Impacts of CAP 2015 reforms on animal health and welfare of Scottish dairy herds

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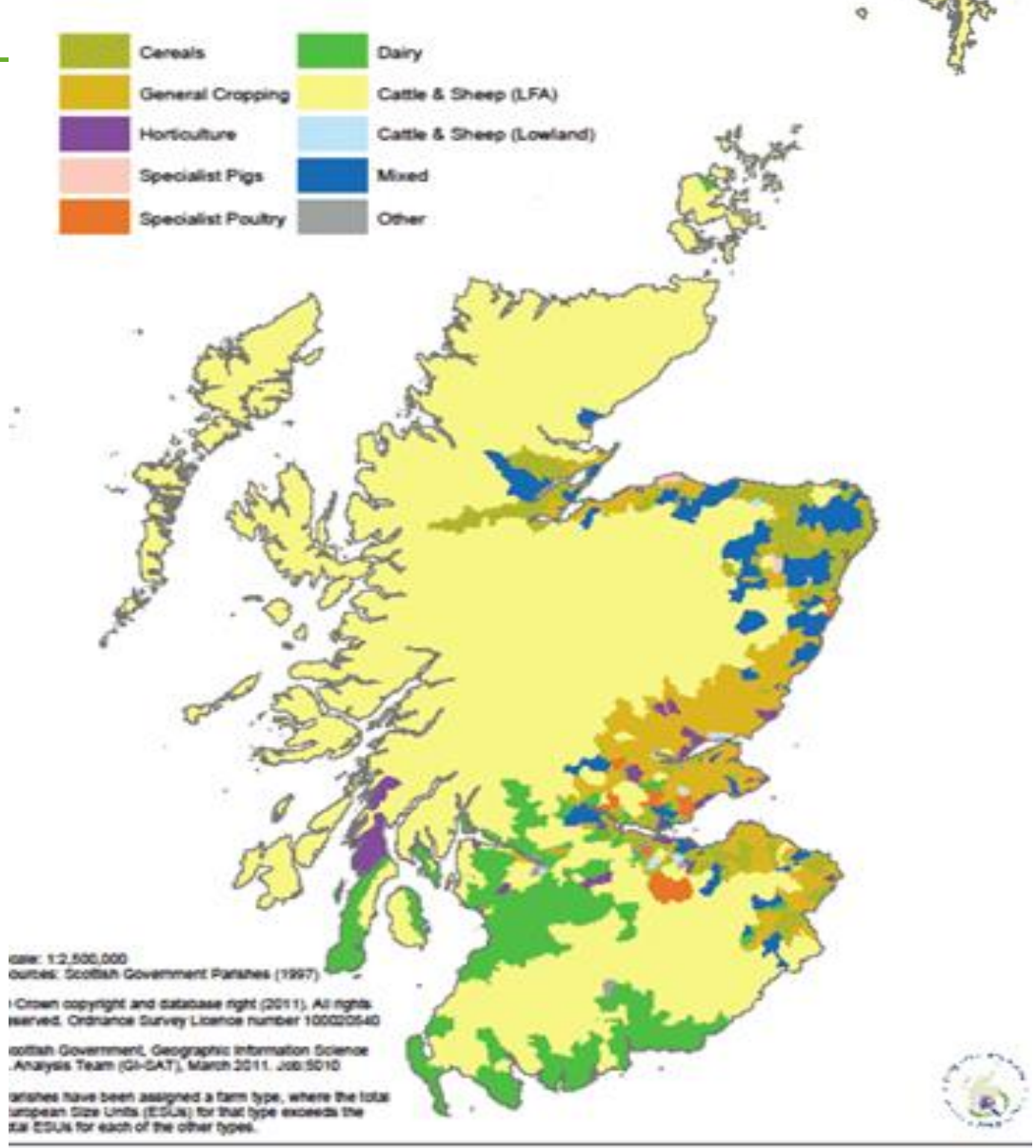
Background

- Dairy farms under increasing economic pressure:
  - high production costs
  - low milk prices
- CAP reform imposes further cost cut
- Directly & indirectly affects health & welfare

Scottish farm types



Impact of CAP reforms

- Redistribution of payments
- >85% of land – LFA, majority of which are extensive farming systems
- Effect at farm level could be severe especially for intensive farms
- Dairy farms - among the most efficient and most profitable farms in Scotland
- Expected to loose out financially

