



Cooperative for Real Education in Agricultural Management



Advisory Board Day Booklet

Wednesday 6th December 2006

Agenda
C.R.E.A.M. Advisory Board Meeting
6th December 2006

	<i>Speaker</i>	<i>Time</i>	<i>Location</i>	<i>Booklet Page</i>
Lunch for Advisory Board			Manor Restaurant	
Welcome		2.30	GRC Lecture Theatre	
Chair person	Ross Murray			
Review of previous minutes	Robert Whittaker			
My time as C.R.E.A.M. student	Lewis Ogilby			
<i>Finance and Promotion Team</i>		2.45		
Targets within the herd	Stuart Fulton			3
Rolling Herd Performance Update	Mark Beattie			4
Gross margin analysis 05/06	John Wallace			6
<i>Feeding Team</i>		3.05		
Current diet evaluation	Andrew Callighan			8
Current cow condition scores	Denis Nulty			11
Out of parlour feeder update	Denis Nulty			13
<i>Milking and Health Team</i>		3.25		
Lactation curves	James Frazer			16
Health plan/vaccination policy	Stephen Agnew			18
Veterinary/health analysis	David Dodds			20
Importance of milk composition	Richard Cummings			23
<i>Breeding Team</i>		3.50		
Current PTAs of the herd	Michael Woodrow			25
Bull selection criteria	Paul Reaney			26
Fertility results 05/06 breeding year	Domnal Young			29
<i>Questions/Discussion time</i>	<i>Board Members and attending staff.</i>	4.10		
High tea		4.50	Manor Restaurant	

Please note that the information contained within this report are student findings and not those of CAFRE.
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C.R.E.A.M. HERD TARGETS FOR 2006/2007

At Greenmount students are taught when setting objectives and targets that they must be specific, measurable, achievable, and realistic and time specific. With this in mind it was felt that some of the targets/objectives of the past were no longer suitable for the herd. As such the targets of 2005/2006 have been revised for the current academic year.

Table 1. Targets for the herd for 2005/2006 and 2006/2007

Target	2005/06	2006/07
Number of cows	30	30
Milk yield	>10,500l/cow/year	>10,750l/cow/year
Protein (%)	3.10	>3.10
Butterfat (%)	3.70	>3.79
TBC/SCC	to attract hygienic quality premium each month	
Concentrate usage	3.5 T/cow	3.5T/cow
Calving index	420	420
Average days to first service	70	70
Conception rate to first service	40%	40%
Conception rate to all services	40%	40%
Submission rate	>70%	>70%
Replacement rate	25%	25%
Gross margin	To be within the top 15% of benchmarked herds producing over 8000litres.	Cost of production of 12 ppl.

C.R.E.A.M. HERD PERFORMANCE
(Rolling Herd Averages)

Table 2: Physical Performance of the herd from September 2005 – October 2006

	Oct 2005	Jan 2006	Oct 2006	Target
Cows in herd	31	32	32	30
Calving (%)	116	108	115	-
Milk Yield/cow (litres)	9,710	9,718	10,607	>10,750/ cows/yr
Concentrate/cow (kg)	3,966	3,974	3,919	3,500
Milk Price (ppl)	17.26	17.06	15.89	-
Butterfat (%)	3.76	3.72	3.74	3.79
Protein (%)	3.04	3.03	3.00	3.1
SCC ('000)	126	110	57	<150
TBC ('000)	6			<10
Bactoscan (Began Oct 05)		9*	13*	<50

* - average result since introduction of bactoscan.

Milk yield/cow is almost 900 litres higher than the same time last year; however we are below this years set target of 10,750 litres. In August 2006 we successfully reached our target milk yield (Table 3) after which point 7 heifers calved into the herd pulling the rolling average figure down. The number of heifers can potentially affect the overall yield as they characteristically have a flatter lactation curve. There are currently a total of 14 first lactation heifers milking in the herd. However several of these are approaching the end of their first lactations and some are to be sold (due to surplus replacements) in the near future. Butterfat and protein concentration continues to be an issue within the herd. Our ongoing bull selection policy of selecting positive component bulls will eventually reap reward by increasing both the components in the milk. In recent years in we have observed an increase in butterfat concentration however protein concentration remains relatively unchanged. Protein concentration in the milk is more difficult to manipulate than butterfat and breeding is a long term strategy so it may be some years before we see a notable improvement. SCC and Bactoscan are consistently low and always well below our target, allowing us to consistently achieve the extra grade premium in our milk price.

Rolling 12 Months Averages	2006												
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Cows in herd	31	31	32	32	32	31	31	31	32	32	32	32	32
Calvings % herd	116	115	105	108	107	108	111	105	104	98	91	97	114
Milk yield/cow	9710	9714	9712	9718	9825	10069	10272	10512	10708	10813	10815	10715	10553
Milk from forage (litres/cow)	897	916	1045	886	987	1115	1216	1744	1638	1674	1920	1964	1888
Concs/cow (kg)	3966	3959	3900	3974	3978	4029	4075	3946	4081	4113	4002	3938	3899
Concs/litre (kg/l)	0.41	0.41	0.40	0.41	0.40	0.40	0.40	0.38	0.38	0.38	0.37	0.37	0.37
M.O.C./cow (£)	1078	1086	1101	1087	1100	1132	1149	1191	1192	1193	1192	1175	1130
M.O.C./litre (p)	11.10	11.18	11.34	11.19	11.20	11.24	11.19	11.33	11.14	11.03	11.02	10.96	10.71
Price/litre (p)	17.26	17.25	17.20	17.06	16.92	16.81	16.71	16.56	16.46	16.36	16.24	16.08	15.89
Cost/tonne concs (£)	151	149	146	144	141	139	139	139	140	140	141	139	140
Weighted average butterfat (%)	3.76	3.75	3.75	3.72	3.72	3.72	3.72	3.72	3.72	3.73	3.74	3.74	3.74
Weighted average protein (%)	3.04	3.04	3.04	3.03	3.02	3.02	3.02	3.01	3.01	3.00	3.00	3.00	3.00
Weighted average SCC (' 000)	126	123	115	110	106	100	92	87	80	71	65	62	57
Weighted average TBC (' 000)	6	6	6	6	5	6	6	7	8	9	10	12	13

Table 3. Rolling herd performance figures October 2005 to October 2006.

