Department of Primary Industries

Pasture-based automatic milking systems in Australia

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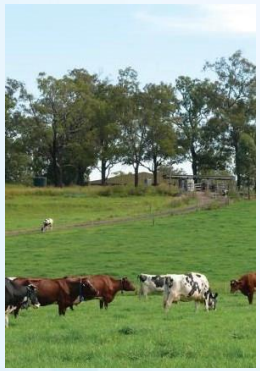
EAAP 2015 – Warsaw, Poland

Agenda for today

- Australian dairy industry
- Australian automatic milking systems (AMS)
- Research on milking intervals, incentives, impact and management
- Current & future industry issues around AMS



Australian dairy industry

- 3rd largest rural industry
- 1.69 million dairy cows (76% HF)
- ~6,200 dairy farms
- ~9.500 million litres of milk
- Average farm: 270 cows (5,500 lts/cow)

AMS status in Australia

2 + 1

4

8 + 1

4

10 + 1

8 + 2

36 farms up & running

5 farms being installed

AMS status in Australia

Robots

144 robots

Cows

~10,250 cows

Milk

~56 mill litres milk

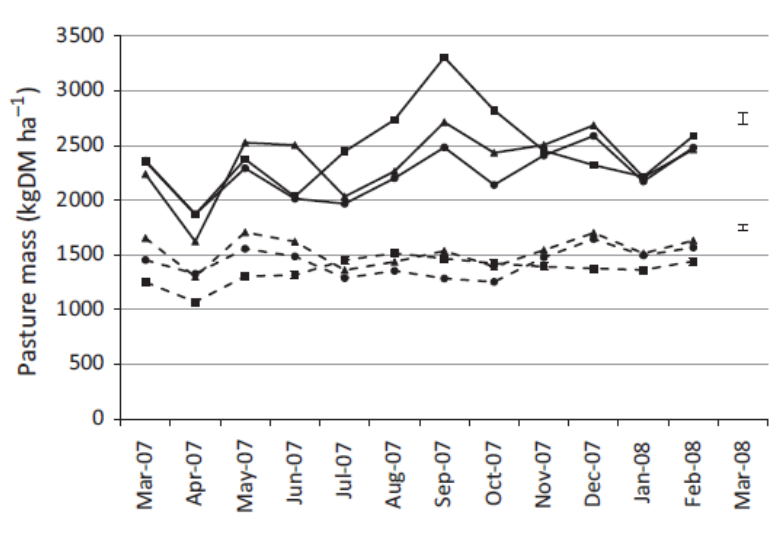
AMS status in Australia

Indoor systems	Corral based systems	Pasture-based systems
		
11%	6%	83%

AMS in pasture-based systems

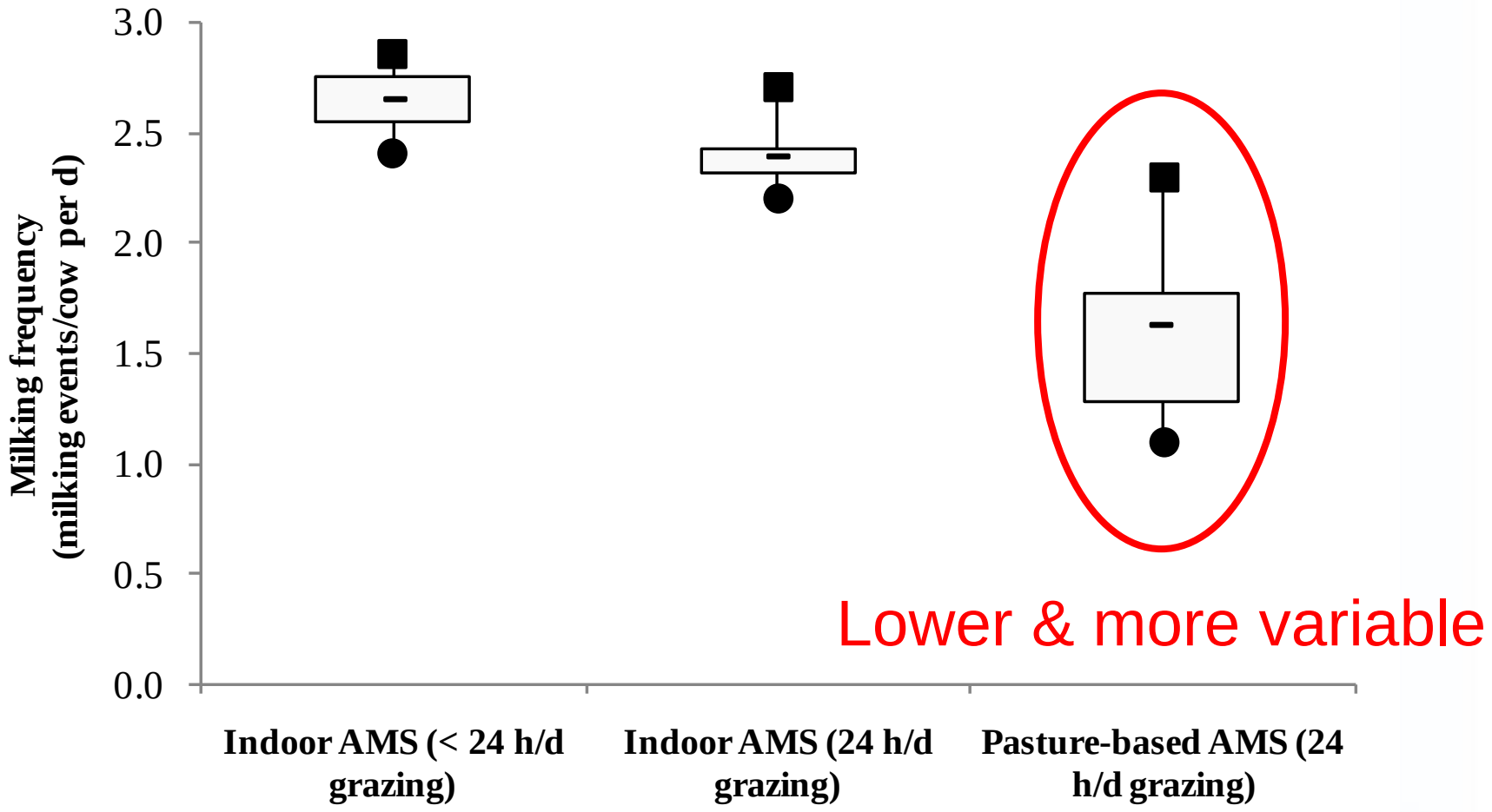
What had already been proven?

AMS could work in pasture-based systems and achieve high levels of pasture utilisation



