IRISH CATTLE BREEDING FEDERATION

Playing with Xbred records in Interbeef

ICBF genetic team / InterBeef

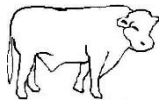
NDP
National Development Plan
Transforming Ireland

Background

- Interbeef evaluations
  - 2 breeds LIM CHA
  - Pure breed genetic evaluations
- Some countries may have data on commercial animals
  - IRL : 70% weaning weight records are commercial data

Xbred specificities

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

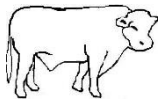

100% CHA


100% CHA


100% CHA

HET = 0

REC = 0


100% CHA


50% CHA
25%AAN
25% BFR


75% CHA
12.5%AAN
12.5% BFR

HET = 0.50

REC = 0.31

Integration of Xbred data

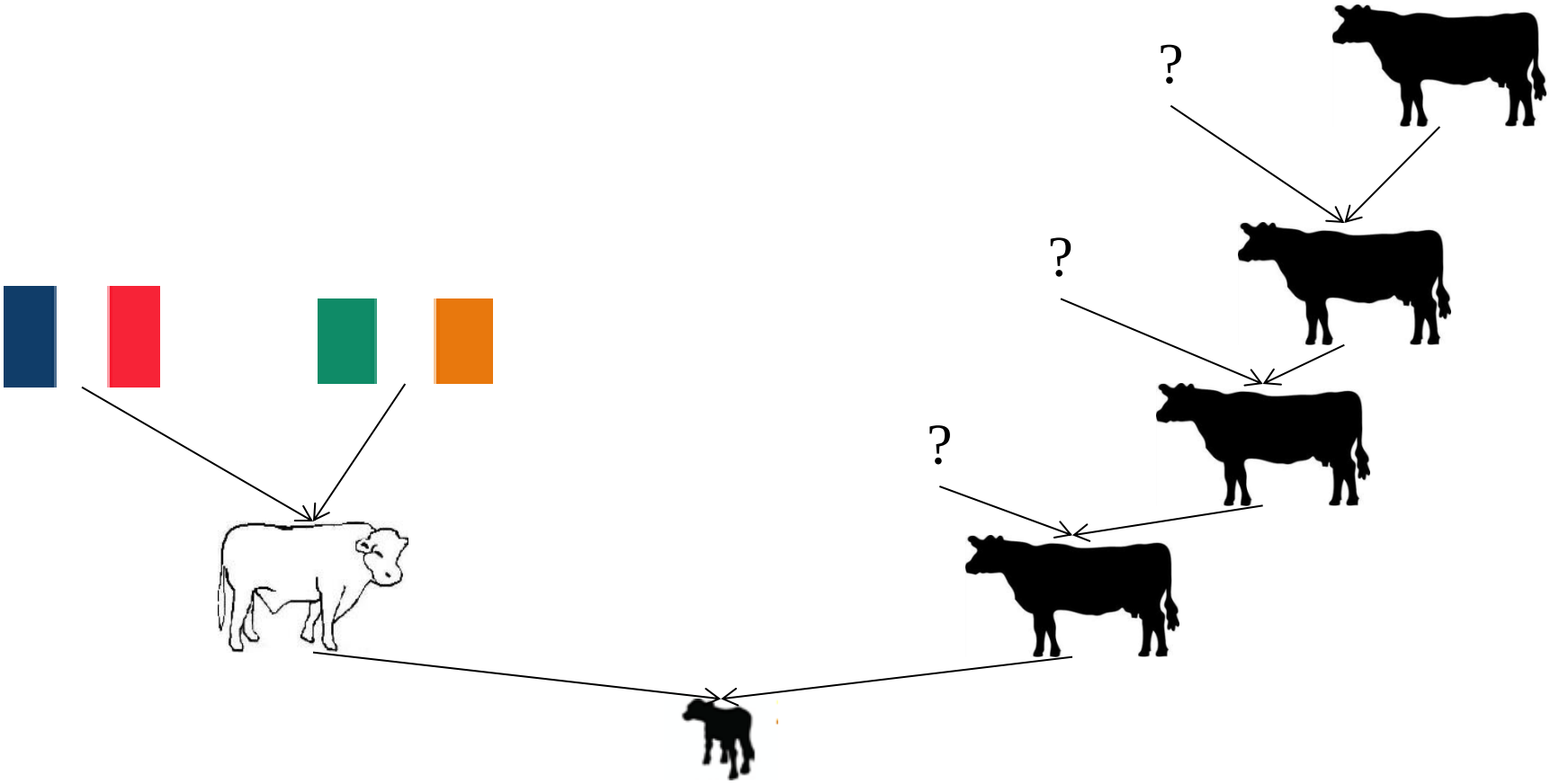
- Major steps
  1. Deriving breed composition info
  2. Re-estimation of parameters involving Ireland
  3. Adapting Interbeef model
     - Correcting for het. & rec.
     - Correcting for breed composition

