Agenda

	Speaker	**Time**	**Location**	**Page Number**
Lunch for visitors		12.30	Manor Restaurant	
Welcome	Elaine Vance (Chair person)	2.00	GRC Lecture Theatre	
Review of previous minutes	Hazel Gilmore (secretary)	2.05		
Finance and Promotion Team		2.10		1
Rolling Herd Performance Update	Ian Latimer			2
P.R. Diary	John Russell			8
Feeding Team		2.25		
Current diet evaluation	William Robinson			13
Home vs. contract grown maize	Steven Graham			17
Cost benefit analysis of out of parlourfeeders				19
Milking and Health Team		2.40		
Lactation curves	Keith Meehan			22
Teat Scoring and milk screening	Ross Murray			25
Breeding Team		2.55		
Preliminary fertility results	Paul Anderson			31
Future E.T work	Richard Walker			35
Progesterone testing in the herd	Samuel Watson			37
Questions/Discussion time	***Board Members and attending staff.***	***3.10***		
Depart for C.R.E.A.M. unit		3.45		
Viewing of C.R.E.A.M. unit and stock		4.00	C.R.E.A.M. unit	
Board buses to Manor Restaurant		4.25		
High tea		**4.35**	**Manor Restaurant**	

Please note that all material within this document has been prepared by students.

Finance and Promotion

C.R.E.A.M. Rolling Herd Performance

Physical performance:

The performance of the C.R.E.A.M. herd is summarised below. Annual milk yield is currently 818 litres below target at 9,682 litres. Over the past two years a high proportion of the milking herd has been first lactation heifers. In the current year 36% of the herd is first lactation heifers, compared to only 10% in 2003-2004. It is well established that first lactation heifers have flatter lactations curve than second lactation plus cows. This has resulted in the rolling herd average decreasing over the past 18 months.

Table 1. Rolling herd performance

	Jan 2005	Sept 2005	Jan 2006	Target
Cows in Herd	29	31	32	30
Calvings (%)	109	117	108	-
Milk Yields/cow (Litres)	10,666	9,722	9,682	10,500
Concentrate/cow (kg)	4,344	4,099	3,945	3,500
Milk Price (ppl)	17.35	17.27	17.58	-
Butterfat (%)	3.62	3.75	3.72	3.7
Protein (%)	3.06	3.05	3.03	3.1
SCC ('000)	112	126	110	<150
TBC	13	7		
Bactoscan (Began Oct 05)			9 *	<10

Due to the lower milk yield, concentrate consumption has decreased over the past year by 400kg/cow and is currently 3,945kgs/cow/year. This should be further reduced with the installation of the out of parlour feeders in the unit and enable us to reach our short term (3.5 tonne/cow/year) and long term (3.0 tonne/cow/year) meal consumption targets in the future. The rolling herd butterfat figure is currently above target at 3.72%, however the protein results have remained below the herd target at 3.03%.

- ***Bactoscan Note:*** This measurement was introduced to eventually phase out TBC measurements and to replace them. January of this year was the first month to record Bactoscan solely, and the measurement taken from C.R.E.A.M. was 9. It will be twelve months before a rolling herd average for the Bactoscan results can be calculated. The hygienic quality of the milk since September has been excellent and consistently received the appropriate bonuses.

Financial performance:

Due to the timing of the Advisory Board day this semester it is not possible to calculate a gross margin for the herd as all the necessary figures are not yet available. A gross margin analysis will be posted out to all Board members with the minutes of the present meeting. To give an indication of financial performance the rolling margin over concentrates (MOC) for January 2005 and 2006 is presented in the table below and compared to the average for benchmarked herds over 8000 litres.

Table 2. Comparison of margin over concentrates.

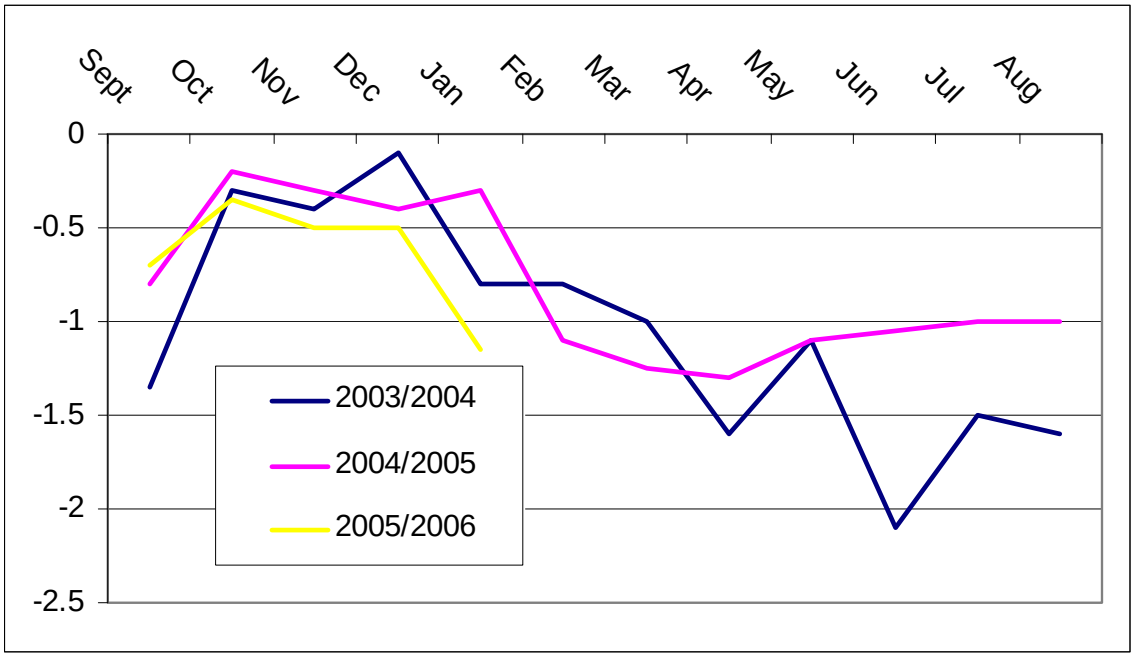
		C.R.E.A.M.		Bench marked herds
		Jan 2005	Jan 2006	over 8000 litres
Margin over concentrates	£/cow	1092	1130	1163
	Pence/litre	11.28	10.62	13.64