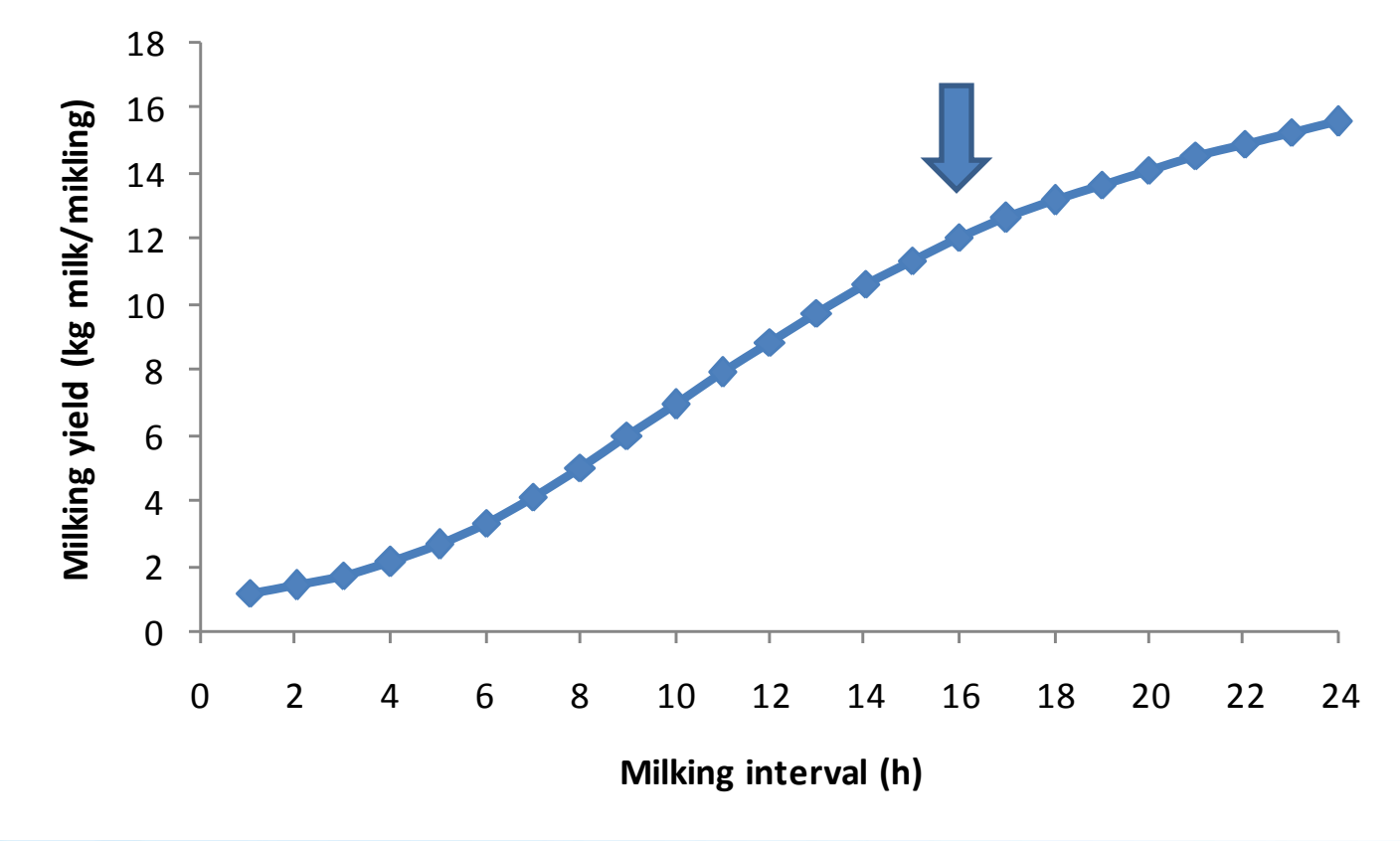
Clark et al. (2015) GFS, doi: 10.1111/gfs.12171.

