

Report on the Performance of the Future Herd

2009-10 and 2010-11



May 2011

This report aims to summarise the production performance of the Future Herd in the 2009-10 and 2010-11 financial years against the targets set for the herd. These were defined at its launch in November 2006 as:

Milk production:	Yield	8,500 litres/cow/year
	Butterfat	4.10%
	Protein	3.50%
	Milk from forage	4,000 litres/cow/year
Lifetime performance:	Lifetime yield	40,000 litres/cow
Fertility:	Submission rate	80%
	Conception rate	50%

Milk production

The target level of milk production for the Future Herd is 8,500 litres, with 4,000 litres of this being produced from forage. Results on rolling average production from the Future Herd for the year ending 31 March 2011 are shown in Table 1.

The average milk yield in 2010-11 was 7,982 litres, an increase of 371 litres on the figure for 2009-10 (7,611 litres) which was a significant decline from that in 2008-09 (8,099 litres) – the principle reason being two wet summers (2008 and 2009) with less effective utilisation of grass and lower quality silage than would normally be fed. Hence, milk from forage production in 2009-10 in particular was lower than what it had been in previous years, though there was some recovery again in 2010-11 (see Figure 1).

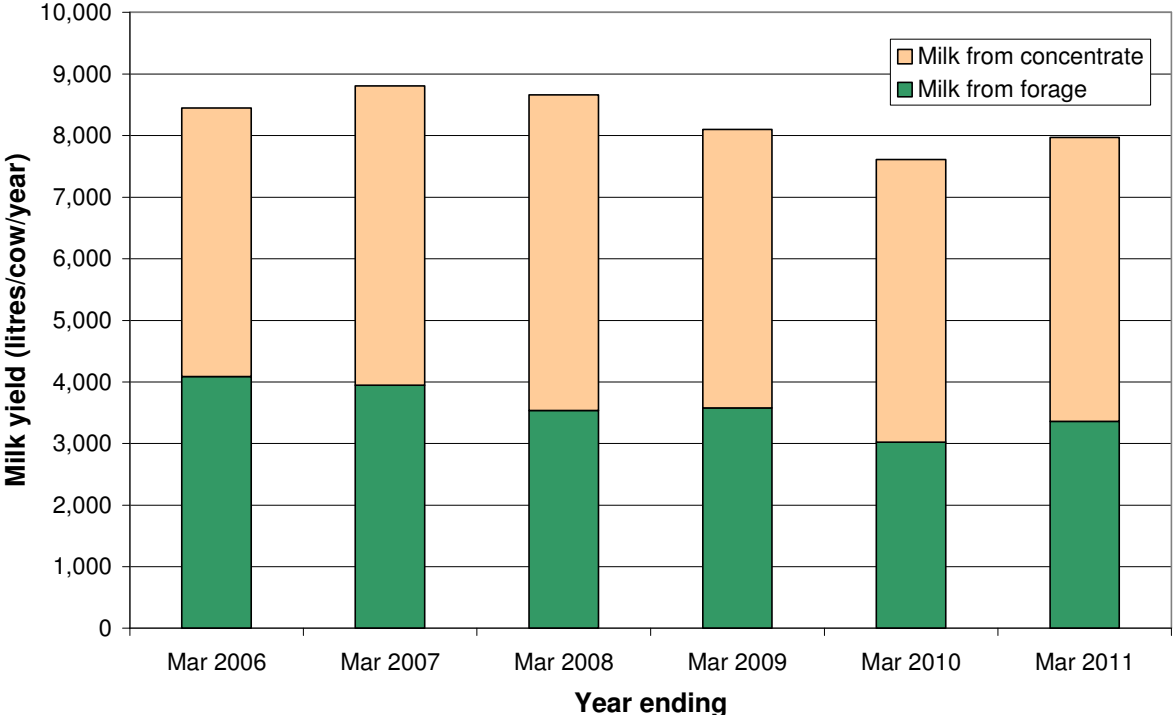


Figure 1: Average annual production per cow in the Future Herd indicating change in annual milk production from forage.

Table 1: Summary of Future Herd production performance since 2006.