Rolling 12 Months Averages	2005 JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	2006 JAN
Cows in herd	28.54	28.92	29.15	29.31	29.54	29.77	30.08	30.38	30.85	31.23	31.38	31.62	31.62
Calvings % herd	108.63	100.27	99.47	105.77	104.95	107.49	106.39	105.32	116.71	115.27	114.71	104.38	107.54
Milk yield/cow	10666.00	10757.72	10694.99	10611.36	10527.13	10274.86	10000.25	9790.27	9721.77	9679.88	9685.10	9676.48	9681.98
Milk from forage (litres/cow)	1014.15	940.38	1203.49	1199.68	738.89	1254.36	1091.83	845.71	613.03	945.87	955.32	1072.48	914.61
Concs/cow (kg)	4343.33	4417.80	4271.17	4235.25	4404.71	4059.22	4008.79	4025.05	4098.94	3930.30	3928.40	3871.80	3945.31
Concs/litre (kg/l)	0.41	0.41	0.40	0.40	0.42	0.40	0.40	0.41	0.42	0.41	0.41	0.40	0.41
M.O.C./cow (£)	1130.21	1131.18	1139.51	1140.10	1114.26	1141.07	1108.62	1080.65	1052.52	1117.06	1166.74	1226.05	1109.99
M.O.C./litre (p)	10.60	10.52	10.65	10.74	10.58	11.11	11.09	11.04	10.83	11.54	12.05	12.67	11.46
Price/litre (p)	17.35	17.29	17.19	17.16	17.20	17.27	17.29	17.30	17.27	17.26	17.25	17.20	15.43
Cost/tonne concs (£)	165.74	165.01	163.76	160.76	158.01	156.16	154.87	152.22	152.86	140.84	128.29	113.21	97.26
Weighted average butterfat (%)	3.62	3.62	3.62	3.62	3.64	3.68	3.71	3.74	3.75	3.76	3.75	3.75	3.72
Weighted average protein (%)	3.06	3.06	3.05	3.06	3.06	3.06	3.06	3.05	3.05	3.04	3.04	3.04	3.03
Weighted average SCC (' 000)	111.57	114.05	118.44	122.98	127.95	125.04	132.13	128.08	126.20	125.71	122.58	115.02	110.34
Weighted average TBC (' 000)	12.55	13.24	13.95	13.45	12.75	6.97	6.88	6.67	6.96	6.50	6.09	5.67	4.74

Table 3. Rolling herd averages Jan 2005 to Jan 2006.

Milk price received

Graph 1. Monthly difference between the milk base price and the price received by the herd September 2003 - present.



The graph above demonstrates the difference between milk base price and the milk price received by the herd over the previous three years. The graph demonstrates that during the 2003/2004 summer period the milk price that herd received deviated negatively a substantial amount from the base price on a number of occasions. This trend did not occur to such as extent in the following year (2004-2005) and it is hoped that this can be maintained or improved upon in the incoming year.

Promotion Diary

At the previous board day in November 2005, the Advisory Board suggested that a lot more promotional work should be carried out within the project. As a result a promotional diary has been collated. In an effort to increase the public awareness of the unique C.R.E.A.M. project it has been the intention of the students to compose a minimum of one article per month for the academic calendar.

Table 4. C.R.E.A.M. project promotional diary

Month	**Title**	**Media**
November	Paul Anderson	United News
December	Nov 05 Board Day	Farming Life
January	Low Bactocount	United News
February	Mastitis Report	Farming Life
Future promotional	activities:	
March	Today's Board Day	Farming Life
April	Milk Progesterone Testing	Under Review
May	Balmoral Show	
April	Open Night	Greenmount Campus

Article snapshots:

C.R.E.A.M. STUDENTS ACHIEVE CONSISTANTLY LOW BACTOCOUNTS

By: Hazel Gilmore, Ian Latimer and Richard Walker, Higher National Diploma Students, Greenmount Campus, CAFRE.

Since the introduction of the new Bactoscan method of hygienic quality analysis, C.R.E.A.M. has been achieving consistently low readings with an average of 10,000 cells per ml. This is well within the *Excellent* classification of hygienic quality control set out by United Dairy Farmers and can be attributed to the attention to detail concept adopted by the students.

Article snapshot:

STUDENTS COMBAT MASTITIS IN THE C.R.E.A.M. HERD

By the Finance and Promotion Team, C.R.E.A.M. project, Greenmount Campus, CAFRE.

This article is currently under construction. It is planned that a large article on mastitis in the herd which will cover recent teat scoring and milk bacterial screening of the herd will be published in the farming press.

Future Promotional Activities

To further increase the profile of the unique C.R.E.A.M. project it is hoped that the students involved in the project will attend Balmoral Show this year as part of the CAFRE stand. They will be involved in dispensing leaflets on CAFRE and its unique learning by doing approach.

The students also plan to attend the open night in the Campus in June, where they hope to set up a C.R.E.A.M. enterprise management stand and interact with prospective students.

Feeding

C.R.E.A.M. diet evaluation

The TMR for the C.R.E.A.M. herd during winter feeding season 2005 consists of 1st cut grass silage, fermented wholecrop wheat, concentrate blend, molasses and straw. This is formulated to produce M+34 litres. However to try to optimise concentrate feeding three feeding groups have been set up on the computer. 1. Main milking group: offered concentrates in the parlour above 34 litres of production; 2. late lactation group: offered concentrates in the parlour above 37 litres of milk and 3. thin group: offered concentrates in the parlour above 30 litres of production. Parlour concentrate is fed at a rate of 0.45kg/litre above these levels.

The computer recording spread sheet that we have been using allows accurate measurements of Dry Matter Intakes (DMI's) to be calculated each day by recording weights of feeds in the feeder wagon and then weighing the feed not eaten the next day. Dry Matters of forages were checked every 2 weeks.

The spreadsheet also calculates the adequacy of the diet energy and protein levels to ensure it meets the average milk yield of the herd and ultimately calculates weight loss or gain on average in the herd. A summary of these intakes are shown overleaf for each week since October 2004. Changes to feeding levels and type of concentrate throughout the winter were based on this information along with the monthly BCS data for the herd.

