



THE UNIVERSITY OF
MELBOURNE

FACULTY OF
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SCIENCES

Cow milking order and its relationship with production in a pasture-based automatic milking system



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- Pasture-based automatic milking systems rely on voluntary cow movement.
- Is the cow milking order consistent over time?
- How does it relate to milk production?
- More broadly, how can we make value out of the data collected on farm?

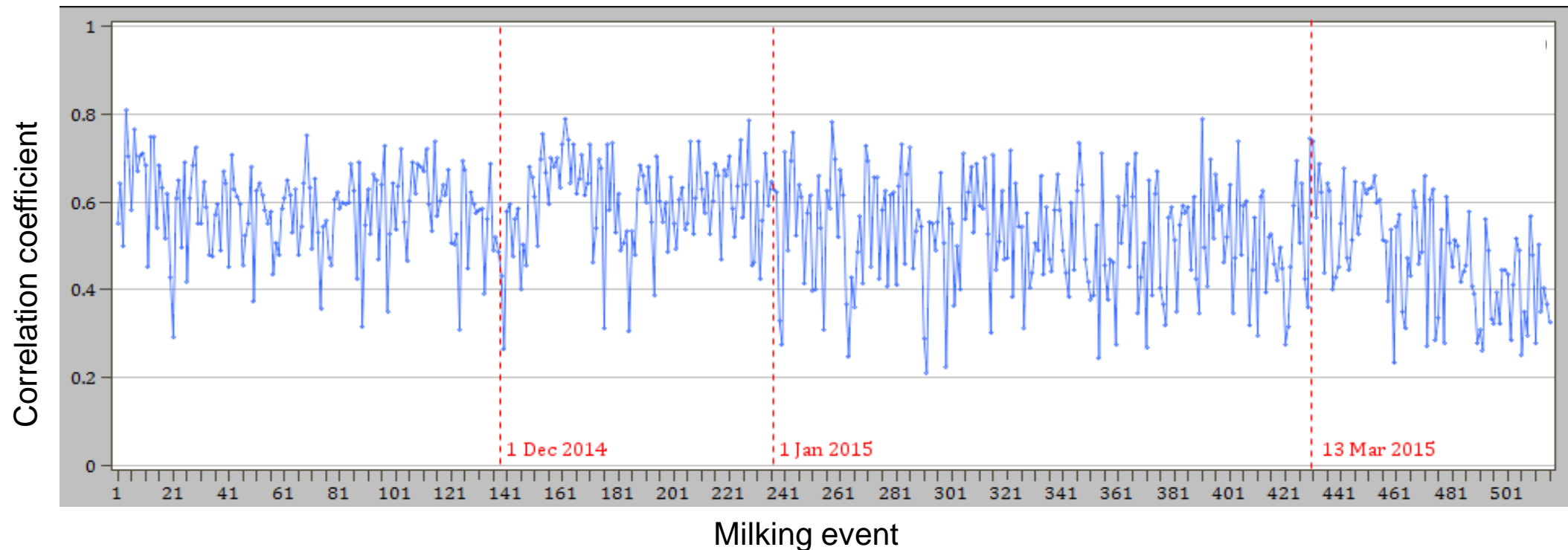


- Located in northern Victoria.
- 43 hectares of irrigated pasture, 3-way grazing.
- 122 cows (at the time of this study).
- Cow milking records from 15 October 2014, to 14 April 2015.
- Rank order calculated for each cow and milking event.





- Correlations between successive milking events ranged from $r = 0.2-0.8$.
- Correlations stronger in earlier in lactation.
- Lower correlations during hot weather.



Correlation coefficients between successive milking events across the study period



- Correlations between daily milking order were stronger with 1 day interval, decreasing with 7, 14 and 28 day intervals.
- Stronger correlations seen between mean monthly milking order:

| | Oct 2014 | Nov 2014 | Dec 2014 | Jan 2015 | Feb 2015 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Nov 2014 | 0.91 | | | | |
| Dec 2014 | 0.84 | 0.92 | | | |
| Jan 2015 | 0.69 | 0.76 | 0.85 | | |
| Feb 2015 | 0.67 | 0.75 | 0.79 | 0.84 | |
| Mar 2015 | 0.65 | 0.76 | 0.81 | 0.73 | 0.87 |

Does order relate to production?

- Milking order was correlated with milk production and milking frequency, but not with parity or liveweight.

| | First half of order | Second half of order |
|---------------------------------|---------------------|----------------------|
| Milk production (kg/day) | 28.3 | 23.4 |
| Milking frequency (milking/day) | 2.75 | 2.39 |





- Is higher milk production related to access to greater quality and availability of pasture?

Pasture mass and nutritive characteristics of pre-grazing pasture in three height categories (March 2015)

| | 0-5 cm | 5-10 cm | 10+cm |
|-------------------------------------------|---------------|----------------|--------------|
| Pasture mass (kg DM/ha) | 1100 | 650 | 500 |
| Crude protein (%) | 10.0 | 17.1 | 22.8 |
| Acid detergent fibre (%) | 26.6 | 22.3 | 16.0 |
| Neutral detergent fibre (%) | 52.5 | 48.2 | 40.2 |
| Digestibility (%) | 70 | 77 | 83 |
| Estimated Metabolisable energy (MJ/kg DM) | 10.4 | 11.6 | 12.7 |



- Milking order was consistent in this voluntary cow movement system.
- Cows earlier in the order were milked more frequently and produced more milk.
- Overall goal to use data to manage cows/herds more effectively.

