

*Productivity, Profitability & Efficiency
of Select Pastoral Organic Dairy
Farms in New Zealand- A
comparative assessment*

Professor Nicola M Shadbolt

23rd Annual IFAMA World Forum and Symposium
, Atlanta, Georgia, June 16-20th, 2013

Introduction

- Global organic foods market revenues of US\$54.9b in 2009 from US\$18b in 2000 – double digit growth rates
- Slowed in developed countries in 2009, now lifting again – dairy fastest growing segment
- Supply not keeping up with demand in US/EU markets and emerging nations
- Provides an opportunity for the NZ dairy industry
- Provides a differentiation strategy to an industry built on cost leadership
- Overseas research is not always useful due to varying certification requirements, farming systems and a wide difference in government support schemes and price premia



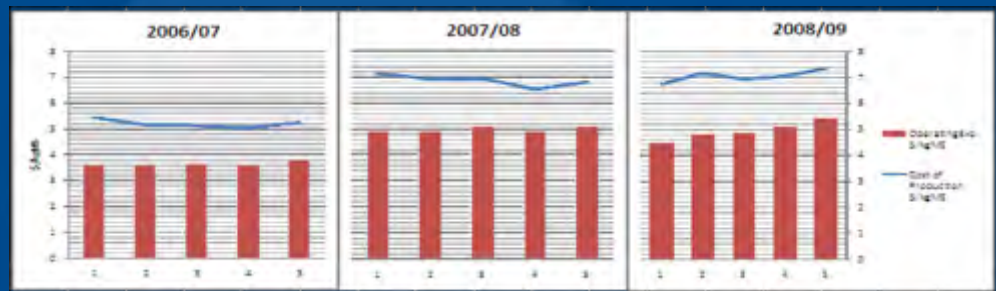
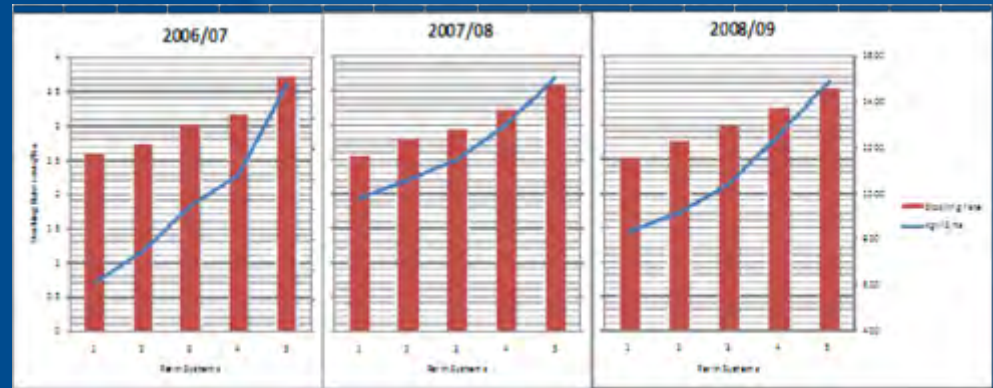
Strategy

- Competitive strategy in NZ dairy farming systems is through cost leadership not differentiation
- In recent times the resource configuration of NZ dairy farms has begun to vary
 - Low input farms achieving low cost through the numerator effect
 - High input farms achieving low cost through the denominator effect
- Cost leadership is still the overarching strategy

Cost leadership strategy of conventional farms

Higher production but same cost of production across systems 1 to 5 – low to high input systems

Same return on assets except for 2008/09 when operating efficiency (Operating Profit Margin) deteriorated as systems intensified



Competitive strategies

- Organic milk production is a differentiation strategy
- Conventional wisdom is that companies devise successful competitive strategies around either operating profit margin or asset turnover.
- Under a cost leadership strategy firms typically generate a low operating profit margin but balance that against a high asset turnover
- Under a differentiation strategy firms typically generate a low asset turnover but balance that against a high operating profit margin
- Is this the case for NZ organic dairy farms?



Organic dairying

This paper compares competitive strategies and uses the Du Pont model to assess performance and differences in the relationship between RoA, capital efficiency and operating efficiency.



Challenge is the holistic approach of organic agriculture not compatible with the reductionist mode of conventional scientific enquiry



How to compare?