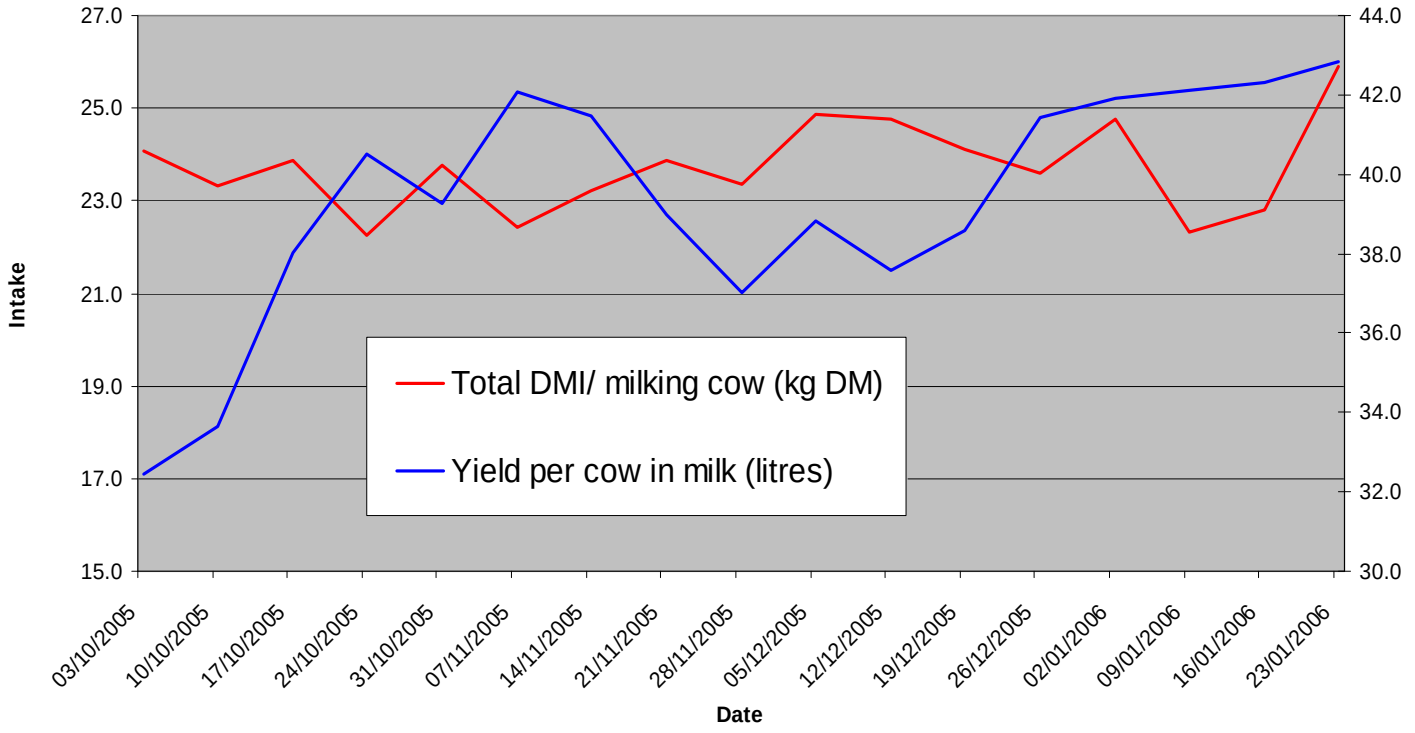
Current TMR diet (fresh weight fed/cow/day week commencing 4 April)

1st / 2nd cut grass silage	25kg
Wholecrop wheat	8kg
Molasses	0.5kg
Straw	0.4kg
21% CP blend	11kg
+ 18% CP parlour nut	

Table 5. Analysis of TMR components

	FWt (kg)	ME	DM%	CP%
1st cut grass silage (pH 3.9 NH_3 7)	25	12	33	14.4
Whole crop wheat	8	9.8	50	8.1
Blend	11	13.6	87	21
Straw	0.3	6.5	87	4
Molasses	0.3	12	75	6

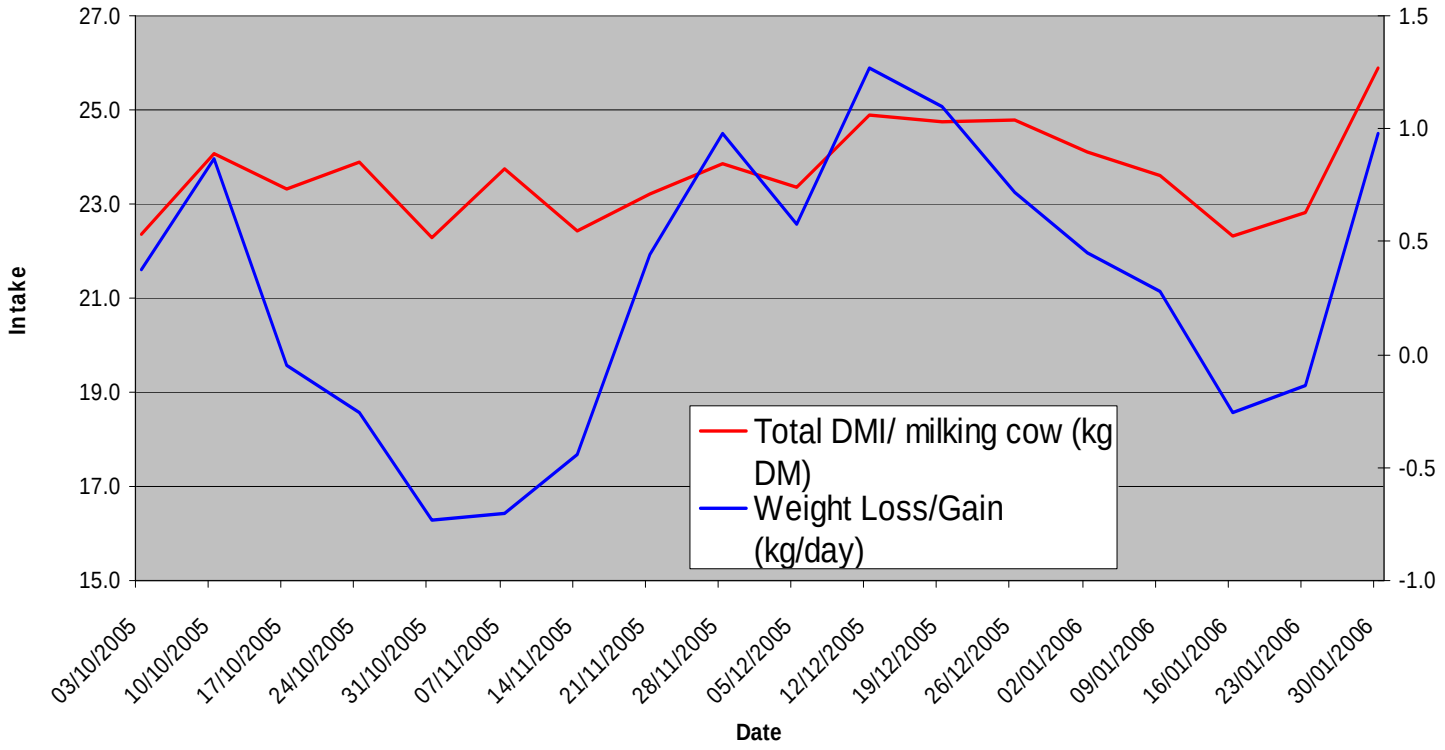
Graph 2. Total DMI/milking cow and daily yield per cow from October 2005 – Feb 2006



