



What role has the tactical use of once-a-day milking on Irish dairy farms?

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Introduction

- Why consider short-term once-a day (OAD) milking
 - Difficulty sourcing labour
 - Better work life balance
 - Overcome issues with workload e.g. calving
- Benefits of OAD
 - improved energy balance due to lower bodyweight (BW) and body condition score (BCS) loss
 - improved fertility performance
- Potential drawbacks of OAD
 - reduction in milk production (~22%)
 - increased somatic cell count (SCC)
 - may result in decreased farm revenue



Moorepark Experiments Overview

Compared to twice-a-day (TAD) milking:

- 3 years fulltime OAD
- Early lactation OAD
- Late lactation OAD
- Early and late lactation OAD

	2019	2020	2021
Herd EBI	€164 (Fert €70)	€169 (Fert €66)	€214 (Fert €87)
Proportion heifers	23%	24%	27%

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
- Grass – target post grazing height 4-4.2cm,
 - Allowance 12 hrs during 1st rotation, 24 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



Fulltime OAD

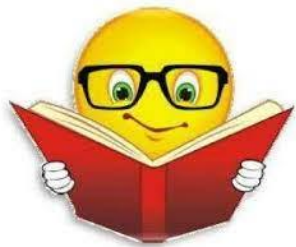


Fulltime OAD – 3 years (2019, 2020 & 2021)

3 year average



	Milk Yield (kg)	Milk Solids Yield (kg)
TAD	5566	478
OAD	4020	379
Difference	-28%	-21%



- NZ data suggests 11% reduction in first year of OAD but by year 3 prior level of production regained
- Moorepark: difference between OAD and TAD herd similar over first three years – no recovery!

Fulltime OAD – 3 years (2019, 2020 & 2021)

Milk Yield (kg)

	<u>2019</u>	<u>2020</u>	<u>2021</u>
TAD	5138^a	6016^b	5546^b
OAD	3814^a	4292^b	3955^b
Difference	-26%	-29%	-29%



Milk Solids Yield (kg)

	<u>2019</u>	<u>2020</u>	<u>2021</u>
TAD	424^a	516^b	493^b
OAD	341^a	403^b	393^b
Difference	-20%	-22%	-20%

	<u>2019</u>	<u>2020</u>	<u>2021</u>
Concentrate fed (kg/cow)	450	330	590

Early Lactation OAD

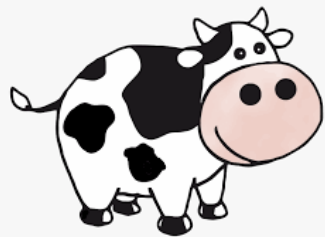


1st 4 weeks of lactation



- 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
Daily 4-week milk yield (kg/cow/day)	17.4	22.1
DAily 4-week MSY (kg/cow)	1.57	1.96



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%

90^c

-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
Cumulative 35-week milk yield (kg/cow)	5073 ^{ab}	4913 ^b	4815 ^b	5300 ^a
Cumulative 35-week MSY (kg/cow)	405	398	387	415

- 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
- 7% reduction in 35-week MSY when milk OAD for 8 weeks at start of lactation
- **Effect even less at farm level as milk OAD as not all cows calved at start**

