

Genetic parameters for cattle prices collected at livestock marts

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Motivation

- ◆ Sale of surplus animals sole source of revenue for beef
 - ◆ Beef sales also contribute to dairy revenue
 - ◆ Details on genetic variation for animal live-weight and price are lacking
 - ◆ Should animal price and live-weight be included in the national breeding programme
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- A stylized silhouette of a mountain range in shades of teal, located in the bottom right corner of the slide.

Materials & methods

- ◆ ~3 million mart records
- ◆ 71 livestock marts

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 - ◆ 71 livestock marts
 - ◆ 875,000 on farm weights
 - ◆ Beef animals 150 to 600 days
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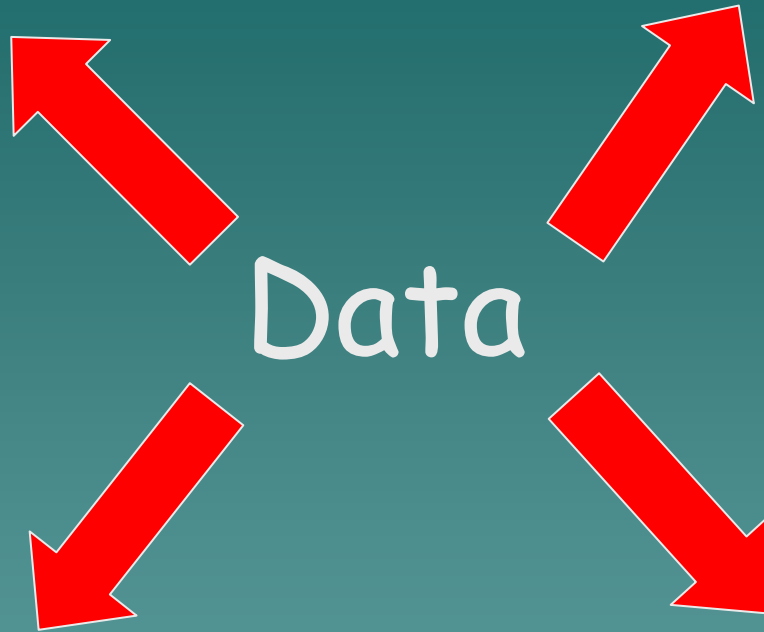
Calves

Weanlings

Data

Post-weanlings

Cows



General edits

- ◆ Years

- 2000 to 2008

- ◆ Pedigree

- Sire, MGS

- ◆ Single lots

- ◆ One record per animal retained

Maturity Groups

	Calves	Weanlings	Post-weanlings	Cows
Animal Type	Dairy	Beef	Beef & Dairy	Beef & Dairy
Age	2- 84 d	6-12 m	12-36m	calving or >30 m
Age group	2-24 d	6-9 m	12-24 m	2-6 yr
	25-48 d	9-12 m	24-36 m	7-10 yr
	49-84 d	-	-	-
Final Num	40,571	44,117	53,531	17,504

Mixed model - fixed effects

- ◆ Contemporary groups
- ◆ Breeds
- ◆ Heterosis
- ◆ Recombination loss
- ◆ Single/ twin
- ◆ Calving ease

All
maturity
groups

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- ◆ Dam parity
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Calves, weanlings
and post-weanlings

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◆ Dam parity

◆ Gender

◆ Age relative to median calving age

◆ Cow lactation number

◆ Fate post-sale

◆ Stage of lactation

All
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Mixed model - random effects

- ◆ Animal
 - ◆ Maternal genetic
 - ◆ Maternal permanent environment
- Covariance
- 

Results



Calves

- ◆ Direct heritability 0.34 (s.e.= 0.03)
- ◆ $CV_g = 16.3\%$
- ◆ Maternal component not different from zero

Weanlings

- ◆ Heritability

- Price 0.31 (s.e.= 0.05)

- Weight

- ◆ Direct 0.26 (s.e.= 0.03)

- ◆ Maternal heritability 0.07 (s.e.= 0.01)

- ◆ Maternal repeatability 0.12 (s.e.= 0.01)

- ◆ Correlations

- Price and weight 0.75 (s.e.= 0.04)

Post-weanlings

- ◆ Heritability
 - Price 0.19 (s.e.= 0.04)
 - Weight 0.25 (s.e.= 0.04)
- ◆ Maternal component not different from zero
- ◆ Correlations
 - Price and weight 0.55 (s.e.= 0.06)

Cows

- ◆ Heritability
 - Price 0.07 (s.e.= 0.03)
 - Weight 0.25 (s.e.= 0.05)
- ◆ Maternal component not different from zero
- ◆ Correlations
 - Price and weight 0.69 (s.e.= 0.08)

Correlations across price

	Calf Price	Weanling Price	Post-weanling price	Cow price
Calf Price	1	N/A	0.43	0.04
Weanling Price	0.52 (0.07)	1	0.58	0.23
Post-weanling price	0.72 (0.04)	0.67 (0.03)	1	0.82
Cow price	0.34 (0.12)	0.83 (0.48)	0.67 (0.10)	1

Correlations across weight

	Weanling Weight	Post-weanling weight	Cow weight
Weanling Weight	1	0.43	0.36
Post-weanling weight	0.79 (0.03)	1	0.61
Cow weight	0.16 (0.05)	0.75 (0.05)	1

Results

- ◆ High h^2 estimates compared to other subjective measures → live-weight and price determines profitability
- ◆ For calves, weanlings and post-weanlings consistently higher h^2 for females → genetics of replacements important
- ◆ Lower h^2 for cows → farmers less interested in genetics of cow and management plays important role

Conclusions

- ◆ Ample genetic variation in live-weight and price in all maturity groups
- ◆ Routinely collected data allows for estimation of breeding values
- ◆ Potential goal traits in Irish breeding objectives
- ◆ Application: implemented into the genetic evaluations in 2010

Acknowledgments

- ◆ BSAS for travel bursary