C.R.E.A.M. Gross Margin 2005/2006

		<i>10068 litres @ 16.39ppl</i>	£/Cow
Milk Output			1722
Calves			191
Less Replacements		less	208
Total Output			1705
Meal Fed	4.05	Tonnes @ £	152 617
		plus straights	
		@ £	35
		plus mins @ £	8
Grassland Costs			69
Vet and Medicines			129
A.I.			45
Sundries			136
Quota leasing			1
Total Variable Costs			1040
Total Variable Costs per Litre		10068 Litres	10.33 ppl
Gross Margin per Cow			665
Gross Margin ppl			6.61
Stocking rate			2.04
Gross Margin / Hectare			1357
Average herd size			31
Calving index			413 Days
Replacement rate			29 %
Milk Quality		Protein	3.02 %
		Butterfat	3.72 %

FEEDING TEAM

C.R.E.A.M. Winter Feeding Regime

Table 4. Analysis of the silage, whole crop wheat and concentrates offered for the winter of 2005.

	Dry Matter (%)	ME (MJ/kg DM)	Crude Protein (%DM)
Silage (*)	36	11.4	13.4
Whole Crop (*)	56	10.0	7.2
Blend	87	13	33%(fresh)
Nut	87	13	18% (fresh)

(* - Source Hillsborough Feeding Information Service)

Currently the TMR for the C.R.E.A.M herd during winter feeding season 2006 consists of (fresh weight offered /cow/day):

- 27 kg Grass Silage
- 8kg Whole Crop Wheat
- 0.2 kg Straw
- 0.5 kg Molasses
- 3.5 Kgs (33 % protein) Blend

This is calculated to supply maintenance plus 20 litres for cows and 17 litres for heifers at 16% crude protein. Over and above this level of production the cows receive 0.45kg parlour nut per litre of milk. The first 6 kgs of this is offered through the parlour with the remainder being fed through the out of parlour feeders (OOPF).

This means that a cow yielding 42 litres will be receiving 9 kgs of nut in the OOPF/parlour with a total diet protein percentage of 17.5%.

To optimize condition score management three feeding groups have been set up on the C.R.E.A.M computer.

- i. Main Milking group
- ii. Thin Milking group
- iii. Late lactation group, (cows whom are close to drying off)

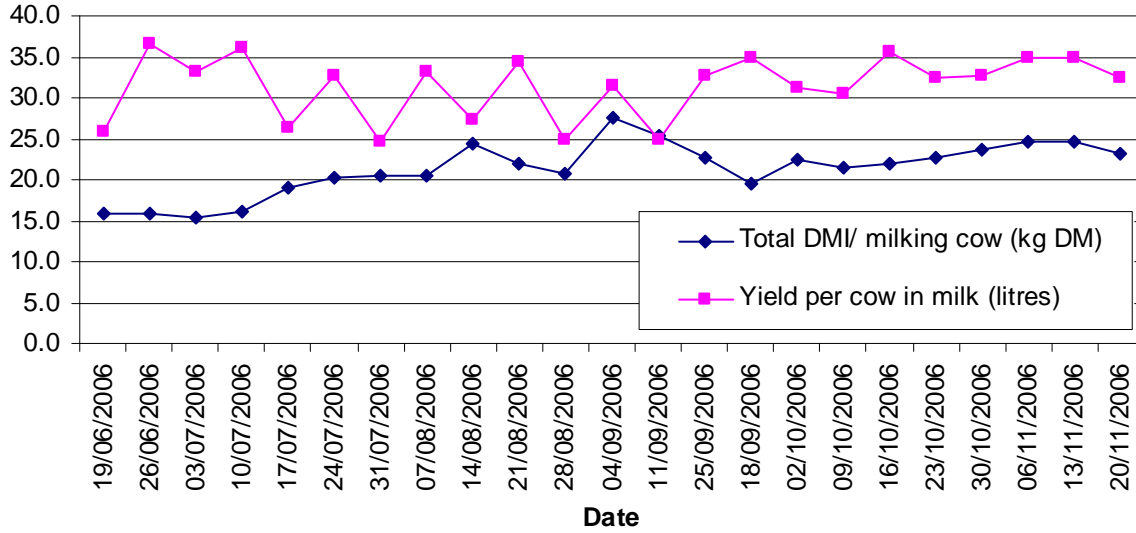
Table 5. Maintenance, minimum and maximum feeding levels set on computer through *ration calc* package for each feeding group.

(kg of concentrate)	Cows			Heifers		
	min	Max	M +	min	Max	M +
Main group:	7 (<120 days)	15	20	5 (<120 days)	13	17
	1 (>120 days)	15	20	1 (>120 days)	13	14
Thin Group:	7	15	18	5	13	14
Late Lactation:	0	15	22	0	15	20

Through continued use of the ration intake spread sheet, dry matter intakes are recorded on a daily basis. The spread sheet also calculates the adequacy of the diet in terms of energy and protein levels to ensure it meets the average milk yield of the herd and as a result calculates the average weight loss or gain within the herd. Changes to feeding levels and type of concentrate will be based on this information along with the monthly (B.C.S.) Body Condition Score. From the cows have come into the house in September the herd has been on average gaining 1.15 kg/day suggesting that most of the herd is in a positive energy balance. It must be remembered however that due to the nature of the spread calving pattern within the herd there is likely to be a large deviation from this figure for some animals at any given time.

