

IRISH CATTLE BREEDING FEDERATION

Love Meat Tender



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Background



Species Breeding: Be

234 - Phenotypic and Genetic An Presenting Author: Francis K

Conclusions

- Meat eating quality as assessed by trained scorers exhibits additive genetic variation
- No significant differences between breeds based on current small dataset
- Potential useful relationships with traits collected routinely e.g. temperament and pH at factory post slaughter
- No indication yet of major genes at play
- Need to collect larger volumes of data and run validation studies with consumers to confirm results

O Irish Cattle Breeding Federation Soc Ltd 2013

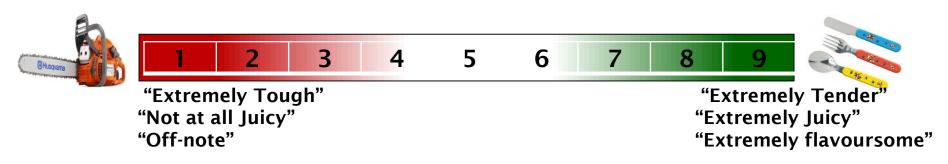




Background

Meat Tasting Phenotypes

3 phenotypes: **Tenderness**, **Juiciness**, & **Flavour** - Scored 1 to 9



Meat Tasting Protocol

Longissimus thoracis muscle from right side of each carcass 2.5cm steaks which were thawed at 4°C at 24 hours before analysis Grilled to a 'medium' cooking finish, allowed to rest for two minutes



- · Eolas International, Co. Cork
- · 7-10 trained panellists
- · http://www.eolasinternational.com



What's new?

- Meat Eating Quality (MEQ) phenotypes collected
 - Tully test station
 - WCGALP 2014 ~ 500 animals
 - ICAR 2016 ~1.500 animals

What's been investigated?

- New Variance Components
- Estimation of EBVs and Reliabilities
- Breeds and Bulls
- EBV Validation



New Variance Components

 Across-breed model using repeated records (date of tasting & scorer)

	Irel	International	
	2014	2016	
Tenderness	0.27	0.24	0.22
Juiciness	0.07	0.09	0.17
Flavour	0.16	0.13	0.10

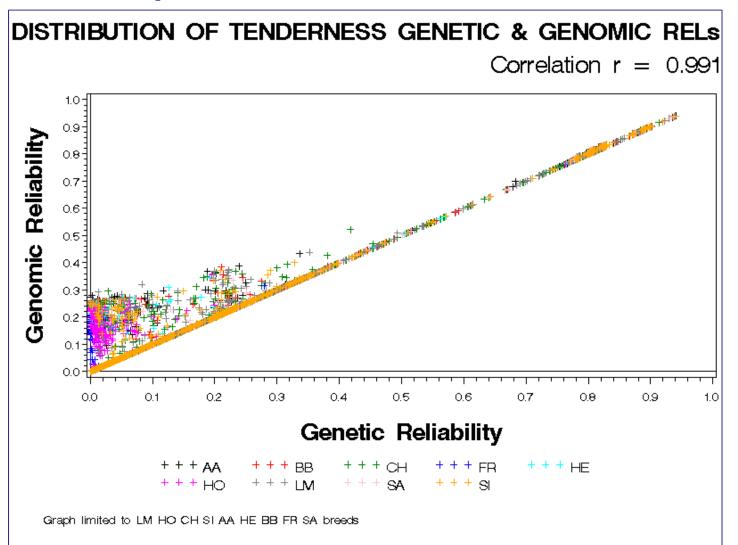


Data for EBV estimation

- MEQ data
 - 1,513 animals finished in Tully test station
 - Slaughtered from 09/2013 to present
- Across-breed model
 - Correcting for breed composition (AA, BB, FR, HE, HO, LM, SA & SI)
- 2 types of evaluations / EBVs
 - Genetic evaluation using pedigree relationship matrix
 - 1-step genomic evaluation
 - · 2,770 animals genotyped (1,244 with phenotypes)
 - MiX99 (Luke, Finland)