As cows began to calve down and reach peak yield, yield per cow rose during October and peaked at the beginning of November. At this point the herd was visited by its nutritionist who identified that the body condition score (BCS) of the herd was lower than would be acceptable. In an effort to improve this, the overall protein of the diet was lowered. It was hoped that this would reduce milk out put and enable to cows to increase in BCS. Graph 2 above demonstrates that at this time milk yield did decrease and Graph 3 demonstrates that a corresponding weight gain (and subsequent BCS) was observed on average through out the herd. In mid December the nutritional status of the herd was examined again and the average protein concentration of the ration was increased. This lead to an increase in milk production, and combined with the fact that a lot of freshly calved cows were reaching peak lactation, the herd

began to lose weight/condition. A certain amount of weight loss is to be expected with high genetic merit Holstein cows during peak lactation.

Graph 3. Total Dry matter intake and weight loss/gain from October 2005-Feb 2006



Growing Maize as Alternative Forage

At the previous Board meeting in November growing maize for the C.R.E.A.M. herd was proposed by the students. The board was in agreement that it should be investigated further.

Maize as an alternative forage has certain advantages and disadvantages.

Potential advantages of maize as an alternative forage include;

- Increased forage dry matter intakes.
- Increases milk yield.
- Increases milk protein.
- Possible fertility improvements.
- Has the potential to lower the amount of concentrates fed to the herd.

Hillsborough has demonstrated several of these advantages.

Table 6. Physical performance results achieved by offering different forages to dairy cattle.

	Silage Low conc.	**Silage High conc.**	**Fermented Whole crop**	**High DM whole crop**	**Forage maize**
Milk yield (kg/d)	28.5	30.5	29.6	28.7	30.9
fat yield (g/d)	1124	1169	1129	1129	1238
Protein yield (g/d)	867	966	928	924	993
Fat + protein (g/d)	1989	2129	2053	2057	2236

Possibly the largest advantage of feeding maize in the C.R.E.A.M. is the potential concentrate sparing effect that it has. Hillsborough has carried

out experiments investigating the possible concentrate sparing effect of maize silage and their results range from 1.3-5.0 kg/day. In contrast to maize, in the same studies, whole crop wheat (presently fed as an alternative forage to the herd) has a potential concentrate sparing effect ranging from 0.5-1.4 kg/day.

Disadvantages of maize silage include:

- It is a marginal crop and cannot be grown in all areas of NI
- Needs good weather conditions at both planting and harvesting along with plenty of sunshine during maturity to maximise starch levels.
- Plastic mulch is currently a problem due to it being photodegradable although research has now turned to make this biodegradable.

The costings of homegrown maize vs. contract bought maize will be presented and discussed at the Board day.

Appraisal of out of parlour feeders

The 2005/06 target for concentrate consumption within the C.R.E.A.M. herd is 3.5 tonne/cow/year, with the long-term target being to reduce this to 3 tonne/cow/year. Concentrate consumption for 2004/2005 was an average of 4.2 tonne/cow/year and therefore to meet targets this needs to be reduced. At the previous Board day in November 2005 installation of out of parlour feeders (OOPF) for the unit was proposed. Since then they have been installed in the unit and should be operational within the next two weeks. This should enable us to feed lower levels of concentrates through the diet feeder and hence, lower the amount of concentrates to be fed to lower yielding cows.

With the installation of the out of parlour feeders we may also have the option of feeding more than one concentrate through the feeders. This gives us with the option of reducing the amount protein fed to late lactation cows etc. and in turn the option of increasing condition score without increasing the amount of concentrate fed.

In order to calculate the potential concentrate savings that the OOPF may bring the intake records from the 30 week period October 2004 to May 2005 were used as a template (as intakes are only recorded during the academic portion of the year).

It was decided for calculation purposes that the TMR offered to the cows, in conjunction with the OOPF, should provide 23 litres (approximately the nadir of the average lactation curve of the herd). Examining the weekly intake and production records, the amount of concentrates, which would follow a feeding to yield format for the average cow in the herd over and above 23 litres, was

calculated (0.45kg/litreover 23 litres). This was carried out for each of the 30-week periods individually. Once this figure had been calculated it was subtracted from the amount of concentrates the cows were actually fed.

The results are summarized below:

Total meal saved on the herd overall Fresh weight	28224kgs
Total saved per cow over 30 weeks (DM)	818.kgs
Total saved per cow over 30 weeks Fresh weight kgs	940.8kgs
Financial savings per cow for 30 weeks @£150/tonne	£141.12
Savings for the whole herd £	£4233.6

There may be less potential to save money in the other 22 weeks of the year as the cows will be at grass and will not have sufficient access to the out of parlour feeders during the day. As a result the PMR offered at night may need a higher level of concentrate included to minimize loss of body condition and maintain yield.

