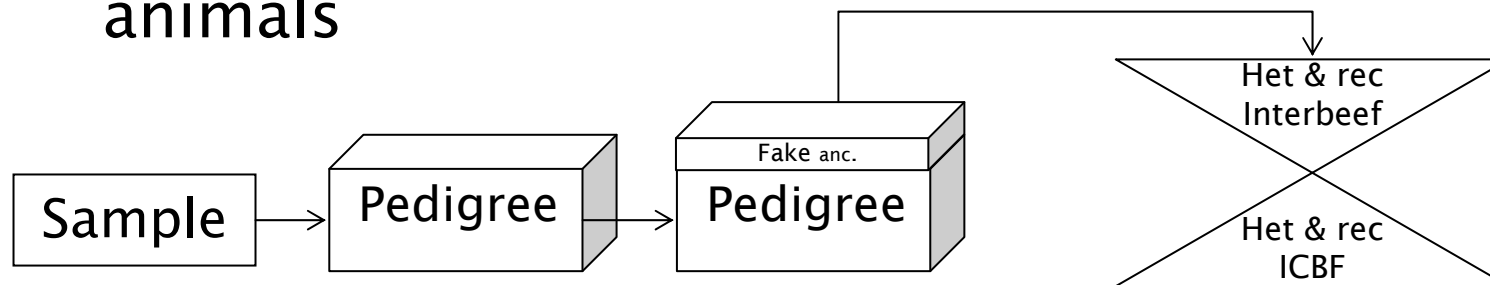


- Incomplete pedigree



Testing fake ancestry

- 691,000 animals with WWT record
 - Born after 2008
 - From CHA or LIM comp. (88% Xbred)
- 6 random samples taken
 - 5,000; 10,000; 15,000; 20,000, & 25,000 animals



Basic rules

- Fake ancestors are created for Xbred founders
- Fake tags = BBBCCCS**FAKE**edddddddd
- Fake tags are unique
- No fake tag = purebred animal

More rules

- Max .4 breeds/animals were considered
- Xbred animals candidate for fake ancestry were divided in 3 categories
 - Mostly purebred : 75%+ = 1 breed
 - Mostly half-bred : 50% to 75% = 1 breed
 - The rest (-50%)
- Rest of rules => See document

Results

5.1. Overall correlations

Table 3. Correlation for heterosis [$r_{(HET)}$] and recombination [$r_{(REC)}$] coefficients between ICBF and InterBeef calculations in animals with records [perf.] and animals in pedigree file [pedigree]

		sample1	sample2	sample3	sample4	sample5
Animals with	N	5,000	10,000	15,000	20,000	25,000
performance	$r_{(HET)}$	0.90	0.89	0.90	0.90	0.90
	$r_{(REC)}$	0.80	0.80	0.80	0.80	0.80

Table 5. Example illustrating the relative robustness of HET calculations compared to REC

		X	
ICBF database Correct breed composition	100%CHA	HET = 1 REC = 0.360	40%LIM 30%HER 10%SIM 10%HOL 10%BFR
InterBeef: 5 th breed was dropped and the most prevalent breeds were kept to build back-ancestry => HET not impacted => reduction of REC	100%CHA	HET = 1 REC = 0.250	50%LIM 50%HER