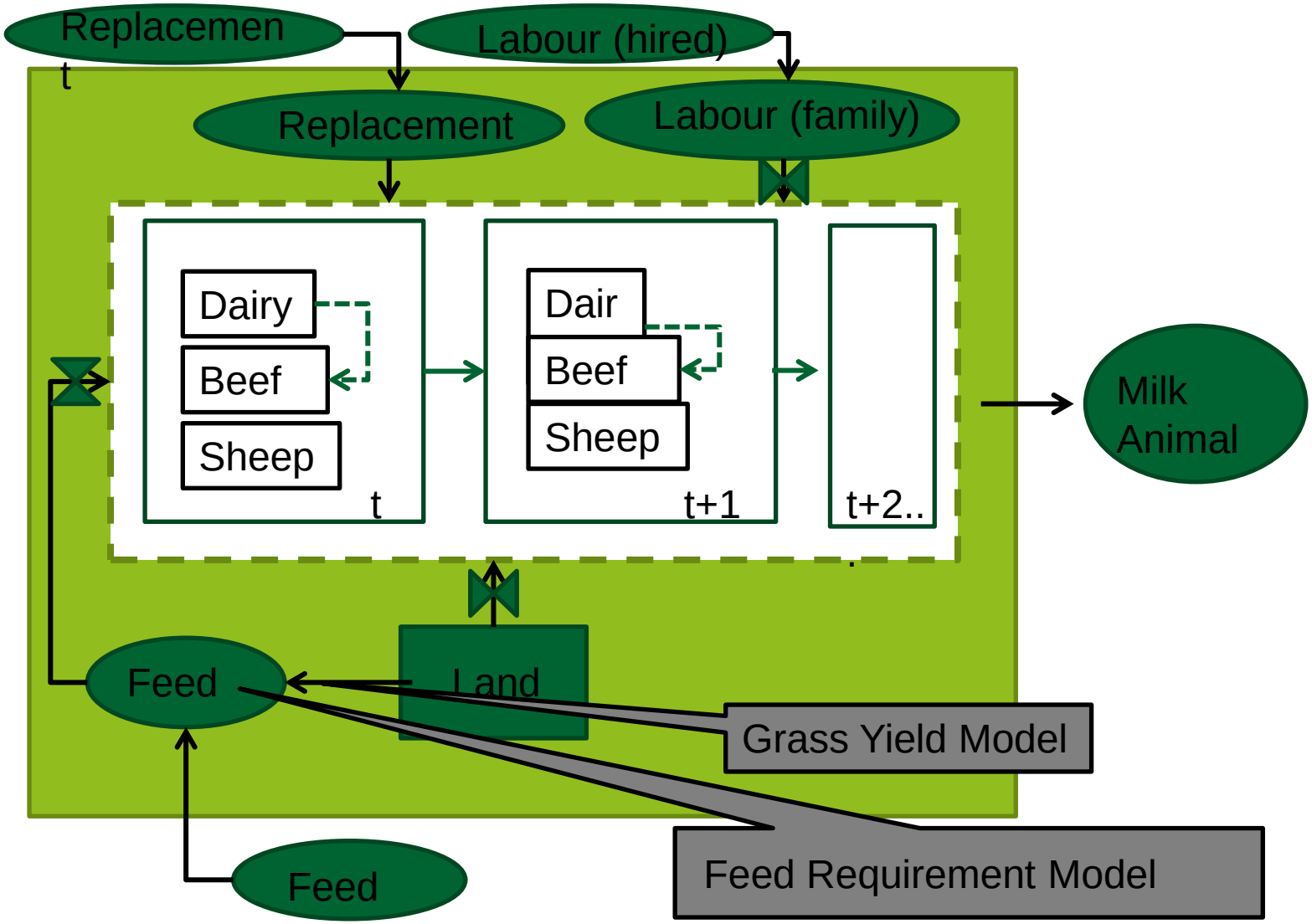
Objectives & tools

- To assess/predict the direct financial impact of CAP reforms *(how farmers will respond!)*
- To investigate consequences on animal health, welfare and environment (*how animals and environment will respond!*)
- Farm level optimisation models:
  - LP (ScotFarm)
  - DP