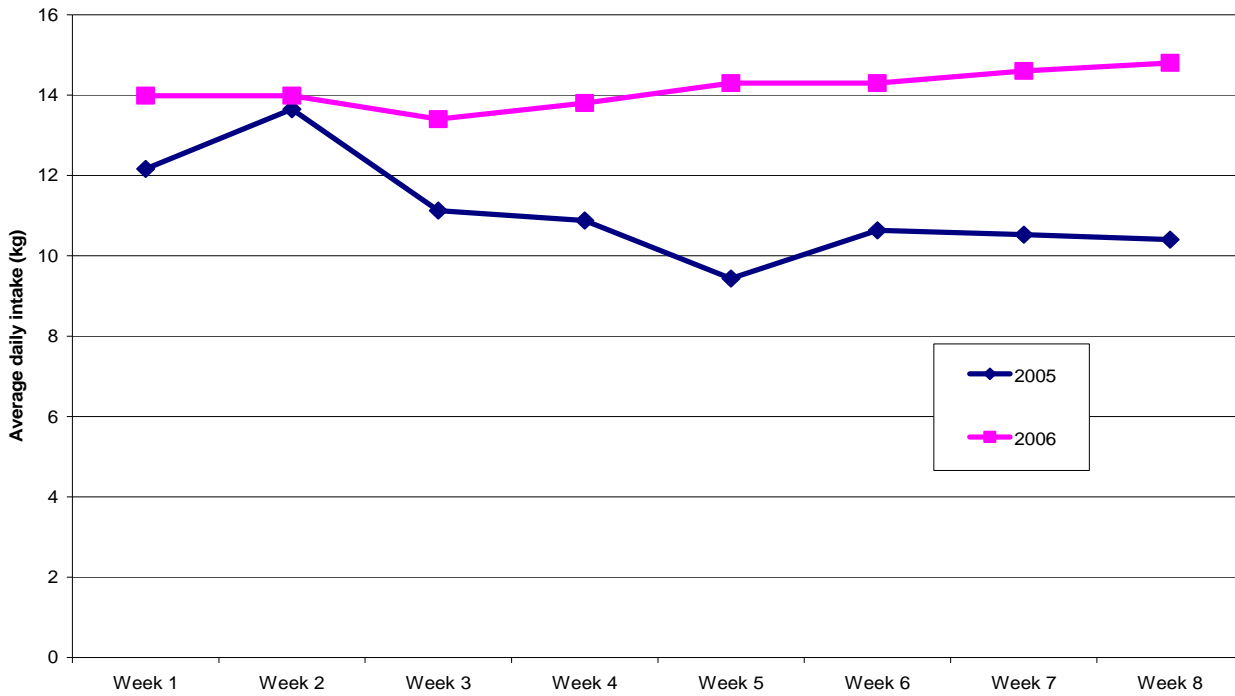
Graph 1.

Total DMI Intake and daily yield per cow from June 06 to November 06.

