

Once-a-day Milking: Research Update

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Current dairy industry facts

Number of dairy cows increased by over 27% between 2013 and 2018

Domestic milk intake increased by just under 40% in the period 2013 to 2018

6-week calving rate increased 8 % between 2015 and 2019

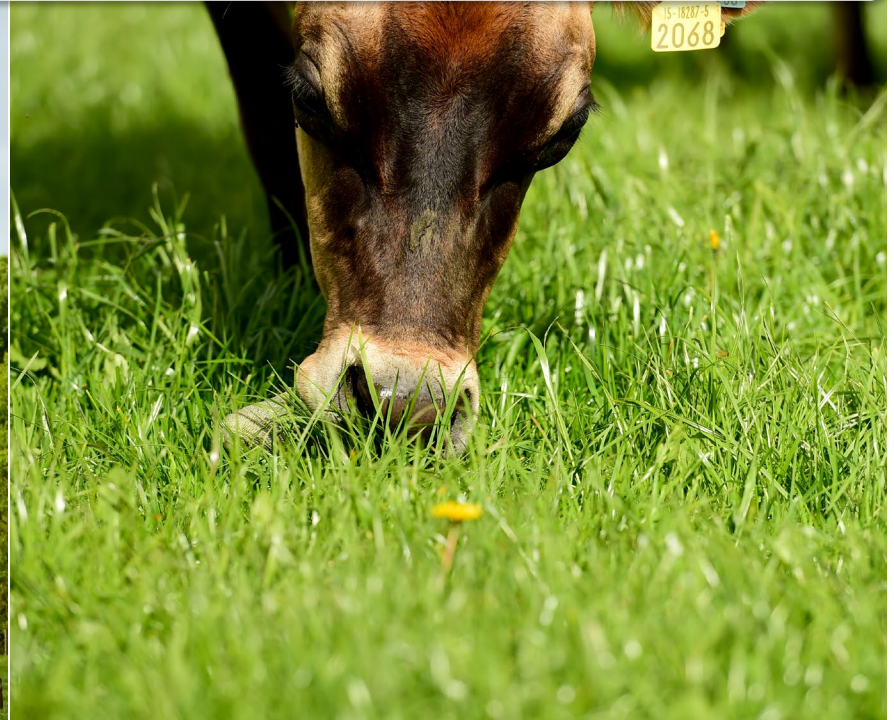
Higher labour input required – particularly in spring!

Difficulties sourcing short term labour

Age profile of farmers:
2011: 11% under 35;
13% over 65
2016: 5% under 35;
16% over 65

Possible Solution?

Once-a-day (OAD) milking:



- In systems where milk production per cow is not the focus OAD milking may offer a viable alternative
- Short-term OAD milking can help alleviate labour shortages in spring

OAD milking experiments at Moorepark



■ Year 1 – 2018

- Compare twice-a-day (TAD) milking to OAD for 4, 6 or 8 weeks at the start of lactation on immediate and total lactation performance

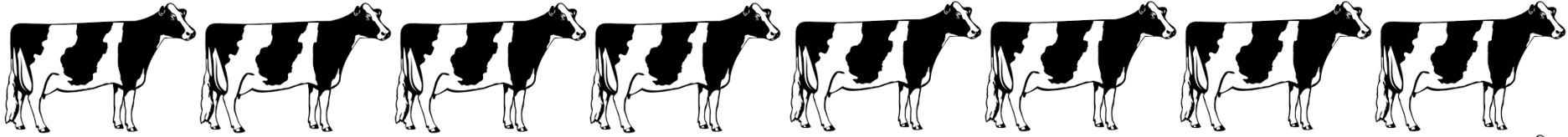
■ Year 2 – 2019

- Compare TAD milking to fulltime OAD and OAD for 2, 4 or 6 weeks at the start of lactation on immediate and total lactation performance

Grassland and herd management

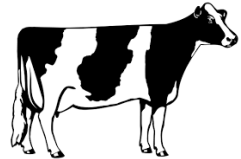
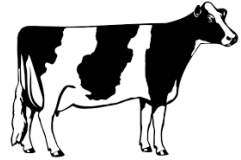
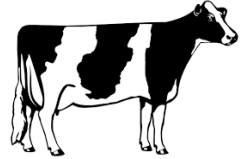
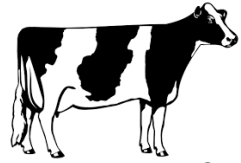
- Milking routine
 - teats stripped, pre dipped, dry wiped, clusters on and post dipped (Deosan). Normal routine
- OAD cows milked first, received all concentrate in one feed
- Minimal concentrate supplementation
 - 2018: 875 kg (snow and drought)
 - 2019: 450 kg
- Grass – target post grazing height 4-4.2cm,
 - Allowance 12 hrs during 1st rotation, 24 -36 hours 2nd rotation onwards
 - Always high quality grass available (pre-grazing yield 1400 – 1600 kg DM/ha)
- Farm cover guidelines used as per PBI (O'Donovan et al., 2019)
- 11 week breeding season





Herd Description - 2018

- 60 cows
- 15 first lactation cows and 45 in their second or greater lactation
- 47 Holstein Friesian (HF) cows and 14 HF x Jersey cross cows
- Herd EBI = €162
- Mean calving date of the herd was 11th March, 2018 (s.d. 14.5 days)