ScotFarm model

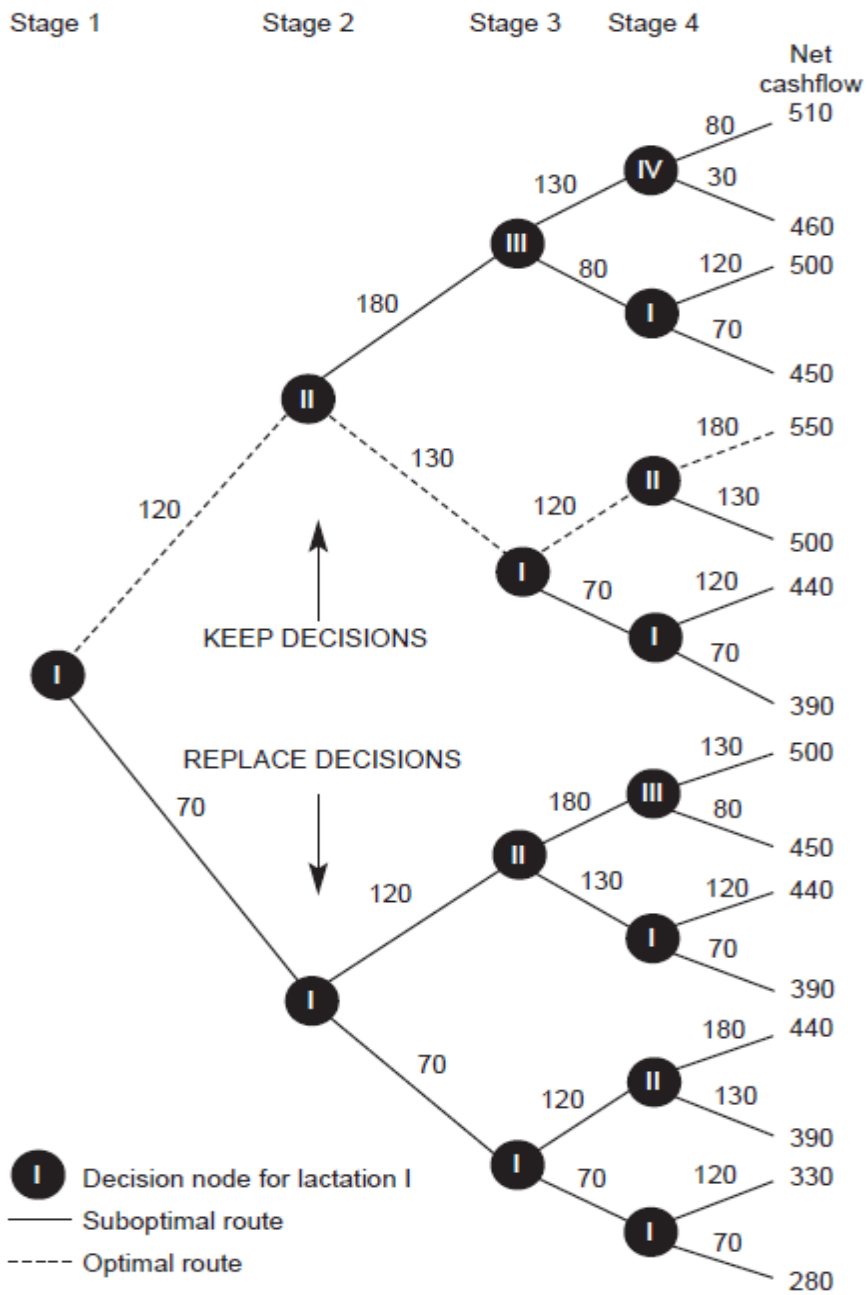
- Linear programming – optimising profits
- Farm system analysis
  - Replicates farm activities
  - Financial and physical parameters
  - Decision makings
- Pseudo-dynamic
  - Runs over 15 year timeframe but results averaged out of middle 9 years
  - yearly runs with month as a subset

Livestock module



DP model

- Dynamic programming – optimising profits
- The objective is to maximise the expected net present value (ENPV) of returns from a current heifer and all its successors
- By selecting the appropriate sequence of keep or replacement decisions at the start of each stage.