Grazing and AMS



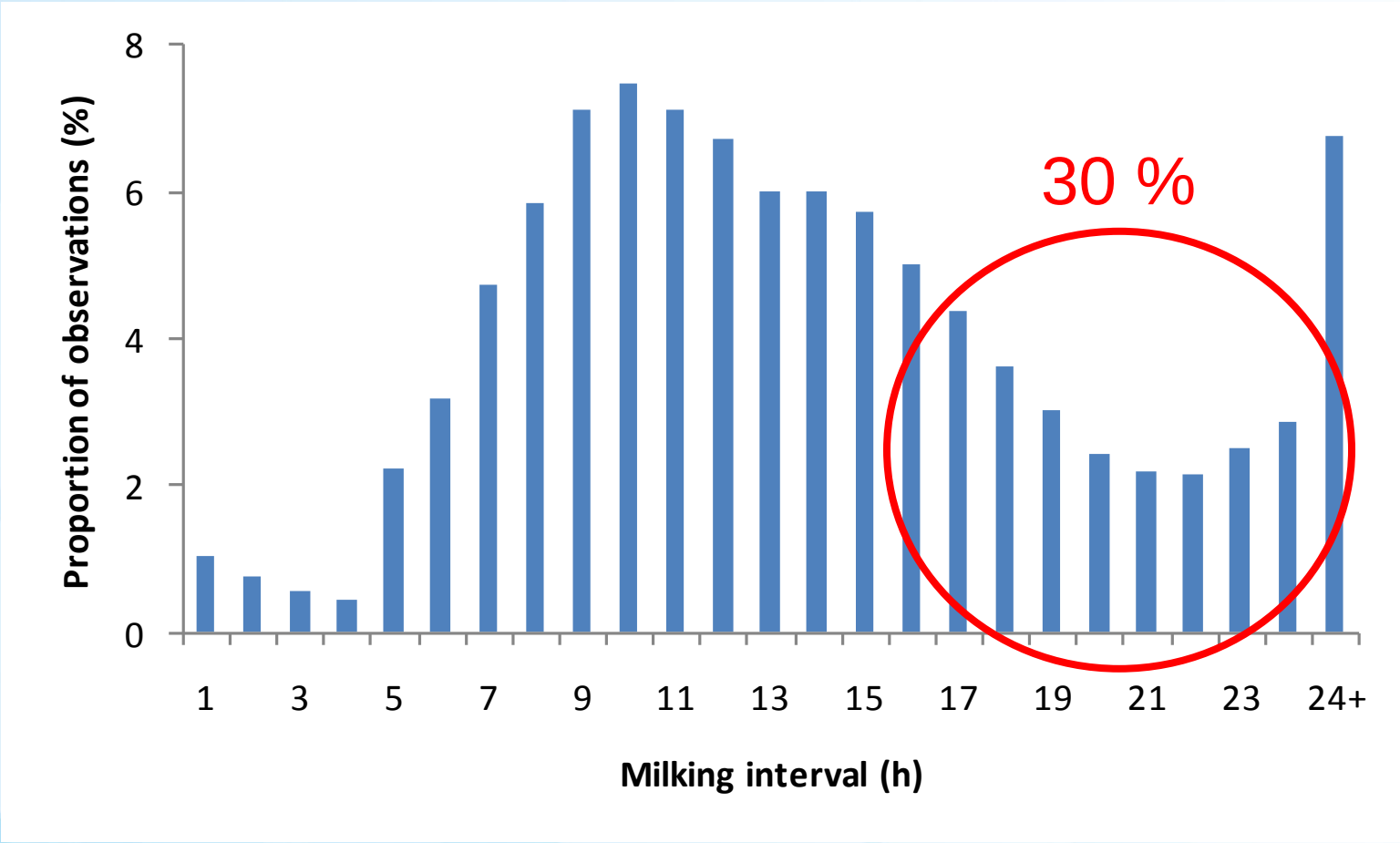
Lyons et al. (2014) Liv. Sci., 159, 102-116.

Concept of extended milking intervals



Lyons et al. (2013) Liv. Sci., 158, 179-188.

Milking intervals in pasture-based AMS



Lyons et al. (2013) Liv. Sci., 158, 179-188.

So what next?

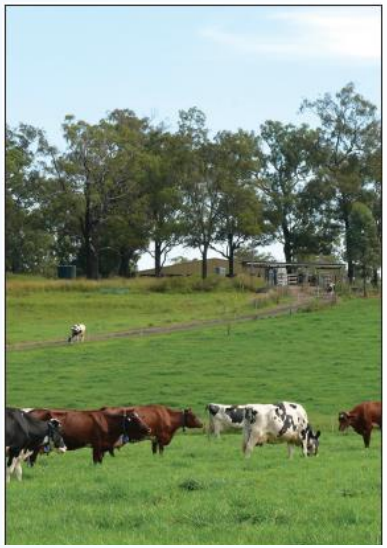
How can we..?

↓milking interval - ↑milking frequency - ↑milk yield

2 vs 3 way grazing trial

Hypothesis

- Frequency – size of allocations
- Smaller allocations
- Depleted quicker
- Cows would traffic out sooner
- Lower milking intervals
- Higher milk yield