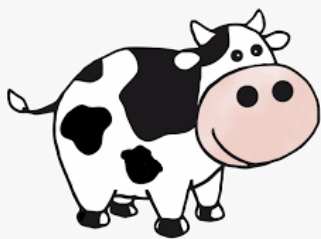


1st 4 weeks of lactation



- OAD milking reduced **milk yield** by **22%**
- No effect on milk fat, protein and lactose %
- OAD **milk solids yield** (MSY) was **20%** lower than TAD

	OAD	TAD
Cumulative 4-week milk yield (kg/cow)	487	618
Cumulative 4-week MSY (kg/cow)	44	55



1st 8 weeks of lactation

	OAD4	OAD6	OAD8	TAD
Cumulative 8-week milk yield (kg/cow)	1204 ^b	1165 ^{bc}	1076 ^c	1415 ^a
Cumulative 8-week MSY (kg/cow)	101 ^b	100 ^b	90 ^c	117 ^a

-24%

-23%

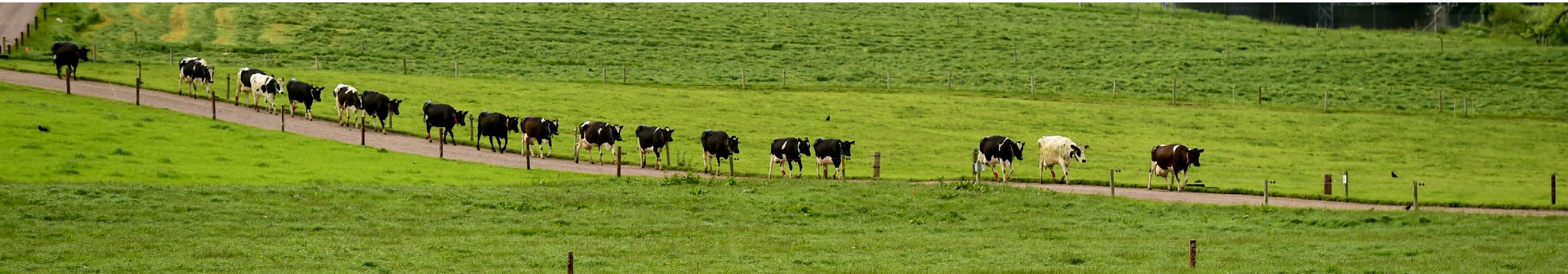
- After 8 weeks
 - TAD higher MY and MSY than all OAD treatments
 - OAD8 MSY lower than all other treatments

35 weeks of lactation

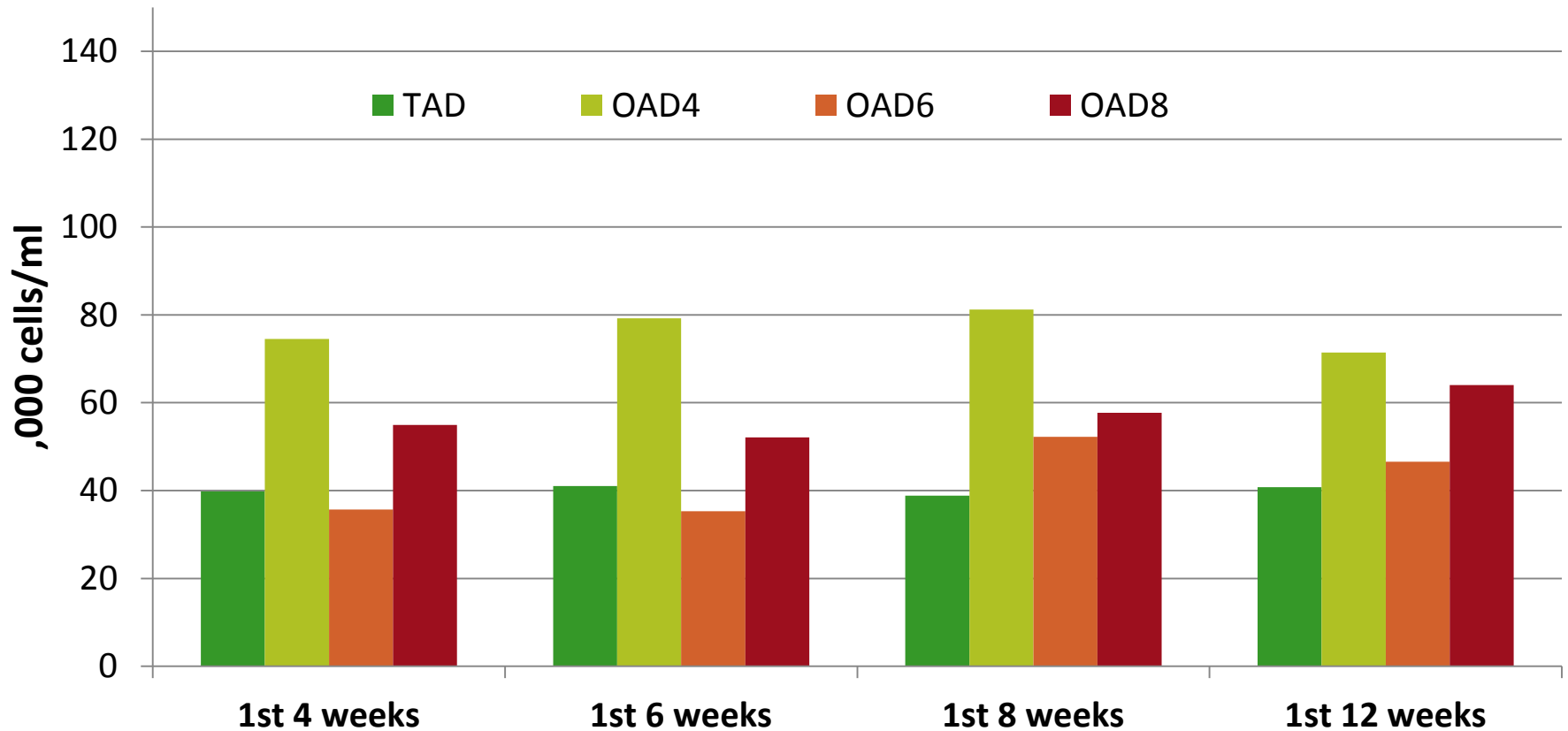
	OAD4	OAD6	OAD8	TAD	P value
Cumulative 35-week milk yield (kg/cow)	5073 ^{ab}	4913 ^b	4815 ^b	5300 ^a	0.035
Cumulative 35-week MSY (kg/cow)	405	398	387	415	0.299