Stott et al., 2005

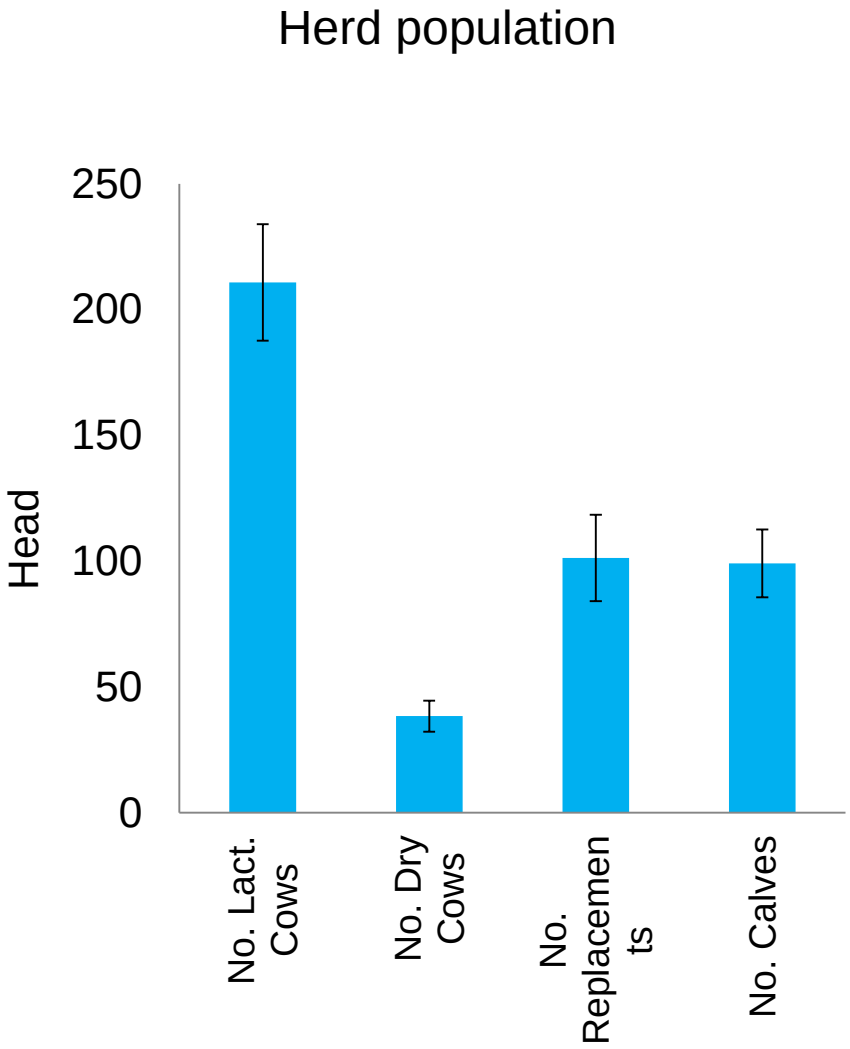
Data -- used in ScotFarm

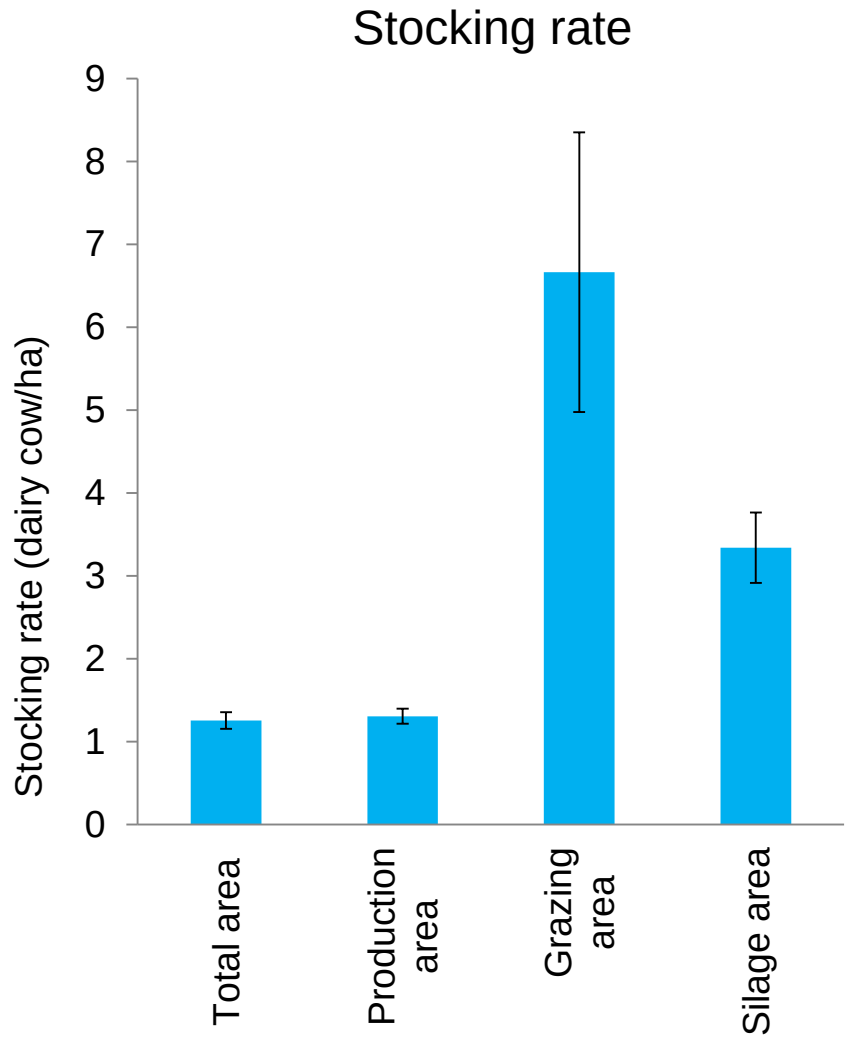
- Scottish Farm Accountancy Survey (FAS)
  - Dairy farms - 55 farms
- Physical data: land, animals, labour
- Production level: milk, crop, grass yields
- Management: feeding, land, stocking rate
- Prices/costs
- Coefficients: LU, feed contents, labour requirements, feed requirements

Data -- used in DP model

- An inventory of 42 commercial dairy farms in Scotland collected in 2013 that contains:
  - Physical data (farm area, nutrition and labour supply)