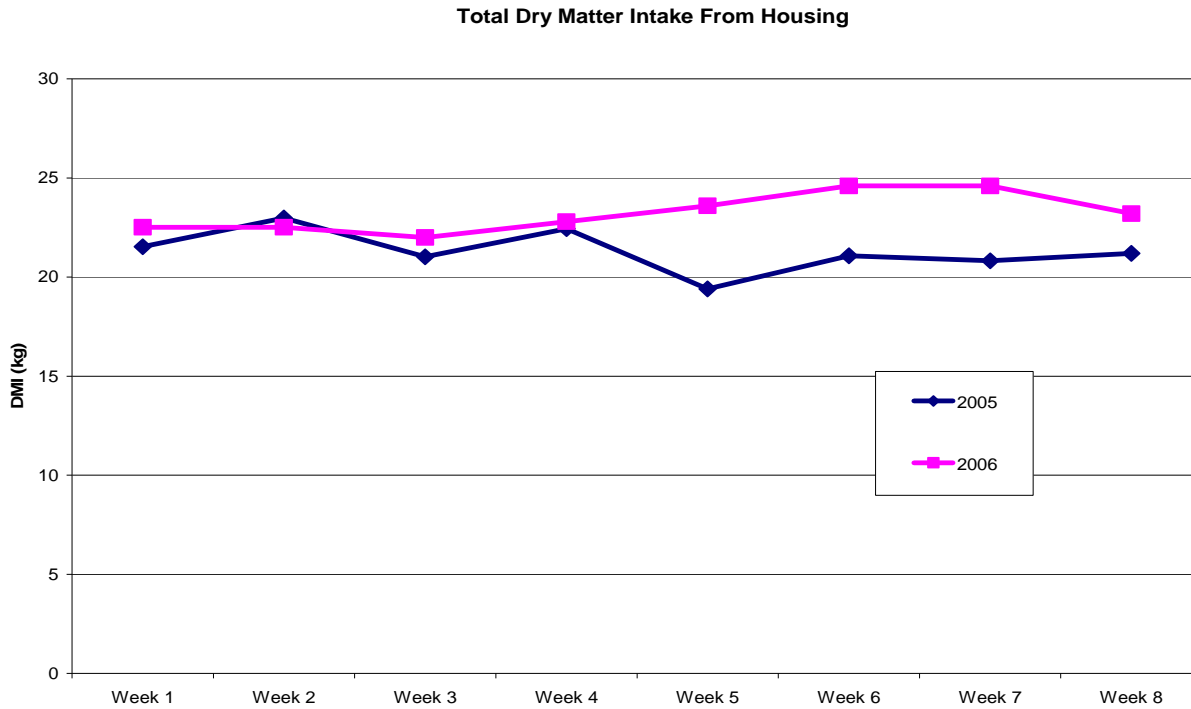


Graph 2

Total forage intake from housing



Graph 3



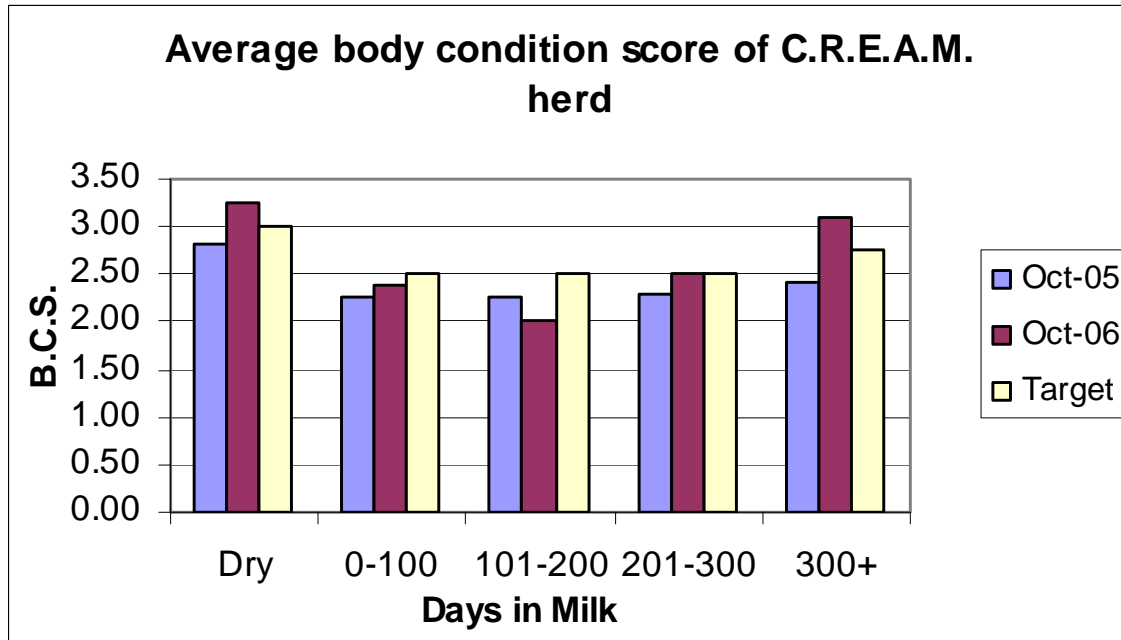
C.R.E.A.M. herd current body condition scores

The herd is condition scored in order to keep a record of the physical condition of the herd through the different stages of lactation. Adequate body reserves are necessary to maintain health, production and reproductive efficiency in dairy cattle. Under-conditioned cows are prone to reduced milk production, poor persistency of lactation and poor reproductive performance. Over-conditioned cows are likely to suffer dystocia, fatty liver syndrome and metabolic disorders. The Dairy Herd Fertility Challenge recommended body condition scores are as follows:

Stage of lactation	Condition score
Calving	3.0
Service	>2.5
Drying off	3.0

The body condition scores of the C.R.E.A.M. herd for October 2005 and November 06 are represented in the graph below. The overall average BCS of the herd at present is 2.58. The graph below shows the cows broken down into five groups.

Graph 5.



Within C.R.E.A.M. it is important to look at condition scores on an individual basis as due to the small numbers, results, such as those presented in Graph 5, can be misleading. For example although we appear to be almost half a condition score away from reaching our targets in the 101-200 and 300+ groups, there are only 3 animals in each group with one or two of them effecting the average. For this reason the cows are monitored on a fortnightly basis by the supervisor on duty to assess groupings (on the computer) etc.

Out of parlour feeders update

The main aim of installing the out of parlour feeders (OOPF) was to reduce concentrate wastage by improving the efficiency of the concentrate fed. In order to establish the interim effect of the OOPF in the C.R.E.A.M. unit, a comparison was required.

The feeders were installed in late April 2006 so it must be highlighted that they have not been in use for a full year therefore a complete economic appraisal of their performance is not available (this will be presented at the next board meeting). However, in an attempt to approximate their benefits an interim performance appraisal has been carried out.

The total amount of concentrate fed in the intervening period from the OOPFs installation (30 weeks from May 2006 until mid November 2006) was calculated as **2200 kg**. A crude estimate of projected usage over a 52 week period was found by multiplying 2200 kg by 1.73 (52/30) giving an estimate of **3812 kg** for 52 weeks.

From April 2005 to March 2006 an average cow in the C.R.E.A.M. unit consumed 4045 kg of concentrate. This was 545 kg above the target figure of 3500 kg.

The addition of the out of parlour feeders will mean that significant savings can be made from concentrate purchases. In the period from April 2005 to March 2006 £660 per cow was spent on concentrates. If the estimated figure of 3812 kg is used and an average concentrate price of £151, the average cost of feeding concentrates to a C.R.E.A.M. cow is £575. This equates to a saving of £85 per cow. If the herd averages 30 cows, this saving amounts to £2550 per year.

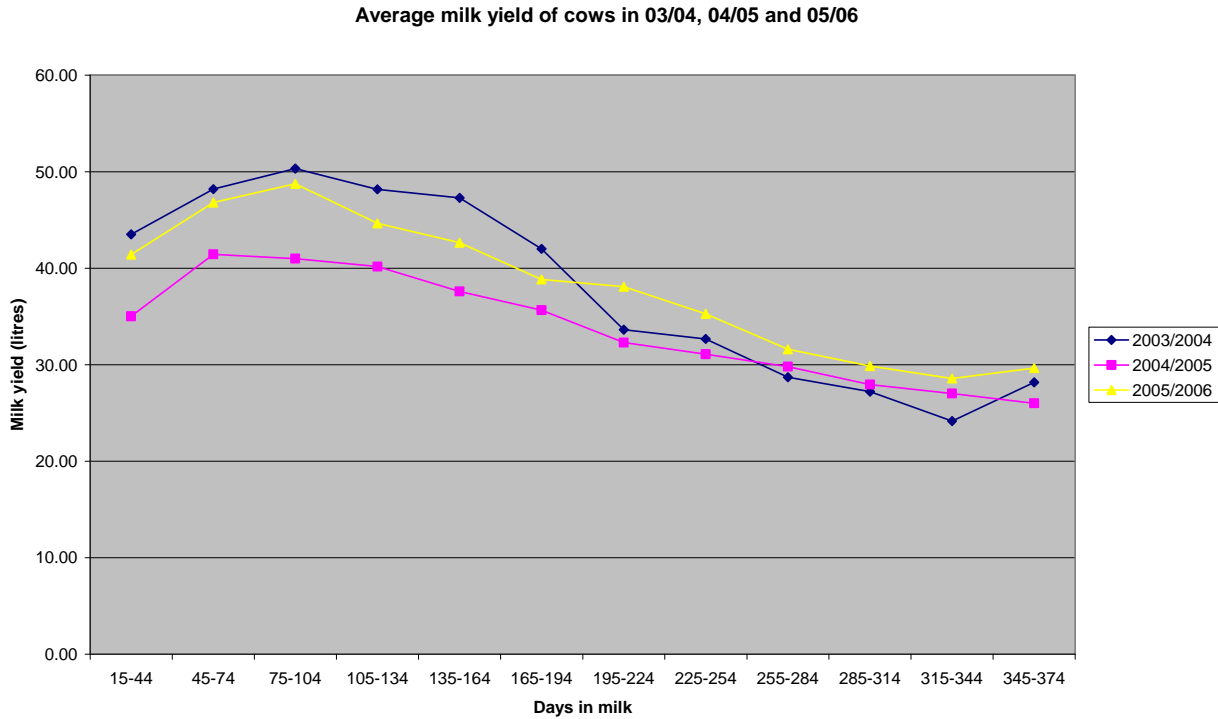
There are also many health benefits associated with out of parlour feeders. Body condition scores have always been below target in C.R.E.A.M. in recent years.