- TAD and OAD4 similar 35-week milk yield
- All OAD herds had similar milk yield
- OAD6 and OAD8 had lower milk yield compared to TAD

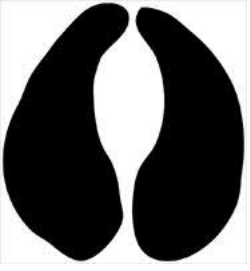
No difference in cumulative 35-week MSY



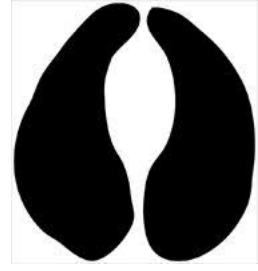
Somatic Cell Count



- **No difference in SCC between treatments**
- **Cows not selected on SCC before experiment**



Locomotion scoring



No difference in locomotion scores (indicator of lameness) between treatments



Fertility

- No difference between treatments

Milking Time

1st 4 weeks

- Total milking time 9.3 minutes for OAD cows
- Total milking time 13.2 minutes for TAD cows

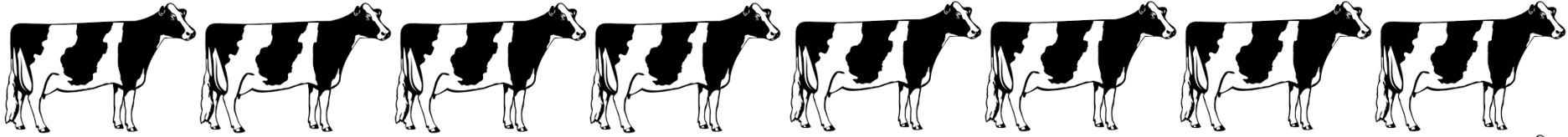


Key Findings – Short term OAD 2018

- Short term OAD is an option in early lactation on all farms
 - Initial 22 – 24% reduction in milk yield
 - 20 – 23% reduction in milk solids yield
 - Immediate increase in production when cows return to TAD
 - No difference in total lactation MSY
 - 6 and 8 week OAD in early lactation reduce milk yield compared to TAD
 - No difference in SCC
 - Milking time reduced by 30%

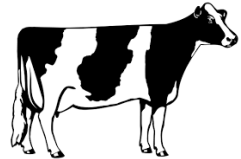
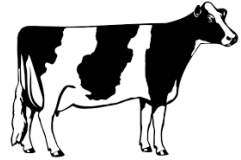
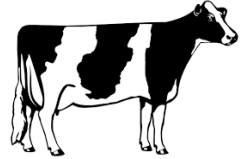
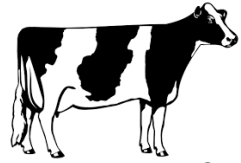
Moorepark 2019 OAD Study

Investigation of short term OAD in early lactation compared to fulltime OAD and twice a day milking



Herd Description - 2019

- 85 cows – 5 Treatments, 23% first lactation cows
- Herd EBI = €164 – Fertility (70) – 10% Jersey cross
- Mean calving date of the herd was 18th Feb, 2019
- Randomised pre-calving: Previous lactation MY, EBI, BW and BCS, SCC (<200)
- As cows calved they were assigned onto the treatment and stayed for their allocated time. No cows were changed off OAD, all stayed on assigned treatments
- Cows calved to grass, little to no silage offered, max of 4kgs offered post calving, reduced based on grass supply
- Exceptional spring assisted the fast settling of the herds