	2006-07	2007-08	2008-09	2009-10	2010-11
Milk yield (litres/cow/year)	8,805	8,663	8,099	7,611	7,982
Butterfat (%)	4.10	4.17	4.22	4.37	4.31
Protein (%)	3.24	3.32	3.38	3.40	3.43
Avg conc. intake (kg/cow/year)	2,185	2,307	2,035	2,065	2,080
Milk from forage (litres/cow/year)	3,949	3,536	3,577	3,021	3,360

During the 2009-10 and 2010-11 production years, the protein content of the milk continued to increase with the result that it is up 0.05% points on where it was two years previous, and up 0.19% points on where it was at the end of 2006-07, four years previous. Part of this increase could be attributed to the decline in milk yield with the production of more concentrated milk but other factors such as more targeted grouping of cows and feeding to yield, slower build-up of concentrate intake in early lactation to delay onset of peak lactation producing a lower-flatter lactation curve and long-term breeding for milk protein all have an influence on this result.

Milk butterfat content increased considerably in 2009-10, mainly due to the decline in milk yield, but with the increase in milk yield in 2010-11 milk butterfat % has declined again. Despite this, at the end of March 2011, it was still considerably higher than what it was at end of March 2007.

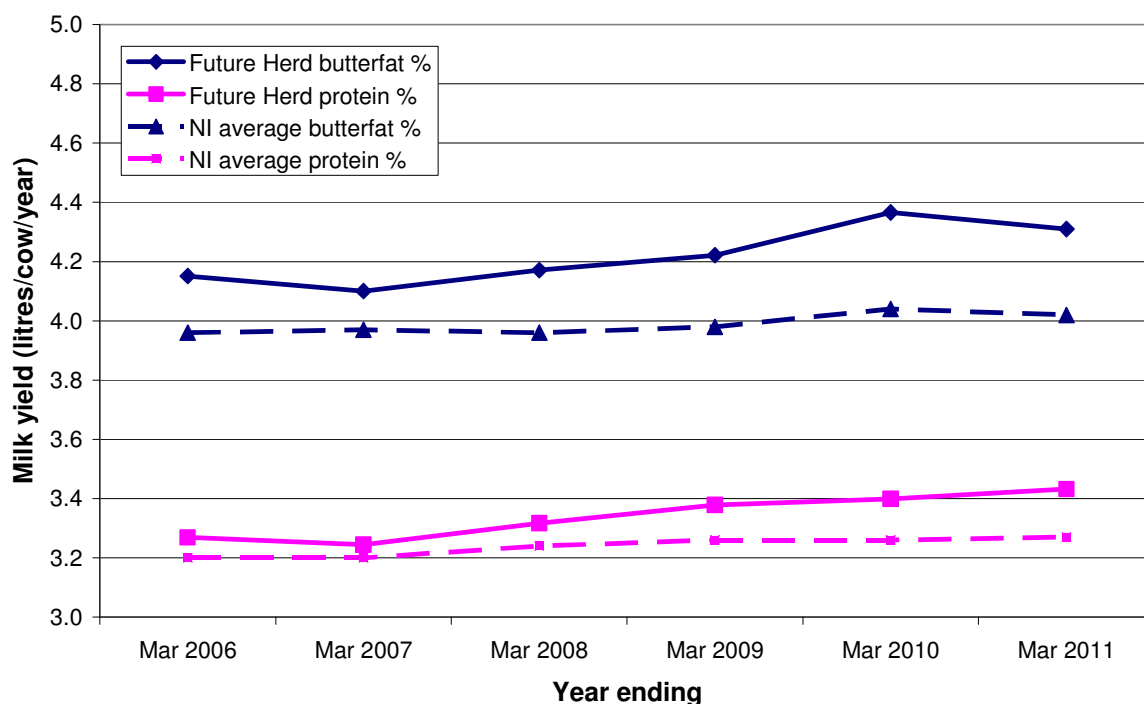


Figure 2: Average annual butterfat % and protein % in the Future Herd since 2006 compared to the Northern Ireland average.

Milk quality has been a key target in the Greenmount Herds for some time with the target of the former Premium Milk Herd being to achieve milk of 3.50% protein, though the highest protein content achieved on a 12-month rolling average basis was 3.42%. When the Future Herd was established in autumn 2006 from the amalgamation of the Premium Milk and High Forage herds, the protein target was maintained at 3.50%. In December 2010 it reached 3.44%, higher than that previously achieved in the Premium Milk Herd.

