

#### **IRISH CATTLE BREEDING FEDERATION**

## International Beef Breeding; Challenges and Opportunities.



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## Overview of Talk.

- Beef Production; Challenges & Opportunities.
- International Beef Breeding;
  Challenges & Opportunities.
  - "Large scale" genotyping projects.
  - International collaboration => ICAR-Interbeef.
- · Questions & Answers.



#### Challenge; Green House Gas Emissions.





Challenge; If you are farming, milk cows!

## Fig. 2: Average Family Farm Income 2015-2016



## Challenge – Meat Free Diets.

Search Results

# The case against meat Why turning vegan could save the world

Turning your back on tucking into other creatures is not simply the morally correct choice, it could also go a long way to saving the world says Suzanne Harrington

Irish Examiner 10 May 2017 +1 more

Vegan is the new vegetarian. There are three big fat reasons – environmental, medical and ethical. So overwhelming are the arguments in its favour, people are ditching animal products for no figures available for here, anecdotally it's spreading faster than avocado on sourdough.

From Moodley Manor's Badass Bacon in Dublin to Dee's Wholefoods vegan sausages and tract record numbers, and menus are beginning to offer vegan options as standard. What used to be the preserve of Brooklyn and Berlin has gone mainstream, and what used to be considered al-

SIGN UP! IT'S ONLY FOR ONE WEEK SPREAD THE WORD THROUGH SOCIAL MEDIA, WORK AND FRIENDS FUNDRAISE AND RAISE MONEY FOR A GREAT CAUSE

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### **Opportunity**; **Global consumption.**

#### Beef & veal consumption changes, 2017-22f



Very few anticipated declines





## Opportunity; We need beef cows.



- Suckler cows & beef cattle are a key part of rural infrastructure, especially in Ireland
  - Small fragmented farms, marginal land, balancing eco-systems
- There are still 1 million beef cows in NZ!



#### **Opportunity**; **Balanced Eco-systems**.



- Sir Albert Howard, 1940. Botanist and Organic Farming Pioneer.
- "Never does Nature separate the animal and vegetable worlds. This is a mistake she cannot endure, and of all the errors which modern agriculture has committed this abandonment of mixed husbandry has been the most fatal."



#### **Opportunity; Sean Connolly's Steakhouse!**





## Very Happy Customers!!



## Beef Breeding; Challenges & Opportunities.

#### · Challenges;

- Multi-breeds, including cross-breeds.
- Low AI usage (linkages + impact on genetic gain).
- Small herd size.
- Poor data recording especially for maternal traits.
- Separating direct and maternal effects.
- · Opportunities.
  - Genomics => Large scale Genomic programs.
  - International collaboration => ICAR-Interbeef.



### 1. Opportunity; Genomics Programs.





#### Genetic parameters in Australian Beef Cattle (de Haas et al., JAM 2016)

Trait	$\sigma^2 a$	σ²p	MeP	RPM	RGM	DMI	WT
MeP	49.7	166.9	0.30	0.65	0.55	0.83	0.80
			(0.06)	(0.11)	(0.14)	(0.05)	(0.06)
RPM	12.9	84.7	0.71	0.19	0.98	0.04	-0.01
			(0.02)	(0.05)	(0.02)	(0.17)	(0.17)
RGM	11.8	96.7	0.62	0.94	0.15	0.00	0.00
			(0.02)	(0.00)	(0.05)	(0.18)	(0.18)
DMI	0.1	0.2	0.70	0.00	-0.10	0.39	0.98
			(0.02)	(0.04)	(0.03)	(0.06)	(0.01)
WT	415.4	1010.6	0.67	0.00	0.03	0.93	0.41
			(0.02)	(0.04)	(0.03)	(0.01)	(0.06)

\* Heritabilities on diagonal, genetic correlations above diagonal, phenotypic correlations below diagonal

• Smaller cows => eat less feed => produce less methane.



