



Introduction

Calculating the herd biomass of cattle in Ireland and the related economic value can provide an important denominator for economic evaluations. Utility of the biomass and economic value estimates:

- Develop profitability assessments
- Estimate the animal health losses
- Analyse trends in biomass and value over time
- Inform considerations of the environmental emissions from cattle

The aim of the study was to quantify and characterise herd biomass within the sector, including the total stock valuations by herd type each month

Data Sources

Three Department of Agriculture, Food and the Marine Ireland data sources were used for this study

- DS1: Animal Health Computer System (AHCS)
- DS2: Live Cattle Pricing (LCP) database
- DS3: Animal Identification and Movement (AIM) database

The data from DS1 were the bTB reactor slaughter data collected as part of the 'On Farm Market Valuation Scheme' of the bovine TB eradication programme. The livestock market data were obtained from DS2, and the movement data were acquired from DS3.

Methodology

bTB Reactor Data (DS1)

2011-2021

- AGE
- SEX
- BREED
- LIVEWEIGHT
- PRICE

Animal-level
71,393 records

1

Linear Models (DS1)

2

Animal-level
30,757 records

Two linear models (liveweight and price data) were created using 2015-2019 animal records from bTB reactor data, which included:

- age
- breed type
- liveweight
- price

and adjusted for month and year

Herd population structure (DS3)

The models were run via the animal movement data (DS3) for 2019, and each animal was given a biomass and price figure

The data were then aggregated to herd level

The herd types were classified using the Brock et al. (2021) herd classification tree model

Animal-level: 82,671,108 records
Herd-level: 1,249,325 records

3

Validation (DS2)

4

bTB reactor animal

- Age: 0-6 months
- Sex: Female
- Breed: Friesian
- Live weight: 150 kg
- Price: €402

Market Data Price: €400-€450

A total of 108,643 herds were included in the final dataset

Table 1. Number of herds and median herd size by herd type in the 2019 births and movement data (DS3)

Herd Type	Number of Herds (N%)	Median Herd Size (Range)
Beef	52,367 (48.2)	31 (1-1542)
Dairy	12,443 (11.5)	149 (1-2051)
Fattening	17,343 (16.0)	32 (1-2492)
Mixed	5,146 (4.7)	119 (2-1271)
Stores	17,028 (15.7)	17 (1-794)
Traders	687 (0.6)	26 (1-1135)
Seasonal	3,629 (3.3)	6 (1-1076)

Results & Conclusion

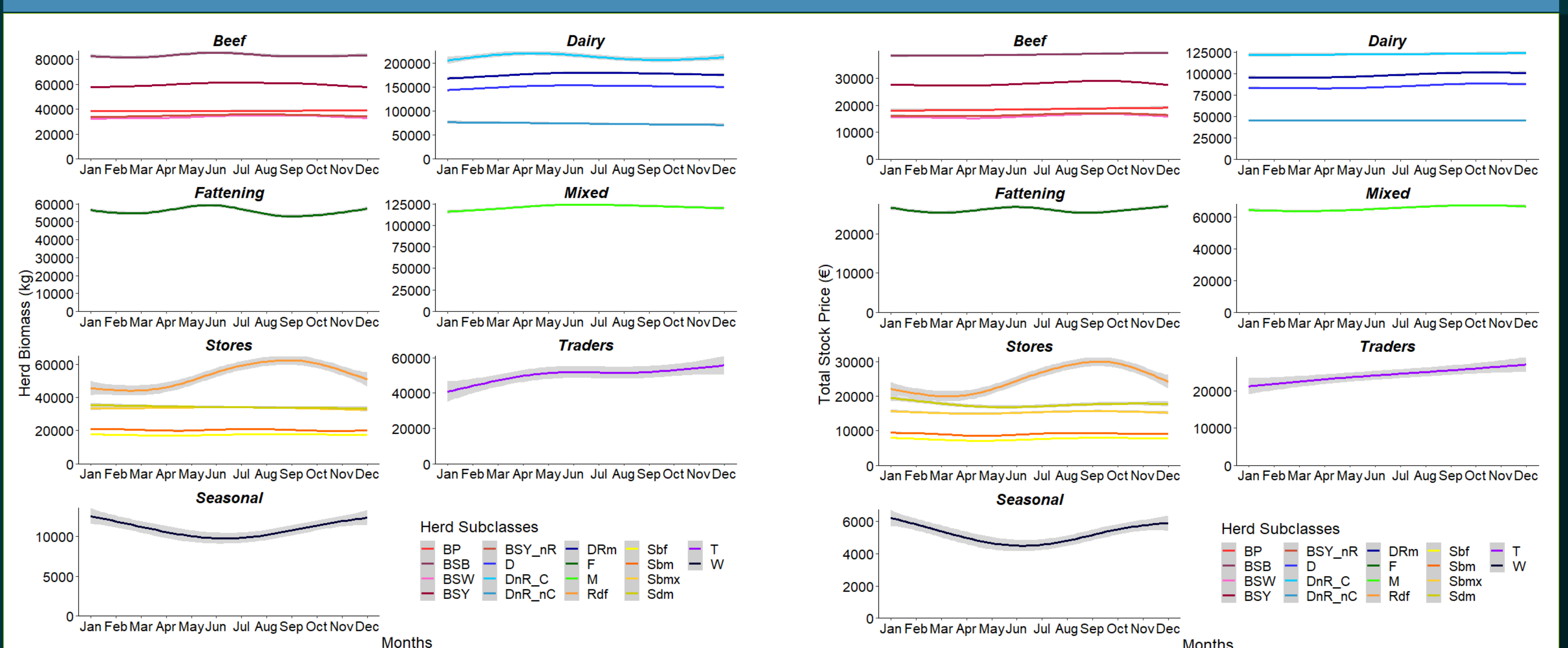


Figure 1. Average herd biomass (kg) of cattle herds in Ireland by herd type for each month in 2019.¹

Figure 2. Average total stock value (€) of cattle herds in Ireland by herd type for each month in 2019.¹

Price and liveweight temporal changes show similar trends within the year

¹Herd Subclasses abbreviations: Beef pedigree (BP), beef suckling to weanlings (BSW), beef suckling to youngstock (BSY), beef suckling to youngstock-no rearing (BSY-nR), beef suckling to beef (BSB); dairy (D), dairy no rearing-contract (DnR-C), dairy no rearing-no contract (DnR-nC), dairy rearing male calves (DRm); fattening (F); mixed (M); rearing dairy females (Rdf), store dairy males (Sdm), store beef males (Sbm), store beef females (Sbf), store beef mixed (Sbmx); trading (T); seasonal (W)

Reference: Brock, J., Lange, M., Tratalos, J. A., More, S. J., Graham, D. A., Guelbenzu-Gonzalo, M., & Thulke, H. H. (2021). Combining expert knowledge and machine-learning to classify herd types in livestock systems. *Scientific Reports*, 11(1), 2989. <https://doi.org/10.1038/s41598-021-82373-3>