2 vs 3 way grazing trial: Design

2WG

9 kg DM/cow
12h grazing

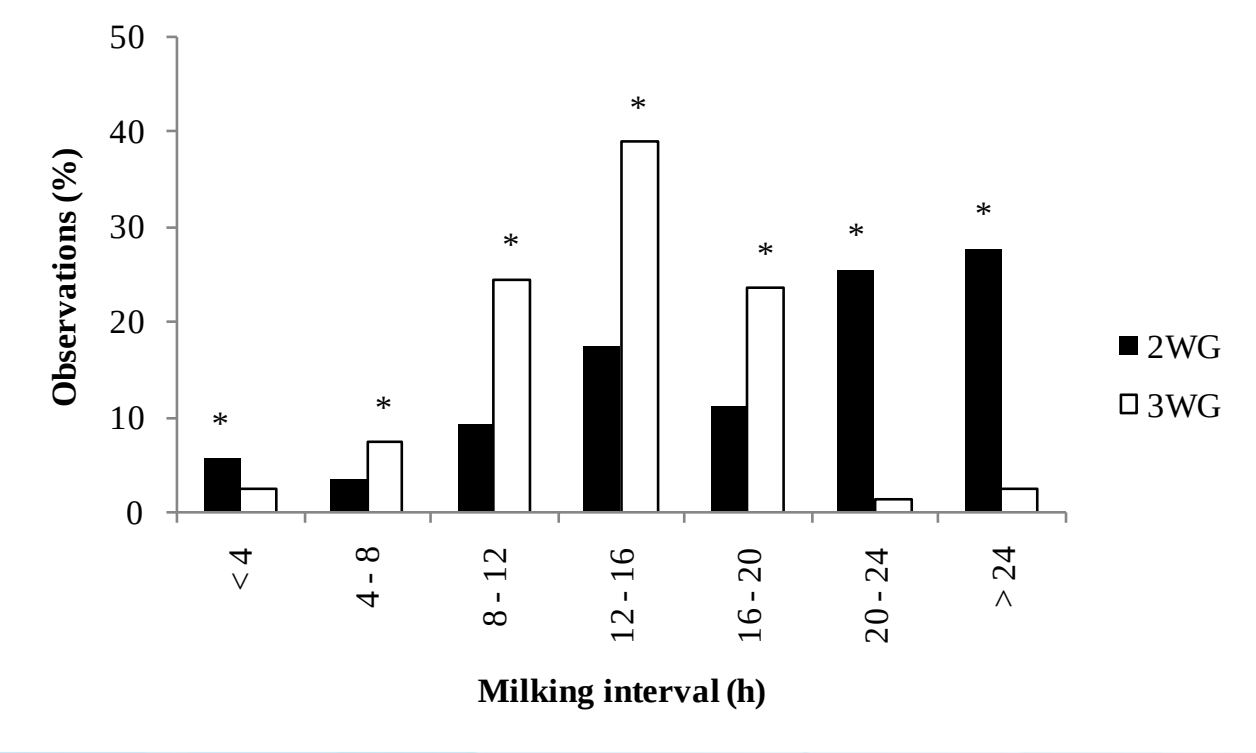
3WG

6 kg DM/cow
8h grazing

2 vs 3 way grazing trial: Results

↓ Milking interval - ↑ Milking frequency - ↑ Daily yield

(-31%) (+40%) (+20%)

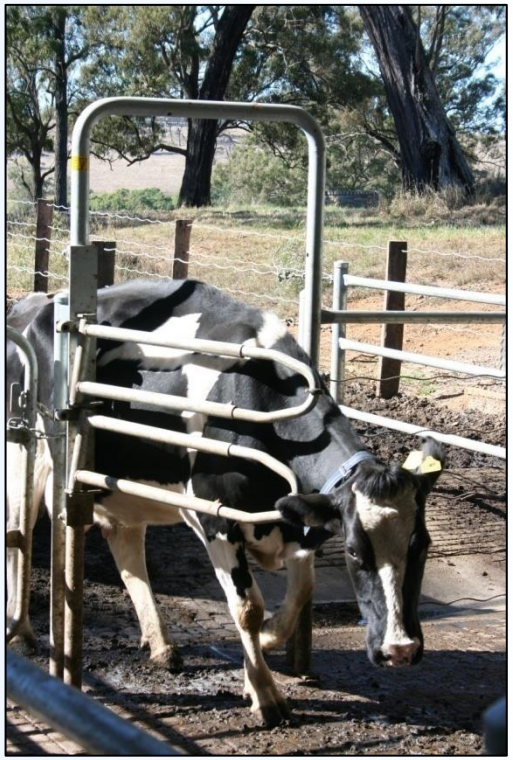


Lyons et al. (2013) J. Dairy Sci, 96, 4494-4504.