- **Comparative observations** – from farmer anecdotal evidence to matched pairs of organic and conventional farms to comparisons with clusters of conventional farms
- **Field experiments** – conventional experimental design – limited use, mostly fertiliser v compost – difficult to extrapolate the results to whole system
- **Whole system experiments** – long-term comparisons
- Stanhill (1990) evaluation concludes on average organic yields within 10% of conventional agriculture but there are conflicting views on transition/conversion or yield stabilising effects
- Evidence of modification of farm practices under comparative observations methodology (capturing experiential learning) so they measure less difference than field experiments



Background: Organic/Conventional Dairy System Comparison Trial

- In 2001, Massey University set up its Dairy Cattle Research Unit (DCRU) as a whole system comparison between organic and conventional pastoral dairy farming – achieved certification in 2003.
- Two units of similar size, soil composition, fertility and herd composition
- The long-term aim of this research was to better understand organic dairy farming systems by investigating component interactions in these systems, and by determining how impacts and interactions change over time as organic systems mature.
- Extensive monitoring of soils, water, pastures, forage, animal health & production and economics





Massey University Organic/Conventional Comparative Dairy Systems Trial – results from first 5 years as certified organic farm

- 23% higher cost of production
 - 18% lower production/ha
 - 12% lower RoA
- Organic systems are more vulnerable as they cannot rely on ‘props’ used in conventional systems
- On-going aim of trial is to further modify the organic system to contain costs – specifically feed & fertiliser
- If comparison had instead been between a ‘cluster of conventional farmers’ the results show a 13% higher cost of production and the same RoA to conventional
- Begs the question of what commercial organic farms are doing and how they compare; hence this research

Grow Organic Dairy (GOD) Project

Aim

to lift productivity across the organic dairy sector and stimulate more farmers to convert to certified organic dairy production.

Case Study Farms

8 farms selected for the Grow Organic Dairy Project were either certified organic or in the process of obtaining full organic certification. All were low input farms, comparable to systems 1 & 2 Farms

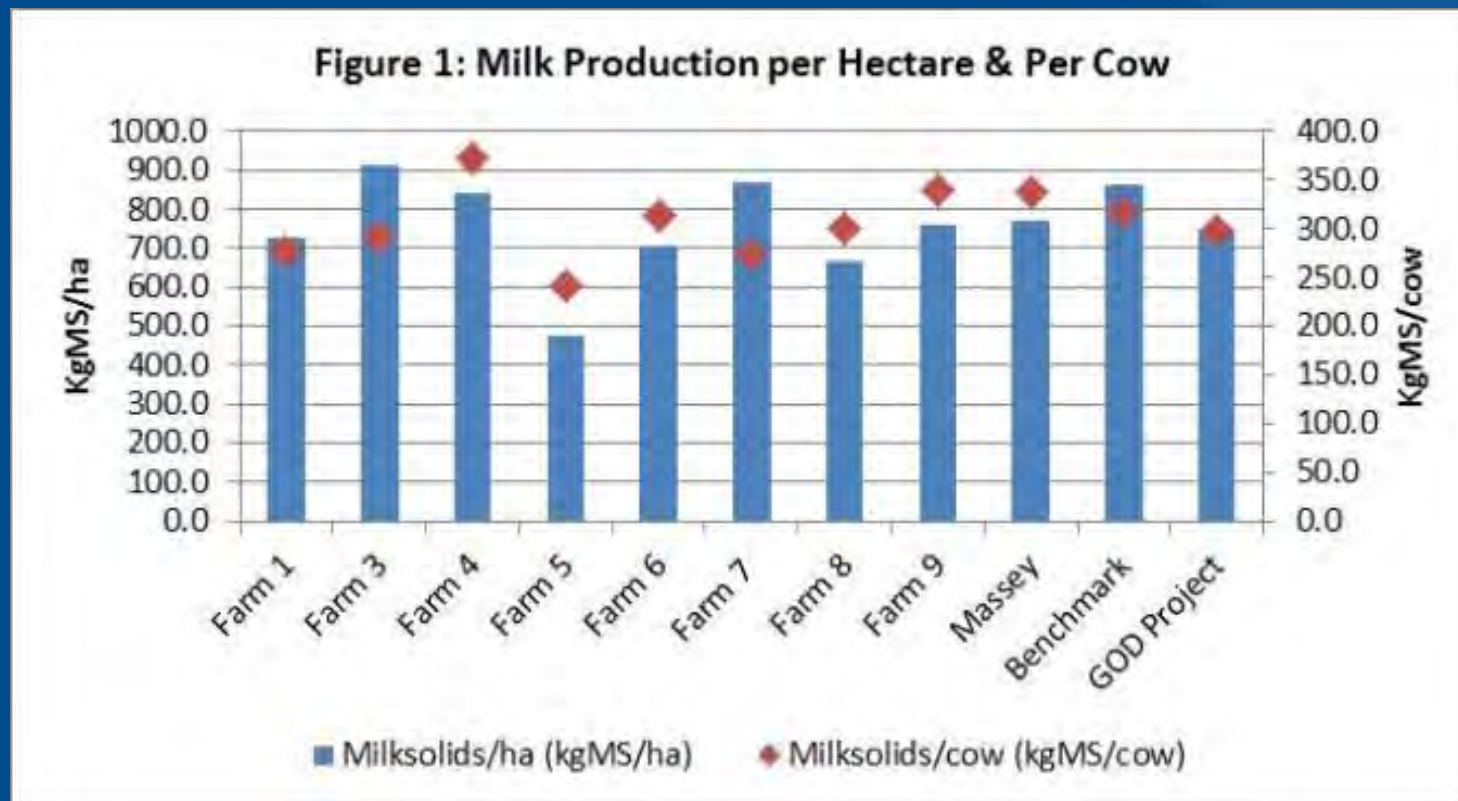
Analysed 5 years of data (2007-08 to 2010-11)