However, with the installation of the new feeders, we have seen average Body Condition Score increase (refer to previous section). This can be explained by the fact that with concentrate feeding being regulated there is better utilization of feed. There is also a stabilising effect on rumen pH and this has resulted in a reduction in cow stomach problems from 12 cases in 2005 (per 100 cows) down to 3 cases in 2006 (per 100 cows).

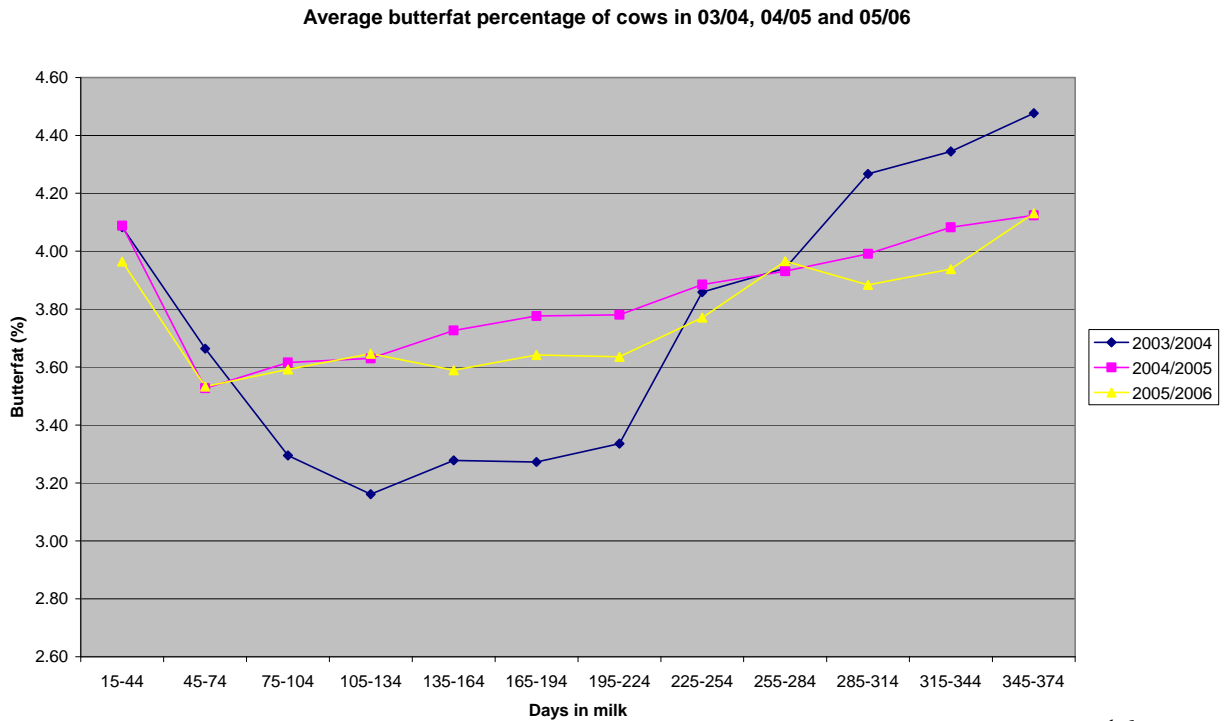
MILKING AND HEALTH TEAM

Lactation and Milk Composition Curves

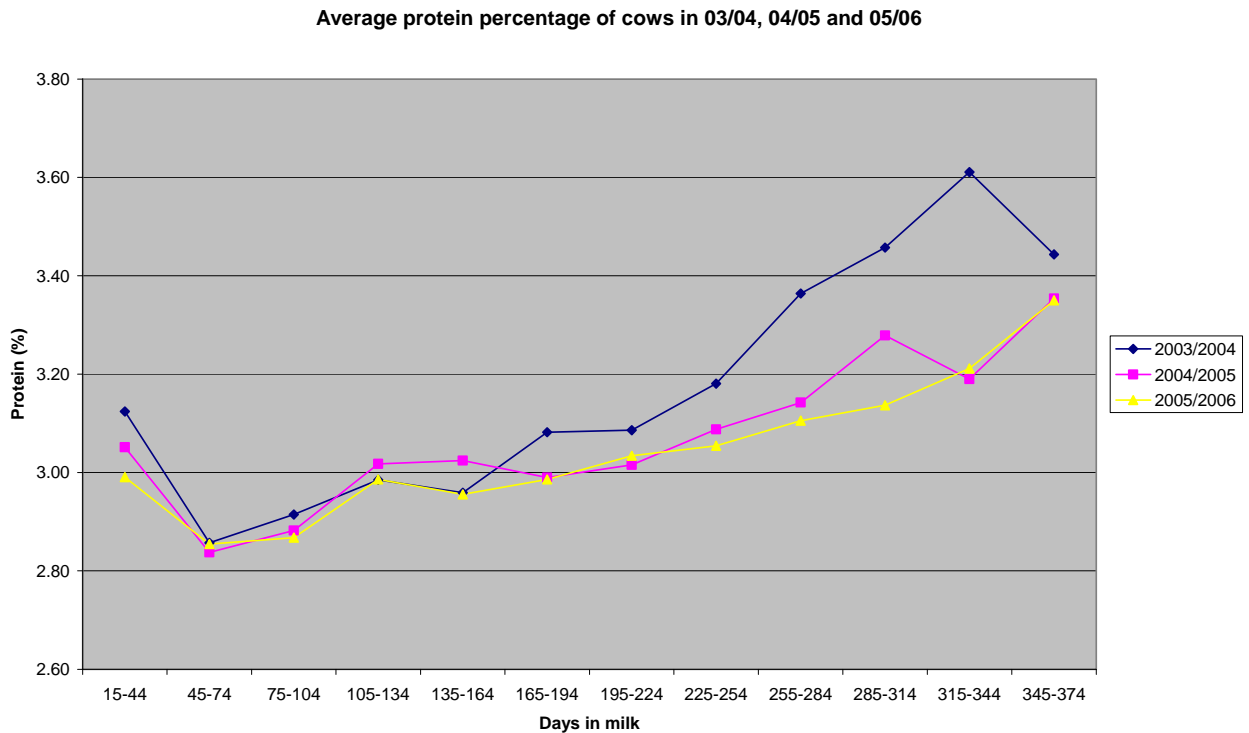
Graph 6: Average daily milk yield of cows in 2003/2004, 2004/2005 and 2005/2006