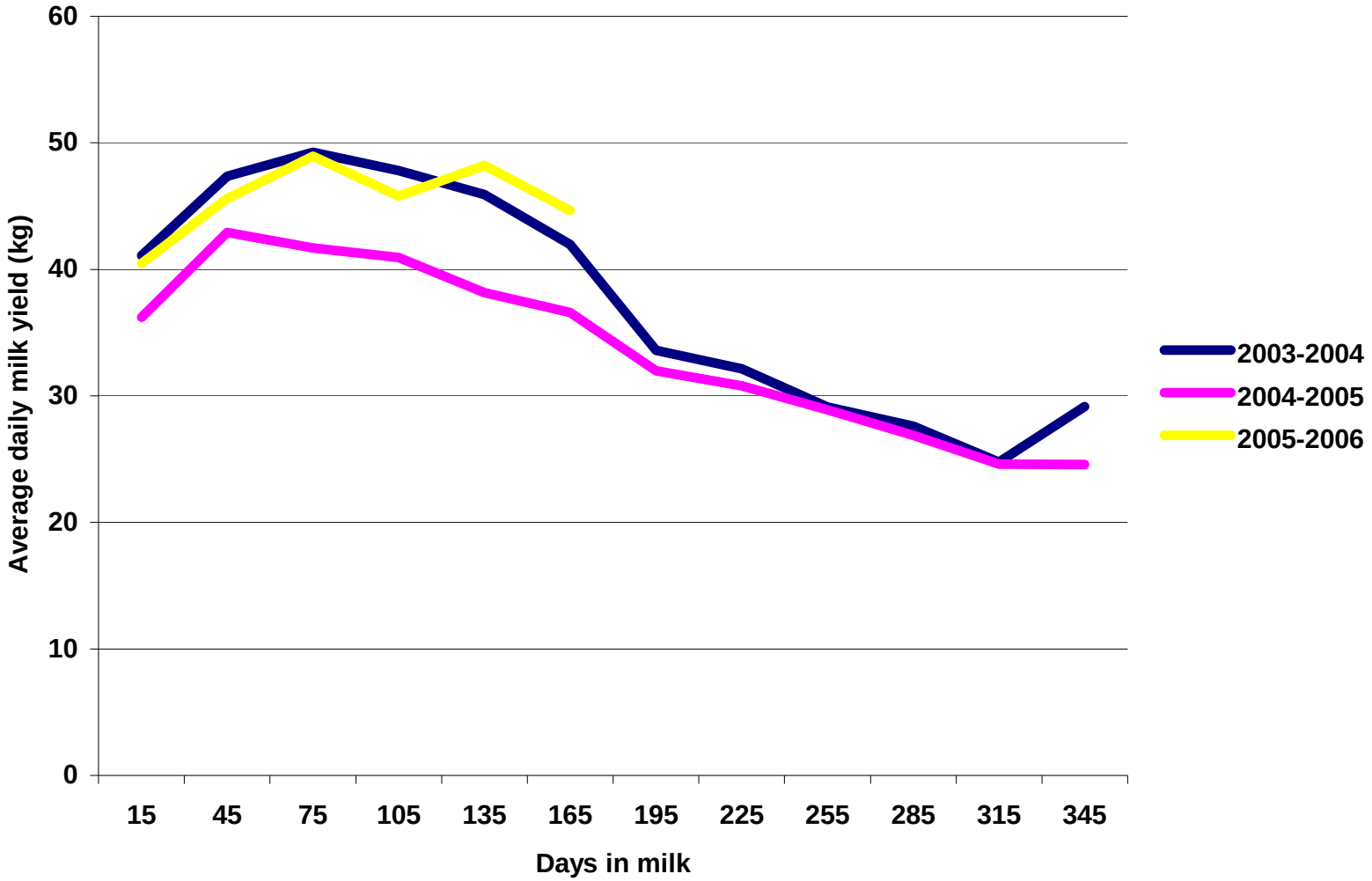
Milking and Health

Lactation Curves

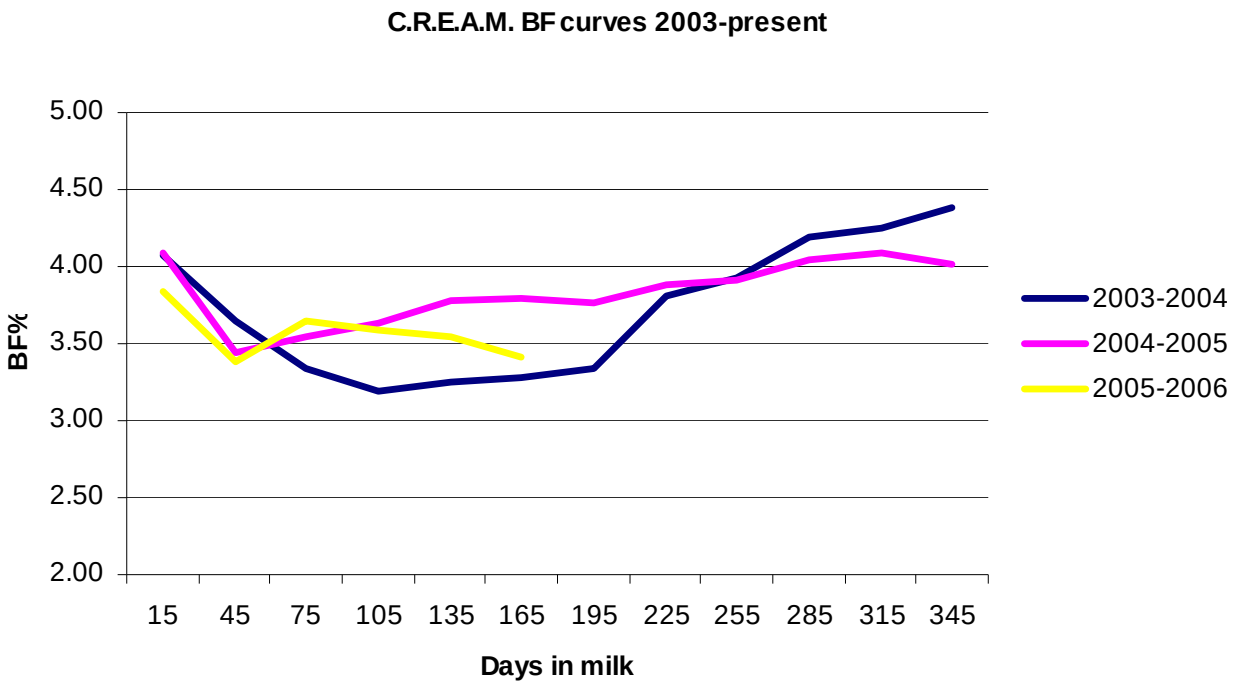
Graphs 4, 5, and 6 illustrate the lactation curves for yield, butterfat and protein of the entire herd over the present and previous two lactations. Although C.R.E.A.M. is an all year round calving herd, for the purpose of these graphs the commencement of the calving season was taken as 1st August each year. This allows a fair comparison of performance in terms of yield and components between each lactation.

