CREAM

Cooperative for Real Education in Agricultural Management

Management Report

Board Day Booklet

23rd April 2008

Any figures/opinions/views presented in this booklet are those of students and do not necessarily reflect the opinion of CAFRE.

Milking and Health

Teams

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-Rolling Averages,
-Lactation Curves,
-Locomotion Scoring,

Marcus Stewart

Introduction to Rolling Herd Average.

A rolling average looks at the monthly average over a 12 month period.

It allows the farmer to see seasonal trends and how he/she can adapt to improve these. For example using seasonal calving takes out the peaks and dips in production figures.

Rolling Herd Averages

	February 2007	*February 2008*	Target
Cows in herd	33	32	30
Calving (%)	122	108	N/A
Milk yield/cow (Litres)	10,542	10,104	>10,750
Milk From Forage (Litres per cow)	2324	1,953	3,500
Milk price (ppl)	16.89	22.21	N/A
Butterfat (%)	3.81	3.85	>3.90
Protein (%)	3.00	3.04	>3.10
SCC ('000)	62	82	<150
Bactoscan	13	20	<50
Concentrate/cow (kg)	3,698	3,670	3,500

Margin over concentrate (12 Month Rolling herd average)

	February 2007	February 2008
Price/ litre (p)	15.77	22.21
M.O.C./ litre (p)	10.75	15.88
M.O.C./cow (£)	1134	1605

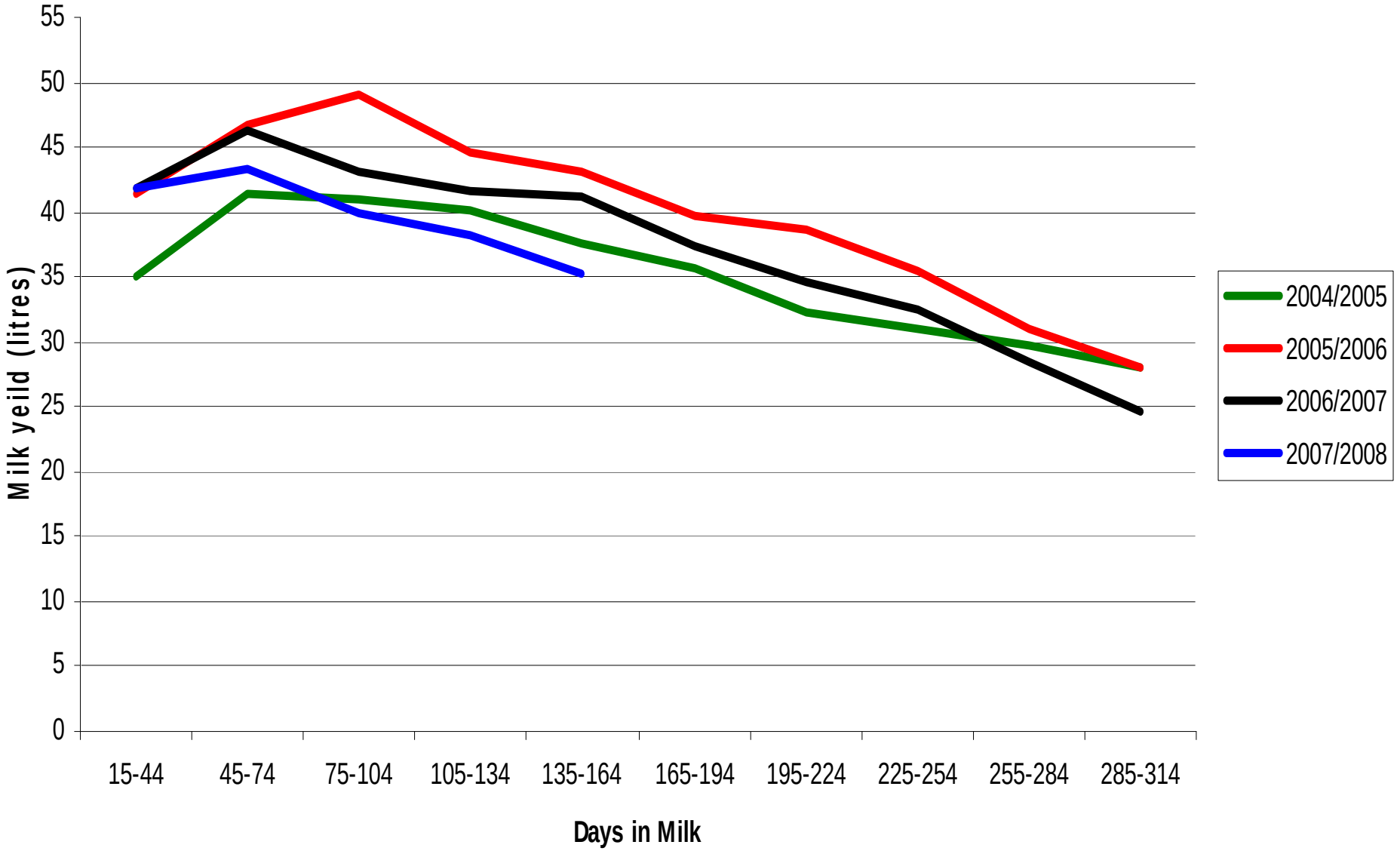
- **M.O.C./ litre and M.O.C./cow has increased significantly over the past 12 months.**
- **This is due to the increased 12 month rolling milk price.**

Lactation Curves.

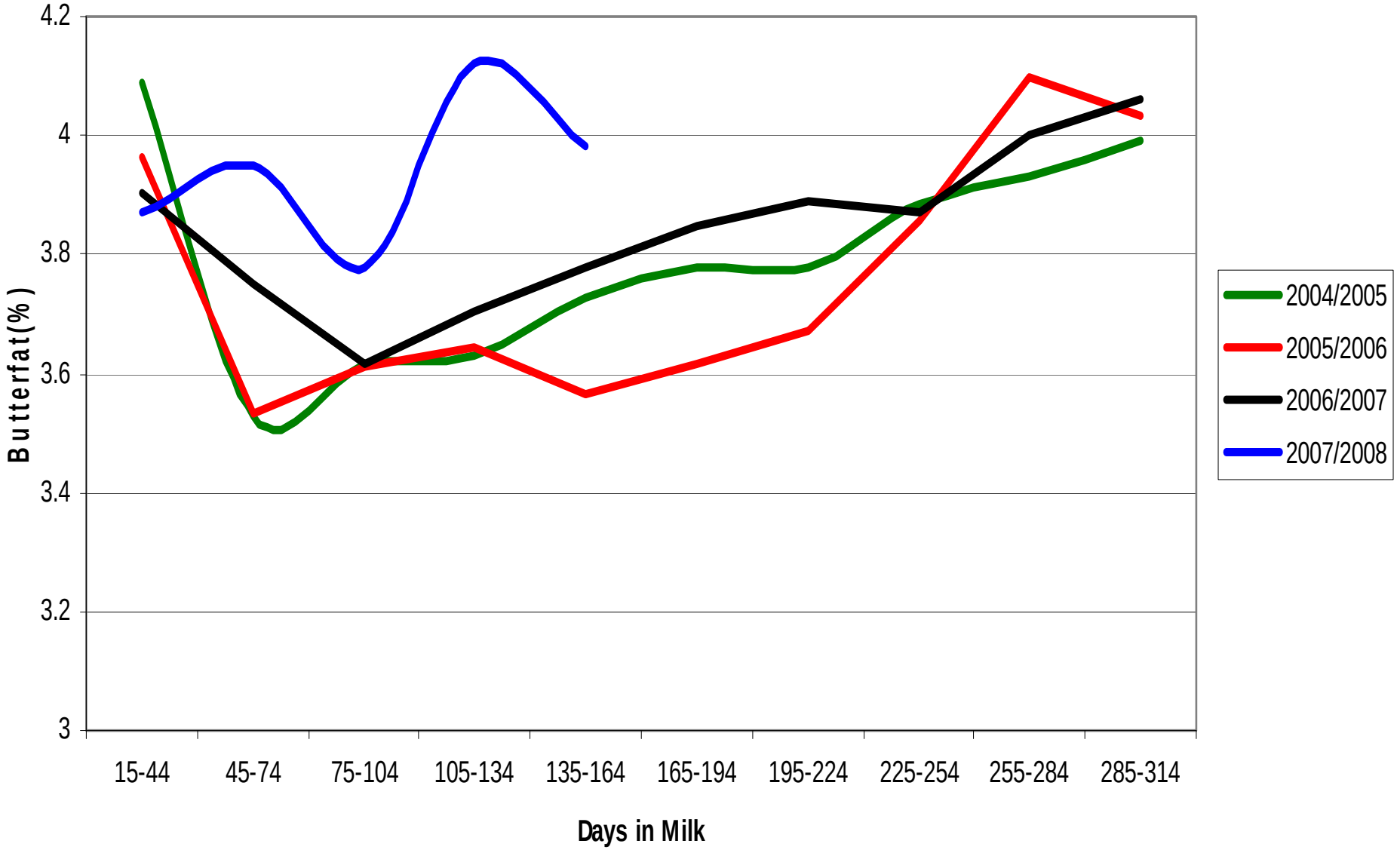
The following graphs demonstrate:

- **Milk production**
- **Butterfat percentage**
- **Protein percentage**

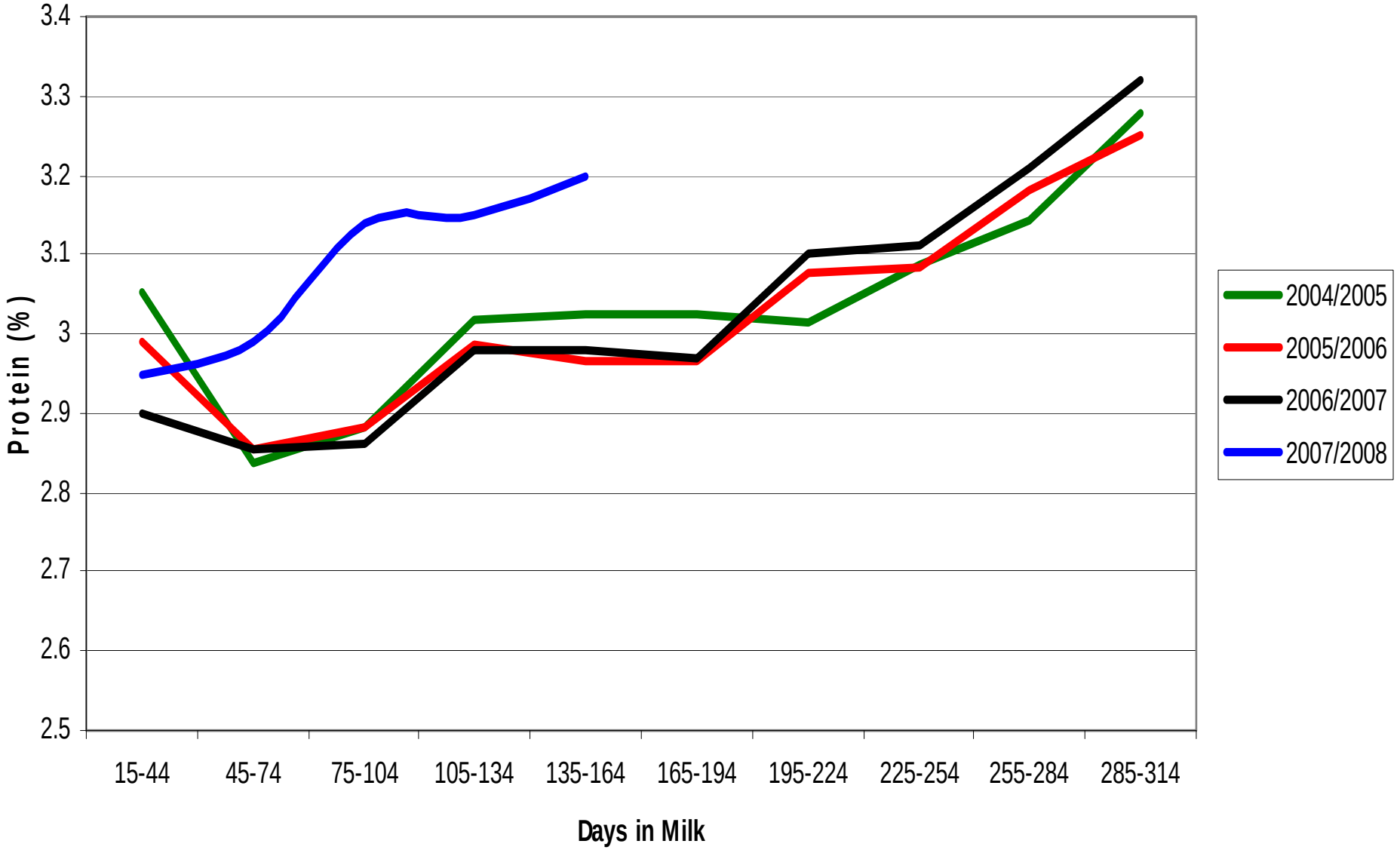
Average Milk Yeild of Cows



Average Butterfat Percentages of Cows



Average Protein Percentage of Cows



Summary Of Lactation Curves.

- Milk Yield has decreased slightly over recent years, however this can be attributed to a reduced calving % and a slight run over in calving pattern.

- Butterfat and protein have seen significant improvements compared to recent years.

- Improvements in compositional quality can be seen as a result of long term breeding policies that have been put in place and improved nutrition throughout the herd.

What is Locomotion Scoring?

- Locomotion score is a qualitative index of a cow's ability to walk normally. It is visually scored on a scale of 1.0 to 4.0.
- A locomotion score can be visually assessed in only a few seconds.
- Generally, locomotion scores of 2.0 and 3.0 are considered to represent sub clinically lame cows.
- Scores higher than 1.0 may suggest intervention to prevent further depreciation in cow health.

Locomotion Score 1

- **Walks fast and without obvious pain.**
- **Takes long steps.**
- **The back is generally straight.**
- **Holds head straight.**
- **Not holding any one foot.**
- **No effect on Body condition score.**

Locomotion Score 2

- **Walks slightly slower.**
- **Slightly shorter steps than score 1.**
- **The back is usually level when standing and slightly arched when walking.**
- **Holds head usually straight.**
- **Not carrying any one foot.**
- **Generally no effect on Body Condition Score.**

Locomotion Score 3

- **Slow when walking and often stops.**
- **Short steps due to pain.**
- **Arched back when standing and walking.**
- **Noticeable head bobbing when walking.**
- **Not consistent when distributing weight on all feet.**
- **Minor Body Condition Score loss.**