Deriving breed composition

- At national level
  - herdbook data, calf reg. data
  - May find inconsistencies

- At Interbeef level
  - TC Prague (Nov.2013): Using Interbeef pedigree to build breed comp. of animals with records
    - Purebred founders 
    - Xbred 'founders' 

CHAIRLF36129513105



CHAIRLF361295131105

In ICBF database

HET = 0.48

REC = 0.25

ANIMAL MAINTENANCE

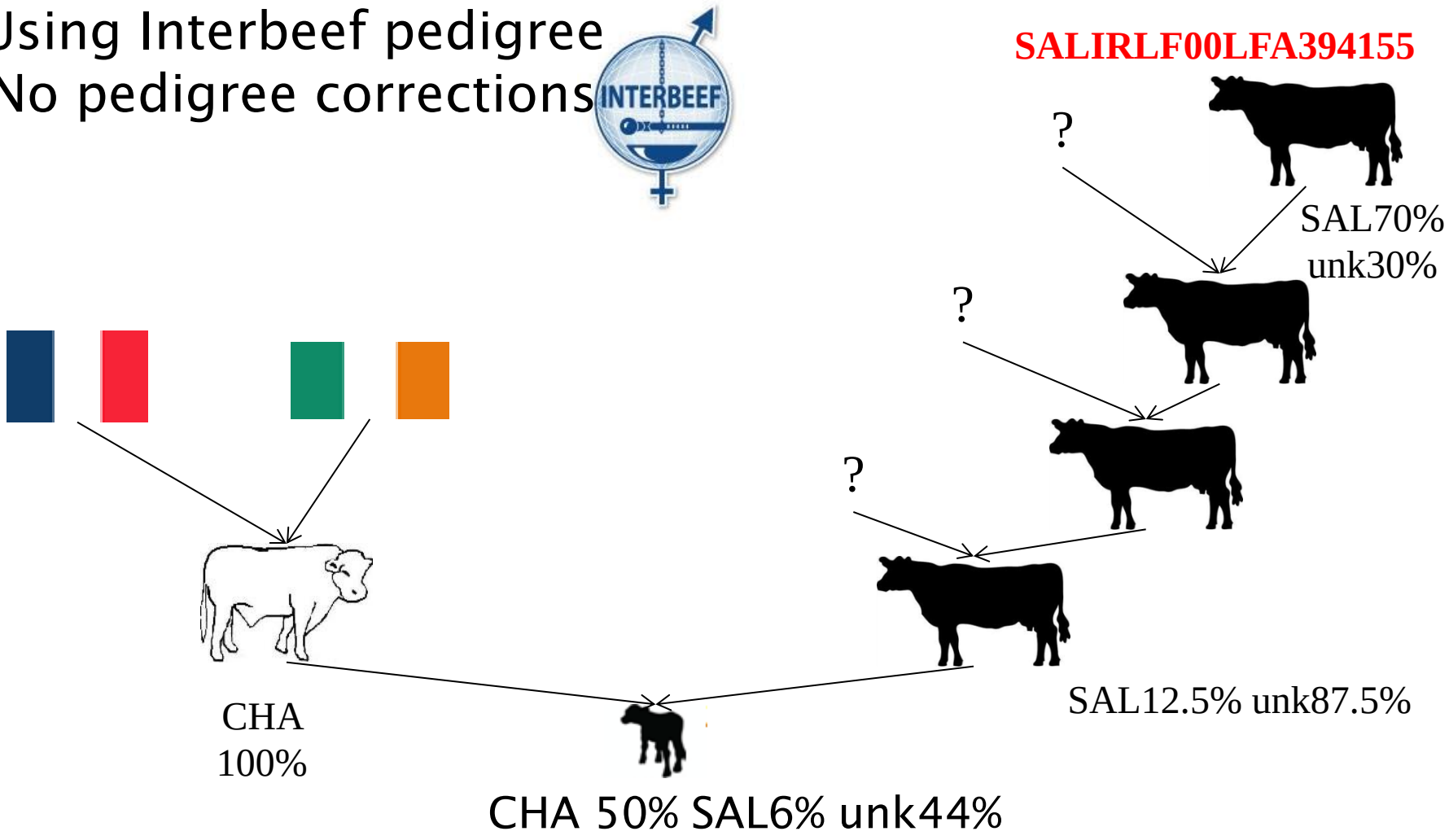
Edit Details

Animal Number	IE361295131105
Animal Name	
Breed	CH (71.88%), SA (21.88%), UN (6.25%)
Semen Catalogue	

Sire Number	IE141968630001	**Sire**	PMO	CH (100%) PED	**Sire**	8991100066 GRIMALDI	CH (100%) PED
Sire Name	TARABE VICTOR (ET)		POMPON		**Dam**	5894110539 JUNON	CH (100%) PED
Sire Breed	CH (100%) PED	**Dam**	IE141235470449 CARRIGFADDA SUE	CH (100%) PED	**Sire**	CF52 DOONALLY NEW	CH (100%) PED
					Dam	DFL460516 ROSEBANK ELSA	CH (100%) PED
Dam Number	IE361295120584	**Sire**			**Sire**		
Dam Name					**Dam**		
Dam Breed	CH (43.75%), SA (40.63%), UN (15.63%)				**Sire**		
Surrogate		**Dam**	IE182191470114	SA (78.13%), UN (21.88%)	**Dam**	IEXGNK0010W	SA (68.75%), UN (31.25%)

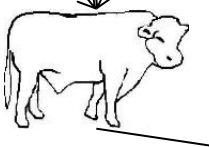
CHAIRLF36129513105

Using Interbeef pedigree
No pedigree corrections



CHAIRLF36129513105

Using Interbeef pedigree
With pedigree corrections using calf reg. information
=> creation of pseudo ancestry

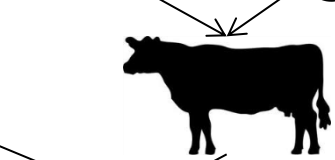


CHA 100%

CHA 75% SAL23% unk2%

CHA 100%

SAL100%



SAL70%
unk30%

SAL100%

CHA 50% SAL47% unk3%

SAL100%

SAL100%

SAL100% unk100%

CHAIRLF361295131105

	ICBF	Interbeef no corrections	Interbeef + corrections