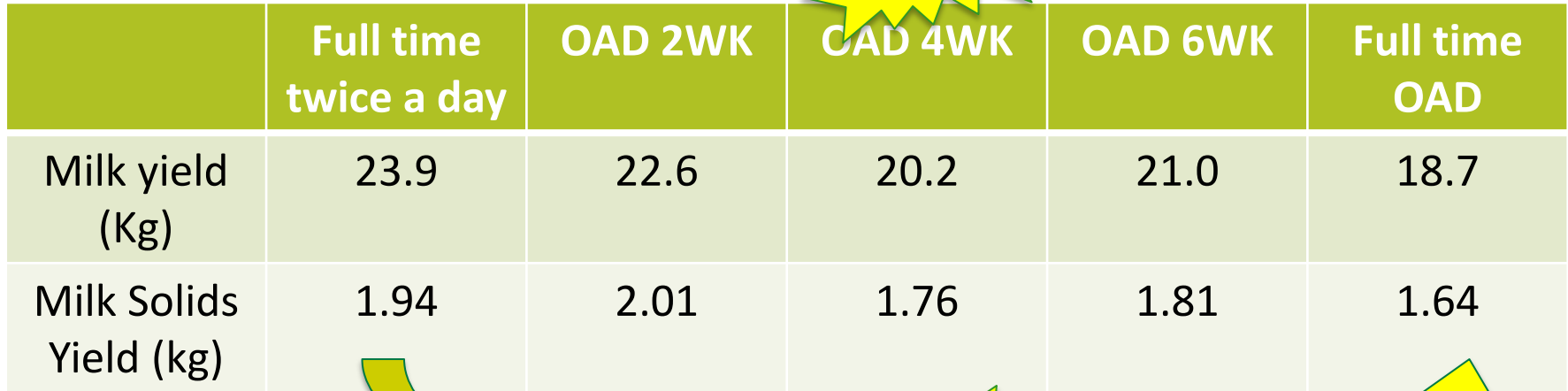


Herds Milk Performance First 6 weeks

	Full time twice a day	OAD 2WK	OAD 4WK	OAD 6WK	Full time OAD
Milk yield	22.5	21.4	18.2	19.6	18.2
Milk Fat conc (%)	5.08	5.73	5.96	5.46	5.53
Milk Protein conc (%)	3.44	3.62	3.46	3.44	3.57
Lactose Conc (%)	4.75	4.75	4.58	4.64	4.66
Milk solids Yield (kg)	1.92	1.99	1.69	1.75	1.65
% Milk Solids diff vs TAD		No diff	12%	9%	14%

12% reduction

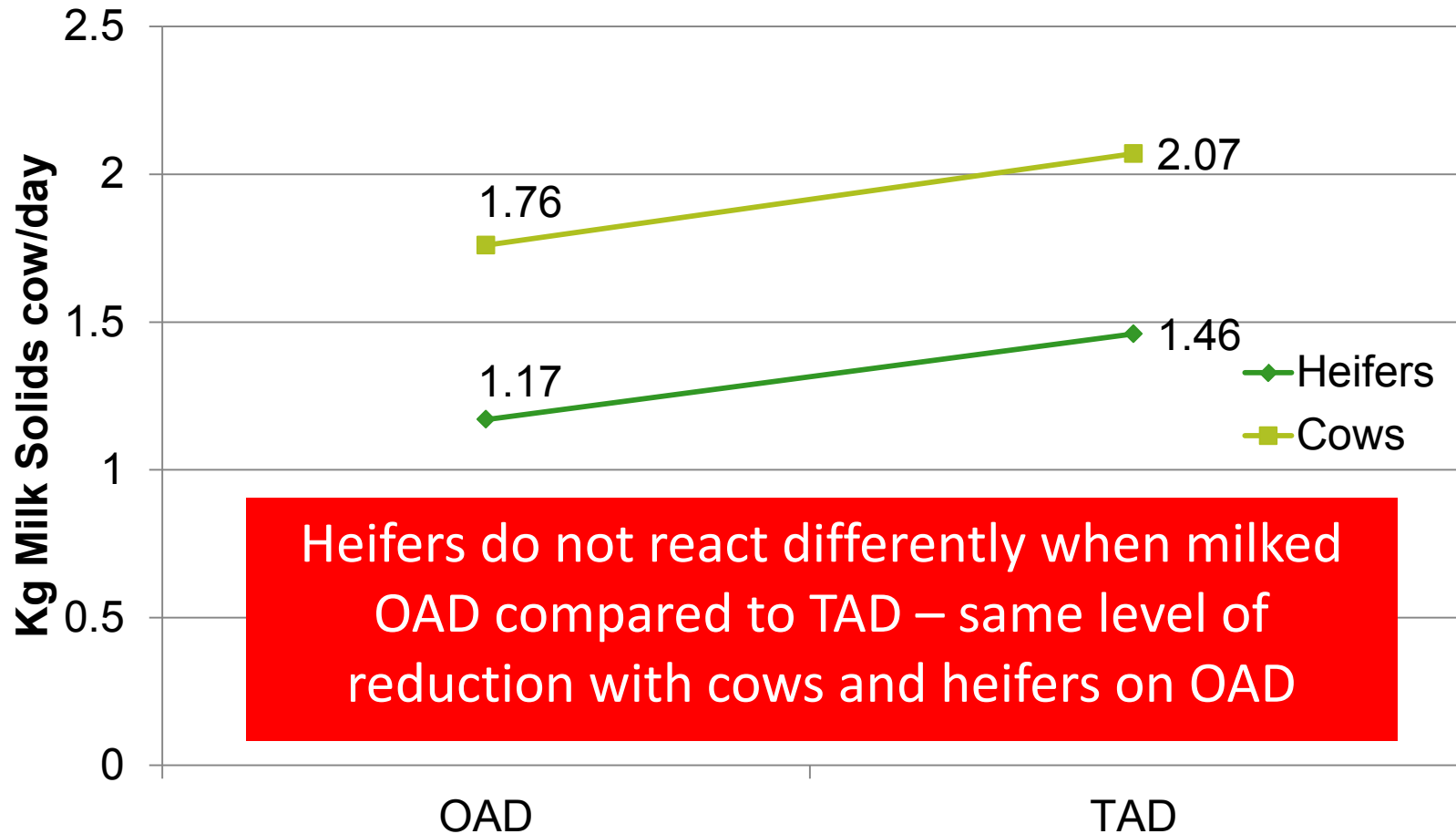
Milk Performance First 10 weeks



	Full time twice a day	OAD 2WK	OAD 4WK	OAD 6WK	Full time OAD
Milk yield (Kg)	23.9	22.6	20.2	21.0	18.7
Milk Solids Yield (kg)	1.94	2.01	1.76	1.81	1.64