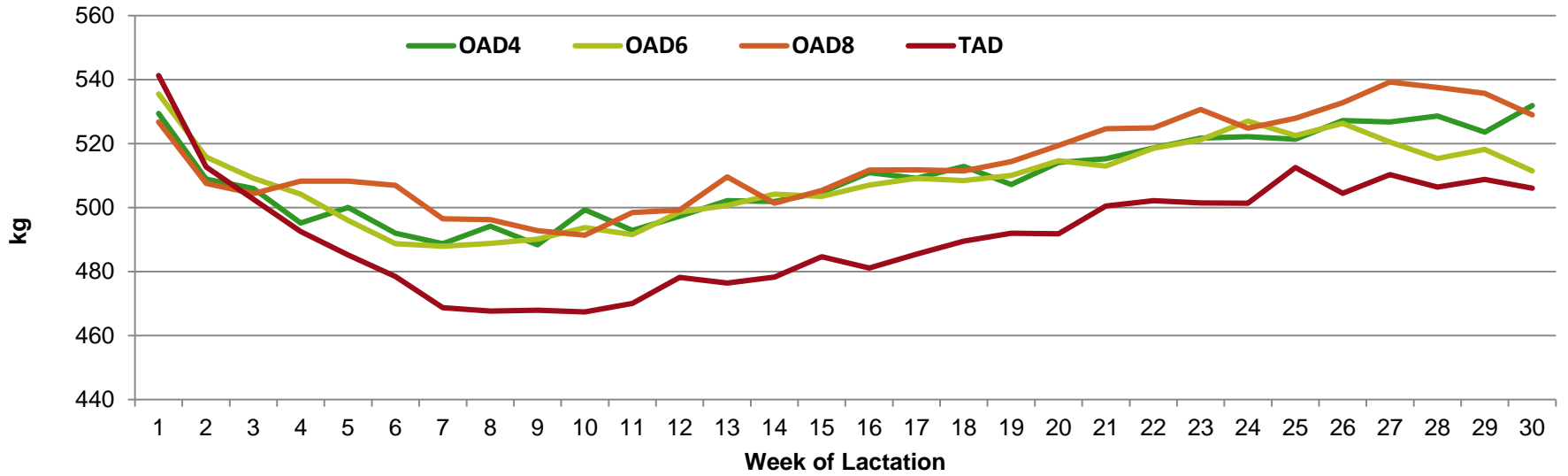


Somatic Cell Score

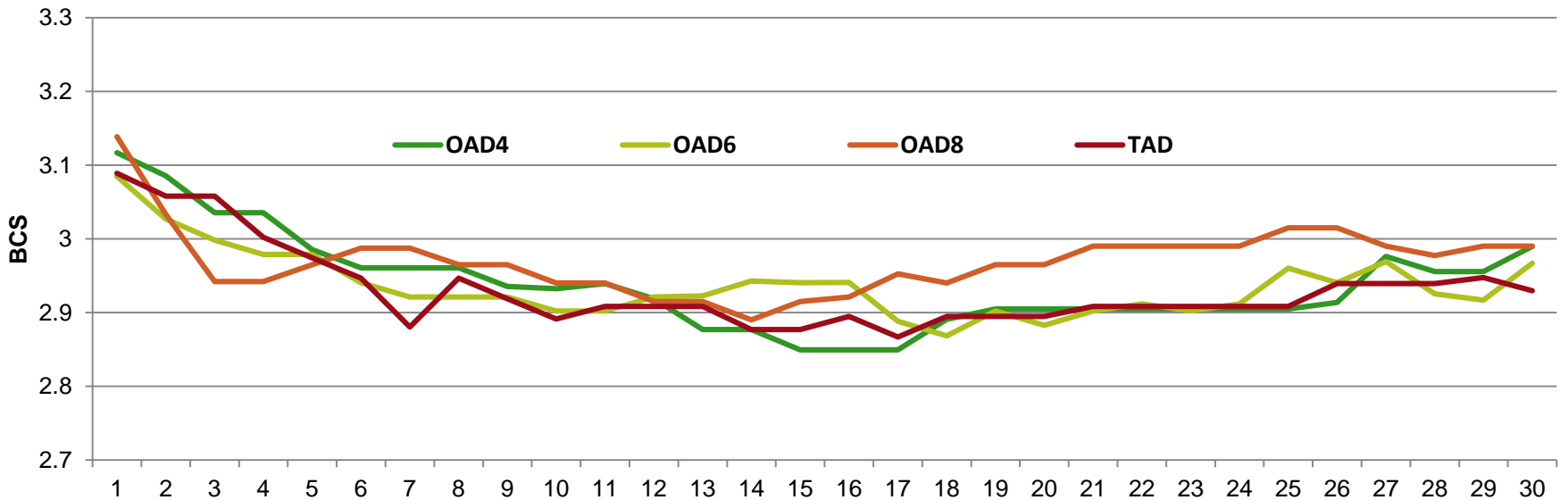
	TAD	OAD 4wk	OAD 6wk	OAD 8wk
Week 1 to 4	3.26 ^b	4.43 ^a	4.02 ^a	4.19 ^a
Week 5 and 6	3.30	3.93	3.79	4.00
Week 7 and 8	3.16	3.96	4.30	4.05
Week 9 and 10	3.28	3.39	3.52	4.39
Full Lactation (35 weeks)	3.54	3.85	3.94	3.98

- OAD milking increased SCS during first 4 weeks lactation
- Tendency for higher SCS with OAD milking
- No effect over whole lactation

Bodyweight and Body Condition Score



Body Condition Score



Key Findings – Early Lactation OAD

- 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
 - 6 and 8 week OAD in early lactation reduce milk and milk solids yield compared to TAD
 - No difference in SCC
 - Milking time reduced by 30%

Late Lactation OAD



Milk yield – late lactation

- Average pre-grazing yield was 1521 kg DM/ha,
- Post-grazing height was 5.0 cm
- Concentrate input was 2 kg DM/cow/day
- OAD11 changed to OAD 25th Sept. & OAD7 changed 23rd Oct.

