

Using precision technology to investigate personality and plasticity of movement in farmed calves and their associations with production

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1. Introduction

- Individuals show consistent differences in behaviour (**personality**).
- Individual variation can affect how animals cope with changes (**behavioural plasticity**).
- This can have effects on disease detection, welfare and management changes.



2. Aims

- Use precision livestock technology to quantify personality types from movement behaviours.
- Measure the consistency of personality across time and contexts.
- Investigate individual differences in behavioural plasticity.
- Detect correlations with production measures.



Ultra-wideband location sensor

Fig 1: Calf wearing a location sensor housed in a collar

3. Methods

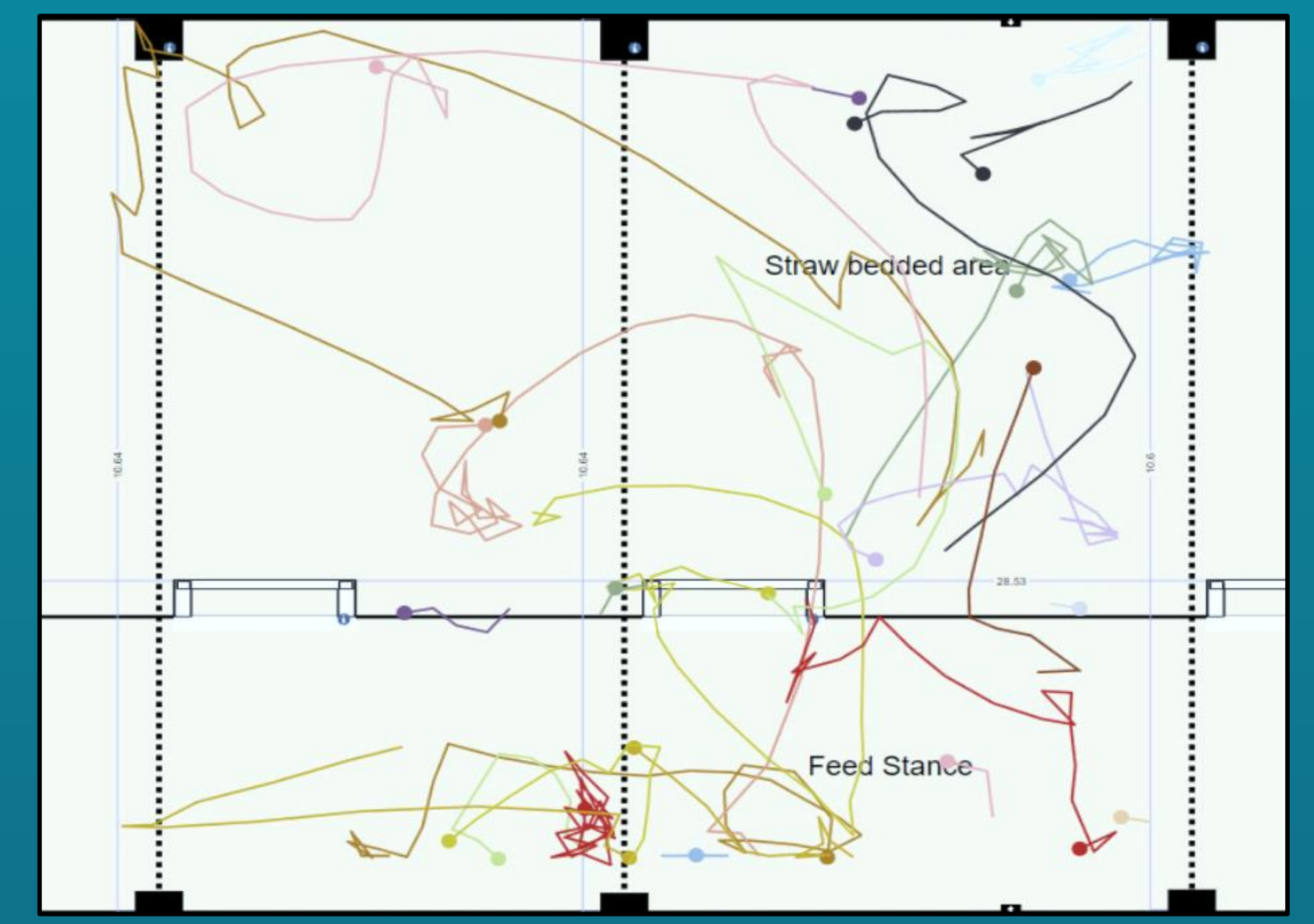
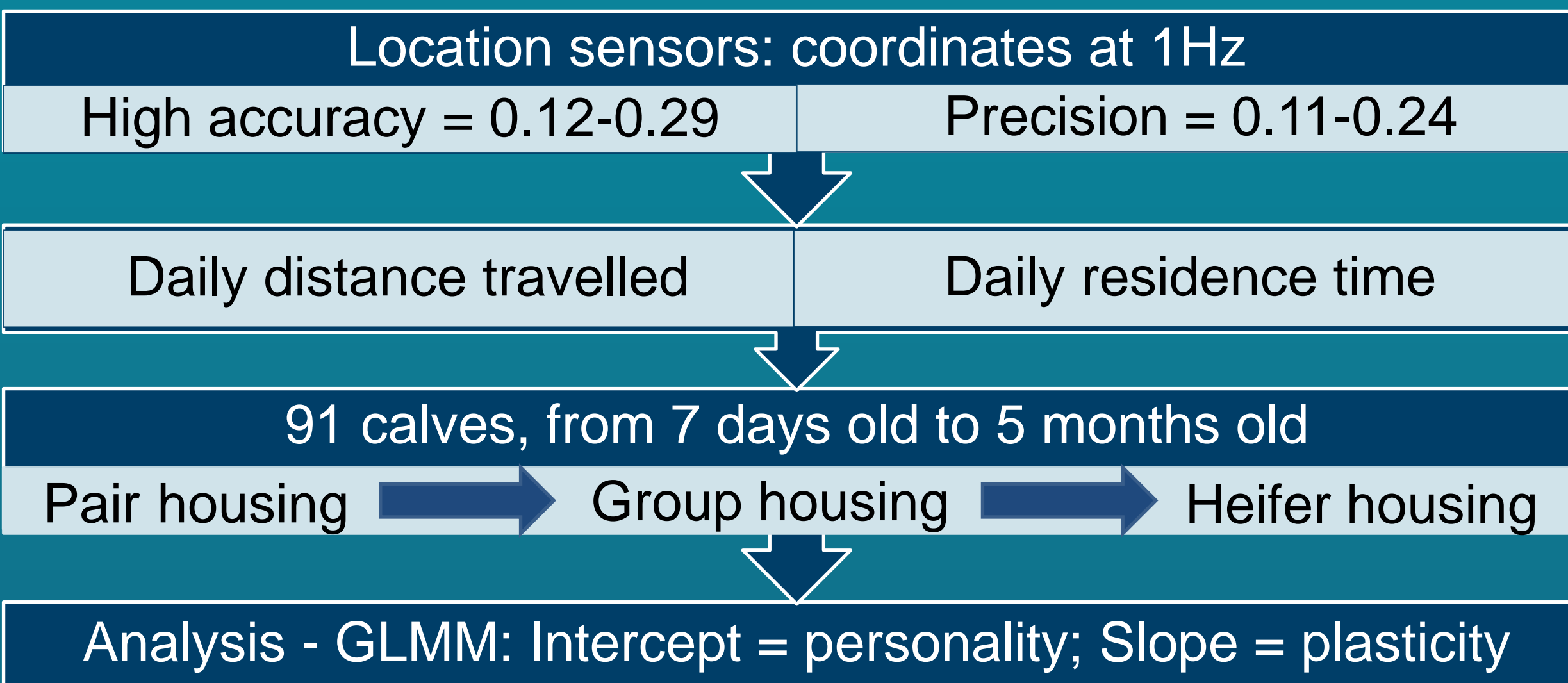


Fig 2: location sensors showing the position of each calf in the home pen

4. Results and discussion

Personality-Plasticity:

- Movement behaviours showed **consistent variation** between calves across three housings.
- This indicates the presence of “**active** and “**exploratory**” personality traits.