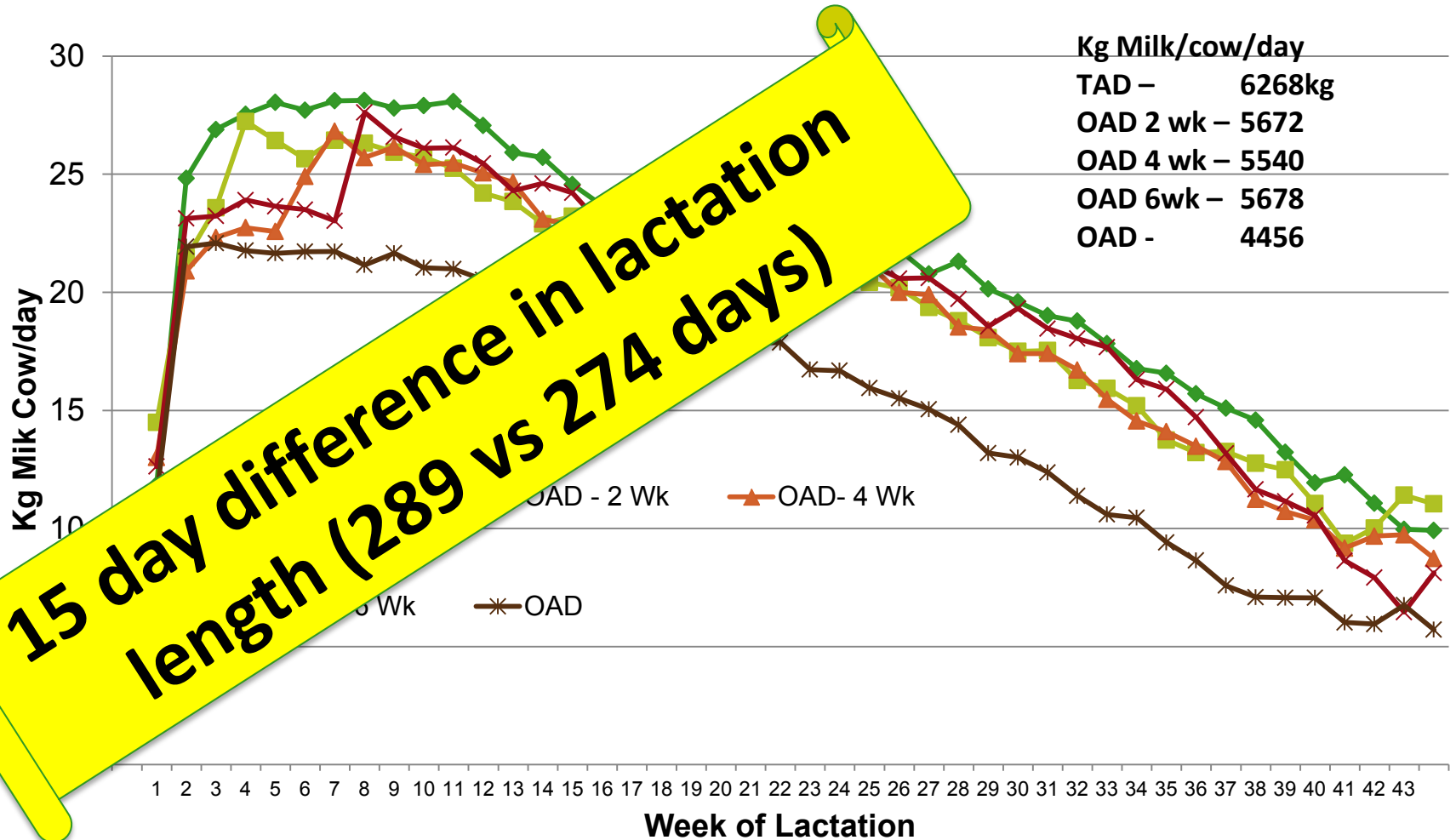
- No difference between TAD and OAD2
- OAD4 and OAD6 similar but **↓14% in milk yield** and **- 8% in MSY** compared to TAD
- Full-time OAD lower than all other treatments

Milking frequency effect on first lactation & mature cows (30 weeks)