	TAD	OAD7	OAD11
Weeks 1 to 4 (kg/day)	16.2 ^a	16.5 ^a	13.2 ^b
Weeks 5 to 8 (kg/day)	14.5 ^b	11.8 ^a	10.7 ^a
Weeks 9 to 11 (kg/day)	12.8 ^b	8.9 ^a	8.1 ^a

Annotations: A starburst labeled '-12%' is positioned between the TAD and OAD7 columns for the first two rows. A starburst labeled '-25%' is positioned between the OAD7 and OAD11 columns for the last two rows. Arrows indicate the direction of comparison for these percentages.

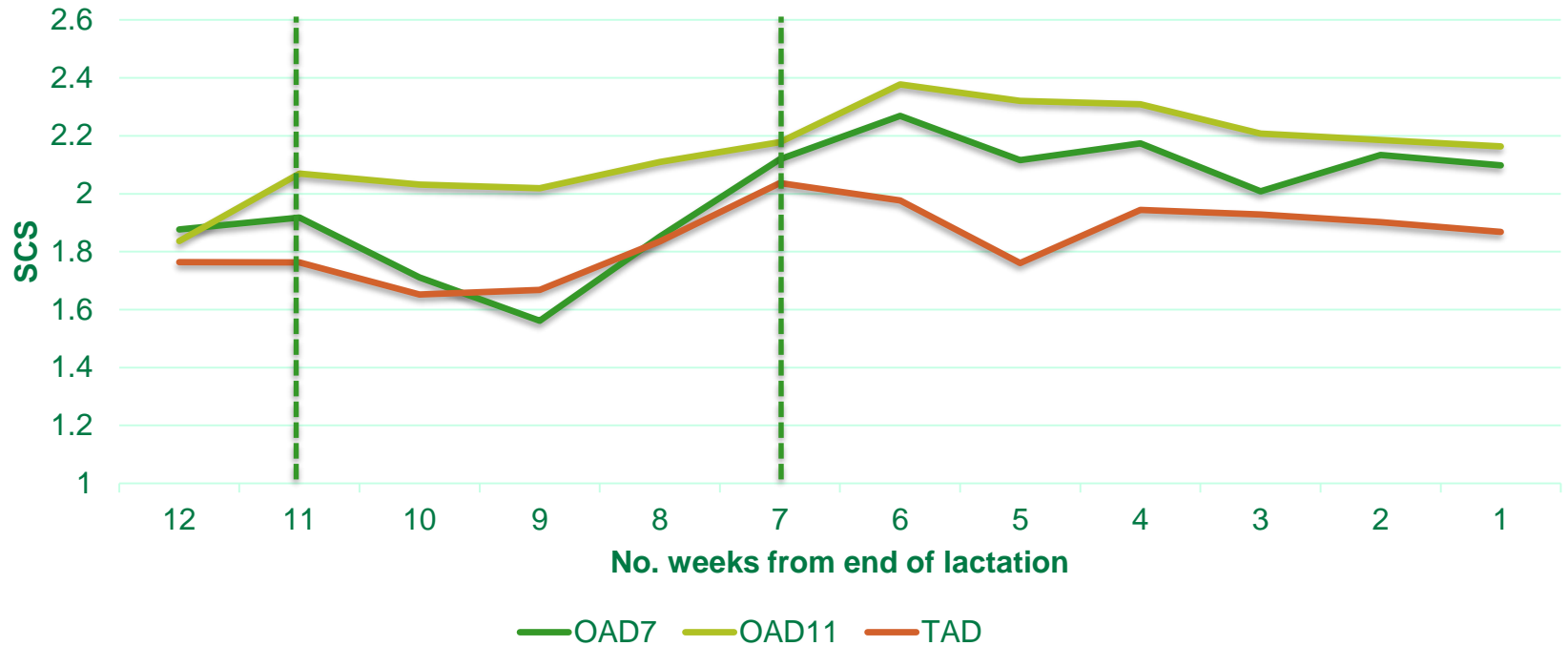
- 1st four weeks of OAD milking MY was 19% lower (OAD11 & OAD7)
- Drop in production greater when milking OAD
- Relative production loss **less** in late lactation compared with early lactation, as milk volumes are considerably lower in late lactation