  - Health/welfare data (e.g. reasons for culling and number of cows culled in each category)

Examples 1

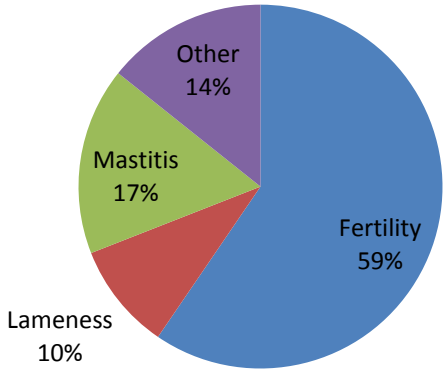

Herd population
Head
250
200
150
100
50
0
No. Lact. Cows
No. Dry Cows
No. Replacements
No. Calves


Stocking rate
Stocking rate (dairy cow/ha)
9
8
7
6
5
4
3
2
1
0
Total area
Production area
Grazing area
Silage area

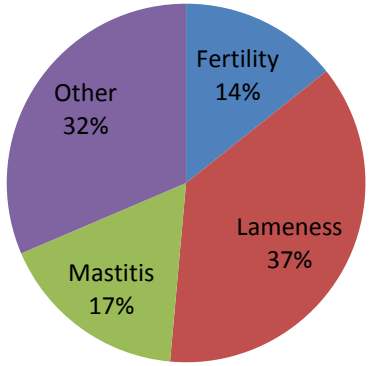
Examples 2

Proportion of farms with the main causes of culling expressed as first, second and third reasons for culling.