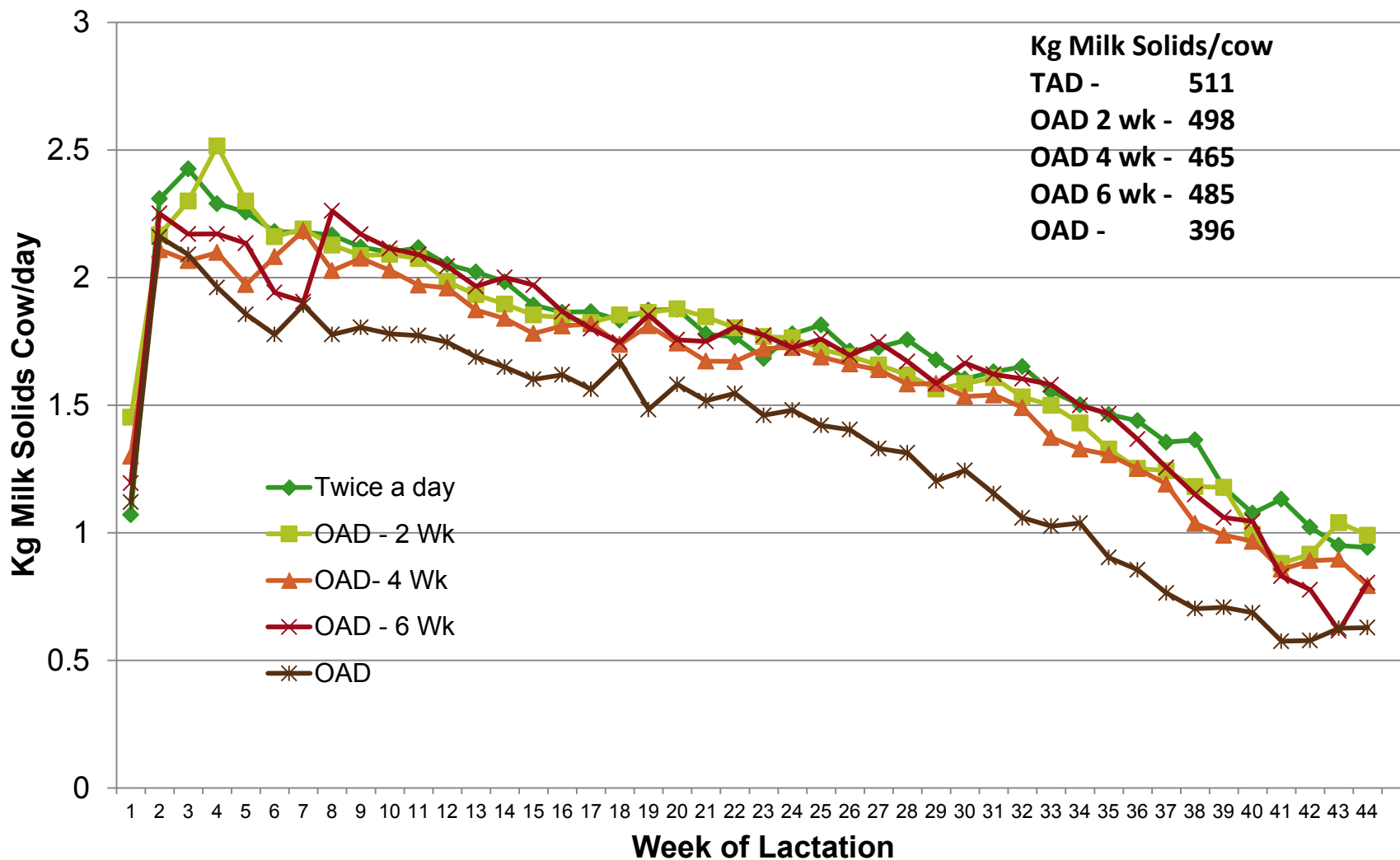
Heifers do not react differently when milked OAD compared to TAD – same level of reduction with cows and heifers on OAD