Milk solids yield – late lactation

	TAD	OAD7	OAD11
Weeks 1 to 4 (kg/day)	1.5 ^a	1.5 ^a	1.3 ^b
Weeks 5 to 8 (kg/day)	1.4 ^b	1.2 ^a	1.1 ^a
Weeks 9 to 11 (kg/day)	1.2 ^b	1.0 ^a	0.8 ^a

- MSY reduces by ~11% in the first 4 weeks with OAD milking
- Weeks 5 to 8 of OAD milking the magnitude of the reduction increased as the OAD cows were producing 20% less MSY than the TAD cows

Effect of late lactation OAD on SCS



- Immediate increase in SCS when switch to OAD milking
- Highest SCS when milking OAD for 11 weeks
- On average SCS was 12% higher with OAD in late lactation
- Need SCC \leq 100,000 before switching to OAD

Late lactation OAD – take home messages

- Good grassland management essential
 - Need to include grass in diet for as long as possible
 - Reduce indoor milking
- Need low SCC with good management practice
- Increase in SCC when switch to OAD but reduces again **but** not back to TAD levels
- Labour saving
- Work life balance

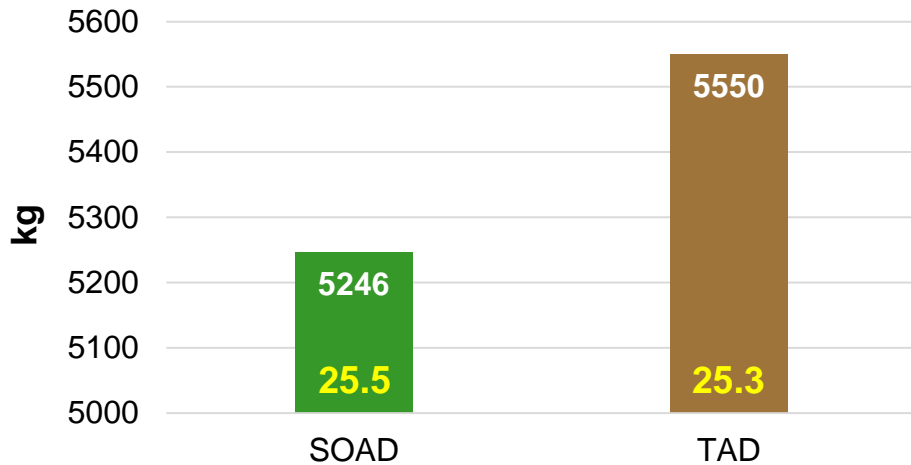
Early & Late Lactation OAD



3 weeks OAD start of lactation and 9 weeks OAD at end of lactation (Oct 4th)
(84 days OAD)

Milk and milk solids production – total lactation

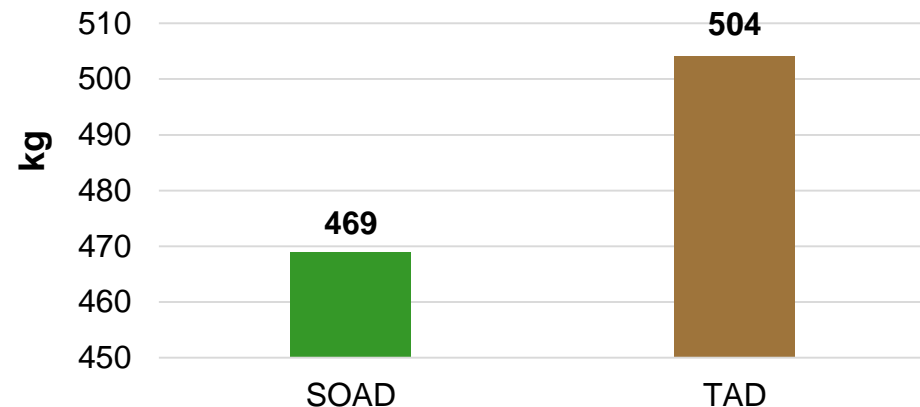
Total Lactation Milk Yield



- 5% reduction in MY with short-term OAD compared to TAD (304 kg)
- Peak MY same for SOAD and TAD
- Average lactation length same: 41 weeks