Animal Breeding & Genomics Centre

## The Irish Beef Data and Genomics Program (BDGP).

- Focused on breeding more profitable, sustainable and carbon efficient cows.
- Funded from EU Rural Development Program.
  Co-funded by Irish government (DAFM).
- ~€300m total funding 6 years (2015-2020)
  - Farmers paid ~€90/cow/year to complete key actions re: the scheme. 25k farms & 650k cows. Current cost of genomic service is €22/animal.
  - Other countries now looking at similar approaches (Scot, Fra, AUS, NZ.....).



## Validation; Are high genetic merit females more profitable & GHG efficient?

		Rep	%	Age 1st	Cow Milk	Calf wean	Cow Lwt	Calf/cow
Stars	Animals	Index	Culled	calv	Score	weight kg	kg	ratio kg
5 star	9 <i>,</i> 383	€117	5.7%	803.9	3.93	291.3	561.5	0.52
4 star	4,155	€82	7.0%	797.2	3.8	291.5	557.5	0.52
3 star	2,649	€65	7.2%	800.1	3.74	285.2	582.1	0.49
2 star	1,545	€49	8.9%	824.4	3.73	282.9	591.1	0.48
1 star	878	€23	10.0%	902.4	3.67	304.7	698.1	0.44
Total	18,610	€92	6.7%	808.2	3.85	290.5	573.5	0.51

- Based on 18,610 1<sup>st</sup> calving females that entered herds between 1<sup>st</sup> Jul 16 and 30 Jun 17. Selected based on initial genomic evaluation (Aug 2016). How have they performed subsequently?
- Early days, initial validation analysis. Using genomics => €100 more profit/cow and 18% more efficient.



## Genetic Trends in Beef Profit.





## 2. Opportunities; International Collaboration =>Interbeef



- International genetic evaluation of beef cattle.
- Based on using countries pedigree and <u>phenotype</u> data => International EBV's (*Phocas, 2005*).

- Countries own models, variances & correlations.

- Currently includes 10 countries, 3 breeds (LM, CH & SI) & 4 sets of traits (Wean wt, Calving, Female fertility & Carcass).
- Research capacity provided by members.
- Database & routine services provided by the Interbull Centre.
- WG chaired by Andrew Cromie (IRE) and TC chaired by Eric Venot (FRA).



## Status of Interbeef Evaluations.

	Jan 2016	Jan 2017	Jan 2018*
Number of countries	10	10	10
Number of breeds	2	3	3
Number of cou- brd-trt combinations	18	24	50
Number of animals in the pedigree database (both dairy and beef)	25,389,096	28,256,603	29,338,894
Number of submitted national records	7,472,166	7,977,376	37,012,251
Number of estimated international EBVs	57,996,544	61,142,008	203,625,798
Number of publishable international EBVs	1,108,658	1,344,841	4,403,605

## Interbeef Priorities for 2018+



- 1. New routine evaluations for female fertility.
  - Move current research work in female fertility evaluations (being undertaken by DEU) from research environment to routine evaluations.
- 2. Complete work on use of cross-bred data in Interbeef evaluations.
- 3. Data call and genetic parameter estimation for carcass traits for existing breeds (CH, LM and BSM).
- 4. Data call and genetic parameter estimation for new breeds (Angus and Hereford).
  - Involvement of ABRI-Breedplan as a new member is key. Data (a lot!) + new research partner.

## Interbeef Priorities for 2018+



- 5. Build system for routine parameter estimation as new countries/breeds start to participate within Interbeef.
- 6. Develop procedures to facilitate the optimal integration of Interbeef EBV's within National evaluations.
- 7. Pilot project to share information on genotypes through IDEA and potentially genotypes through GenoEx (v2).
- 8. Undertake a review of ICAR guidelines re: beef performance recording.
- 9. Continue to expand Interbeef service to new members. As services expand, review fee structure (upwards) to more accurately reflect total breeding cows, breeds & traits within participating countries.

## Summary.

- We need to increase the profitability and sustainability (GHG efficiency) of beef production systems in the future.
  - This includes the quality of beef => consumers.
- Genomics/genetics will have a major role to play in addressing these challenges.
- Opportunities around "large scale" projects + greater international collaboration (ICAR-Interbull) are key => confidence in genetic gain.
- We especially welcome potential new members/countries to our ICAR-Interbeef group.



#### Yesterdays Working Group Meeting.