Locomotion Score 4

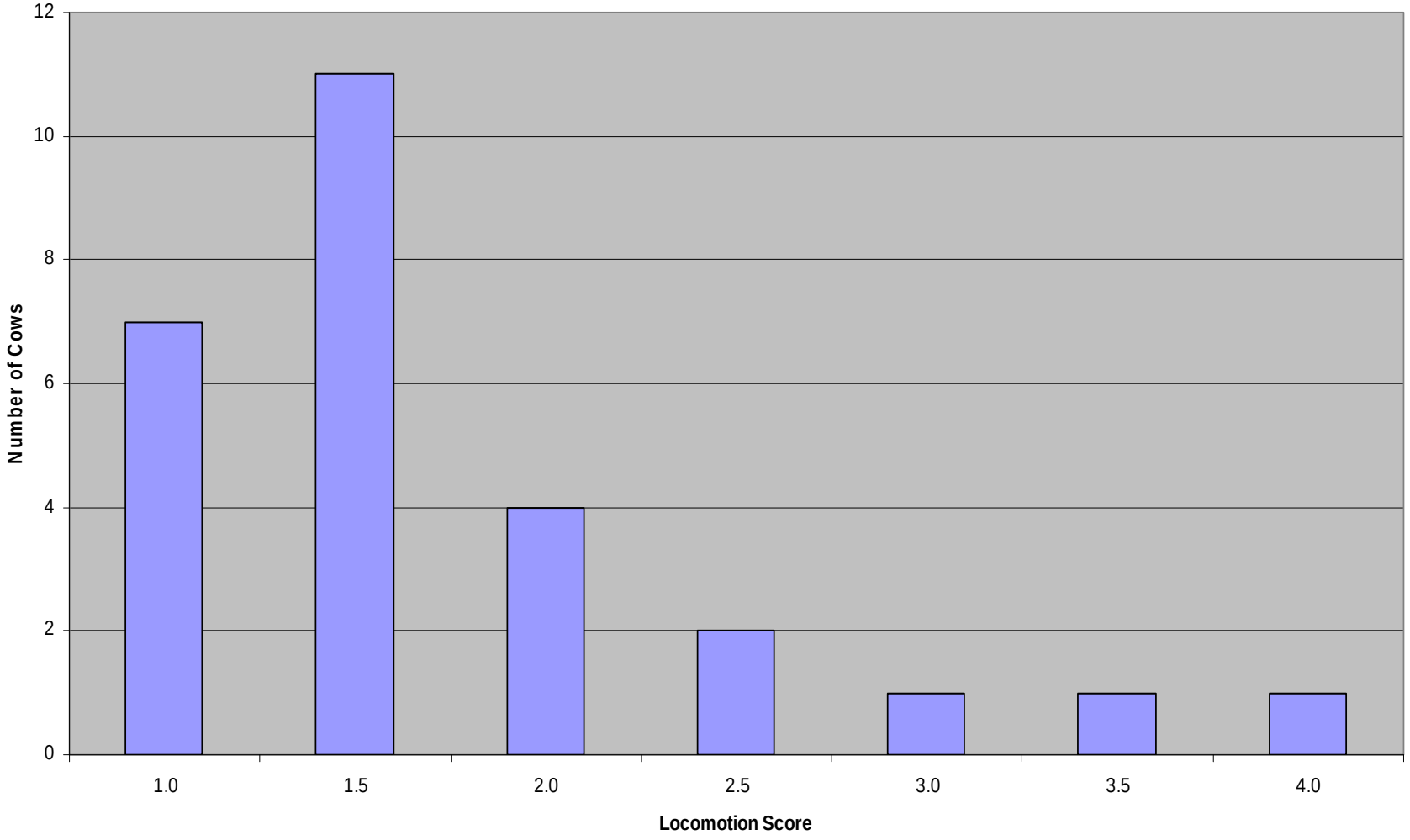
- **Very slow when walking and takes regular stops.**
- **Very short steps due to extreme pain.**
- **The animals back is very arched when both standing and walking.**
- **Severe head bobbing.**
- **Often holds feet from the ground and puts weight on the other feet.**
- **Dramatic Body Condition Score loss.**

Prevention of Lameness.

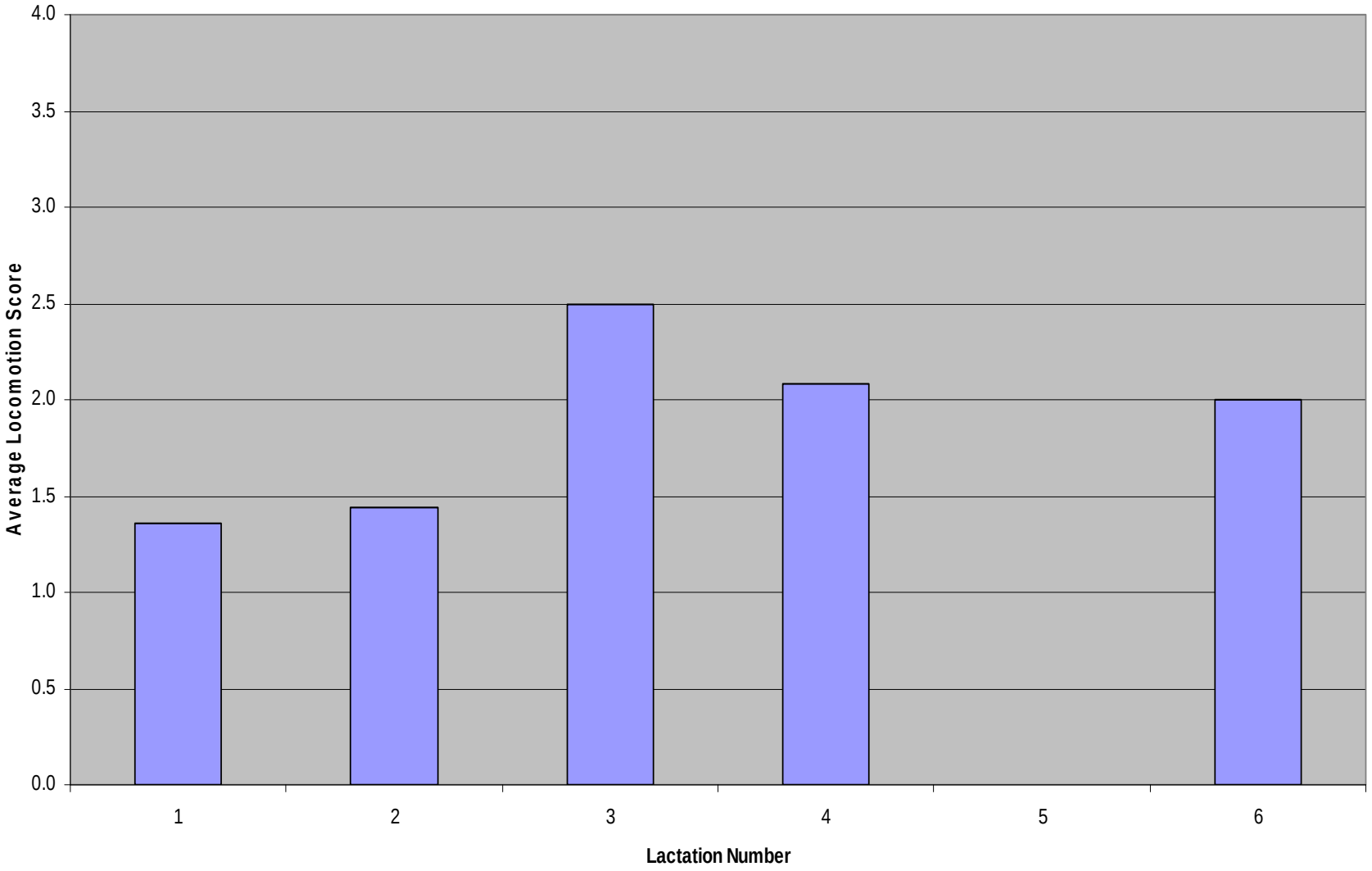
- Cows with a score of 2 or more should be immediately treated.
- Cows with a score of 4 and do not respond promptly to treatment should be culled.
- Cubicle mats should be used to maximise cow comfort.
- Breeding policies, using bulls with good feet and leg scores.

Analysis of CREAM Locomotion Scores.