As discussed previously the rolling herd milk yield has decreased steadily over the past 18 months. This was attributed to the fact that the replacement rate of the herd in 2004-2005 was unusually high due to a decision in the past to sell all replacement stock. As a result the daily milk yield of the herd decreased. Upon examination of Graph 4 it can be observed that the average daily milk yield for the herd for the present year has risen to a level equal to that of the 2003-2004 academic year. This is quite impressive as in 2003-2004 there were only 3 heifers milking in the herd (10% replacement rate) compared to 11 (36% replacement rate) in the present year.

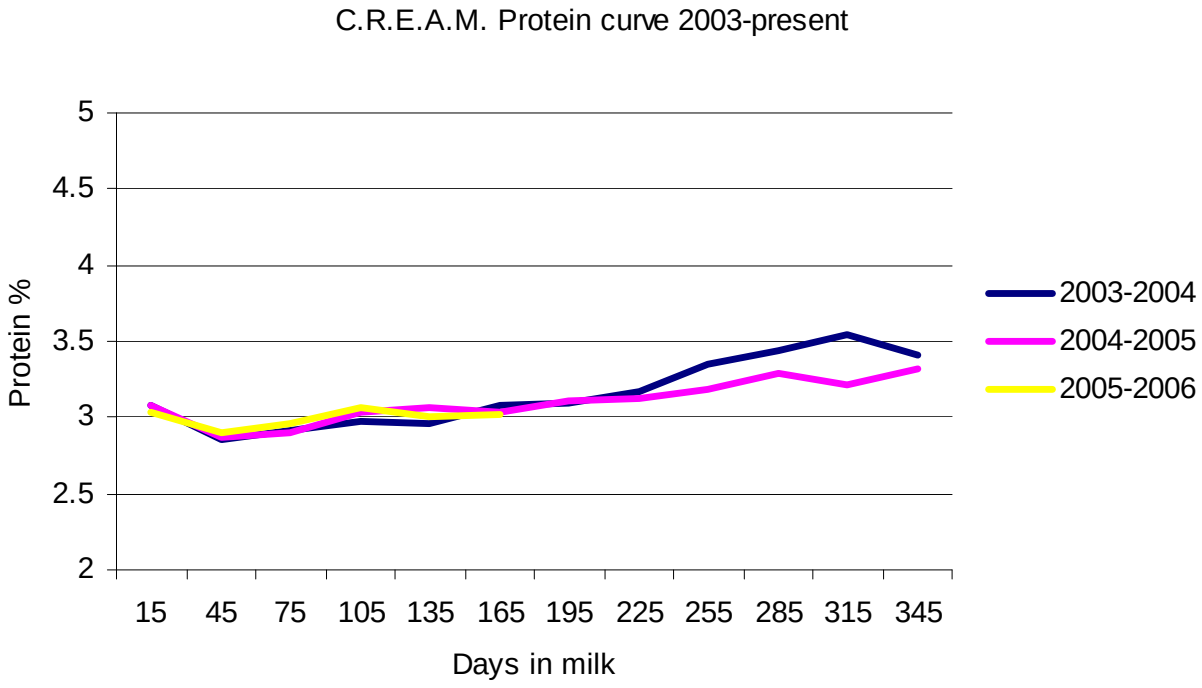
Graph 4. **Lactation curve 2003-present**



Graph 5



Graph 6



Combating Mastitis

At the previous Board meeting it was highlighted that, as on many dairy farms, the incidence of mastitis is above average (68 cases per 100 cows). Each case of mastitis within a diary herd has the potential to cost £200. As a result it was suggested that problem cows in the herd should be screened to enable specific treatment of the problem. In conjunction with this, the herd vet recommended teat scoring all cows to estimate the extent of teat damage in the herd. Damage to the teat end can provide a potential entry point for bacteria, causing mastitis.

Recent Teat Scoring

Teat Condition Scoring is a relatively new method of assessing the effects of milking management, milking equipment and environment on the teat tissue and hence the risk of intramammary infections such as mastitis.

Teat end damage is most commonly caused by defective milking machinery. This is normally the result of;

1. Incorrect pulsation
2. Clusters too heavy/big
3. Vacuum incorrect
4. Liners worn and causing slippage
5. Overmilking

Changes that can be identified include colour change. This is easiest to identify immediately after milking when the clusters are removed. If the vacuum or the

pulsation of the milking machine is too high the cow's teats may appear red or in more severe cases they may appear blue. This is due to the pressure being put on the teat restricting or preventing completely, the flow of Oxygen in the blood to the teat (Cyanosis). Other teat damage may be visible through the swelling or a raised ring developed around the orifice. Keratin may also be formed around the orifice and extend out from it. The outer tissue of the teat may also be cracked. The degree of openness of the teat orifice is another indication of teat damage. After milking the teat orifice should be closed or else slightly open and will close in the period that the cows stand post milking. Worse teat damage will leave the orifice widely opened, roughly about the width of a matchstick. When this happens the chance of bacteria entering the teat and causing mastitis are greatly increased.

When carrying out teat scoring cows should be scored on a scale of 0 to 4. A score of zero means that the cow has good teat condition with little to no damage. A score of 4 will mean alot of build up of keratin around the teat end and the teat orifice will have prolapsed.

Examples of teat scores found in the C.R.E.A.M. herd are demonstrated below.

TEAT SCORE = 0

No build up of Keratin, or circular swelling around the teat orifice. Teat orifice is also tightly closed.

TEAT SCORE = 1

Beginning of circular swelling around the teat orifice.

TEAT SCORE = 2

Clear swelling of the area around the teat orifice. Some Keratin will also be building up and the teat orifice will be slightly open.

TEAT SCORES = 3

Clear build up of Keratin and area around the teat orifice raised a lot (about 3-4ml). Teat orifice also slightly open.

TEAT SCORES = 4

Teat orifice very wide and prolapsed. Milk may leak a lot from the teats. There will be a lot of keratin build up.

When carrying out teat scoring it is important to assess the cows regularly. Once a month is ideal to monitor any changes in teat condition before the problem causes permanent damage or mastitis. It also enables you to identify a problem that may exist with your milking machine. Due to the fact that this is a subjective measurement it is important that the same person scores the cows each time it is carried out.

In general the teat scores of the cows were very good. Most of the cows scored either ones or two with only a few scoring over two. The overall average of the herd was 1.35.