Results

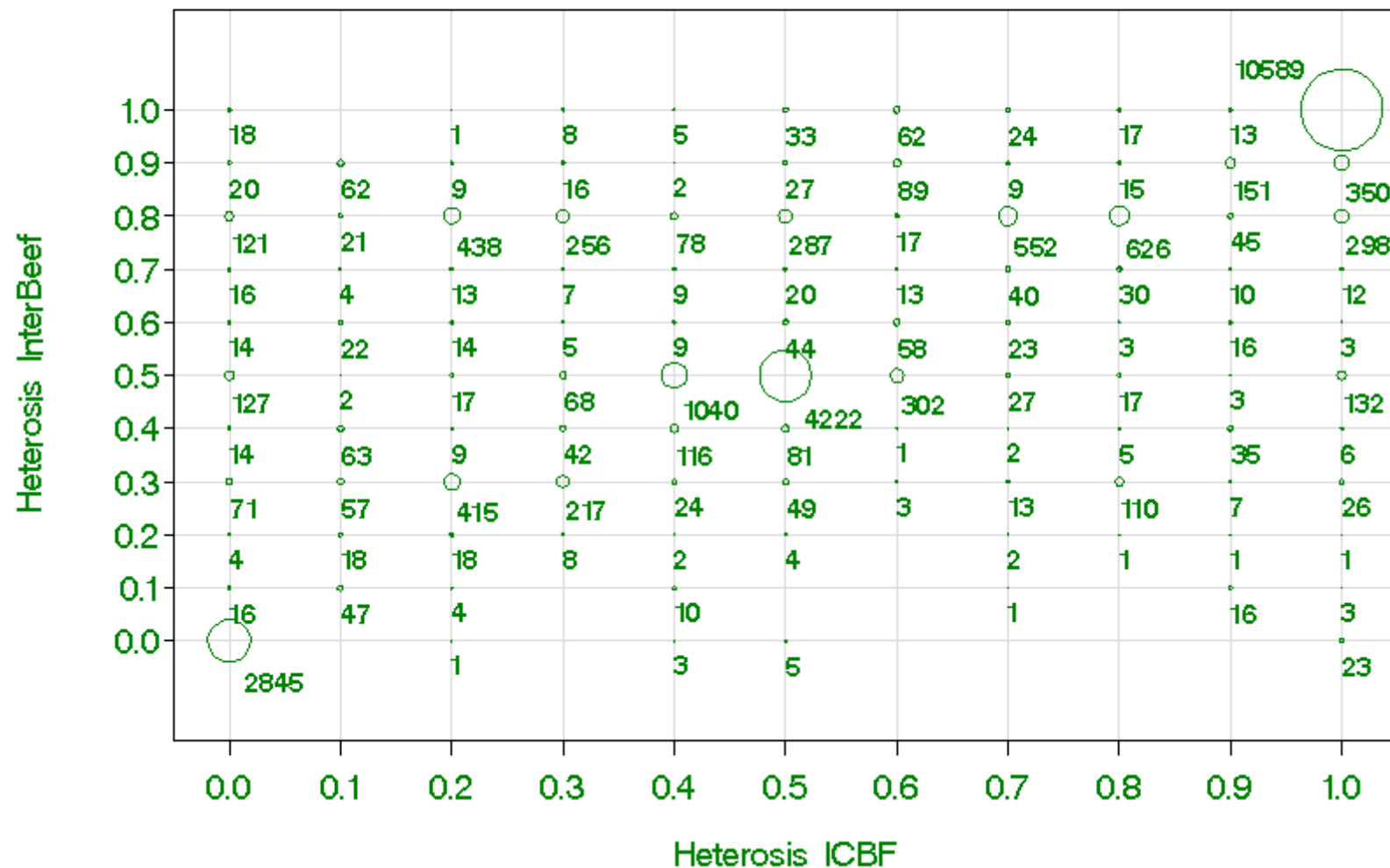
DISTRIBUTION OF HETEROSIS CALCULATED FROM INTERBEEF & ICBF PEDIGREE ANIMALS WITH PERF. — FULL PEDIGREE