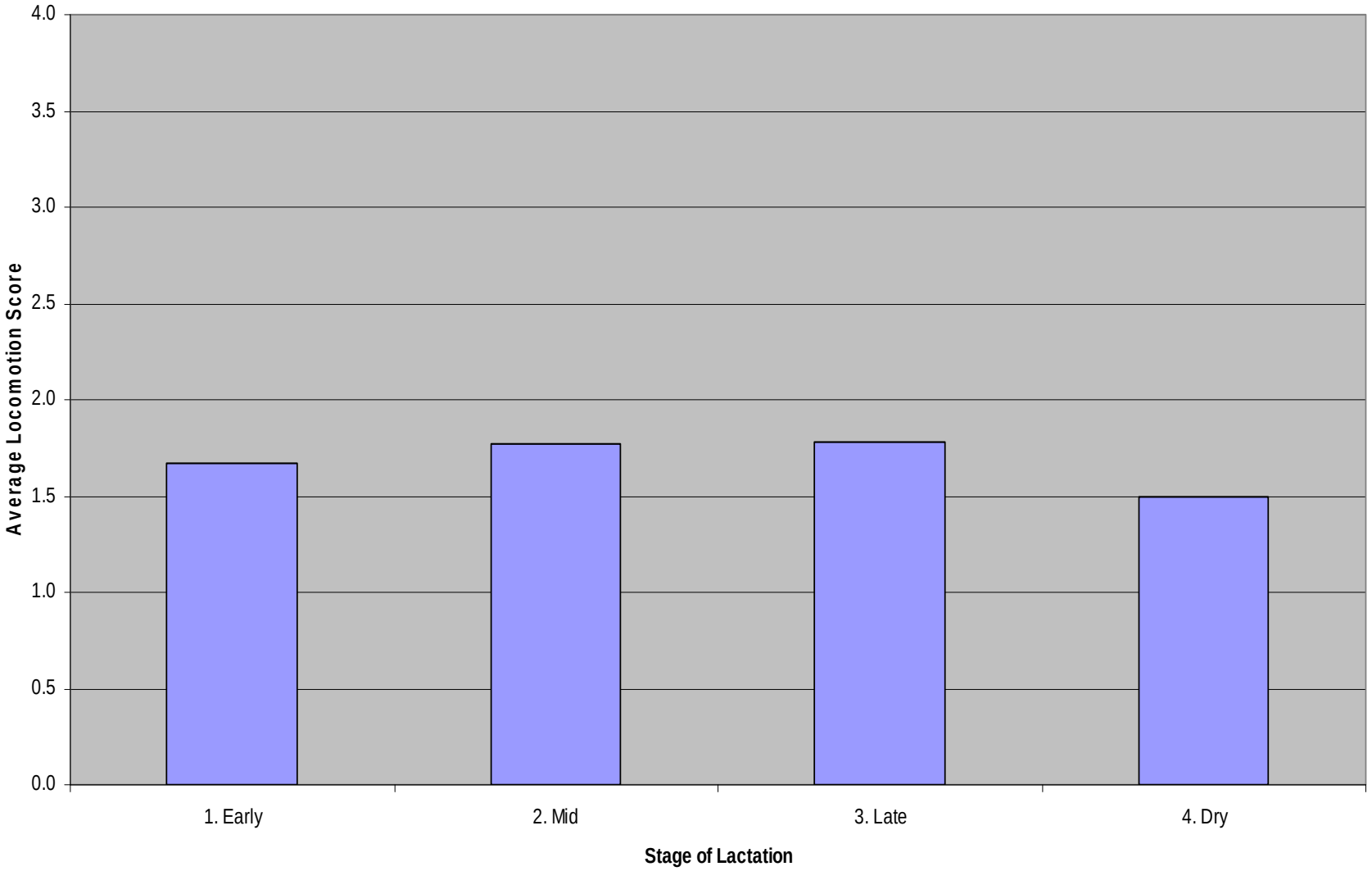
Cows per Locomotion Score.



Average Locomotion Score relative to Lactation Number.



Locomotion for cows related to stage of Lactation.



Comparison between the Actual and the Target Locomotion Scores.

Locomotion Score	Actual Score %	Target Score %
1 – 1.5	66%	>70%
2 – 2.5	22%	<20%
3 – 3.5	8%	<10%
4	4%	0%

Summary / Recommendations.

- Where Required Hoof Trim Regularly.
- Comfort of Cows during travel to and from parlour.
- Nutrition of Cows using a balanced diet would keep the cows resistance high.
- Breeding policies to minimise feet problems.

FEEDING TEAM

Forage Maize
It’s Economic Benefits

Alan Lockhart

Maize at Greenmount…..

- **The mature crop should be at the optimum whole plant dry matter of 30% to allow maximum benefit from the silage.**
- **The use of a proven crop specific forage innoculant is recommended**
- **Excessively short chop lengths should be avoided**

Maize Ensiling Techniques

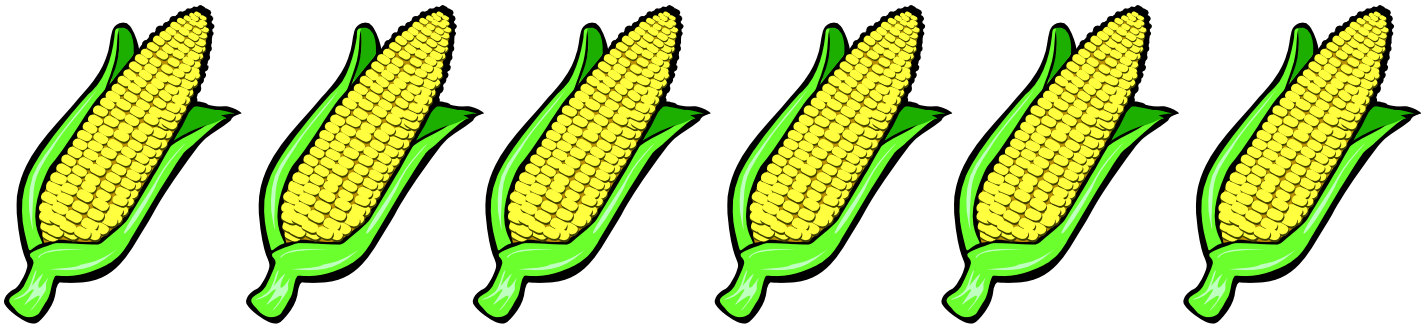
- Clamp consolidation is vital to encourage an anaerobic environment for effective fermentation.
- Side sheeting of the clamp is recommended to minimise spoilage at the walls and shoulders of the clamp
- Drainage pipe should be laid down the each side of the clamp so that any effluent may be caught and directed to a proper collection facility in conjunction with current legislation on good farming practice

Justification for growing maize at Greenmount

- Area grown in NI has increased from 69ha in 1997 to 3116ha in 2007.
- Financial costs and production effects have been analysed by the technologists at C.A.F.R.E
- Growing & feeding of maize silage to the CREAM herd provides student with experience of handling alternative forages.

Benefits of Forage Maize Inclusion in the Cream Herd T.M.R

- Increased forage dry matter intakes
- Increased milk protein levels
- Increased milk yield from forage
- Possible fertility improvements
- Potential to reduce concentrate feed costs



Disadvantages of growing maize

- Maize is a marginal crop and cannot be grown in all areas of N.I. A typical forage analysis should read 11.2-11.3 MJ/kg DM, 30% Starch and 30% Dry matter to justify growing it.
- variety selection and crop maturity are important agronomic characteristics in relation to field selection.
- Maize depends on Ontario Heat Units for effective crop development and starch production therefore expensive plastic mulch is required to achieve high DM yields of quality forage.
- Poor weather conditions when harvesting must be avoided as ground compaction from heavy machinery will have a detrimental effect on following crops.