PRE vs POST feeding trial

Hypothesis

- Immediate reward
- Quicker return to the dairy
- Lower milking interval
- Higher milking frequency
- Higher daily milk yield



PRE vs POST feeding trial: Design

Whole herd (175 cows)

PRE Feeding

Pasture

↓

Supplements

↓

Milking

↓

Pasture

POST Feeding

Pasture

↓

Milking

↓

Supplements

↓

Pasture

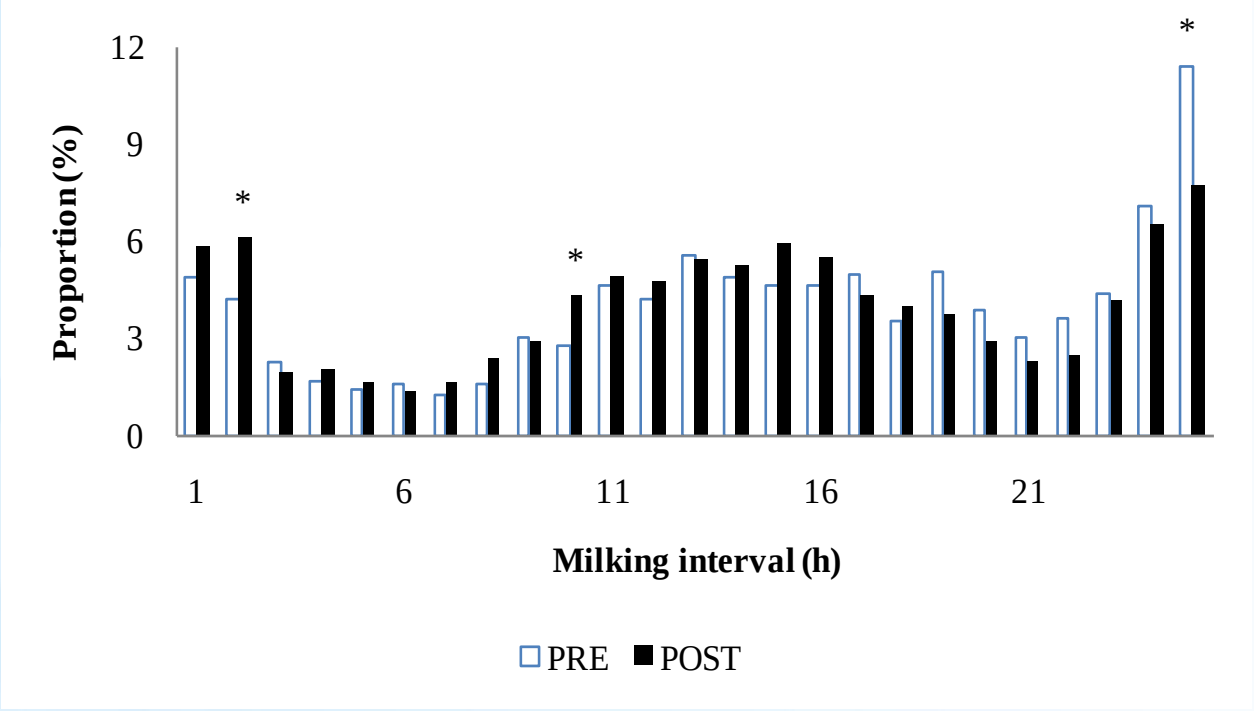
PRE vs POST feeding trial: Results

	PRE	POST	Significance

Difference in time spent on each area, but not on daily yield!

Lyons et al. (2013) J. Dairy Sci, 96, 4397-4405.