Genetic / Genomic Evaluations





Breeds and Bulls

TENDERNESS EBV BY A.I. SIRES BREED

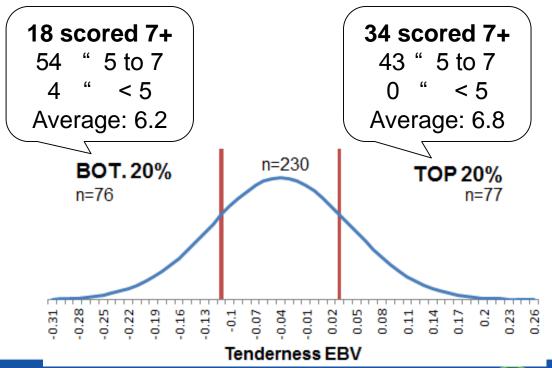
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Belg	ian Blue	BBLBELM	10004557	716400	KUBITUS	DE BRAY			2009
Char	olais	CHAFRAN	M008130	562111	ULRICH				2003
Here	eford	HERGBRI	M700495	200634	DENDOR	1 KOHING	OOR PP		2012
Limo	usine	LIMFRAN	10036150	030964	ROCKY				2000
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Simr	nental	SIMAUTI	л000276	570944	ENFIELD I	HURRICA	NE HUGO		1988
	-0 .6 -L	HE	ВВ	AA	LM	СН	SA	SI	
	Graph limite	d to 1040 A.I. sire				011		0.	



Lab Validation

- Validation on 383 animals (142 steers + 241 bulls) slaughtered on consecutive dates
- Evaluations ran on 1,513 validation animals



Validatio	on for Tende	rness
	Genetic Ge	enomic
Accuracy	0.31	0.31
Bias	1.02	1.24
Accuracy Bias: b(ŷ,	r: r(ŷ,y) / h y)	



Consumer Validation

Breeding better beef

The ICBF puts eating-quality index to the test

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"For that to happen, there will have to be a monetary pain for the farmer in it. Whether that happens will obviously depend on how the index develops—we have upon-unimals extends of a rand the plan in for a socal of 5,400 to be treated

Who, it was be purhed and workerst, rainedly. There's a bit to go yet, but it's extremely aronaising so fax," he con-

Rable 2: ICSF consumer facting scoolon, Teague: Change SECF 2016, 5 July 2016

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Pair	High eating quality steak			Law eating quality steak			"1441"	
	Breed	Tag No.	686	Breed	Tag No.	684	High EBV	Lone ESV
1	90	176	3.3	0.0	408	10.3	5	2
	44	79	3.6	CH	967	-0.0		- 1
3	01	305	2.6	- 01	943	-9.6	5.	2
+	LM	100	2.8	LM	465	14.0	7	0
6	LM	190	7.6	LM	414	-0.9	+	
	LM	537	2.2	LM.	954	-5.6		- 1
7	SA	152	1.7	SA	191	1.6	7	0
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9	90	301	2.6	0.0	412	0.0	- 3	4
10	- 01	966	3.0	-01	536	13.0	5	. 3
ti	44	193	7.2	CH	684	42.5		+
12	LM	366	2.4	LM.	947	1.0	5.	- 3
10	LM	317	2.2	LM	242	10.5	6	2
14	56	947	-0.8	56	644	467		1
			2.4			-2.5	75	26

*Key points

- The ICBF has developed a genetic index for beef eating-quality.
- Data from 1,200 bulls fed at Tully progeny-testing centre used to develop index.
- ⇒ Tested on 101 consumers at BEEF 2016. Given two steak samples, one from a high- and one from a lowindex animal.
- Asked to identify high eating-quality index beef.
- ⊃75% correctly identified the highindex eating quality beef.



Conclusion

- Encouraging results!
 - Data collection is growing
 - Major topic for the industry: Pilot EBVs are well looked at
 - Validation work starting to back EBVs up
- More to do!
 - Focus on more routinely available predictors (pH, shear force, imagery...)
 - Explore major genes roles (CAPN1, CAST, MYO)



Full Steam Ahead

- Meat Technologie Center (est. Oct 2016)
 - Industry and Industry Ireland funded initiative
 - All aspects of meat: grading, safety, consumer...
 - Work packages on genetic and genomic for MEQ
- Need for international sharing
 - data, standards... through ICAR/Interbeef
- Explore full potential of MEQ traits
 - In time, include MEQ traits as part of indexes in Ireland
 - Using genotypes, provide MEQ predictions to industry



Love Meat Tender

Love meat blue!













Thanks for your attention.

