Relationship Between In-line Recorded Milk Flow Rate and Longevity in Estonian Holstein Cows

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INTRODUCTION

- 60% of all dairy cows in Estonia are housed in new or reconstructed farms.
- Robotic milking 52 farms, 168 robots.
- Total number of dairy cows in Estonia 90,516, of which 95.4% are in milk recording.
- Productivity of Estonian Holstein (EHF) cows: 9,062 kg milk, 3.90% fat, 3.32% protein.
- Homogeneity of cows-related farm procedures has become an essential economic factor.
- A major impact to the profitability of the dairy industry, is cows' functional longevity.

THE AIM

- The relationships between in-line recorded average milk flow rate (AFR, kg/min) and survival rate (SR) and culling reasons (CR) in Estonian Holstein cows were investigated.
 - AFR express the efficiency of the milking process.
- SR and CR characterising the longevity.

MATERIAL AND METHODS

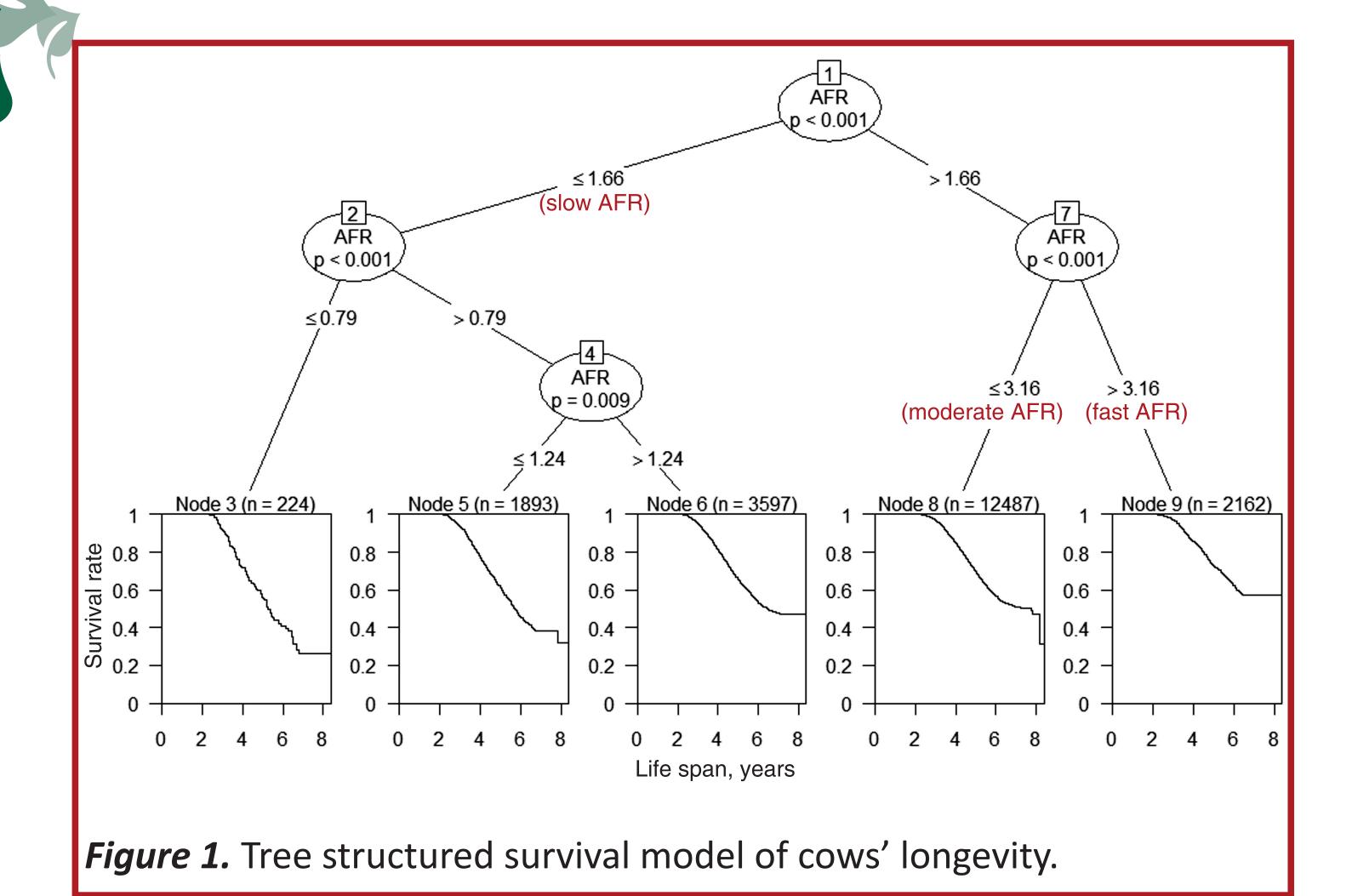
- 20,363 first parity EHF cows AFR records from 2010–2015 was used.
- The number of culled cows was **5,190** (25.5%).
- AFR was divided into three classes:
- slow ≤1.66 kg/min, moderate 1.66–3.16, fast >3.16.
- The Cox proportional-hazards regression model was built and regression tree with package 'partykit' in R was constructed to study the effect of AFR on censored longevity.
- The correspondence analysis (CA) was used to discover the common patterns among final nodes of regression tree and culling reasons.

