

Effect of milking frequency on hoof health and locomotion scores of cows milked in a pasture based AMS

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AUTOGRASSMILK



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Introduction

- Lameness
 - Painful and debilitating condition
 - One of most important welfare issues for dairy cattle
- Costs associated with lameness
 - Reduced milk yield
 - Treatment
 - Increased risk of culling
 - Lower survival rate within herd

Introduction

- Successful operation of AMS requires cows to present at robot for milking on voluntary basis
- Effect of lameness on AMS
 - ↓ visits to AMS (Miguel-Pacheco et al., 2013)
 - ↓ milk production (Bach et al., 2006)
 - ↑ increased labour - fetching lame cows
 - ↓ efficiency of system

Introduction

- Milking frequency and lameness
 - CM pasture based systems
 - OAD milking vs TAD milking (O'Driscoll et al., 2009)
- No adverse effect of OAD milking
- Reduced sole bruising /lesions
 - Less time on roadways and holding yards

Hypothesis

Investigate the effect of reducing milking frequency on hoof health and locomotion scores of cows milked in a pasture based AMS

Materials and Methods

Materials and Methods

- Cows were randomised into two groups balanced for:
 - Breed,
 - Parity,
 - Days in milk,
 - Previous 25 days milk production and milking frequency

Group 1

n = 34

Milking permission 2
times per day

Group 2

n = 34

Milking permission 3
times per day

Materials and Methods

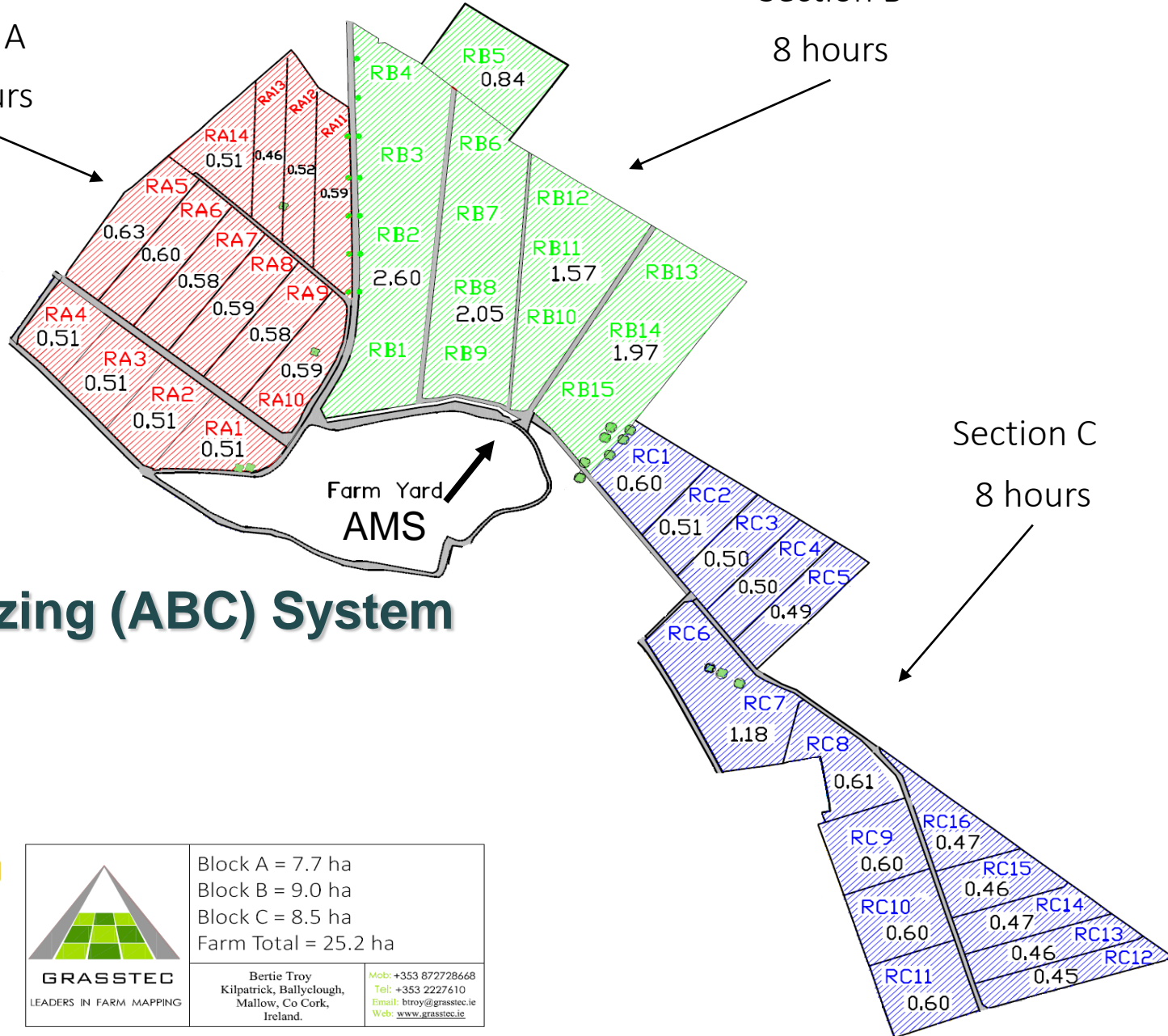
- Treatments were imposed from 60 - 160 DIM
- Diet
 - Grazed grass (17kg DM/cow/day)
 - Concentrate (0.8kg DM/cow/day)
- Grazing
 - Pre grazing herbage mass 1600kg DM/ha
 - Post grazing sward height 5cm