Graph 7: Butterfat percentage of cows in 2003/2004, 2004/2005 and 2005/2006



Graph 8: Protein percentage of cows in 2003/2004, 2004/2005 and 2005/2006



Graph 6 allows comparison of the average milk yield of the herd over the last three years. The rolling herd average milk yield between October 2005 and October 2006 has increased from 9,700 litres to 10,550 litres. This is a steady increase which can be seen clearly on the graph.

Graphs 2 and 3 allow the comparison of milk butterfat and protein percentages of the herd over the last three years. The flatter butterfat curves over the past 2 years are characteristic of a high proportion of heifers in the herd, as there is less of a dilution effect. Graph 8 demonstrates that the protein concentration of the milk has remained relatively constant over the past 3 years, despite selection of positive component bulls. It must be remembered that from bull selection takes place it may take up to 5 years for this selection to have an effect within the herd.

Health plan and vaccines of the C.R.E.A.M. herd

Johne's Disease

Johne's disease is a chronic, progressive wasting condition that is caused by an organism which is closely related to the one which causes Tuberculosis. The disease causes profuse and persistent diarrhoea, severe weight and condition loss, reduced milk yield, infertility and results in early culling of infected cows.

As such Greenmount operates under a strict policy when dealing with the prevention of the disease including the following;

- Implementing a closed herd policy
- Blood sampling all cows over 2 years old for Johne's disease on a yearly basis and culling any infected cows
- Separating calves from their dam as soon as possible
- Only feeding calves colostrums from their dam to reduce the risk of infection.

Herd Vaccinations

A vaccine is "a substance used to stimulate the production of antibodies and provide immunity against one or several diseases. (Oxford Dictionary)"

The Heifers in the C.R.E.A.M. herd are all vaccinated for Bovine Viral Diarrhoea (BVD) and Leptospirosis before they are served. They are also vaccinated against Black leg and tetanus before they go to grass for the first time in the form Tribovex T.

Every year the cows in the C.R.E.A.M. herd are vaccinated against Leptospirosis, Bovine Viral Diarrhoea and Salmonella (in March). The affects of these diseases include:-

- *Leptospirosis* usually becomes apparent during the gestation period of the animal. The main affects that it has on the animal is that it causes abortion, bloody milk and it creates a dirty calf bed in the cow.
- *Bovine Viral Diarrhoea* causes a number of problems these include damage to the digestive and immune system, ammonia, abortions as well as new born deformities and it may also cause scouring.
- In cows *salmonella* causes diarrhoea, decreased milk production and sometimes death. It is contagious through the animal's dung.

The complete herd is treated with Eprinex pour-on in late November, early December to combat against worms. They also receive 2 more Cosecure boluses after they calve to help improve fertility and random cows are blood profiled throughout the year to pick up on any deficiencies that there may be within the herd.

Dry cow practice

When the cows are dried off they are tubed with cepravin dry cow tubes (long acting antibiotic) and Orbeseal tubes which are a sealer. They are also are treated with Fasinex fluke drench to combat against fluke and administered Rotavec Corona vaccine, which aids in reducing the incidence of scour in calves caused by the Rotavirus, Corona virus and E coli.

At this time the cows also receive 2 Cosecure boluses which help to counteract in any deficiencies that the cows may have in trace elements such as selenium. Within the first four weeks of the dry cow period the cows are split into two groups the main group and the thin group, the thin group receive 2kg's/cow/day of dry cow nuts and the main group receive dry cow minerals and then in the last four weeks of the dry cow period they are offered 2kg pre calver nuts per day.

Veterinary Health Analysis

The C.R.E.A.M project records all veterinary and health treatments within the herd. As a result problem areas and problem cows can be identified and actions can be taken to make improvements. It also allows the herd to be benchmarked against published UK health data.

In the past the three health issues with the highest level of incidence in the C.R.E.A.M herd have been mastitis, lameness and stomach problems. Table 5 demonstrates the incidence of these disorders within the past 12 months (October 2005 to November 2006).

Table 5: Comparison of the incidents of mastitis, lameness and stomach problems between C.R.E.A.M. and Daisy Cow research data.

Disorder	C.R.E.A.M. per 100 cows (2004-2005)	C.R.E.A.M. per 100 cows (2005-2006)	Daisy Cow Research (per 100 cows)
Mastitis	68	52	33
Lameness	40	20	24
Stomach Problems	12	3	4

This data suggests that C.R.E.A.M. has a relatively high incidence of mastitis when compared to Daisy Cow Research; however the number of cases per 100 cows has reduced from the same period last year. A high incidence of mastitis can be expected with this type of dairy cow due to the stress of a high input system. The reduction in the number of cases has greatly been helped by the cull of a few problem cows, which were repeatedly being treated and kept figures high. Recently a new milking regime has been introduced which includes the wearing of gloves to help prevent the spread of

bacteria and 'Fore milking' is now carried out prior to predipping. It is hoped that this will further reduce the incidence of mastitis.