Milk Bacteria Screening

The milk recording data for the herd was examined and 6 cows with consistently high somatic cell counts (SCC) were selected an sampled aseptically by the herd vet. Analysis of these samples revealed that one of the six cows had a SCC in excess of 2 million in one quarter (Annmarie). The remainder of the cows sampled had acceptable levels present. Unfortunately the analysis was unable to isolate the bacteria in the affected quarter that may be causing the problem. This cow has subsequently been resampled and we await the results. Since this sample has been taken Annmarie has been dried off and will be commencing a flushing programme with in the next few weeks (discussed later).

Breeding

C.R.E.A.M. Fertility Performance 2005/2006

Calving index

Calving index is widely recognized as the primary measure of fertility and is the average interval between successive calvings for a herd of cows. The calving index from United Milk Records in January 2006 is 408 days. This has decreased by 2 days from 410days in September 2005.

Table 7. Calving Index from United Milk Records

	Jan 2005	Sept 2005	Jan 2006	Target
Calving Index (days)	435 days	410	408	*420*

While widely used, calving index isn't an ideal measure of fertility performance as it doesn't take account of cows that are culled. Calving index is influenced by secondary measures of fertility namely, submission rates and conception rates. These two methods of assessing fertility can be used to compare year on year fertility performance and enable comparisons between herds. At the previous board day (November 2005) updates of the full 2004/2005 breeding year were presented. The following data is for the 2005/2006 breeding year (commencing 1st August 2005) and it must be noted that the results are preliminary and may be subject to change as an increased portion of the herd calves down. Complete results for the 2005/06 year will not be available until the next Board meeting.

Due to the fact that a full data set is not available for the herd (as only two thirds of the herd have calved since the commencement of the breeding year) it is not possible to calculate conception rates for the herd. Interim measures of fertility are however presented below.

Submission Rates

Submission rate is a measure of heat detection rate in a herd. To calculate it you need to have a breeding start date and a Voluntary Waiting Period (VWP). For the purposes of the calculations, submission rate and conception rate were both calculated on services from 9th October 2005 with a voluntary waiting period of 60 days.

The submission rate for CREAM is currently 83% which is 13% higher than the target.

Interval to First Service

Target interval to first service is calculated by adding half the length of an oestrus cycle to your voluntary waiting period. Therefore for C.R.E.A.M. the target is 71-73 days. Currently the interval to first service for the herd is 68 days.

Heat detection rate

Heat detection rate is closely linked to submission rate and has been calculated using inter-service intervals via the same method as Hillsborough in their fertility study of 19 herds (2002). Heat detection rate only takes account of the heats that appear in the regular 21 day cycle. In the Hillsborough study the average heat detection rate was 71% but varied from 55-88% between herds. The current heat

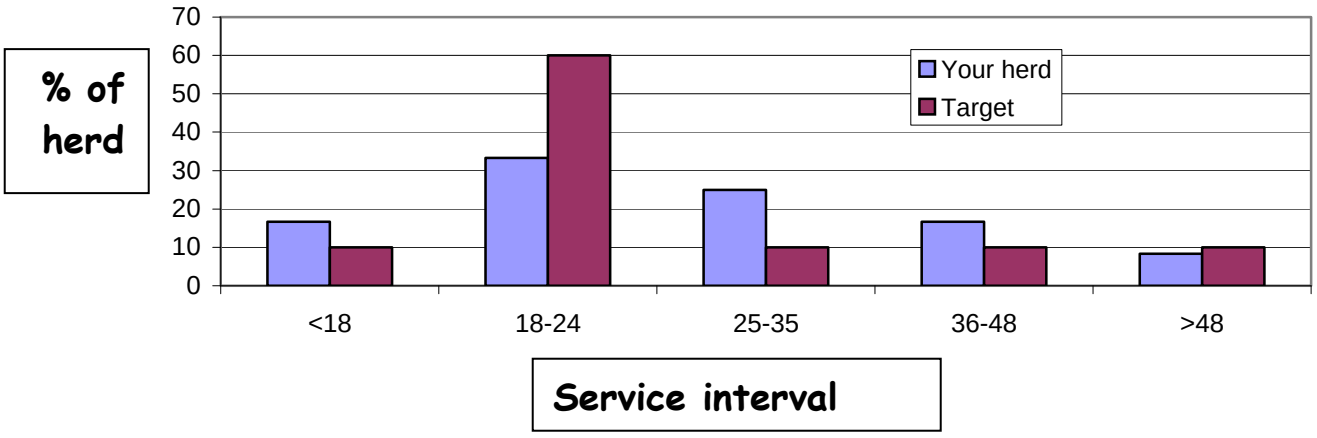
detection rate for C.R.E.A.M is 83%, which is a vast improvement from last year (56%). At the previous board day it was suggested that the students should progesterone test the milk in an attempt to improve heat detection. This has been subsequently undertaken by two students (discussed in depth in subsequent section). This may account for the improvement in heat detection rate.

Heat Detection Accuracy (HDA)

Heat detection accuracy was introduced to C.R.E.A.M last year as a measure of fertility.

Ideally cows should return 18-24 days after service as intervals outside this period indicate irregular heats or poor heat detection rates. The target HDA is to have approximately 60% of repeats falling within the 18-24 day period but currently C.R.E.A.M has only 33 % of cows repeating 18-24 days after service.

