

The Greenfield Project 2007/08

Project update September 2007.

Contact: Rodger Jensen, Farm Systems Specialist
(Rodger.jensen@dexcel.co.nz)

The Greenfield project has made significant progress in the development of a pastoral based system that incorporates automatic milking technology. In 2008 the focus for the research team will be to:

- Assist the South Island commercial farm to implement the new farming system, develop operational procedures and achieve best practice pasture management
- Develop improved grazing regimes (at the Hamilton-based research farm) to achieve higher pasture intakes and increase robot utilisation
- Develop a new research focus by identifying the opportunities for information use within the automated farming environment

Targeting pasture management: the key to viable automatic milking

One of the key determinants in regard to cow flow within an automated milking system is the feed supply within the system. This system works within the constraints of the cyclic nature of milking frequency (feed demand) and feed allocation (pre graze mass, area, post graze mass). As a voluntary milking regime is desired (rather than forced movement) it is essential that these parameters are in balance. It can be seen from Figure 1 that post graze mass has a direct influence on cow movement, and while there are subtle influences that affect cow movement the trend in the data supports what we see occurring on the farm.

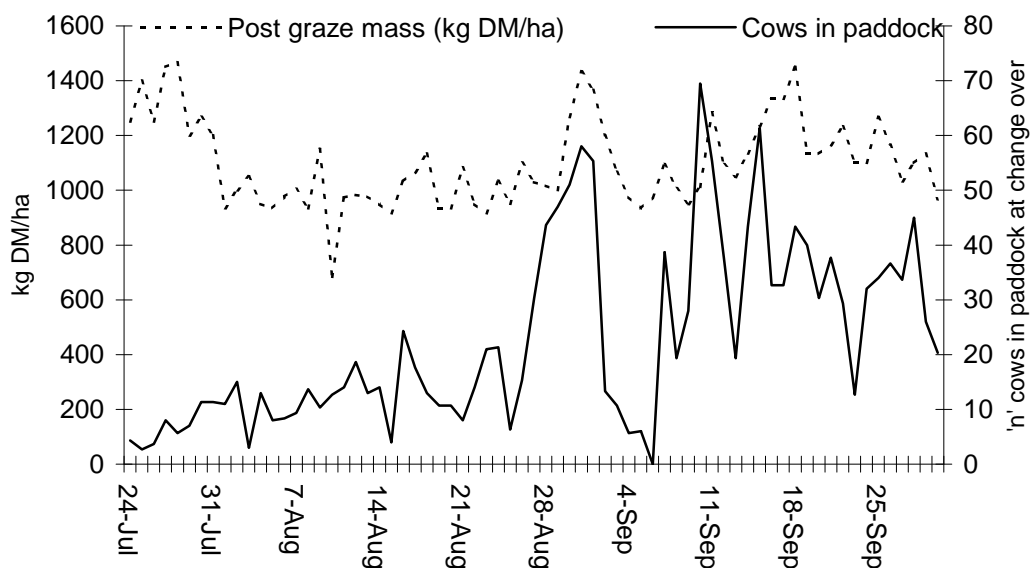


Figure 1. Cows force moved from a paddock, and post graze mass.

The practical implication of this is that feed demand and supply need to be closely aligned, and to add to this we have a further constraint of robot availability. To maintain a balance within these factors 21.7 ha was removed from the grazing area after the first rotation (closed for silage, 41% of the farm area). And by doing this we were able to maintain the desired level of grazing pressure to facilitate voluntary cow movement.

Farm situation as at 30 September 2007

Average pasture cover for the month was 2,151 kg DM/ha (2,329 on the 25th September. Pasture intakes per cow averaged to 13.8 (8.9 and 18.3 kg DM/cow minimum and maximum respectively). Farm area closed for silage is 21.7ha (closed up on the 4th September).

Table 1. System variables for September 2006/07 & 2007/08.

	2006/07	2007/08
Average cows in milk	167	171
Max cows in milk	172	175
Average ratio cows:AMS	86:1	88:1
Effective milking ha	44.5 (53)	53
Average Cows/Ha*	3.75 (3.15)	3.23
Feed parameters as at 30th Sept		
Rotation	23	20
Average pasture cover (kg DM/ha)	2865	2151
Pasture growth rate (kg DM/ha/day)	65	44
Feed Intake (kg DM/cow/day)		
Pasture	14.4	13.8
Grass silage		0
Concentrate (at AMS)	0.5	0.5

*2006-07 season the milking platform was 44.5ha (total farm area was 53ha).

An important aspect of this system is the cyclic relationship of pasture allowance, residual grazing level, cow traffic, milk yield, and robot availability. A high milking frequency will typically induce higher milk production and therefore feed intake. Within this system the restraint of the milking robot is the rate-limiting factor and previous work has shown a milking frequency of 1.5 milkings/day optimises per cow and per robot milk production (Jago et al., 2007, Journal Dairy Research In Press).

There are several aspects that will be carefully monitored during September when the herd size/milk production will peak. It is critical that milking frequency is not compromised to the degree that milk production per cow reduces such that overall system productivity is reduced. Additionally this would result in per cow intakes falling and consequently increased silage conservation.

Key Performance Indicators

Table 2. Current month and year-to-date KPI for the Greenfield Farm.

September	06/07	07/08
Milkings/cow/day	1.22	1.26
Milking interval (h)	19.7	19.0
Milk production (kg)	17.4	19.8
kg MS/cow/day	1.46	1.63
Year-to-date		
kg MS/ha*	298 (354)	348
kg MS/AMS	7,896	9,237
kg MS/cow	92	105

*kg MS/ha calculation 06/07 season was based on milking platform of 44.5ha (figure in brackets), and for the 07-08 season it is 53 ha.

