Impact of cattle health conditions on age at slaughter

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Introduction

- Abattoir post-mortem lesions are a potential source of information to farmers on their livestock health status.
- This data has been collected in Ireland as part of a national cattle programme, Beef HealthCheck, since 2016 to date.
- Selected information on the herds of origin are also collected as part of the programme.

Aims of the study

- Hypothesis that post-mortem changes, as a proxy for specific health conditions, increase the age to slaughter
- Examine three health outcomes – liver fluke, liver abscesses and pneumonia
- Examine differences between animal carcase types – heifers, steers and young bulls

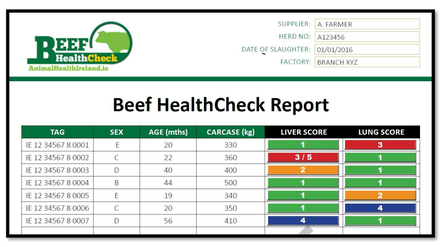
Methods

Beef HealthCheck
Animal Health Ireland.ie

Data collection

National programme collecting cattle slaughter data at 17 abattoirs from 2016-2020

Reports health outcomes to farmers and results added to online database



Minimum records per animal type model

- Heifers 821,055
- Steers 1,159,713
- Young bulls 364,486

Linear mixed models: for subsets of heifers, steers and young bulls

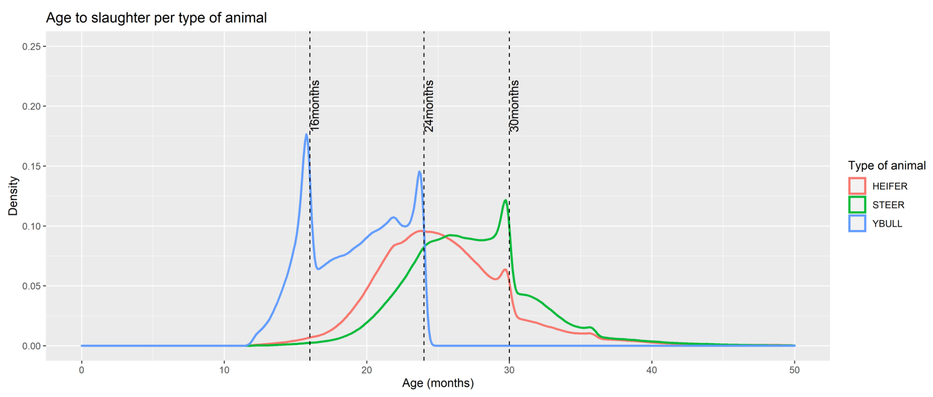
Outcome: Age at slaughter
Variables of interest: liver fluke, liver abscess, pneumonia present at slaughter
Random effects: herd ID

Additional variables: centered carcase weight, province of slaughter farm, year of slaughter, quarter (proxy for season), moved from birth farm, fat score, herd production type
Interaction terms: selected on plausibility

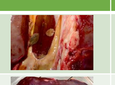
Variable selection criteria based on biological knowledge

Results

Density plot: days to slaughter



Study prevalence

	Heifers	Steers	Young bulls
Liver fluke 	11.4%	11.7%	11.0%
Liver abscess 	3.3%	4.2%	3.3%
Pneumonia 	1.4%	1.6%	2.5%

Linear mixed model summary (days to slaughter)

	Heifers Coeff. (sd)	Steers Coeff. (sd)	Young bulls Coeff. (sd)
Liver fluke 	33.6 (1.5)*	33.8 (1.2)*	-0.6 (1.1)
Liver abscess 	7.6 (0.8)*	7.3 (0.6)*	5.9 (0.6)*
Pneumonia 	12.5 (1.4)*	11.5 (1.0)*	2.5 (0.8) #

* p<0.001, #p<0.01

Comments

- Abattoir incentive deadlines for young bulls at 16 and 24 months, and steers/heifers at 30 months of age.
- Young bulls more likely to graze for one season, steers/heifers graze for two seasons (higher chronic liver fluke risk)
- Young bulls more likely to be intensively finished.
- Model coefficients interpreted as: additional days to slaughter compared to animals without slaughter lesions.

Limitations

- There is interplay between carcase weight and days to slaughter, however this study assumes a farmer sends cattle to slaughter when they reach a suitable slaughter weight
- Reporting and misclassification bias possible
- Liver fluke category includes both live parasites and chronic damage

Conclusions and next steps

- Post-mortem lesions are associated with increased days to slaughter
- Effect is lessened in young bulls (chronic sequelae are possibly time limited due to younger slaughter age)
- Implications for sustainability – increased costs and GHG emissions for additional days on farm
- Liver fluke and pneumonia can be further divided into severity categories, refining the outcomes

This work has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494 (DECIDE). This poster only reflects the author's view and the Research Executive Agency is not responsible for any use that may be made of the information it contains.