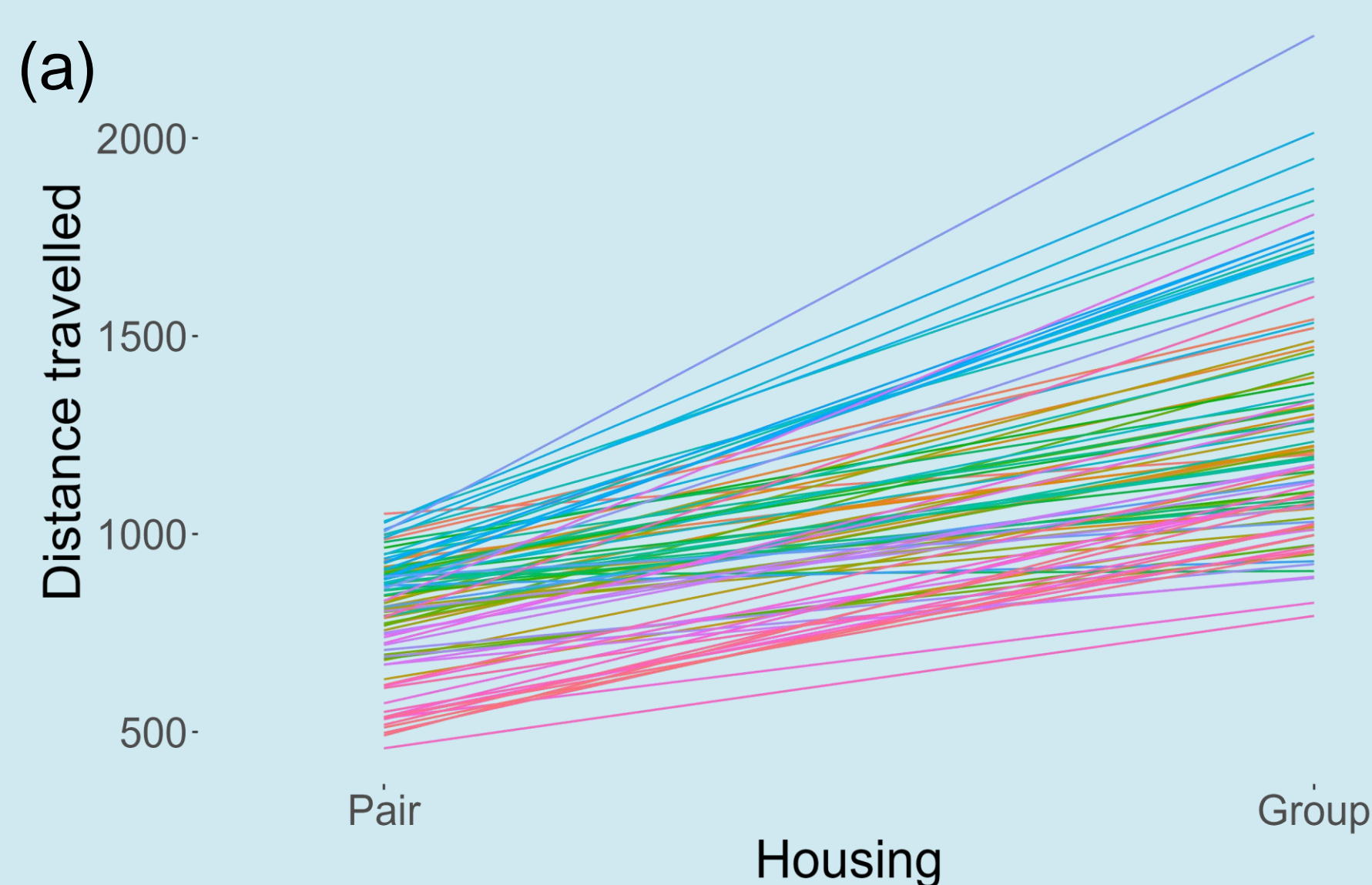


Fig 3: Individual intercept and slope for distance travelled (a) and residence time (b) for the pair and group housing

- Repeatability = 0.20
- Positive correlation between intercept & slope
- **Personality-dependent behavioural plasticity:** Individual differences affect how they react to changes.
- Repeatability = 0.20
- Negative correlation between intercept & slope

Correlations with production:

- There was a significant positive correlation between distance travelled and weight gained.