At 4.31% butterfat and 3.43% protein, the milk quality of the Future Herd for year ended 31 March 2011 was considerably higher than the Northern Ireland average (Figure 2) which for 2010 were 4.02% and 3.27%, respectively. Breeding for milk quality has a major affect on this with milk quality being one of the principle considerations when selecting bulls each year.

Prior to sire selection each year, the average genetic merit of the herd is established producing PTAs for milk, fat% and protein%. If the average cow is served by a bull with a lower PTA for either fat% or protein%, the genetic merit of the offspring will be less than that of its dam with the result that the milk quality of the herd may be compromised in the future. Hence, each year, bulls are selected that have PTAs for milk, butterfat% and protein% that are equal to or higher than the average genetic merit of cows in the herd so that the genetic merit of the herd continues to increase year-on-year, and with it the quality of milk being produced.

The genetic profile of the herd following the August 2010 proof run is summarised in Table 3. Through a rigorous sire selection program selecting for sires with improved milk quality without compromising milk yield together with favourable PTAs for the non-productive traits that has been operative since the herd was established, there is a clear trend for increasing £PLI in the younger cows with increased genetic potential to produce milk, lower somatic cell count and improved fertility and lifespan.

Table 3: Average PTAs for cows in the Future Herd across the range of lactations

	Due to serve	Due to calve	Lactation					All cows
			1	2	3	4	5+	
No. of animals	45	37	34	42	22	14	17	129
Milk (kg)	-6	-86	-89	-129	-199	-72	-329	-151
Bfat (%)	0.13	0.14	0.11	0.15	0.22	0.08	0.09	0.14
Prot (%)	0.07	0.07	0.06	0.07	0.13	0.06	0.06	0.08
£PIN	18	13	10	11	19	9	-7	10
£PLI	87	79	67	57	70	31	-13	50
Sire FI*	3.0	4.3	4.6	-6.1	-1.9	-1.4	-2.5	-1.6
Sire LS*	0.1	0.3	0.5	0.2	0.1	0.0	0.1	0.2
Sire SCC*	-7.2	-11.4	0.4	-12.9	-7.0	0.8	2.9	-4.8

*Weighted average of sire PTAs for Fertility, Lifespan and Somatic Cell Count based on sire proofs from Aug 2010.

Compared to 2008-09 when milk from forage production for the herd was 3,577 litres, there was a decline was increased slightly in 2008-09 and in the months of January and February, milk from forage production per cow exceeded the CAFRE target of 12 litres from winter forage. This was as a result of feeding a TMR blend of excellent quality grass silage (12.3 MJ ME/kg DM) and maize, promoting high forage dry matter intakes. This was also achieved through carefully controlling the level of concentrate feeding by grouping of cows according to parity and stage of lactation, with maintenance + levels on the parlour computer set accordingly.