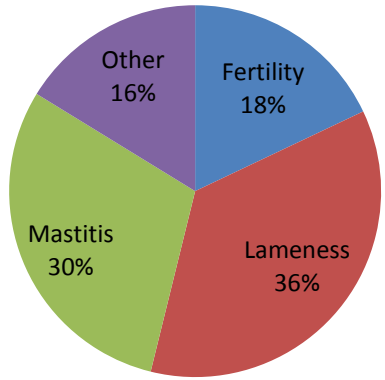
First reason



Second reason

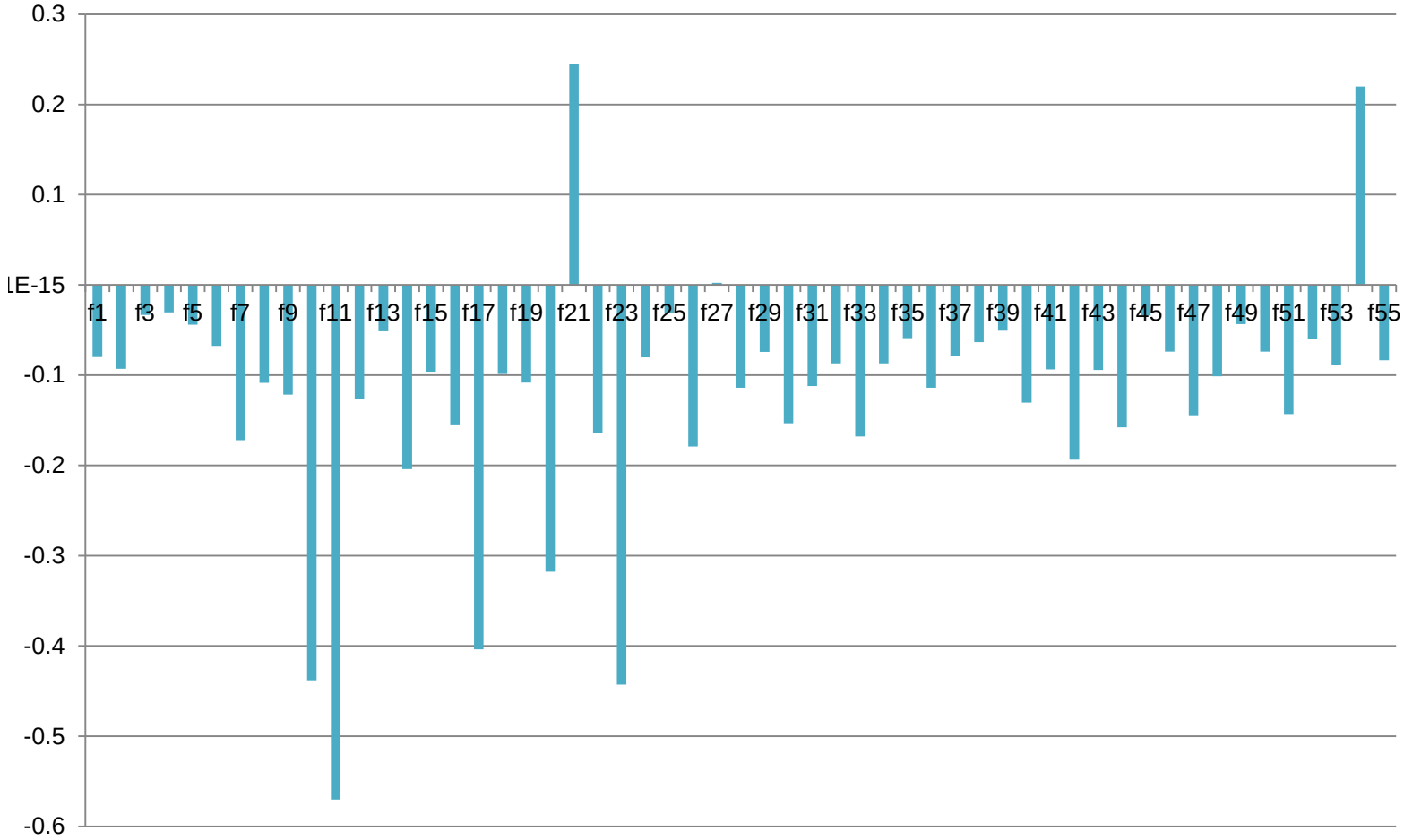


Third reason



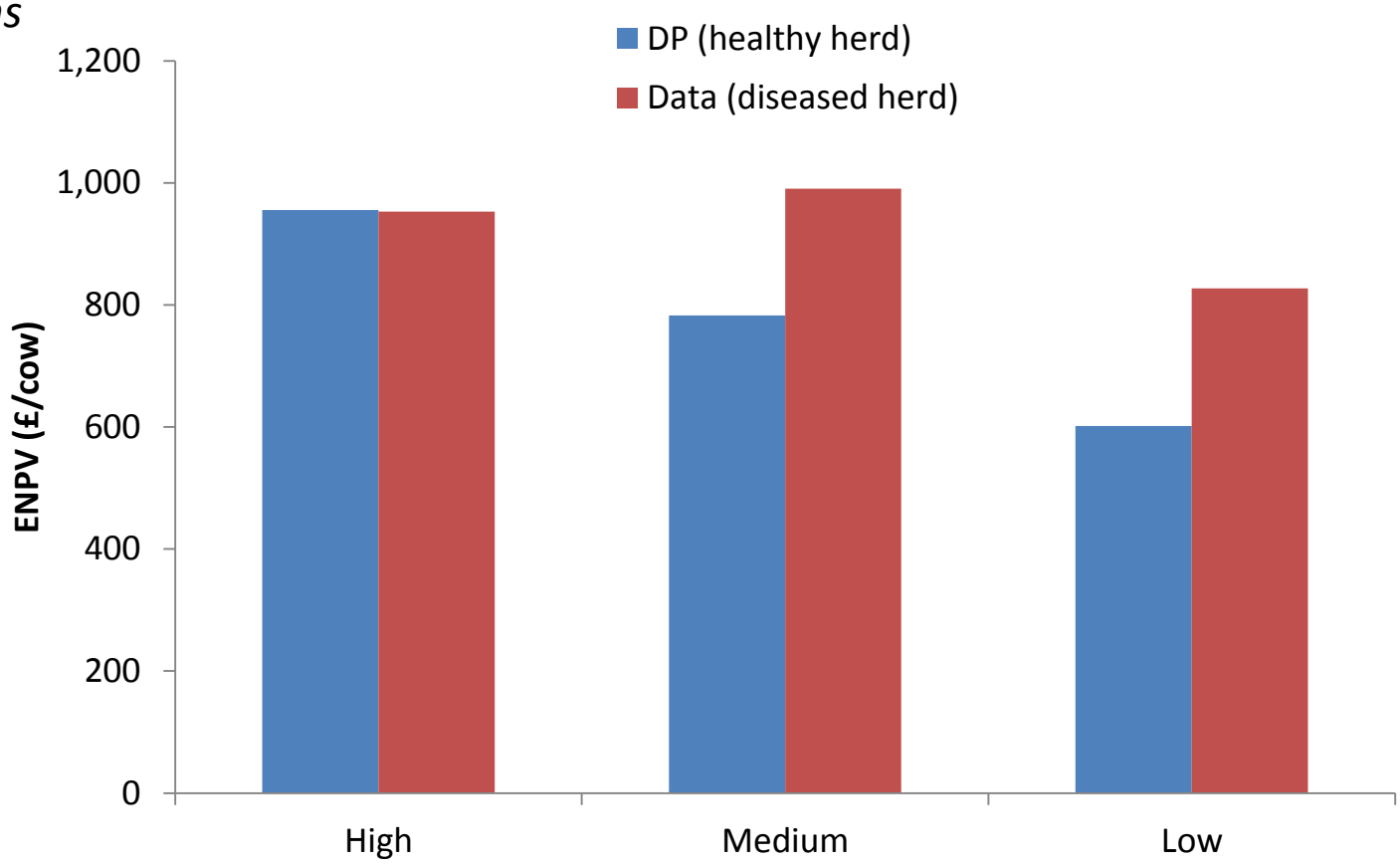
Results (farm margins using ScotFarm)

Percentage difference in Farm Net Margin of 55 farms under payment scenarios compared to the Baseline scenario



Results (ENPV using DP model)

Profit per cow expressed as expected net present value (ENPV £/cow) for each herd category predicted by the DP model compared to estimated figures for the 42 studied farms