Maize costs at Greenmount

	Cost (£)
Spray off (ballad & roundup max)	£22.00
Ploughing	£37.00
Lime (every 7 years)	£17.00
Fertilizer (25-5-5 @575 kg/Ha)	£75.00
Power harrow	£24.90
Seed	£115.00
Plastic	£150.00
Spray (stomp)	£32.00
Drilling	£87.20
Harvest	£137.40
Total cost	£698/ha

- Yield – 9.6 tonnes DM/Ha @ Cost of £73.00/tonne of DM
- NB – this is a ‘cash’ cost without consideration of fixed costs (buildings) or feed out costs.

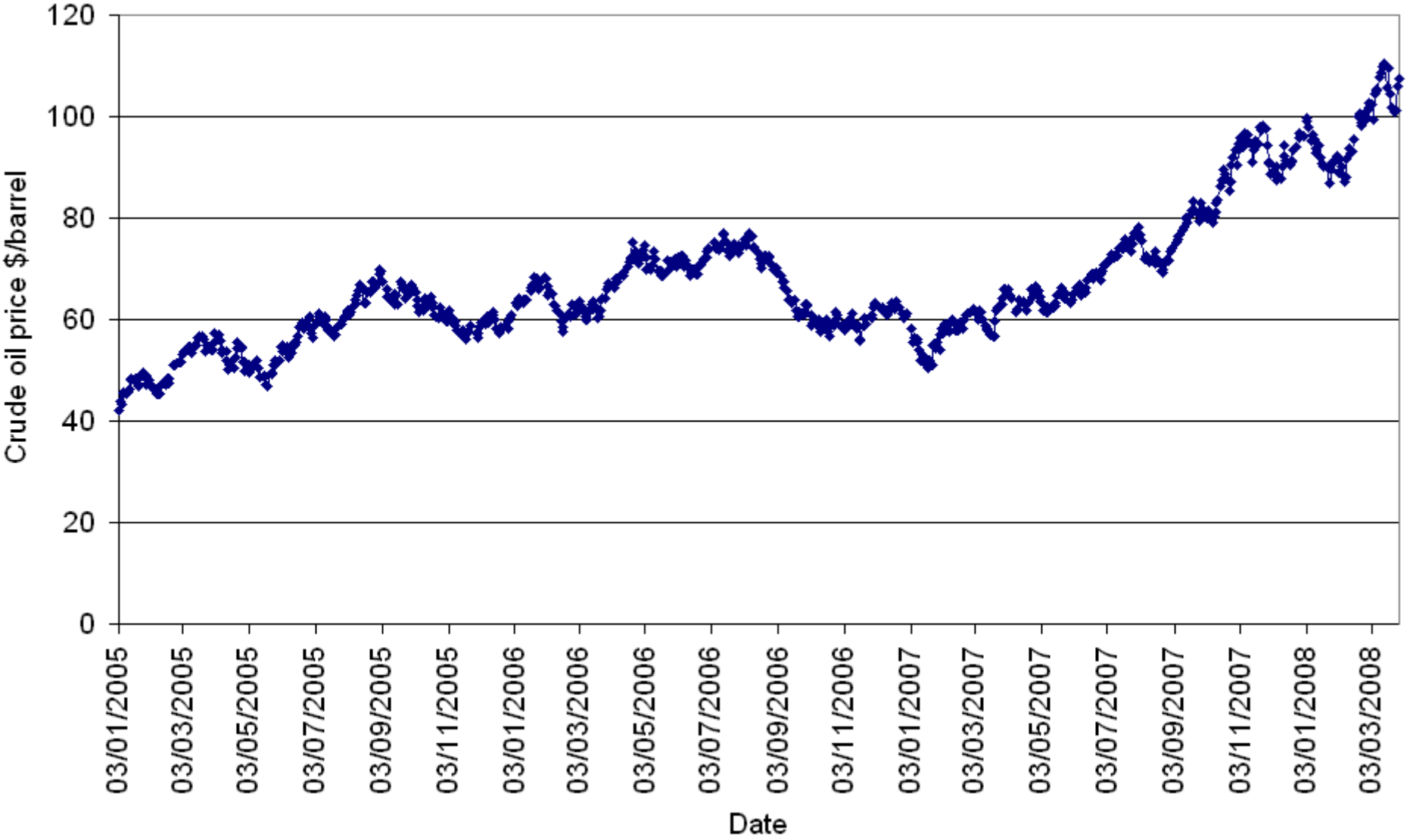
Cash and full economic comparison

Feed	Cash cost (£/t utilisable DM)
Grazed grass	64
WCW	72
Forage Maize	73
3 cut silage	85
4 cut silage	100
18% Concentrate	241

Background

- **Comprehensive comparison carried out by AFBI and CAFRE in 2001**
- **Increased use of alternative forages on Northern Ireland dairy farms**
- **Fuel price rises (+25ppl in 5 years)**
- **Contractor cost increases (+£25/acre in 5 years)**
- **Fertiliser price rises (+£154/t 27.5%N)**
- **Many herds moving to housing at night throughout the year**

Brent Crude Oil Price



Estimated DM yields

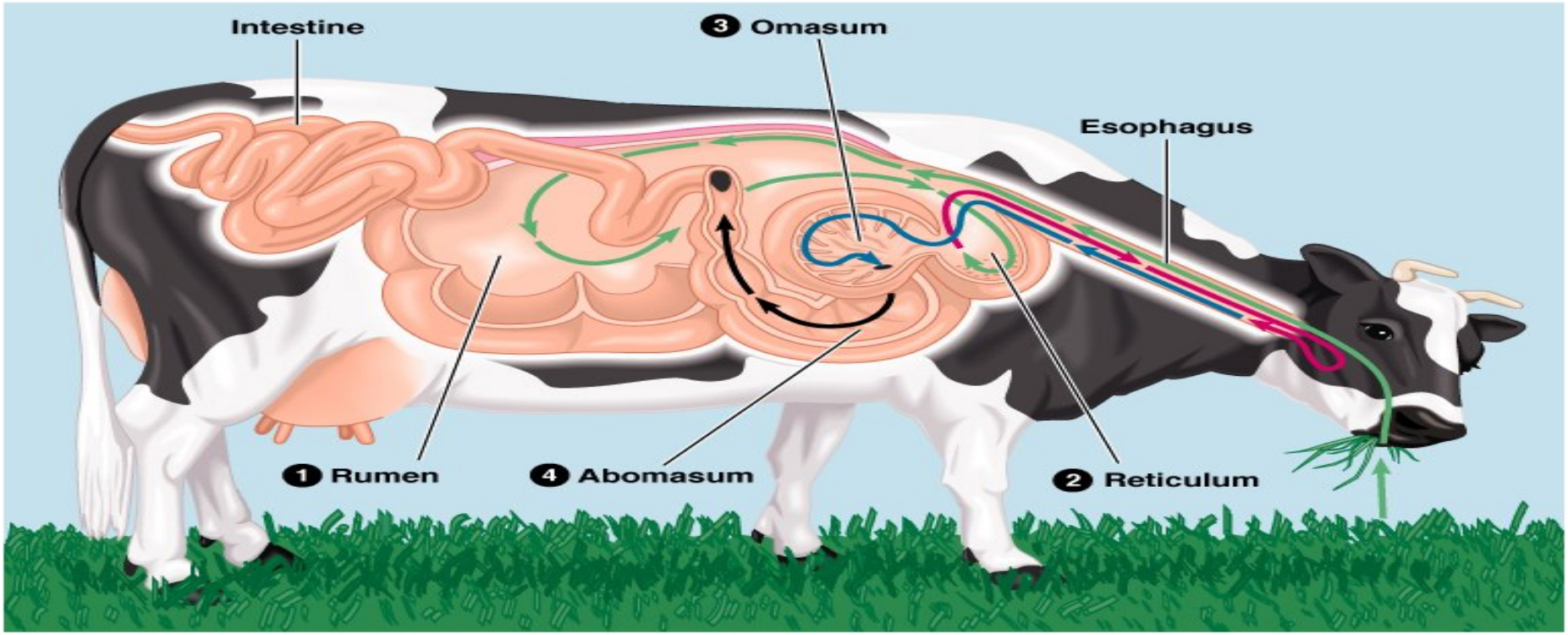
Forage	Yield t/ha	Post harvest % DM losses	Utilisable t/ha
Grazed grass	10.6	25	8.0
3 cut silage	13.8	17	11.5
4 cut silage	12.7	15	10.8
Wholecrop wheat	13.0	15	11.1
Forage maize	14.7	14	12.6

Research done at AFBI showed…..