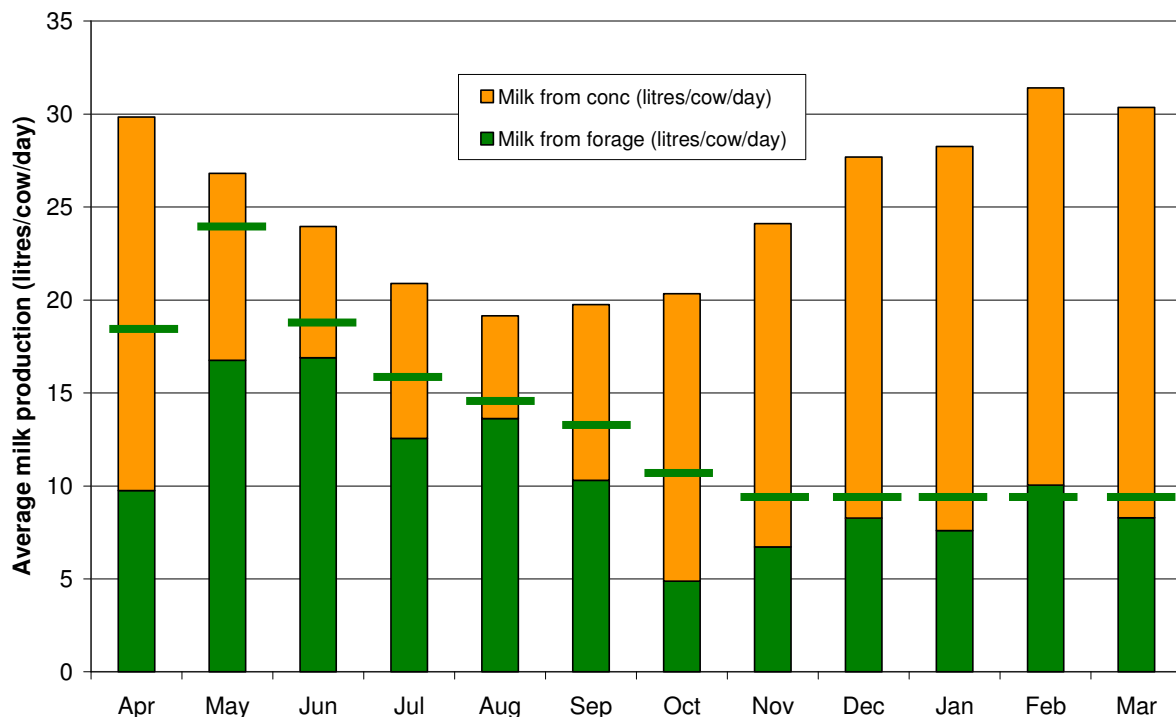


Figure 1: Average milk production by month during 2010-11 showing contribution of milk yield from forage and concentrate and milk from forage targets (green bar).

Milk quality and milk solids production

For cheese manufacture, the ideal protein:butterfat ratio is around 0.9:1.0. In both 2006-07 and 2007-08 the protein:butterfat ratio of milk produced from the Future Herd was 0.79:1.0 but this increased to 0.80:1.00 in 2008-09. This is due in part to the breeding policy where the aim is to improve protein quality by selecting bulls with high PTAs for protein without compromising butterfat, if possible.

While a similar volume of milk was produced by the Future Herd in both 2007-08 and 2008-09 (1.9 million litres) the milk solids yield increased by 1,250 kg from 88,800 kg in 2007-08 to 90,100 kg in 2008-09. The milk solids production is considerably more than the estimated 69,000 kg produced in a typical Northern Ireland dairy herd of equivalent size, where estimates are based on the annual distribution of milk supply and the June 2008 dairy cow population (Figure 2).

The supply of milk solids in Northern Ireland shown in Figure 2 is relatively flat and reflects herds with all types of calving pattern - autumn, spring, spread throughout the winter or year round calving. However, this pattern of milk supply throughout the year is fairly typical of herds in Northern Ireland that calve 8-10 months of the year. In the Future Herd, milk solids production throughout the year is more diverse with the lowest production is September when the largest number of cows are dry. This reflects a more seasonal calving pattern, but also nutrition and the long-established breeding policy on butterfat and protein composition.