Compared results with Massey University organic farm and benchmark data from system 1 & 2 conventional farms

Farmers and academics discussed and interpreted results to determine best practice

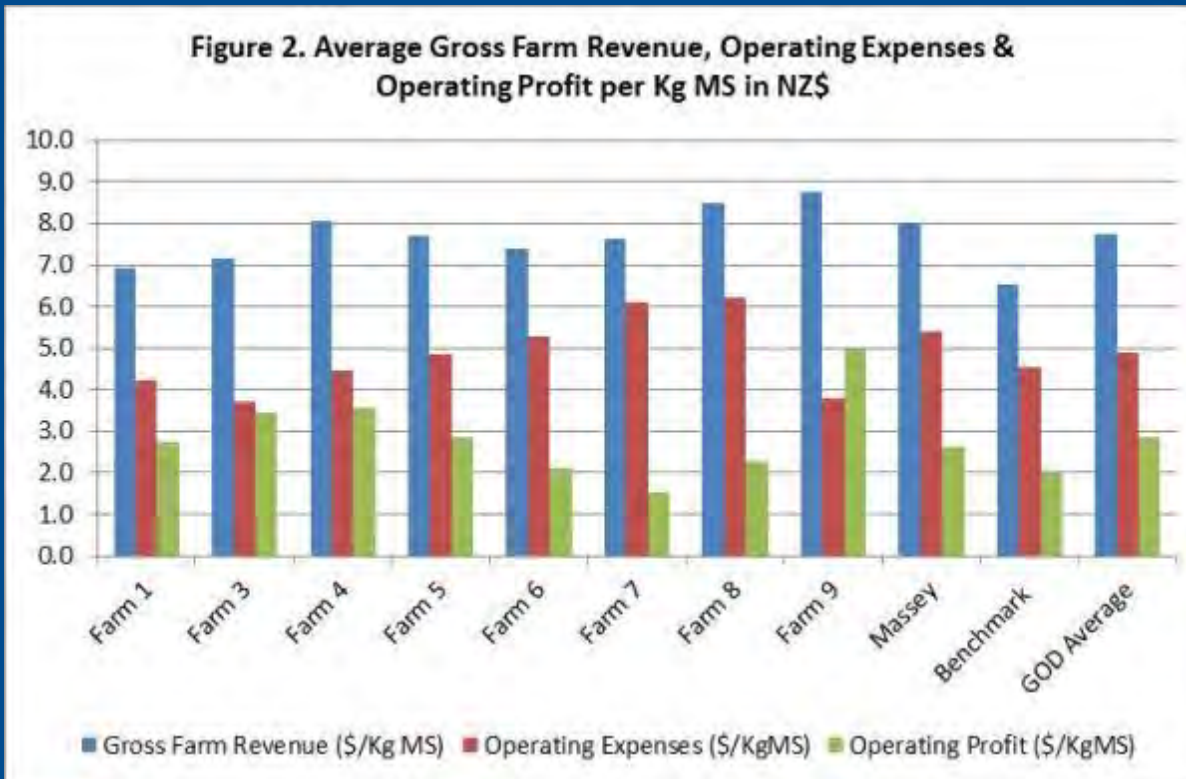
Milk Production /hectare and / cow

On a per hectare basis GOD average was **16.5 % less** than the benchmark average versus 18% in MU systems trial , and on a per cow basis it was **6.6% less** Stocking rate impact is evident in the results



Revenue, Expenses & Profit

GOD Gross Farm Revenue of NZ\$ 7.7/kg MS was **18.5% greater** than the Benchmark average (NZ\$ 6.5/kg MS),
GOD Operating Expenses of NZ\$ 4.9/kg MS was **8.9% greater** than the benchmark average (NZ\$ 4.5/kg MS).
GOD Operating Profit of NZ\$ 2.9/kg MS was **45% greater** than the benchmark average (NZ\$ 2.0/kg MS).