- When they fed maize for two hours post milking there was a concentrate sparing affect of 3.1kg/day (standard dairy concentrate at 18% protein).
- The maize had a 30% DM and 28% starch.
- To maximise return on the cost of growing maize it must be of excellent quality.

Ruminant Health

- We must remember we are feeding rumens not cows
- Diets must be formulated and balanced by qualified nutritionists
- Excessive quantities of finely chopped forage such as maize can depress butter fats and contribute to displaced abomasums.

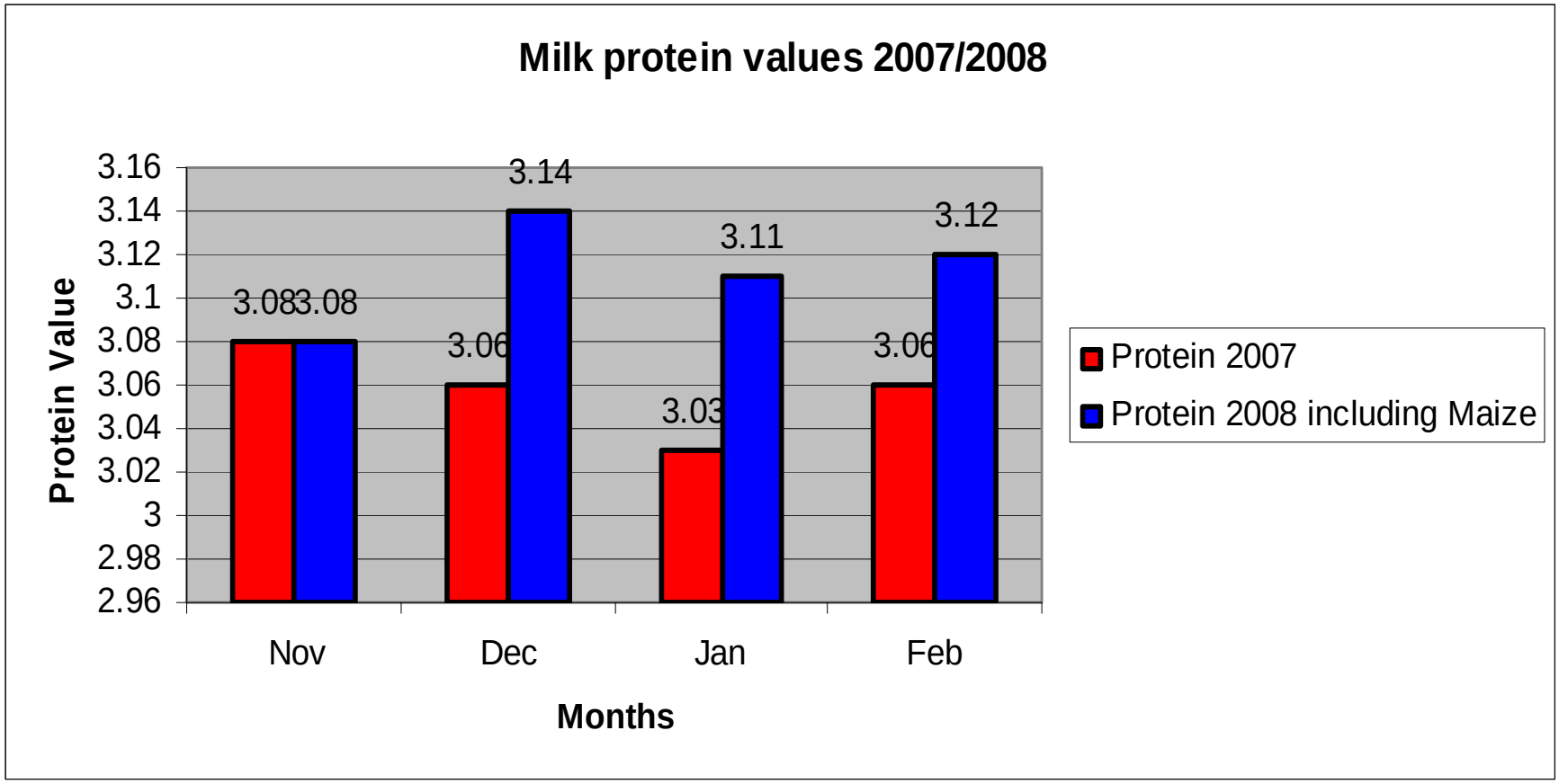


Maize in Cream

Our aims…

- Reduced dependency on bought in concentrates
- Higher DM intakes
- Increased litres from forage
- Improvement in milk protein

Milk Protein levels with/without Forage Maize



Financial benefit of additional milk protein

- Every 0.01 improvement in protein concentration attracts bonus of 0.032ppl
- Average increase in milk protein concentration was 0.073

  This equates to 0.233ppl

- Average yield of cream herd over 4 months (120 days) fed = 38 litres

- Extra protein worth £10.62/cow

- **£1062 per 100 cows**

Current diet evaluation and current cow condition scores.

Analysis of TMR

	ME (MJ/kg DM)	**DM%**	**CP% (DM basis)**
Grass silage	**11.1**	**35**	**13.5**
Whole Crop Wheat	**9.1**	**43**	**8.0**
Blend	**13.7**	**87**	**29.9**
Straw	**8.5**	**87**	**10.4**
Molasses	**12.7**	**75**	**6**

TMR Ration

	Fresh weight offered (kg)	Dry Matter (kg)
silage	19.54	**6.84**
Whole crop	14	**6.02**
Blend	6.842	**5.95**
Straw	0.53	**0.47**
Molasses	0.58	**0.43**

Total DMI (Dry Matter Intake) 19.71kg

TMR Provides:

- T.M.R supports 29.5 litres/day
- Protein concentration of 16.5 % (in the dry matter)
- Therefore a 46 litre cow:
  - Protein concentration in ration of 18.5%

Body Condition Scores

Days in milk	No. of cows in group	Average BCS	Target
0-100	6	2.6	2.5
101-200	13	2.4	2.5
201-300	4	2.5	2.5-3.0
300+	6	2.8	3.0

Finance and Promotion Team

Richard Walker HND 3
John Russell HND 3
James Hill HND 1
Leigh-Ann Clarke HND 1

Gross Margin Analysis

- James Hill HND 1

2007/2008

Milk Output - 10053 litres @ 21.94 ppl	£2,288
Pedigree sales	£252
Calves	£209
Replacements	-£312
Total Outputs	£2,436

Compared to:06/07

Milk Output – 10394 litres @ 15.40ppl	£1,822
Calves	£223
Replacements	-£237

Variable Costs (per cow)

		07/08	06/07
Meal fed	3.45t @ £179 =	£613	3.45t @ £147 = 507
	Straights =	£20	£30
	Minerals =	£2	£11
Grassland Costs		£88	£67
Vet & Medicine		£179	£128
AI		£35	£ 34
Sundries		£139	£178
Quota Leasing		£0	£0
Total Variable Costs		£1100	£955
Total Variable costs ppl 10053 litres @		10.54ppl	9.19ppl

	07/08	06/07
Gross Margin/cow	£1337	£852
Gross Margin/litre	13.30ppl	8.2ppl
Average Milk Price	21.94ppl	15.40ppl
Milk Quality (Protein)	3.05%	3.00%
(Butterfat)	3.87%	3.82%

Heifers sold in Moira

- Cow 137 Creamer Jordan Edie
- Cow 141 Creamer Shaker Marion
- Cow 142 Creamer Shaker Marion 2 all made an average of £1450
- Cow 145 Creamer Export Kitty PI made £1950

Phosphorous balance for C.R.E.A.M.