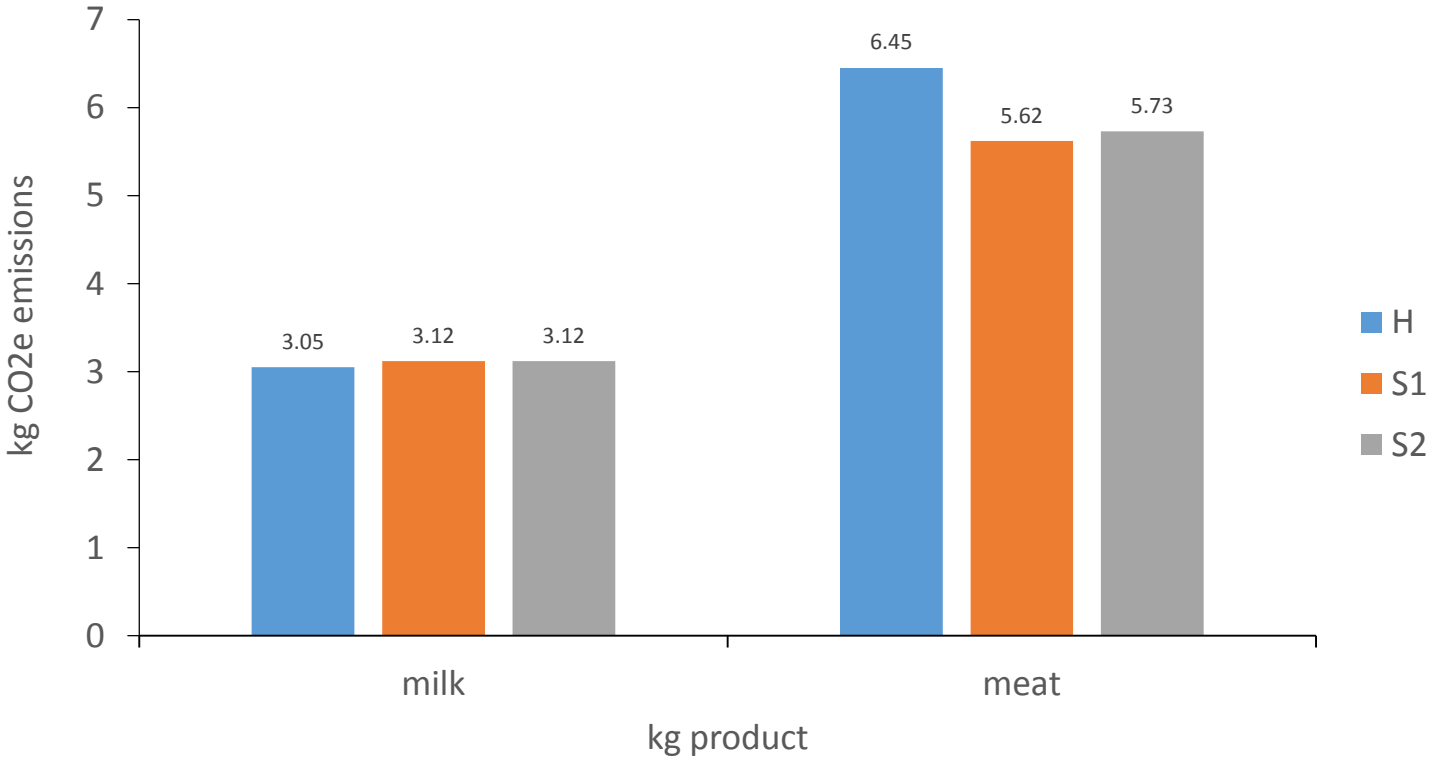
Results DP

Comparing optimum culling rates estimated by the DP model with the averages of actual rates observed in the dataset.

	Farm production categories		
	High	Medium	Low
Involuntary culling (DP model)	0.039	0.044	0.021
Involuntary culling (Data)	0.031	0.044	0.021
Voluntary culling (DP model)	0.087	0.086	0.093
Voluntary culling (Data)	0.164	0.233	0.063
Total culling rate (DP)	0.126	0.130	0.114
Total culling rate (Data)	0.203	0.277	0.083

Results (emissions using DP and HolosNor models)

The GHG emissions produced for kg milk and meat under three scenarios examined: H: healthy herd, S1: herd with mastitis, S2: herd with mastitis and penalised milk price.



Conclusions

- The majority of Scottish dairy farms loose out under the CAP 2015 reforms
- Large farms are the biggest losers (reduction in margins by up to 30% - 55%)
- Increased culling and replacement rates adopted as a strategy to compensate low productivity imposed by poor fertility, lameness and mastitis
- This increases GHG emissions as a result of having more replacements and younger animals

Acknowledgments

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