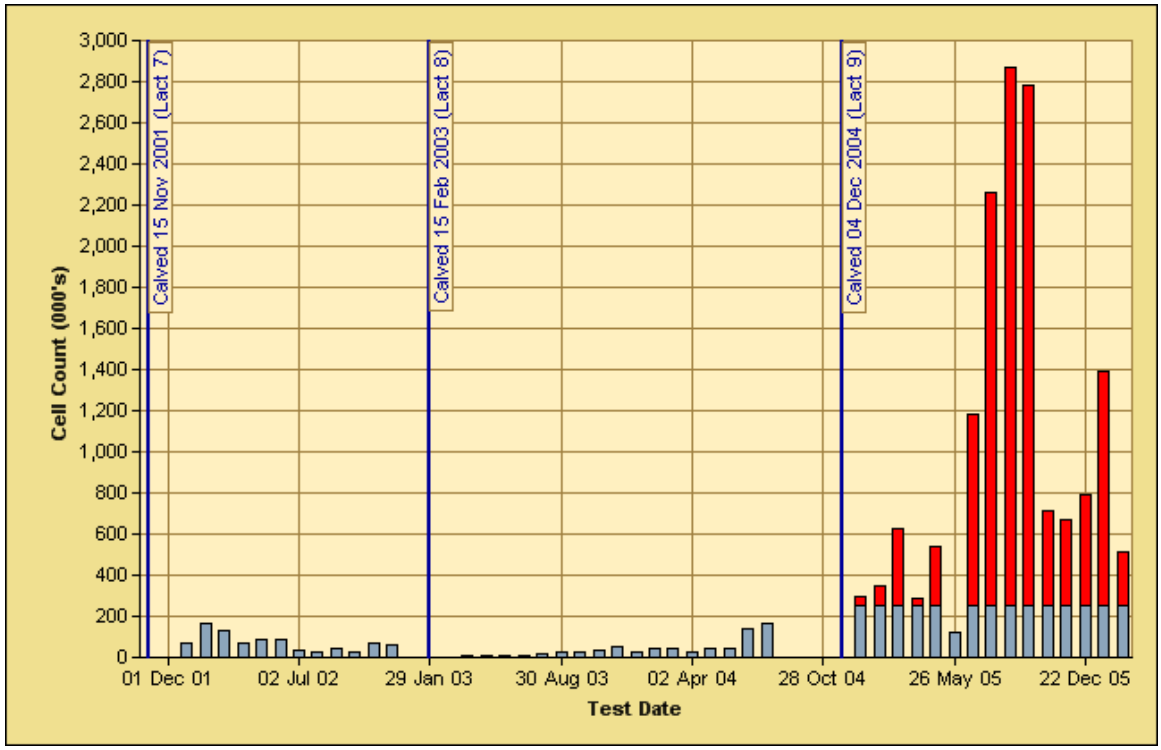
Graph 7 Target vs. actual service intervals



Although our heat detection rate has increased it is obvious from this data that a lot of cows are not cycling regularly. Subsequently monitoring heats using milk progesterone testing at regular cycle intervals may mean that the progesterone testing is not being used as effectively as possible. Ideally to successfully monitor the heats of the herd it may be necessary to sample the herd twice weekly to obtain milk progesterone profiles and gain a true picture of what is occurring. This is not practical in a commercial situation however it is something that the project could investigate further in collaboration with Greenmount technologists.

Future Embryo Transfer Work

Annemarie is currently the only C.R.E.A.M. herd foundation stock remaining. She is in her ninth lactation, with a lifetime yield of 123,938 litres of milk and has been classified as Excellent 5 times. She was dried off at 445 days in milk, producing 27kg of milk per day and after 11 services is not in calf. She has daughters, grand daughters and great grand daughters in the herd by such sires as Formation, Decision, Lucky and Emerson. We have made the decision to flush Annmarie as she excellent yields and obvious longevity. Although Annmarie had extremely high somatic cell counts in her last lactation, she had excellent figures in all previous lactations (Graph 8).



Graph 8. SCC results for Annmarie during her previous 3 lactations (source: United milk records)

Her current PTA figures are:

MILK	FAT KG	PTN KG	FAT%	PTN%
-416	-24.5	-18.4	-0.12	-0.07

(PTA 2005)

Embryos from Annemarie were implanted last year with 1 heifer calf on the ground sired by Silky Gibson. We have decided to attempt o flush Annemarie 3 time's again using 3 different bulls. The bulls we have chosen are:

1. De Crob Adept
2. Mascol
3. Picston Shottle

Table 8. Possible bull selection for embryo transfer work

Bull name	De Crob Adept	Mascol	Picston Shottle
Milk	**+324**	**+428**	**+547**
Butterfat	**+0.09%**	**+0.06%**	**+0.05%**
Protein	**+0.14%**	**+0.09%**	**-0.02%**
Type merit	**+0.47**	**+1.62**	**+3.30**
Reliability	**91%**	**80%**	**97%**

Progesterone Testing Of C.R.E.A.M. Milk to Establish Reproductive Status

C.R.E.A.M. 2004/05 heat detection rate was 56%, compared to an average of 71% in the Hillsborough 2002 fertility study. It was suggested at the previous Board day in November that progesterone testing should be utilised within the herd as an attempt to improve this figure.

Poor reproductive performance is one of the most costly and difficult problems for dairy producers. Even in well-managed herds, reproductive failure continues to be one of the primary reasons why cows are culled. Inaccurate / Inefficient heat detection is the most major cause of low conception rates and long calving intervals.

Progesterone levels in milk are closely related to the stage of oestrus cycle of the cows. Progesterone is the hormone released by the corpus luteum on the ovary and once conception has occurred, it is this hormone that 'maintains' pregnancy until calving, preventing further eggs being released. If the cow has not conceived, the corpus luteum starts to degenerate (approx. day 17 of the cycle) and so progesterone levels decline to minimal concentrations on days 20 to 23 as the cow returns to heat.

The level of progesterone in milk increases slowly for the first 4 to 6 days following ovulation. Maximum concentrations of progesterone will not be reached until sometime between days 10 to 17 of the cow's reproductive cycle. In the non-pregnant cow, levels of progesterone will begin to diminish sharply about day 18or 19. At this time, oestrogen levels are beginning to increase as the cow begins to cycle through another oestrus cycle.

There are several uses of milk progesterone testing in dairy herds:

1. Verify suspicious heats.
2. Diagnosis of Non-Pregnancy
3. Identify Reproductive Problem Cows
4. Embryo Transfer Programs
6. High Producing Dairy Cows

   The stress of high milk production and associated lag in dry matter intake in early lactation is known to adversely affect cyclic activity in dairy cows. Further, negative energy balance and the hormonal dynamics of the early postpartum cow have been shown to reduce the intensity of oestrus behavior. Consequently, the high producing cow is a challenge to catch in heat and successfully breed.

The test is carried out using an ELISA kit, with a strong pink coloration confirming a heat.

Within C.R.E.A.M. cows are sampled on days 40, 42, 44 post calving to confirm that they have commenced to cycle. Cows are also sampled on days 17, 19, 21 and 23 post service. There have been 34 potential heats investigated so far, with 11 heats detected. Some of these heats were not observed heats and consequently would have been missed. The preliminary heat detection rate for the herd is 83%.

Although the progesterone test kit has been successful at identifying cows which are cycling on a regular basis, cows which are cycling outside the 'normal' cycle

length are still potentially being missed. In order to identify these cows it would be necessary to sample the herd on a more regular basis (perhaps twice per week).