Milk Yield - Full Lactation Curve



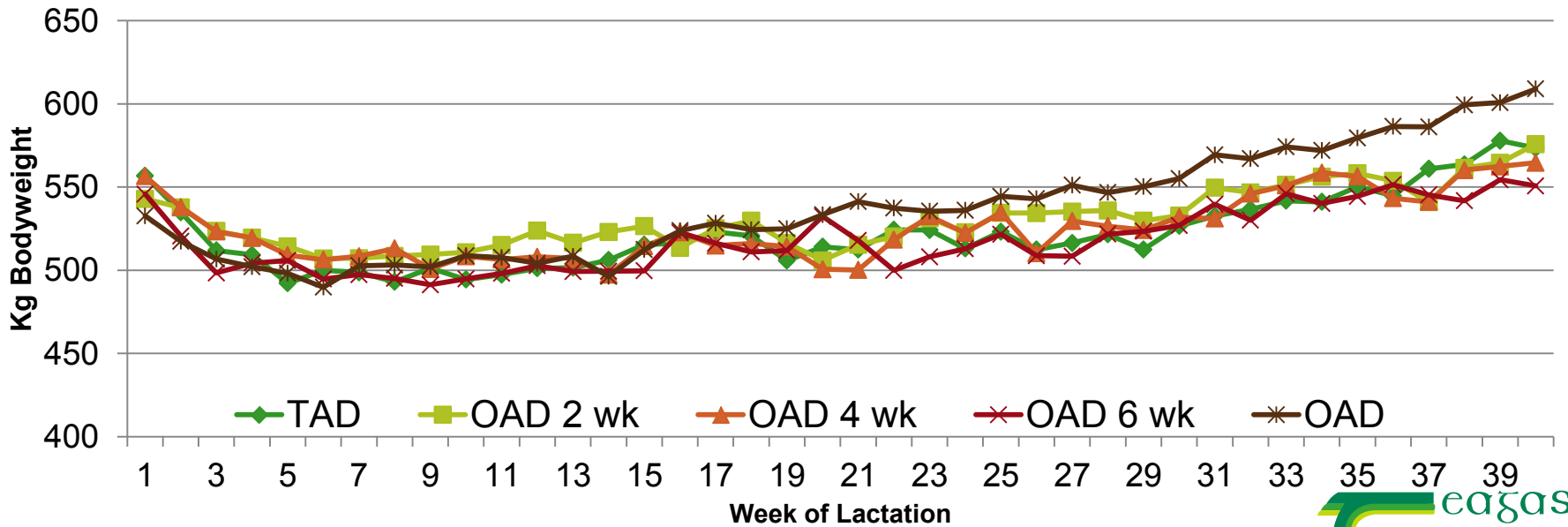
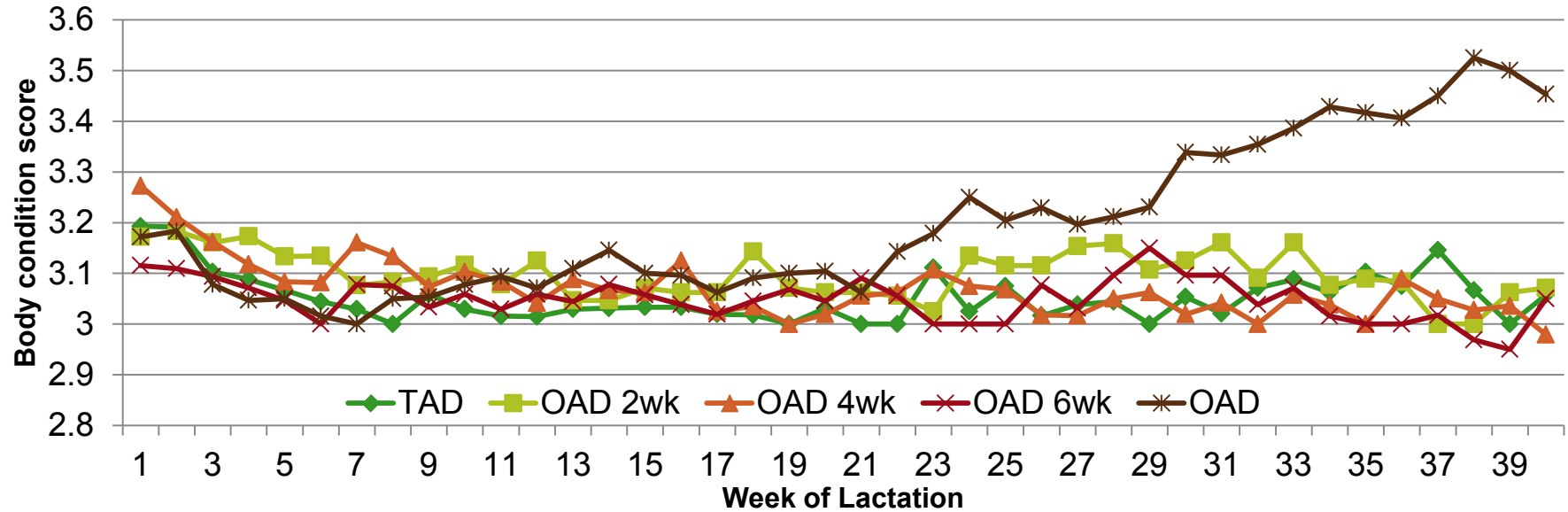
29 % reduction in milk yield OAD compared to TAD

Milk Solids - Full Lactation Curve



23% reduction in milk solids yield OAD compared to TAD

Bodyweight and Body Condition score profiles



Health and Fertility Performance 2019

- No major mastitis incidences across the year
- Minimal cases of mastitis (5 TAD, 4 OAD had quarters treated)
- Little lameness – repeat issues with same cows



	Conception to First Service (%)	Calving to conception (days)	Not in calf (%)
TAD	53	89	18 (3)
OAD	71	91	6 (1)

Take Home Message – Full time OAD

- High performance can be achieved from OAD – almost 400 kg MSY in year 1
- Good grassland and herd management essential
- High concentrate not the answer to achieving performance
- Grazing and milking management needs to be consistent - **one chance to get right!**
- Milk lactose is an issue in late lactation for full time OAD from 250 days in lactation onwards (shorter lactation)

Considerations when thinking of converting to OAD milking

Are you looking for a better work/life balance or find milking physically challenging

Do you find it difficult to attract/retain suitable staff

Would OAD milking avoid capital expenditure to expand or replace the dairy infrastructure

Does your farm have large differences in altitude

Is your herd walking more than 2km to the furthest paddock

Can you afford for your bulk milk SCC to increase by 20 – 40,000

Are you meeting industry targets for reproductive performance

How would you use the time you save by OAD milking

Can your business sustain at least one season of reduced MSY/cow

What is the genetic make-up of your herd

Bull selection

- In theory want bulls with highest yield of solids into the minimum volume of milk and avoid bulls most prone SCC.