Leigh-Anne Clarke

What is a Phosphorous Balance?

Balance between phosphorus coming onto and the amount leaving the farm

P inputs:

- concentrates
- straw
- artificial fertilizer

P outputs:

- Milk
- cull cows and breeding stock sold
- calves sold.

Why do a Phosphorous balance?

Watercourses and lakes become nutrient enriched or eutrophic.

It is estimated that there are 9000 tonnes surplus P in N.I.

Soils excessive in P leach up to 1kg/ha/year

Soils with excessive P have to be managed to reduce this.

Phosphorus levels proposed by the EU

P surplus (kg/Ha) limits as follows…

2010 (+ 10 kg)

2012 (+ 6 kg)

Phosphorus balance for C.R.E.A.M.

C.R.E.A.M. farms 23 ha based on a total of 45 livestock units (milking herd + heifers)

Stocking rate 1.94 LU/ha

P applied in artificial fertilizer

Farm Development Centre currently apply zero P fertilizer to grassland.

Input of P from concentrates

119 t fed to cows in 2007

4.7kg P/tonne = 119x 4.7kg P/tonne= 560kg P

8.3 tonne fed to heifers in 2007

5.9kgs/tonne =8.3x 5.9kg P/tonne = 49kg P

Total P from concentrate is 609 kg

Input of P from straw

Phosphorus content of straw

= 2kg P/tonne

Total tonnes used

= 3.7 tonnes

(bedding and feeding)

Total P from straw = 3.7 x 2 = 7.4kg P

Total Phosphorus inputs

Total input

= Fertilizer +Concentrate + Straw

= 0 + 609 + 7.4

= 616kg P

Phosphorus outputs in milk

1000 litres of milk

= 1kg of P

Milk sales

= 329,536 litres.

= 330kgs P sold in milk

Phosphorus output in livestock sales.

0.5kg P per calf

17 calves sold

= 17x 0.5

= 8.5kg P output in calves

4.8kgs P per cow

9 cull cows sold = 9 x 4.8= 43.2kg P output in cull cows

Total Phosphorus output

Total output

= milk + calves sold + cull cows

=330kgs P + 8.5kg P + 43.2kg P

= 382 kgs P output

C.R.E.A.M. phosphorus balance

Balance

= input- output

= 616 kg - 382 kg

= 234kg of surplus P

P balance per ha

= total imbalance /area farmed

=234kg/ 23ha= 10.1kg P per ha/yr

Methods of reducing phosphorus balance.

Lower levels of Phosphorus in concentrates

Lower the amount of concentrates fed

Lower the stocking rate

Export slurry

Reducing P in concentrate

- At the minute the P levels in the concentrate range from 0.65%-0.43%
- If all the concentrate was fed at a lower rate of 0.45% it would reduce the P by 37kg.
- Overall this would leave P levels at 8.5 kg P ha/yr.

C.R.E.A.M.’s Current Position

The current Nitrogen limit per hectare is set at 170kg

C.R.E.A.M.’s current Nitrogen Output is 137kg N/ha

Phosphorus balance 10.1kg p ha/yr.

BREEDING TEAM

Cream Herd Genetic Summary

Robin McMullan (Bsc AgTec)

What is PTA?

- PTA – ‘Predicting Transmitting Ability’
- Measures milk, butterfat & protein production
- Updated every 5 years
- Helps in breeding programs
- Expressed from a base year average
- Current reference year PTA 2005

PTA Calculation

- (Sire PTA + Dam PTA) divided by two.
- This is done for milk yield, butterfat and protein yield and compositions.
- Anything less than the base levels of production has a negative PTA.

PIN (profit index)

- It is derived from the PTA results and shown in pounds.

- Compared to another animal with a profit index of zero, the PIN is calculated as the additional margin of feed and quota costs per lactation.

Current Herd PTA figures

	Number in each category	Fat PTA (%)	Protein PTA (%)	Milk PTA (kg)	PLI
Average PTA for 1st Lactation	7	-0.05	0.03	159	33
Average PTA for 2nd Lactation	10	-0.05	-0.05	380	33
Average PTA for 3rd Lactation	5	0.02	0.00	-14	-0.20
Average PTA for 4+ Lactations	4	-0.02	-0.01	280	33
Average PTA's for young stock	27	0.07	0.02	127	29
Average PTA's for Milking Herd	27	-0.02	-0.01	201	25

PTAs for In-calve Heifers

- CREAM Heifers due to calve between August 2008 and July 2009.

	Number in category	Fat PTA (%)	Protein PTA (%)	Milk PTA (kg)	PLI
Average PTA for In-calve heifers	**14**	**0.09**	**0.03**	**136**	**32**

Improving PTA's in CREAM

- To improve milk composition of cows in the CREAM herd, we are taking a strict policy to select the best cows.

- This includes looking at the history of all the animals for bad composition in fat and protein.

- Any daughters from these cows will be sold when they calve, only keeping daughters from the best cows.

Embryo Transfer Work

- Designed to improve milk yield and composition in the herd.
- Price of semen is expensive so selection is critical.
- Difficult to select bulls with both good production and fertility.
- Embryos selected for use in accordance with CREAM Bull Selection criteria for 2007/08:

Factor	Criteria
Milk kg	**>200**
Butterfat %	**>=0.1**
Protein %	**>=0.05**
Type	**>=1.5**
Reliability %	**>70**
CVM	**NEGATIVE**

Embryo Transfer Work

- Embryos currently selected for use:

Sire Name	PLI	Reliability (%)	Milk (Kg)	Fat (%)	Protein (%)	SCC	Type
Roumare *TL*TV	£157	70	346	0.13	0.1	-11	2.9
Karona Bonair *TL*TV	£158	72	607	0.01	0.01	8	2.3
Braedale Pagewire	£185	76	686	0	0.04	3	2.1
Emerald-ACR-SA T-Baxter	£157	71	622	0.08	-0.08	-7	2.2

•Target number of embryos is 6, Roumare is first choice.

•Attempt to get as many Roumare as possible, remainder will be made up of Karona and Braedale.

•Emerald has been rejected and will not be used.