- 7% (35 kg) reduction in MSY for SOAD compared to TAD

Total Lactation Milk Solids Yield

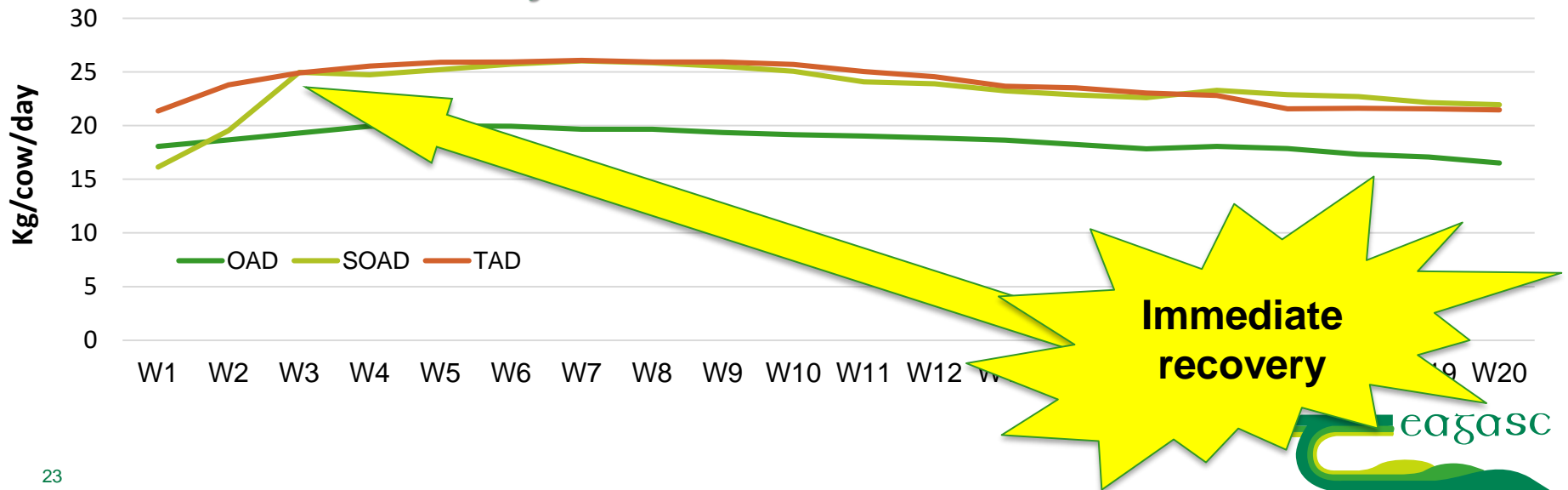


Milk & MSY: 1st 3 weeks lactation

	SOAD	TAD
Milk Yield 1st 3 weeks (kg)	18.0	21.5
MSY 1st 3 weeks (kg)	1.83	2.05

- Milk yield ▼ 16% in first 3 weeks
- Milk solids yield ▼ 11% in first 3 weeks

Milk yield weeks 1 to 20 of lactation



Milk & MSY: Last 9 weeks lactation

	OAD	SOAD	TAD
Milk Yield (kg)	10.0	10.1	13.8
MSY (kg)	0.91	1.05	1.37

- Immediate drop in production
- Over 9 weeks
 - 27% drop in milk yield
 - 23% drop in milk solids yield (due to ↓milk volume)
- SOAD cows producing same as cows on full-time OAD

Somatic cell count increased with late lactation OAD!

- Need SCC less than 100,000 before change over
- Dry any high SCC cows before switching to OAD

Short-term OAD: take home messages

- Good grassland management essential
 - Need to include grass in diet for as long as possible in autumn
- Immediate reduction in production with OAD milking
- Return to TAD: immediate recovery in early lactation
- SCC an issue in late lactation
- Production levels drop faster with OAD in late lactation
- Very little effect on total lactation production with short term OAD
- Labour saving

Short-term OAD has a role on all farms