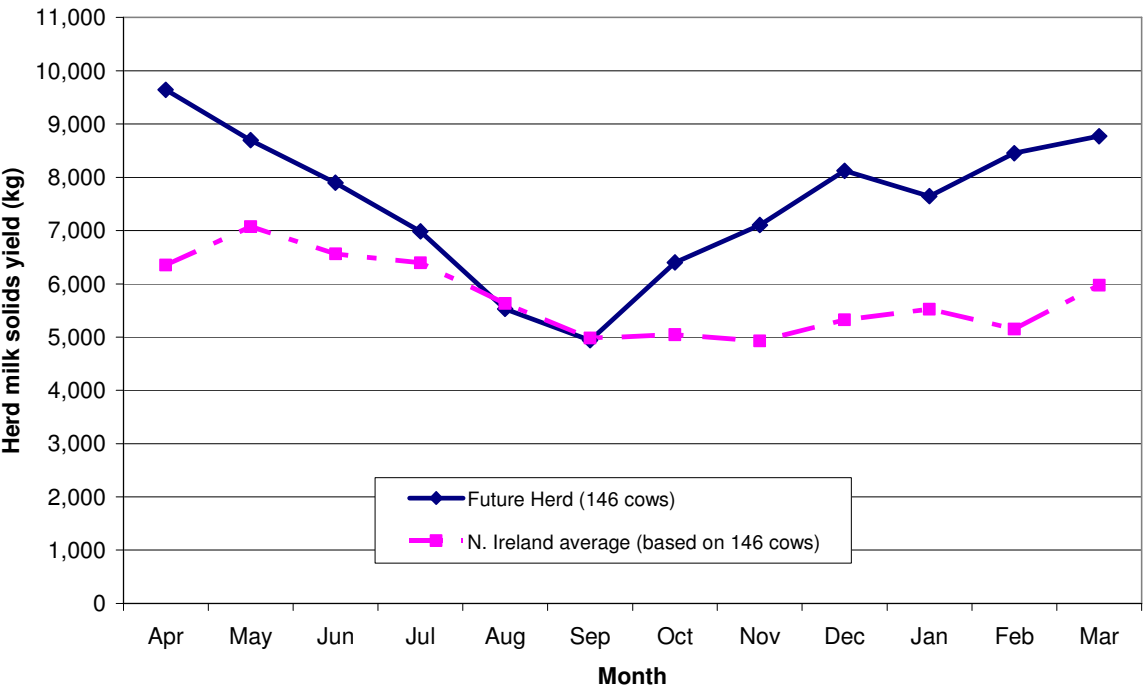


Figure 2: Future Herd Total monthly milk solids production in the Future Herd throughout 2007-08 compared to that of a typical Northern Ireland herd of equivalent size.

Lifetime performance

A lifetime performance of 40,000 litres is specified in the targets set for the herd. The lifetime performance of cows culled from the Future Herd was assessed from terminated lactation certificates based on milk recording with the results being presented in Table 2.

Table 2: Summary of lifetime performance of cows culled from the Future Herd

	Target	2006	2007	2008
No. cows culled	-	25	30	38
Avg. lactation no.	-	4.1	4.3	3.9
Avg. lifespan (years)	-	5.9	6.3	5.8

Avg. productive life (years)	-	3.9	4.2	3.8
Avg. lifetime yield (kg)	40,000	30,680	35,953	33,244

Fertility

Dairy herd infertility is a widespread problem with the causes likely to be a combination of breeding/genetics and nutrition. Milk production from the Future Herd exceeds that expected from its genetic merit, owing largely to batching of cows and heifers to meet their nutritional requirements. Therefore, the current breeding policy is to use only sires that have a positive PTA for fertility (first introduced in 2005) with the aim of improving the fertility performance of replacement livestock.

Like most dairy herds throughout Northern Ireland, the Future Herd is predominantly autumn/winter calving with the first cows calving in late August/early September and the last cows calving in May. The proportion of cows calving before the end of December over the last 3 calving seasons has increased from 59% in 2006-07 to 71% in 2008-09, as seen in the calving profile presented in Figure 3.