RESULTS

- The overall AFR was 2.16 kg/min (SD=0.79).
- The AFR of culled cows was 2.08 kg/min (SD=0.77).
- The SR was the highest on the cows with AFR >3.16 kg/min.
- The SR was the lowest on the cows with AFR <1.24 kg/min (Fig. 1).
- The slow AFR was related with culling due to the low milk yield and various udder and teat defects, and especially with poor milkability (Fig. 2).
- The moderate AFR was correlated with culling due to the reproductive disorders.
- The fast AFR was associated with culling due to the gastrointestinal diseases.

CONCLUSIONS

- EHF cows with faster AFR survive longer than cows with the moderate or slower AFR.
- The faster milking EHF cows have longer productive life and incidence rate of mastitis doesn't increase significantly.



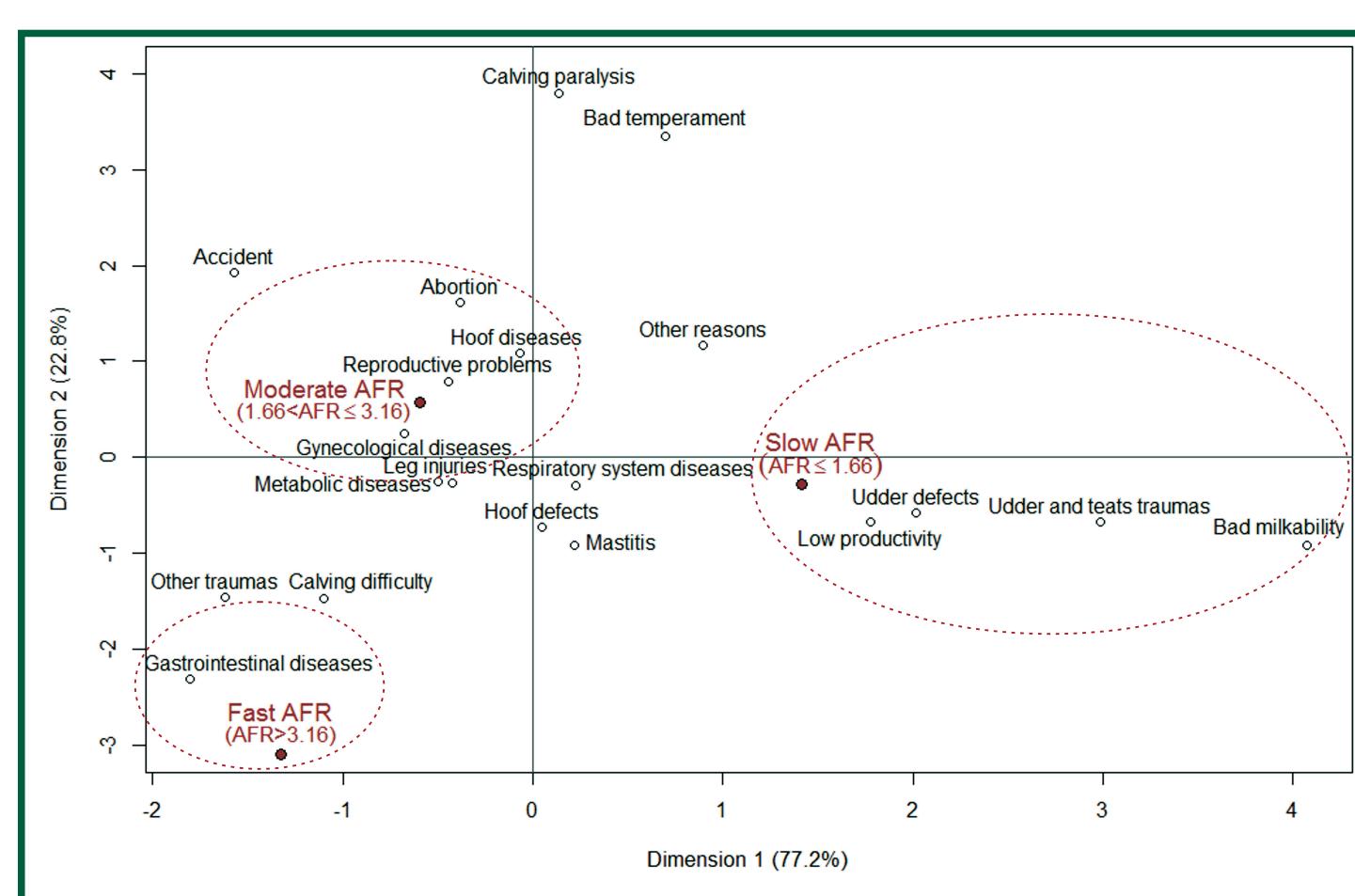


Figure 2. Correspondence analysis of culling reasons and AFR classes.

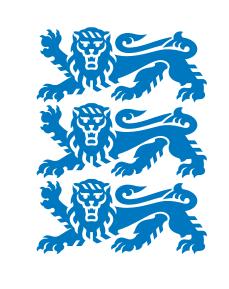
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