- **Active calves grow faster:** Pace-of-life syndrome hypothesis

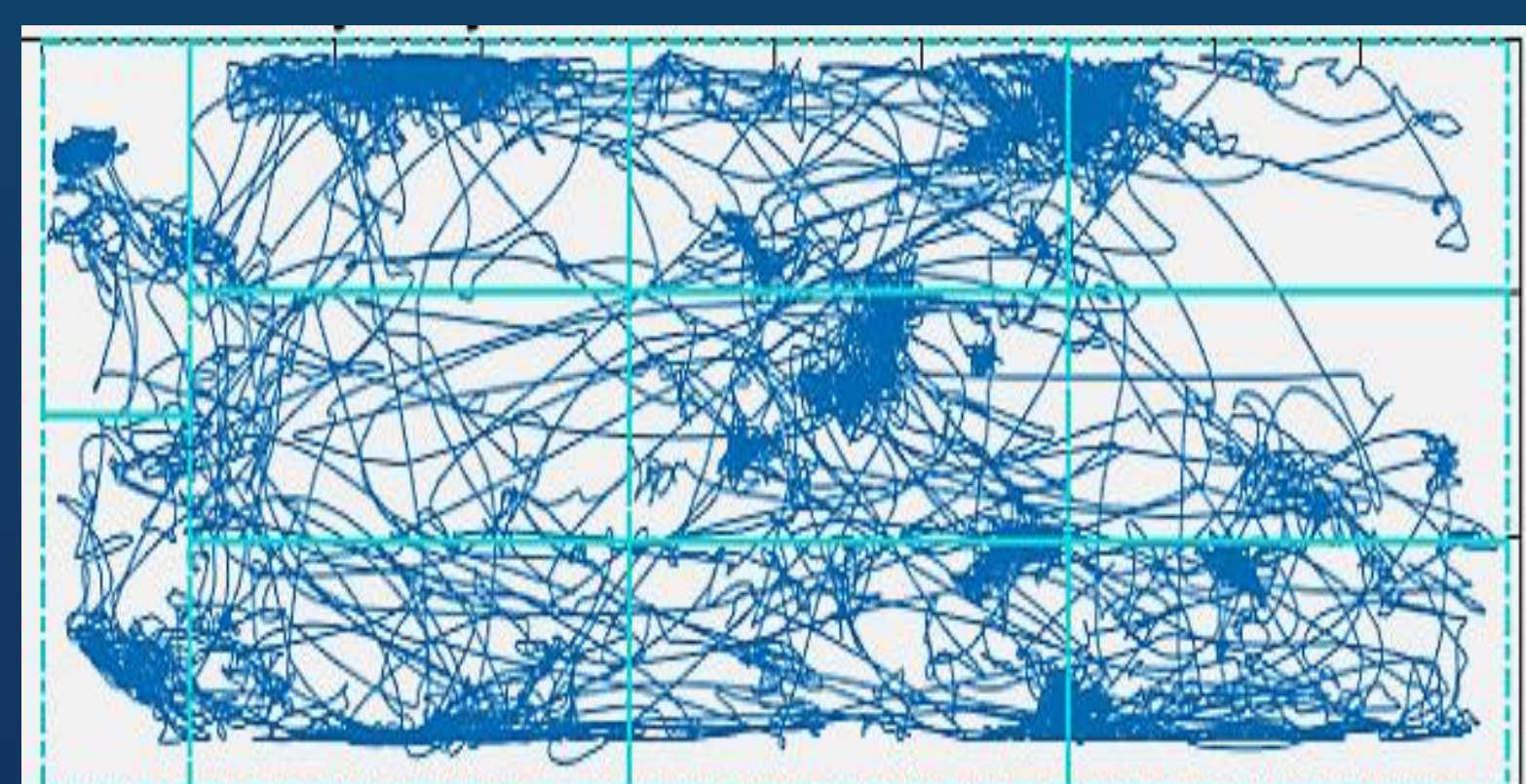


Fig 4: Trajectory of an individual calf for one day

5. Conclusions and further work

- Farmed calves have **consistent personality types** across time (7 days to 5 months old) and contexts (different housings).
- **Personality is correlated with behavioural plasticity** of movement.
- Active **personality is linked with production** measures (weight gain).
- Further studies could explore the factors that affect personality differences and interactions with health.



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