Other hygiene measures include the cubicles being limed and disinfected with Bio-super on a regular basis to keep bacteria at a minimum and the cows are kept out of the cubicles for up to 20minutes to allow their teats to seal and minimise the chance of bacteria entering the udder. We also carried out a teat scoring exercise to determine if there was anything causing damage to the teat ends which would have the potential to lead to an increase the number of cases of mastitis. The overall average was 1 which is very good and gave us no reason for concern.

The Importance of milk components and hygiene (Loughry Visit)

This semester C.R.E.A.M. students visited Loughry Campus to take part in a cheese making practical. The aim of this practical was to increase awareness of the importance of milk composition and hygiene for the milk processor.

Milk composition within the C.R.E.A.M. herd has been an issue which the students have focused on improving in recent years. Many processors in the South of Ireland are already moving their payments away from volume to components and it is feasible to say that processors in the North may do the same in the near future. Therefore it is important that dairy farmers focus on improving milk composition within their herds, whilst maintaining yield. If we compare the level of butterfat and protein concentration in the milk we produce in Northern Ireland (refer to Table 6) to the milk produced in countries like Germany and the Netherlands it is obvious that the levels are substantially lower (e.g. NI is 0.22% lower than Netherlands for protein and 0.5% lower for butterfat (Source; MDC, 2003). This results in a huge loss of revenue for dairy farmers. In NI, 1.8 billion litres of milk are produced. For the equivalent amount of milk produced in the Netherlands they have the potential to receive 25 million pounds more.



Hygienic quality is not so much an issue for Northern Ireland dairy farmers as the standards are generally met. It is however essential in cheese manufacturing to have a very high hygienic quality. This is because unhygienic milk i.e. milk with a high SCC, e.g. 250 plus, has a huge effect on

the composition of the milk by decreasing the pH of the milk and lowering the amount of casein. Casein is the portion of the protein that is utilised by the processor so it is important that the maximum amount possible is present in the milk.



Table 6. Average milk composition within the main milk producing countries in the EU:

Country	Protein%	Butterfat%
Netherlands	3.46	4.43
Germany	3.42	4.23
Denmark	3.41	4.33
UK	3.29	3.99
ROI	3.28	3.74
Italy	3.27	3.67
Northern Ireland	3.24	3.93
France	3.18	4.09

In terms of milk composition the C.R.E.A.M. herd is below average, even for Northern Ireland; however it is hoped that through our continued bull selection policy that an improvement will be observed in the future.

BREEDING

TEAM

Current herd PTAs

Table 7. Current herd PTAs

	Number in each category	Fat PTA (%)	Protein PTA (%)	Milk PTA (kg)	PLI
Average PTA for 1st Lactation	15	0.06	-0.02	210	27
Average PTA for 2nd Lactation	11	0.02	-0.01	118	12
Average PTA for 3rd Lactation	4	-0.03	0	203	18
Average PTA for 4+ Lactations	2	-0.08	-0.06	268	10
Average PTA for Heifers to calve	7	0.06	0.01	82	16
Average PTA's for Young Stock	21	0.08	0.03	99	27
Average of milking herd	39	0.03	-0.01	160.51	18.05

Future animals for sale

For the incoming year there is a surplus of replacement heifers within the herd. As a result all replacement stock PTAs are being scrutinized as they calve down. These figures, along with their mothers performance, will be taken into account when deciding whether or not the heifer should remain within the herd. It is hoped that by removing any poor component animals that our butterfat and protein composition may improve.

Sire Selection

Sire selection in the C.R.E.A.M. herd has concentrated on maintaining milk yield, improving milk and compositional quality as well as improving type (legs/feet, udder, strength and stature). In addition, all bulls selected are CVM free to avoid any potential problems with this recessive genetic mutation.

Table 8. Selection criteria for 2004/05 (PTA 2005) and the new selection criteria for 2006/07 (PTA 2005) are shown on the table below.

	2005/06 PTA 2005	2006/07 PTA 2005
Milk Kg	>50	>50
Butterfat %	>0.1	>0.1
Protein %	>0.02	>0.05
Type	>1.2	>1.2
Reliability %	>80	>70
CVM	NEGATIVE	NEGATIVE

Table 9. Short listed bulls and their PTAs.

Bull	Milk (Kg)	Protein (%)	Butterfat (%)	Legs & Feet	SCC	Type	Rel. (%)	Fertility Index
Joylan Roxell	38	0.07	0.17	1.52	0	1.7	98	5.2
Rietben Charge	178	0.05	0.1	0.81	-24	1.3	95	4.4
Comestar Export	55	0.07	0.21	0.83	-2	1.2	98	0.9
Elmo	97	0.05	0.09	0.91	-6	1	95	0.4
Regancrest Samuelo	111	0.05	0.17	1.76	-11	2.2	72	-1.7
Leif	227	0.06	0.13	0.6	-19	1	75	N/A
Tec Llaneza Builder	186	0.07	0.25	1.9	10	2.2	70	N/A
Mascol	465	0.09	0.12	2.14	-26	1.7	73	N/A
Emil	379	0.08	0.13	1.6	0	1.4	73	N/A
Jonk	498	0.07	0.08	2.16	5	1.9	73	N/A

From the short listed bulls we selected the following three:

- Tec Llanaza Builder (for heifers)
- Mascol
- Regancrest Mr. Samuelo

Reasons for Choice

- Tec Llanaza Builder: good solids, good type, good legs and feet and easy calving.
- Mascol: high milk, with good solids with reasonable type merit and good legs and feet.
- Regancrest Mr. Samuelo: good type, with reasonable solids and good legs and feet.

Bulls That Were Considered and rejected

- Comestar Export: Comestar Export is the Son of Lord Lilly - a bull which C.R.E.A.M. has used extensively
- Rietben Charge: Produces heifers with a narrow chest and body, presently C.R.E.A.M. have several heifers with these undesirable characteristics.
- Joylan Roxell: Low milk yield.
- Elmo: Poor type.
- Leif: Poor type and poor legs and feet.
- Emil: Non improver for somatic cell count.
- Jonk: Unavailable

Update on April 2005 Embryo Transfer Work

Transfer of 6 Silky Gibson x Supreme Annemarie eggs

The above resulted in one heifer calf.