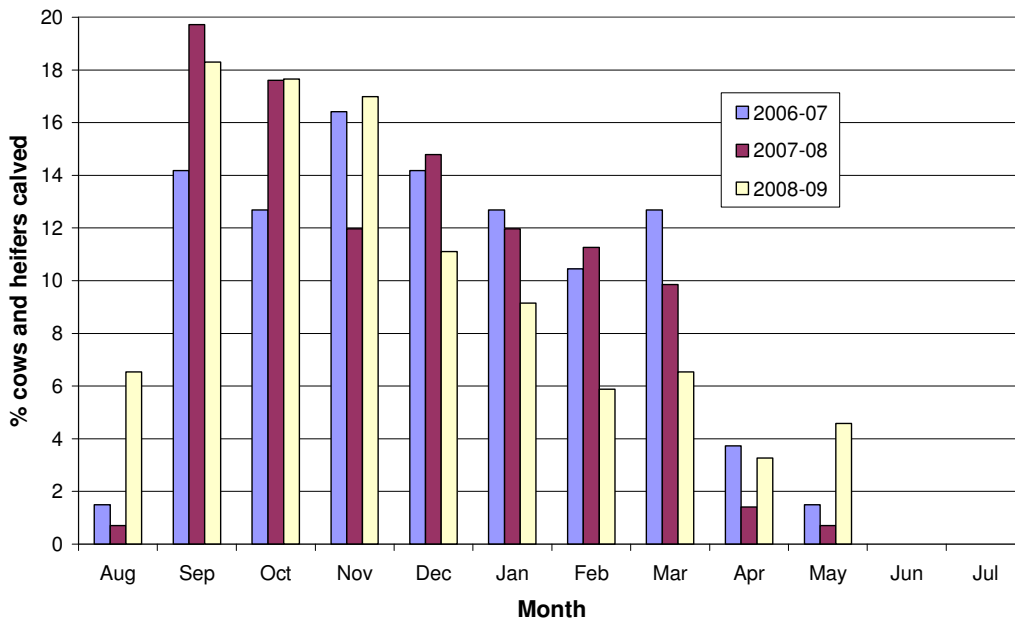


Figure 3: *Monthly calving profile of cows and heifers in the Future Herd over the last three calving seasons.*

Fertility performance of the Future Herd is assessed annually using Fertility Benchmarking Online (Table 3), an application developed by CAFRE that is available to Northern Ireland dairy farmers through the Rural Portal website. Heat detection efficiency, as measured by submission rate is close to the target set for the herd at 80%, due largely to diligent management and use of pedometers. At 75%, this is considerably more than that being achieved by commercial dairy herds with a spread calving pattern throughout Northern Ireland, with a 100% submission rate being recorded for some 3-week periods during the breeding season (Figure 4).

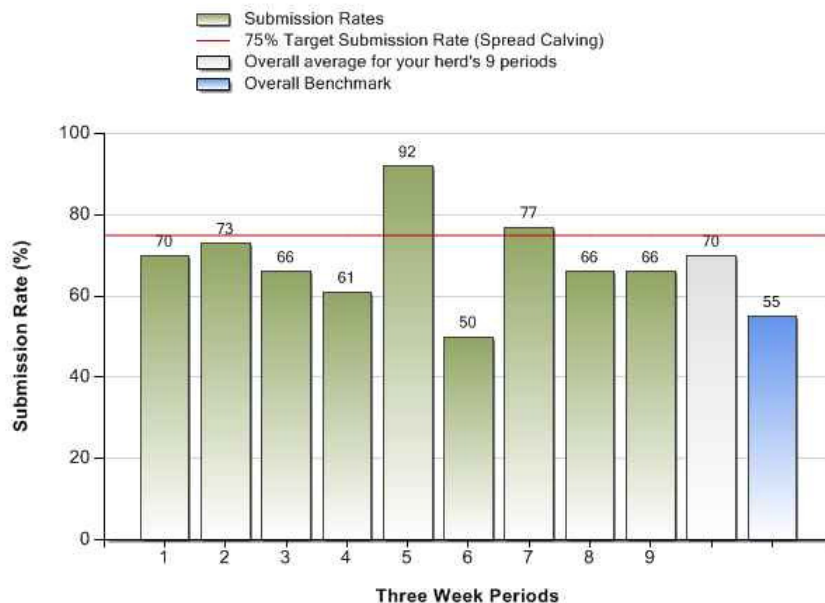


Figure 4: First service submission rate in the Future Herd for successive 3-week periods throughout the 2008-09 breeding season set against the Fertility Benchmarking target of 75% for spread calving herds.

Conception rate for the herd is based on pregnancy diagnosis, with results for last complete breeding season (2007-08) indicating a conception rate of 44% (Table 3). While this is lower than the target of 50%, it is higher than that recorded for 2006-07, with provisional results for 2008-09 (based on 60-day non-return rate) being somewhat lower at 33%. Benchmarked herds recorded an average conception rate of 53% but this is likely to be an overestimate with farmers overestimating the number of cows that actually are pregnant at the end of the breeding season.

Table 3: Summary of Future Herd fertility performance against targets

	Target	2006-07	2007-08	^b 2008-09	^c Benchmark average
Submission rate (%)	80	75	66	70	57
^a Conception rate (%)	50	36	44	33	53

^aCR% to all services based on pregnancy diagnosis. For 2007-08 based on 60-day non-return rate.

^bSeason in progress so submission rate and conception rate results provisional.

^cFertility Benchmarking average based on 67 spread calving herds (2005/06 breeding season).

Fertility Benchmarking reports on the performance of the Future Herd can be viewed on the Rural Portal website by clicking on the following link:

http://www.ruralni.gov.uk/index/livestock/livestock_dairy/dairy_cafre/gmount_dairy_herd/gmount_herd_data/fertility_performance.htm

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