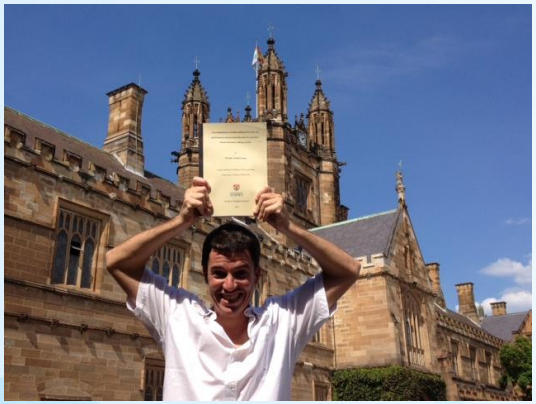
PRE vs POST feeding trial: Results



Lyons et al. (2013) J. Dairy Sci, 96, 4397-4405.

Main findings of my research

- Achievable targets for pasture-based AMS
- Identification of factors that affect milking intervals
- Incentive management (frequency, size & location)



What could the future look like?

How will Australian cows be milked?

- 48% of dairy sheds were commissioned more than 15 years ago
- 56% of dairy farms spend more than 4h/d milking
- 50% of farmers are considering installing a new dairy in the future
- 50% of farmers would consider installing AMS (+22% not sure)

How will Australian cows be milked?

Reasons to consider AMS	Reasons to not consider AMS
Lifestyle (66%)	Economic (75%)
Make dairy attractive (58%)	Farm layout (41%)
Data and information (57%)	Financial (38%)
Higher MF and milk yield (56%)	Support (25%)
Reduce labour units (50%)	Being on call (23%)

Interest for more information

AMS KPI Project

AMS KPI Project - General farm information

July 2015

The Automatic Milking Systems' KPI Project provides the Dairy Industry with key information of what is achievable under commercial conditions. Information about milk production, AMS utilisation and farm demographics will help understand how these farms 'behave' over a 12 month period.

Table 1: General farm information

	Farm 1	Farm 2	Farm 2	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8	Farm 9
Breed of cows	Holstein, Holstein x Jersey, HJx Brown Swiss, Holstein x Brown Swiss, Red Holstein	Holstein	Holstein	Holstein and Brown Swiss (5%)	Holstein	Holstein	Holstein	Friesian x Jersey	Holstein
Calving system	Year round	Seasonal	Split (3 batches)	Year round	-	Year round	Split (2 batches)	Seasonal	Seasonal
Milking area (ha)	55	60	100	40	100	75	43	90	50
Type of robots	Single box	Single box	Single box	Single box	Single box	Robotic rotary	Single box	Single box	Single box
Number of robots (#)	3	3	3	3	6	-	3	3	3
Feed stations (#)	0	6	4	0	6	14	3	2	2
Gate time changes	6:30, 13:00 & 20:00	1:30, 9:30 & 16:30 (feedpad 23:30)	2:00, 8:00 & 17:00	Barn with free cow traffic	0:00, 10:00 & 16:00	4:00, 11:00 & 19:00	5:00, 14:00 & 22:00	1:30, 9:00 & 16:30	2:30, 9:30 & 16:00

AMS KPI Project

Table 2: Herd information

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8	Farm 9
Cows in milk (#)	198	41	149	186	310	368	122	66	105
Heifers (%)	34%	34%	34%	32%	15%	36%	26%	68%	36%
Animals that calved (#)	9	1	23	12	26	49	29	3	7
Farm stocking rate (milking cows/ha)	4	0.68	1.49	4.65	3.10	4.91	2.84	0.73	2.10
Robot stocking rate (milking cows/robot)	66	14	50	62	52	368	41	22	35
DIM (#)	160	260	182	144	193	185	162	151	214

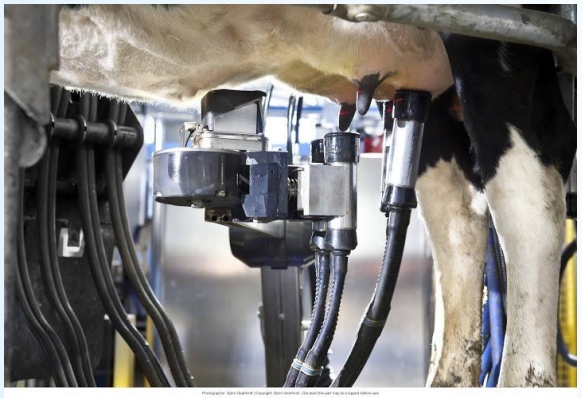
Table 3: Daily milk production and quality