Farm Layout

Section A
8 hours


Section B
8 hours

Section C
8 hours



3-Way Grazing (ABC) System



 <p>GRASSTEC LEADERS IN FARM MAPPING</p>	<p>Block A = 7.7 ha Block B = 9.0 ha Block C = 8.5 ha Farm Total = 25.2 ha</p>
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Hoof Scores

- Subsample: 41 cows
- Cows scored on 3 occasions
 - 44, 85, 167 DIM
- Scored by lifting hind feet
 - Each claw examined individually



Hoof Health Scoring System

Scale



- Heel erosion 1 → 5
- Dermatitis 1 → 5
- White line disease 1 → 4
- Sole bruising 1 → 8

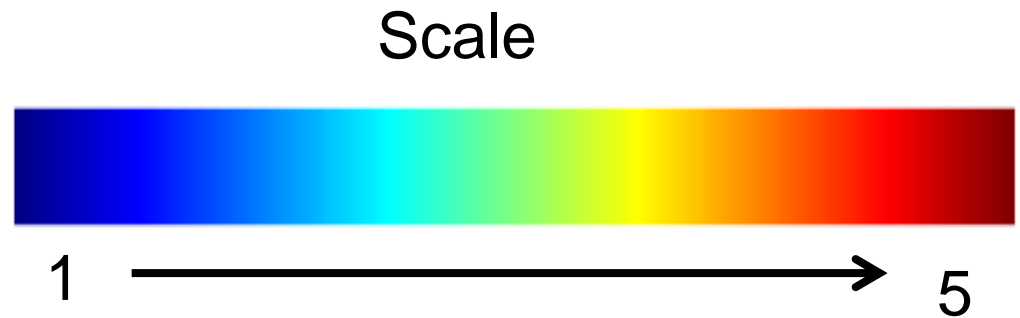
Locomotion Scores

- 67 cows scored
- Cows scored on 3 occasions
 - 64, 85, 113 DIM
- Level, clean, concrete surface
- Observed from side and behind



Locomotion Scoring System

- Spine Curvature
- Speed
- Tracking
- Head Carriage
- Ab/Aduction



Statistical Analysis

- Hoof scores
 - Proc Mixed in SAS
- Locomotion scores
 - Proc Glimmix in SAS
- Fixed effects
 - Milking frequency, breed, parity, DIM, exam and interactions
 - Exam included as random or repeated effect
 - Initial exam included as covariate

Results

Results - Milk Production & Cow Traffic

	G1	G2	p value
Milking Frequency/Day	1.5	1.8	<0.0001
Milking Interval/Visit	15.1	12.6	<0.0001
Milk Yield/Visit (kg)	12.7	10.4	<0.0001
Milk Yield/Day (kg)	18.4	19	NS
Milk Duration/Visit (mins)	7.3	6.6	<0.0001
Milk Duration/Day (mins)	10.7	12.3	<0.0001
Return Time/Visit (hours)	4.3	5	0.001
Wait Time/Day (hours)	1.8	2.5	<0.001

Results

- Clinical Lameness
 - Based on farm managers assessment
 - Cow had to require treatment
 - 10/68 cows (14%) clinically lame once
 - 3/10 cows (30%) clinically lame > once
- Activity
 - G1 - 5% > than G2

Results - Hoof Health

Exam	G1			G2			P-value		
	1	2	3	1	2	3	Trt.	Exam	Trt*Ex
Heel Erosion	4.4	3.7	4.2	5.2	3.7	4.7	NS	NS	NS
Dermatitis	0.9	1.2	1.2	1.0	1.3	1.4	NS	NS	NS
White Line Disease	2.1	1.9	1.3	2.2	2.4	1.8	NS	NS	NS
Sole Bruising	3.6	4.6	1.8	3.6	3.3	1.8	NS	0.001	NS

Results - Locomotion

Exam	G1			G2			P-value		
	1	2	3	1	2	3	Trt.	Exam	Trt*Ex
Spine Curvature	1.9	1.8	1.6	1.9	1.6	1.5	NS	0.001	0.001
Speed	1.3	1.1	1.0	1.3	1.2	1.3	NS	0.001	0.001

Conclusions

Conclusions

- Reducing milking frequency
 - No significant effect
 - Up to 160 days in milk
- Exam had a significant effect
 - 5/6 aspects of locomotion & bruising
- Reduced waiting time for G1 cows
 - Showed no benefit for sole bruising
 - G1 cows had > activity level than G2

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Thank you



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