N= 25000

Current average= 0.66

$r=0.9$

New average= 0.69



Results

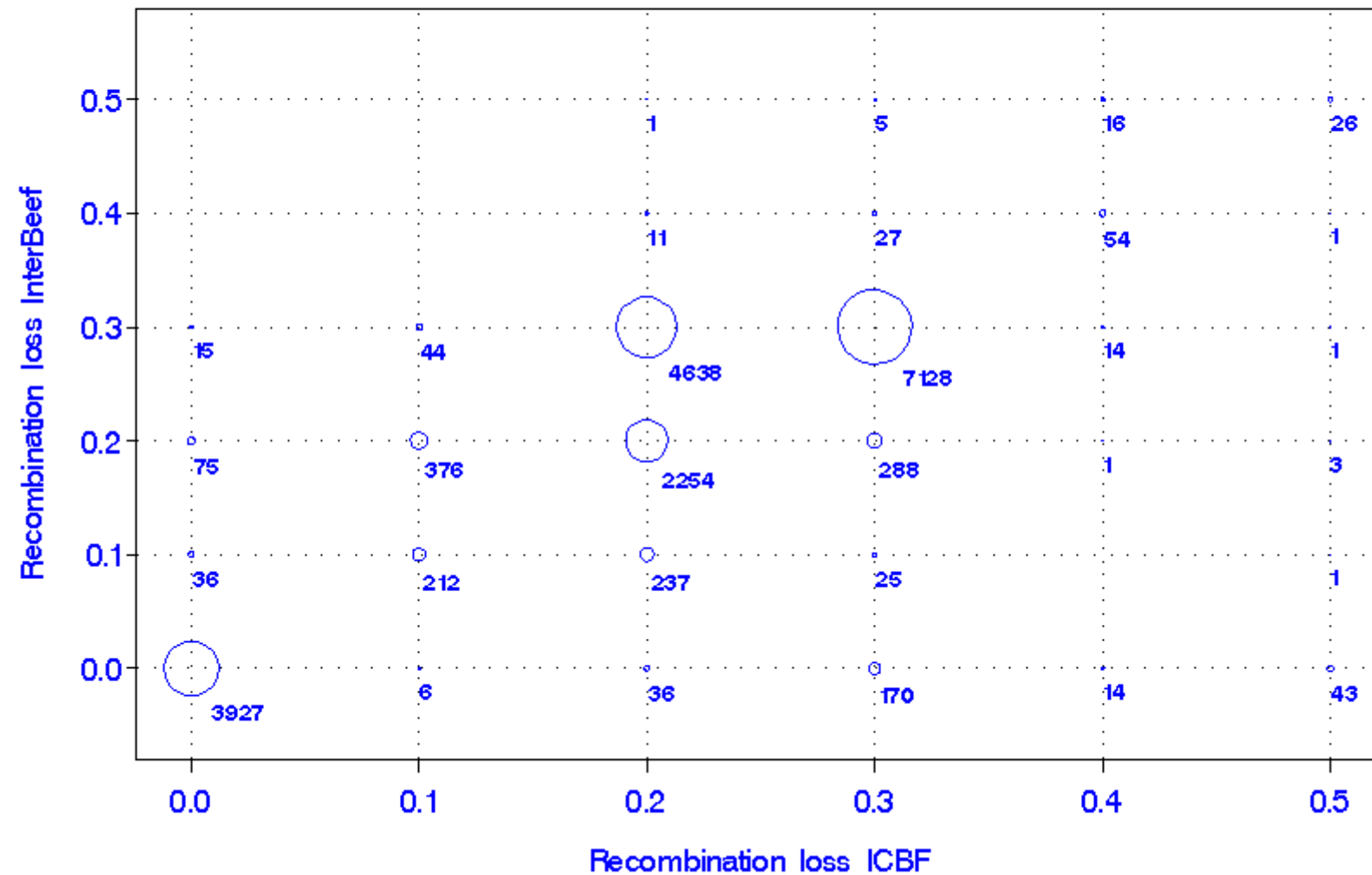
DISTRIBUTION OF REC. LOSS CALCULATED FROM INTERBEEF & ICBF PEDIGREE
ANIMALS WITH PERF. — FULL PEDIGREE

N=20000

Current average=0.21

$r=0.8$

New average=0.2



Pedigree upload

- + 300,000 LIM or CHA animals with records
- + 1,200,000 lines in pedigree
- Uploaded April 2014 in IDEAtest

Variance components

- Research to start Summer 2014

Conclusion

- 'FAKE' ancestors method applicable at Interbeef level in order to include Xbred data in GE
 - Applicable for any member country with Xbred data
 - Requires new steps at Interbeef level
 - breed composition calculation
 - HET & REC calculations
 - Changes in GE model
- Strong correlations between Interbeef & ICBF HET & REC coefficients
 - Some differences will remain due to construction hypothesis and/or national pedigree weirdness