	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5	Farm 6	Farm 7	Farm 8	Farm 9
Daily milk production (kg/day)	4,372	993	3,893	5,792	6,834	7,186	2,704	1,080	2,577
Fat (%)	3.87	3.79	3.82	3.96	-	3.15	4.08	4.6	-
Protein (%)	3.34	3.47	3.34	3.35	-	3.3	3.5	3.37	-
Somatic cell count (x 1000)	188	75	172	146	-	320	84	107	-

All this information is available online

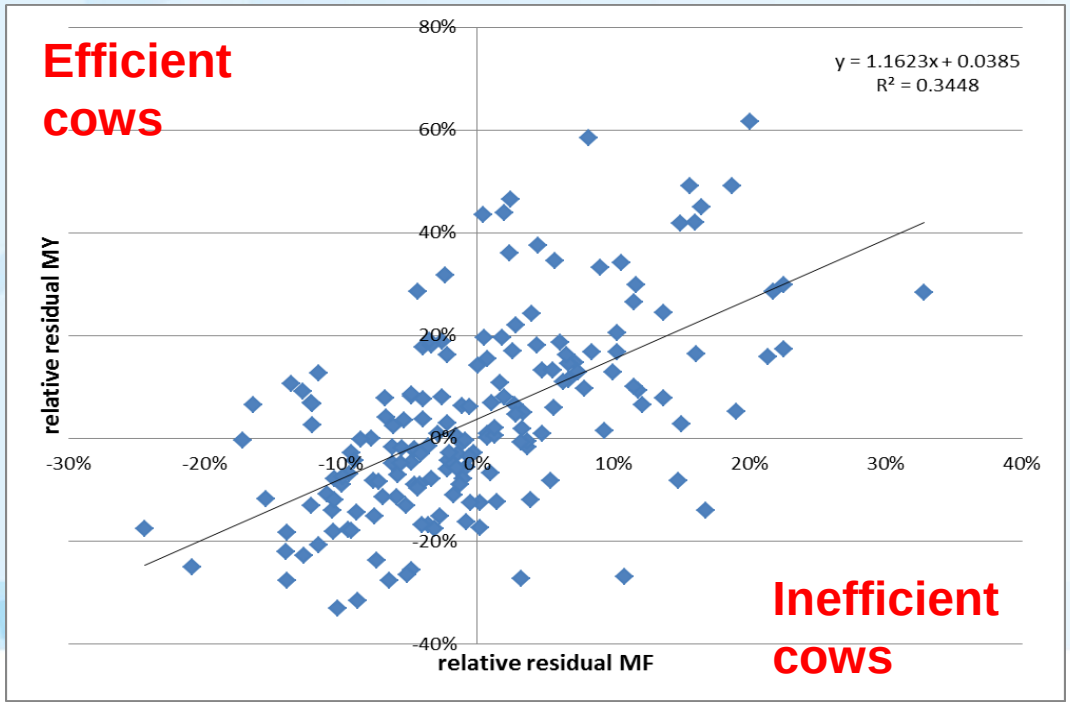
AMS farmers priorities

- Feed allocation / management
- Maximizing system capacity
- Data needs to provide information
- Different needs of different farmers



Industry priorities

- Economics and benchmarking
- Training needs
- Herd testing and breeding



40% more milk with 10% less milkings

Conclusion

- AMS is not a new way of farming
- Good understanding of what is achievable
- Still work to be done for pasture-based systems
- Management of huge amount of data
- Need to have an industry approach

Integrations of technologies on dairy farms enable innovation only if they can have a positive impact on farm (sustainability)

Thank you very much for your attention!

The AW Howard Memorial Trust Inc.

Dairy Australia
Your Levy at Work

NSW GOVERNMENT Department of Primary Industries

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