Transfer of 6 Braedale Goldwyn x Cogent Tugolo eggs (purchased from Cogent)
(PTAs of 215 for milk, + 0.19 butterfat and + 0.09 protein).

The above resulted in one heifer and one bull calf. The bull is to be sold in the spring time. The heifer, due to the excellent genetics for milk and components is to be flushed at least once in the spring before putting her in calf.

C.R.E.A.M Fertility Performance 05/06

Calving Index

Calving index is the primary measure of fertility traditionally used. It is the interval in days between successive calvings for a herd (or group) of cows. Ideally this should be as close to 365 days as possible but in higher yielding herds such as C.R.E.A.M. a longer interval is acceptable. The projected calving index for C.R.E.A.M. is shown in the table below using new Fertility Benchmarking figures and past figures are from United Milk Records.

Table 10. C.R.E.A.M. calving index compared to benchmarked herds

Calving Index (days)	Jan 06	05/06	Range	Target
C.R.E.A.M.	408*	426		420
Benchmark average (36 herds)		390	361-467	
Benchmark average (7 herds >8000l)		415	382-467	

* - Source United Milk Records

While calving index is a good guide to fertility it has two major weaknesses:

- 1) It does not take into account cull cows
- 2) Cows with long and short calving intervals are hidden in the overall average

Calving index will also be affected by other fertility parameters such as submission rate and conception rate.

Heat Detection Efficiency

a) Submission Rate

Submission rate is a measure of heat detection efficiency calculated as a proportion of cows served over the number eligible for service. In Fertility Benchmarking Online these are calculated throughout the breeding season in a series of successive 3-week periods based on voluntary waiting period, (60 days

for C.R.E.A.M.) and breeding start date. Fertility Benchmarking results are shown below.

Table 11. C.R.E.A.M. submission rate compared to benchmarked herds

Submission rate %	March 06	05/06	Range	Target
C.R.E.A.M.	83	71		70
Benchmark average (36 herds)		61	30-94	
Benchmark average (7 herds >8000l)		64	52-79	

b) Interval to first Service

The target interval to first service is calculated by adding half the length of an oestrus cycle to the voluntary waiting period. With a voluntary waiting period of 60 days the Target Interval to First Service for C.R.E.A.M. is 70 days.

Table 12. C.R.E.A.M. interval to first service compared to benchmarked herds

Interval to 1 st Service days	March 06	05/06	Range	Target
C.R.E.A.M.	83	74		70
Benchmark average (36 herds)		76	62-101	
Benchmark average (7 herds >8000l)		74	62-91	

c) Heat Detection Rate

Heat detection rate is a method used to assess heat detection efficiency. It is based on the average interval between services giving an indication of the number of missed heats. For example, a cow with an interval of 21 days would not have missed any heats, while cows with intervals of 42 and 63 days would be assumed to have missed 1 or 2 heats.

Table 13. C.R.E.A.M. heat detection rate compared to benchmarked herds

Heat detection rate %	March 06	05/06	Range	Target
C.R.E.A.M.	83	64		70
Benchmark average (36 herds)		72	47-100	
Benchmark average (7 herds >8000l)		68	49-78	

d) Heat Detection Accuracy

This is another method of assessing Heat Detection Efficiency using inter-service intervals. Ideally cows should not repeat but if they do it should be 18-24 days after service. Intervals outside this indicate poor heat detection or irregular cycles. The target heat detection accuracy is approx 60% of heats falling within the 18-24 day period. C.R.E.A.M. currently has a Heat Detection Accuracy of 38% based on repeats in the 18-24 day period. This is similar to the Benchmark average and is an improvement of 5% from March. The poor result may be due to cows holding to service and then aborting.

Table 14. C.R.E.A.M. heat detection accuracy compared to benchmarked herds

Heat Detection Accuracy %	March 06	05/06	Range	Target
C.R.E.A.M.	33	38		60
Benchmark average (36 herds)		46	17-72	
Benchmark average (7 herds >8000l)		38	17-46	

Conception Rates

This is worked out as a % of cows that hold to service based on pregnancy diagnosis. The table below will show conception rates.

Table 15. C.R.E.A.M. conception rates compared to benchmarked herds

Conception Rates %	05/06 1 st Service	2 nd Service	All Services	Target
C.R.E.A.M.	33	35	39	40
Benchmark average (36 herds)	52	52	53	
Benchmark average (7 herds>8000l)	39	43	43	

C.R.E.A.M. has a poor conception rate and it currently takes 2.5-3 straws of semen to get each cow in-calf. This is because the herd is producing more than the other herds in the band.

The cows will therefore have a larger energy imbalance in early lactation lowering the chance of them holding in-calf.

100 Day In-calf Rate

This is a new method of measuring fertility performance and assesses the proportion of cows intended for re-breeding that are pregnant again within 100 days of calving. It acts as an overall measure of fertility performance and ignores cows not intended for re-breeding.

Table 16. C.R.E.A.M. 100 day in calf rate compared to benchmarked herds

100 day in-calf Rate %	05/06	Range
C.R.E.A.M.	32	
Benchmark average (36 herds)	49	15-80
Benchmark average (7 herds>8000l)	37	28-53

A target could be set at 50% based on Mortons' In-Calf Project Australia. He found the range to be 19-73% based on 43 herds with year round calving.

% Not In-Calf

This refers to the number of cows not in-calf at the end of the breeding season. For C.R.E.A.M. this is running at 7% with the Benchmark average being 12.7%. This shows that even though some of the C.R.E.A.M. figures are below average cows are holding in-calf due to the lower empty % for higher yielding herds.

Table 17. % of cows not in calf by end of breeding season compared to benchmarked herds.

% Not in -calf	05/06	Range
C.R.E.A.M.	7	
Benchmark average (36 herds)	15	0-62
Benchmark ave (7 herds>8000l)	13	0-34