C.R.E.A.M
Fertility Performance Interim report 2007-08

Philip Cargill HND1

Introduction

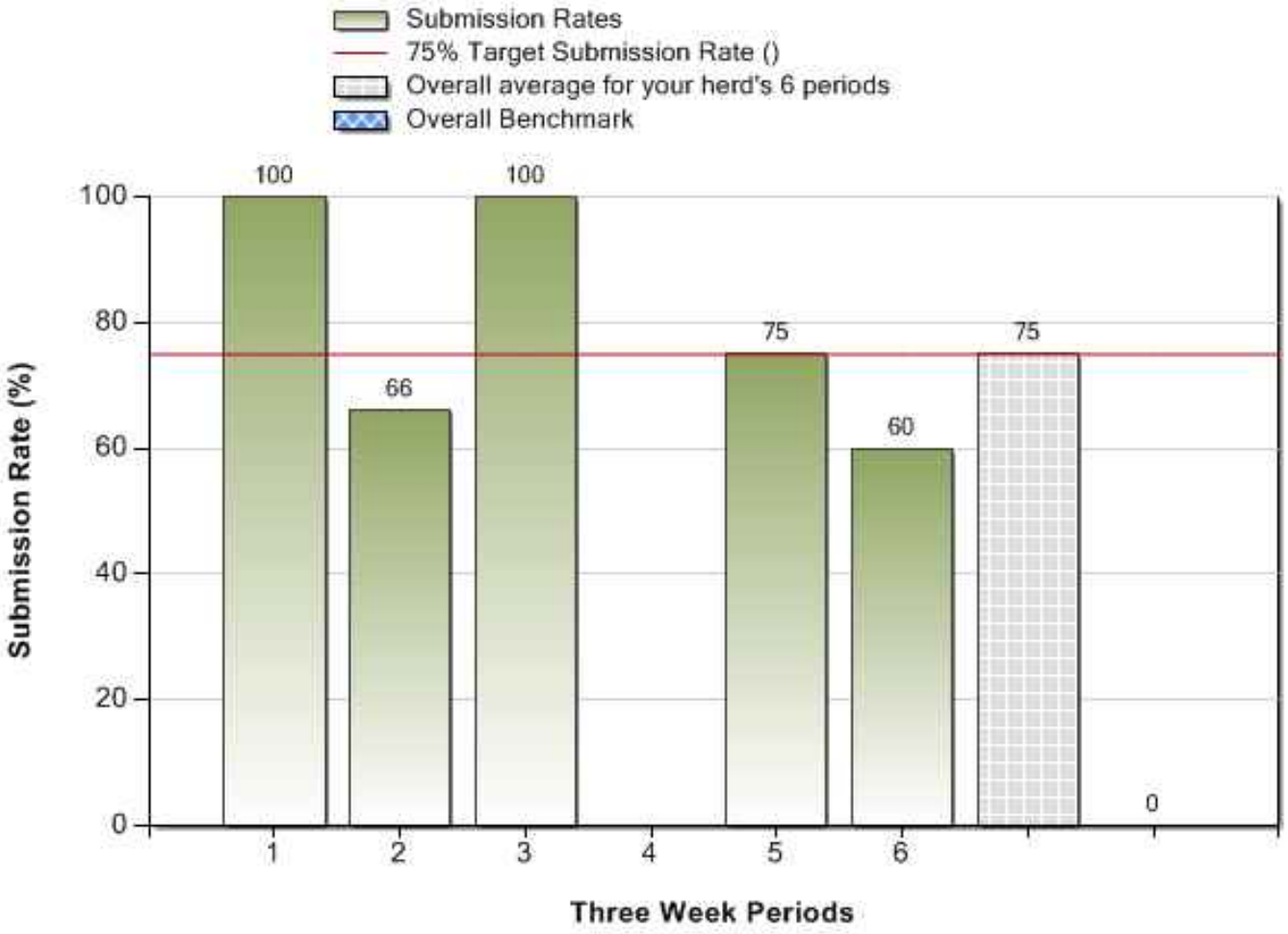
- **Heat Detection Efficiency**
  - Submission rate(%)
  - Days to first services
  - Heat detection rate
  - Heat detection accuracy
- **Conception Rate**

CR to all services(%)

Heat Detection Efficiency

Year	CREAM Herd				FBM average For top 25% of herds
	Cream targets	06/07 annual	06/07 interim	07/08 interim	06/07
Submission Rate (%)	70	79	(76)	(75)	62
Days to First Service	70	79	(74)	(75)	79
Heat Detection Rate (%)	64	41	(41)	(71)	67
Heat Detection Accuracy (%)	57	5	(6)	(67)	38

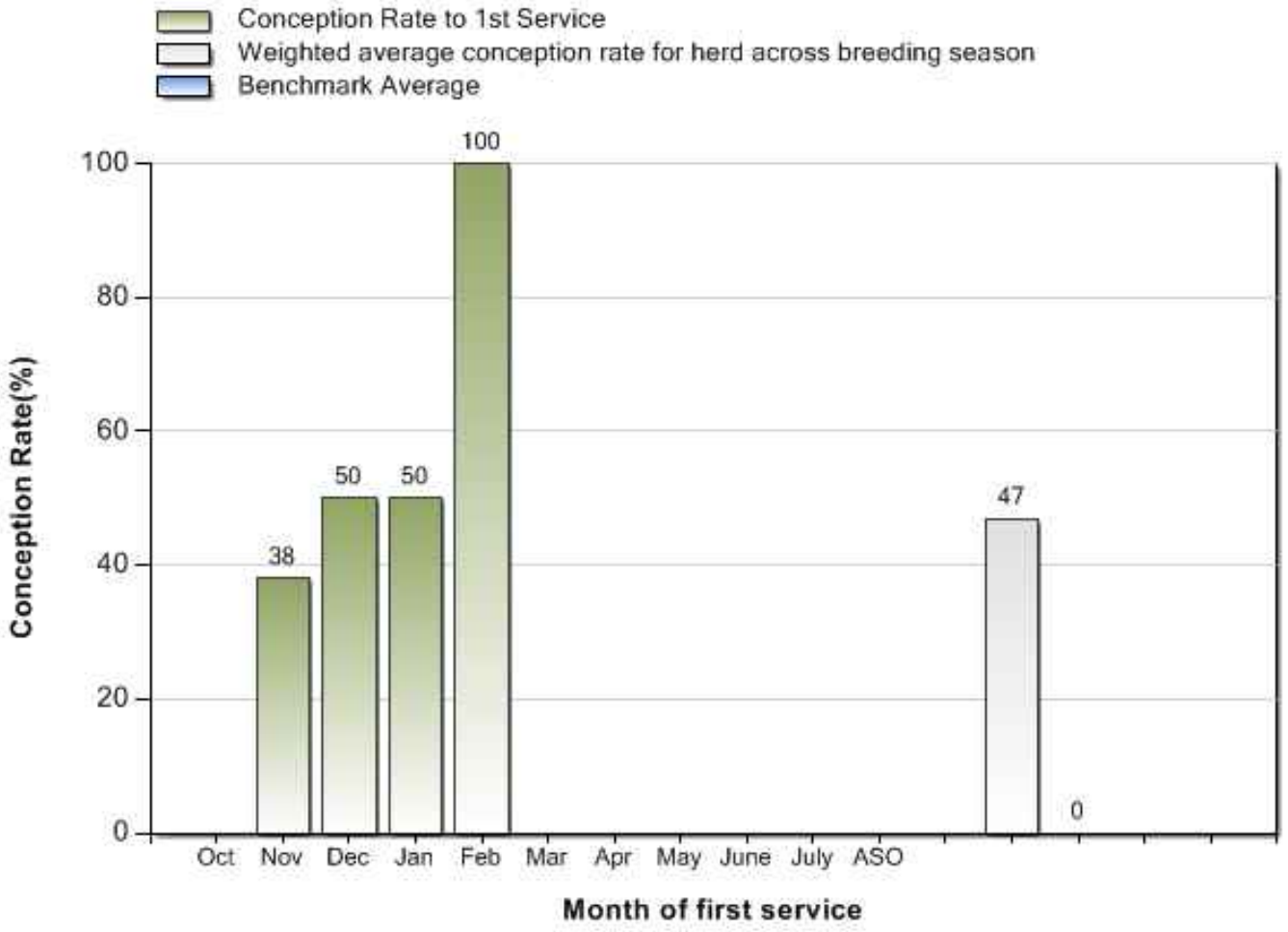
First Service Submission Rate



Conception Rates

Year	CREAM Herd				FBM average For top 25% of herds
	Cream targets	06/07 interim	06/07 annual	07/08 interim	06/07
CR to All Services (%)	40	39	43	47	49

Conception Rates



Conclusion

- Keep striving for improvements in fertility
  - Specifying high fertility bulls
  - Eliminating cows with bad fertility

- Improve heat detection by making better use of the Kingswood action lists and the 21 day diary.