Cut offs are:

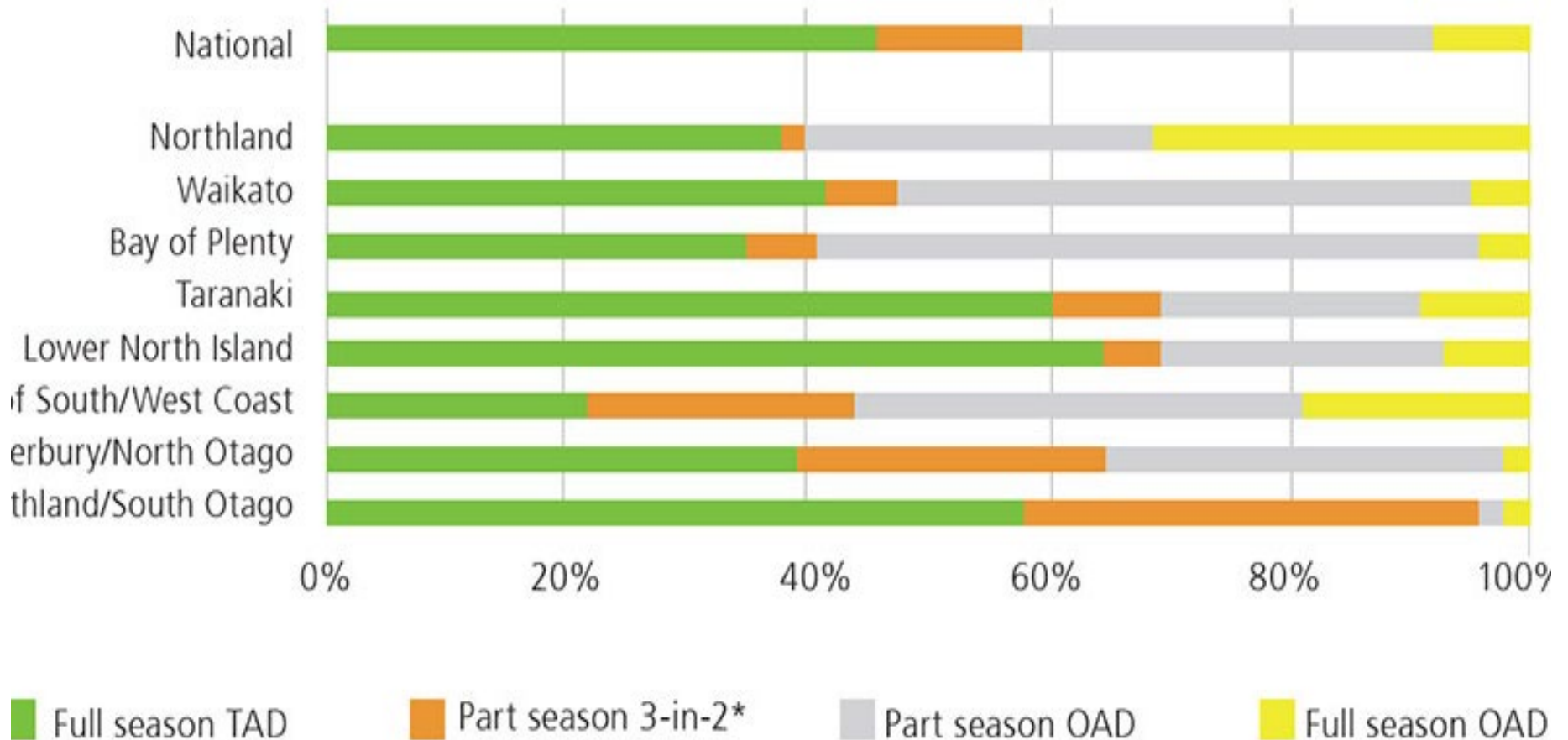
- Positive for Health SI
- Min +20kg (+23kg) combined PTA for milk solids (F+P yield)
- Min +0.2 (+0.24) combined PTA for milk solids (F+P yield)
- Max +200 PTA for milk volume

Rank	Code	Bull Name	Breed	HO %	EBI
36	FR4018	(IG) HILLARY SAMSON	HO	69	269
44	FR2314	GORTCREEN SEBASTAIN	HO	88	264
19	FR4428	JEANJO ART	HO	63	283
4	FR2424	POSSEXTOWN FAITHFUL	HO	66	313
17	FR4337	(IG) GABRIEL ZORO	HO	75	287
74	FR4530	(IG) GRANGEBRIDGE DUNKIRK	HO	66	246
63	FR4207	(IG) KILMANAGH RONALD	HO	81	251
50	FR4154	HAGGARD FRANKO	HO	84	259
3	FR4560	KILRONAN HIGH	HO	75	322
12	FR4547	(IG) DOONMANAGH SEVILLE	HO	78	293
15	FR4510	(IG) RONNOCO MILAN	HO	81	288
70	YKA	(IG) ARDKYLE MOUNT EVERET	HO	75	247
7	FR4571	BRIDEPARK GRANDSLAM	HO	84	308
42	FR2425	SPRINGHAVEN WIZARD	HO	63	266
11	FR4439	KILLALOUGH SAMIR	HO	72	294
32	JE4289	BRADENE PAS TRIPLESTAR	JE	0	273
57	JE4516	CRESCENT EXCELL MISTY ET	JE	0	255

Take home messages (from Donagh Berry's presentation last year)

- **EBI is relevant for OAD but can be tweaked like it can be in all Irish herds**
 - **Different emphasis**
 - **New traits**
- **Milk genetic evaluations translate into improved performance in line with expectations for OAD**
- **No justification for a separate breeding program**

Regional use of different milking regimes in a 2018/19 survey of 500 farms



*Farmers who used 3-in-2 may also have used OAD