The utilisation of the machines is an important performance indicator for the system (maximum theoretical utilisation is 80% - allowing for cleaning and other associated

hygiene/maintenance events). AMS utilisation during September has increased compared to the previous season (59% Sept 2006, 70% Sept 2007, equivalent to an additional 163 minutes in use/day/AMS). While the increase in milkings has been over the 24 hour period there has been a proportionally greater increase in the 12am – 7am period (minimum utilisation rates occurred at 5-6am 12.7% and 38%, 2006-07, 2007-08 respectively).

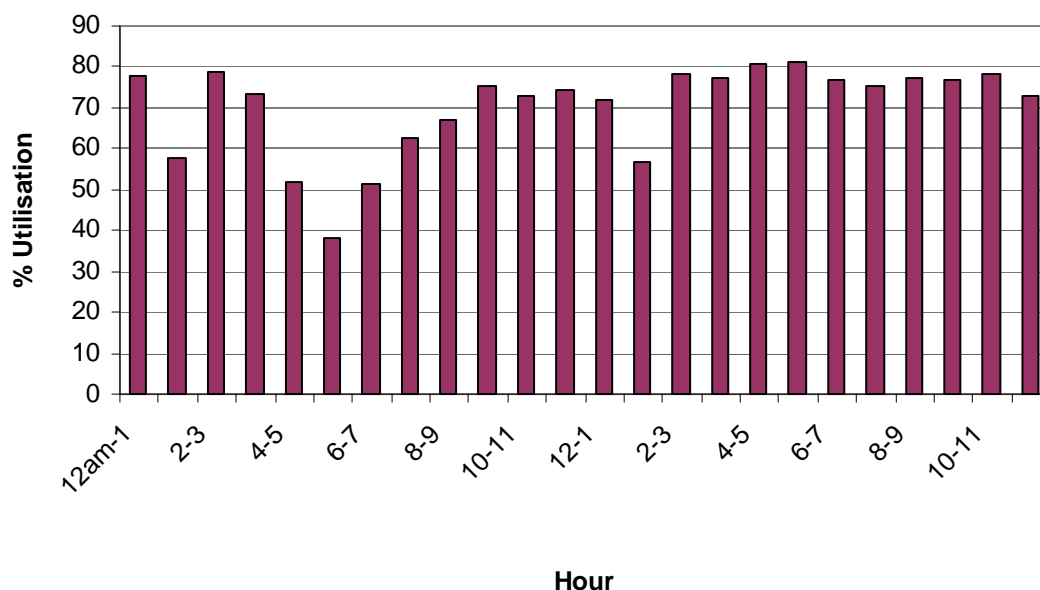


Figure 1. AMS utilisation by hour for September 2007.

The data in table 3 indicates that the increase in milkings during the midnight to 7am period was higher in August than September, and this is to be expected as September is when the system is traditionally optimised. The objective to is to maintain this level of utilisation.

Table 3. Average number of cows milked between 12am and 7am.

	2006-07	2007-08
July	9	17
August	26	43
September	45	50

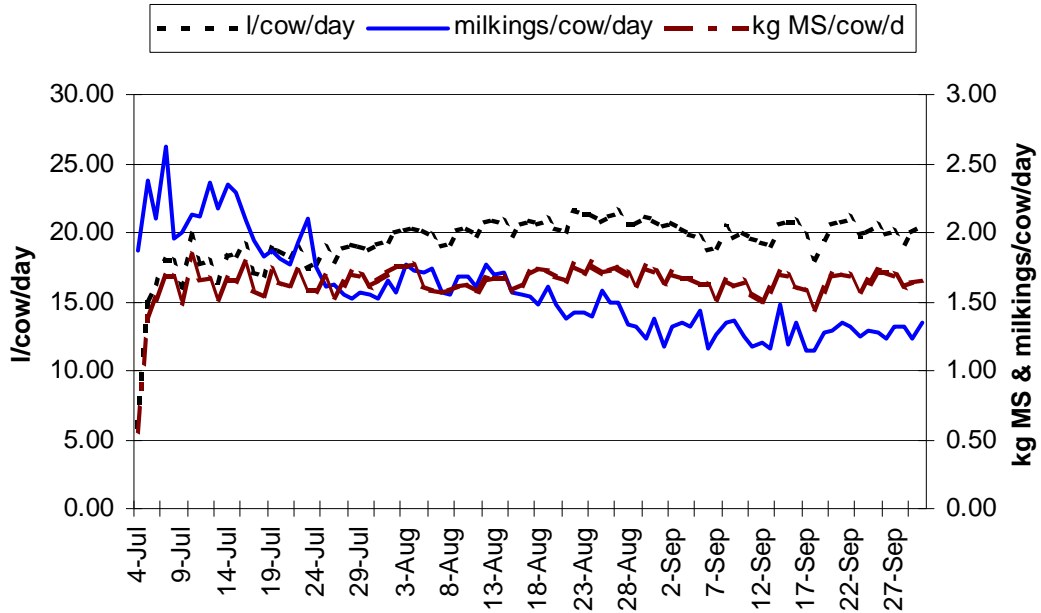


Figure 2. Milk production variables (kg, milking frequency, kgMS/cow/day) for July through September 2007.

Detailed information on the farm layout and system development, as well as live footage of the farm, can be found at www.dexcel.co.nz. The Greenfield Project is Funded by the Foundation for Research, Science and Technology and Dairy Insight and supported by the Waikato Automatic Milking Farm Group.

Waikato Automatic Milking Group