Breed composition of CHAIRLF361295131105	72% CHA 22% SAL 6% unk	50% CHA 6% SAL 44% unk	75% CHA 23% SAL 2% unk
Heterosis	0.48	0.12	0.47
Recombination loss	0.25	0.00	0.23

- Pseudo ancestors are created for Xbred founders
- Pseudo tags = BBBCCCSFAKEddddddddd
- Pseudo tags are unique
- No pseudo tag = purebred animal

Overall 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 performance	N	5,000	10,000	15,000	20,000	25,000
	$r_{(HET)}$	0.90	0.89	0.90	0.90	0.90
	$r_{(REC)}$	0.80	0.80	0.80	0.80	0.80
Pedigree	N full	72,645	117,730	156,176	189,706	224,888
	N fake	18,064	32,538	46,235	58,304	71,702
	N real	54,581	85,192	109,941	131,402	153,186
	$r_{(HET)}$	0.92	0.92	0.92	0.92	0.93
	$r_{(REC)}$	0.80	0.82	0.82	0.84	0.84

Conclusion

- Deriving breed composition from founders works
  - Require creation of pseudo ancestors
  - Good correlation between Interbeef & ICBF coefficients
- Some differences between Interbeef and national databases will remain
  - Due to construction hypothesis
- Method applicable at Interbeef level in order to include Xbred data in GE
  - Requires new steps at Interbeef level

Work near completion

- Genetic parameters for data including Xbred
  - IRL Xbred data uploaded to IDEAtest
    - Including pseudo-ancestry for Xbred founders
    - 300,000 IRL animals with records
  - Genetic parameters (IRL-other)
    - Correcting for HET & REC
    - Using phantom groups of breeds
    - ~finish for LIM & CHA

In the pipeline

- Test run for EBV including IRL Xbred
  - Calculate breed composition at Interbeef level
  - Adapting Interbeef model for IRL
  - Spring 2015




Thank you