Specific input costs averaged over the 5 year period

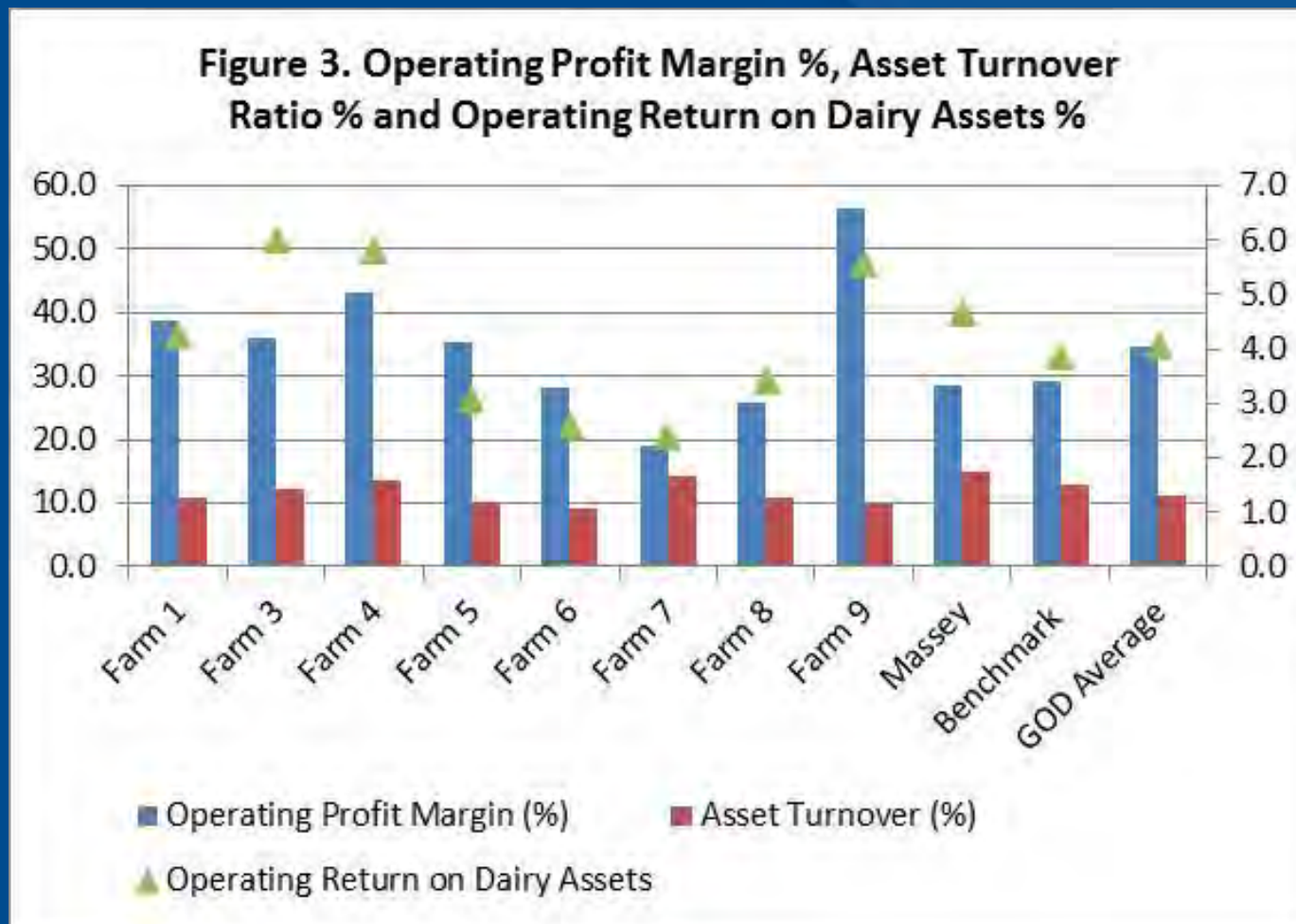
Cost differences highlight Massey fertilizer and animal health concerns are not general
Feed costs less on both Massey farm and the GOD farms than conventional benchmark farms

Massey Farm Benchmark GOD

Fertiliser/GFR %	10.73	8.35	8.09
Total Feed/GFR %	9.16	14.59	11.46
Fertiliser \$/ha	586.14	460.80	418.47
Feed \$/ha	542.13	805.40	621.61
Animal Health \$/cow	95.19	67.20	41.16

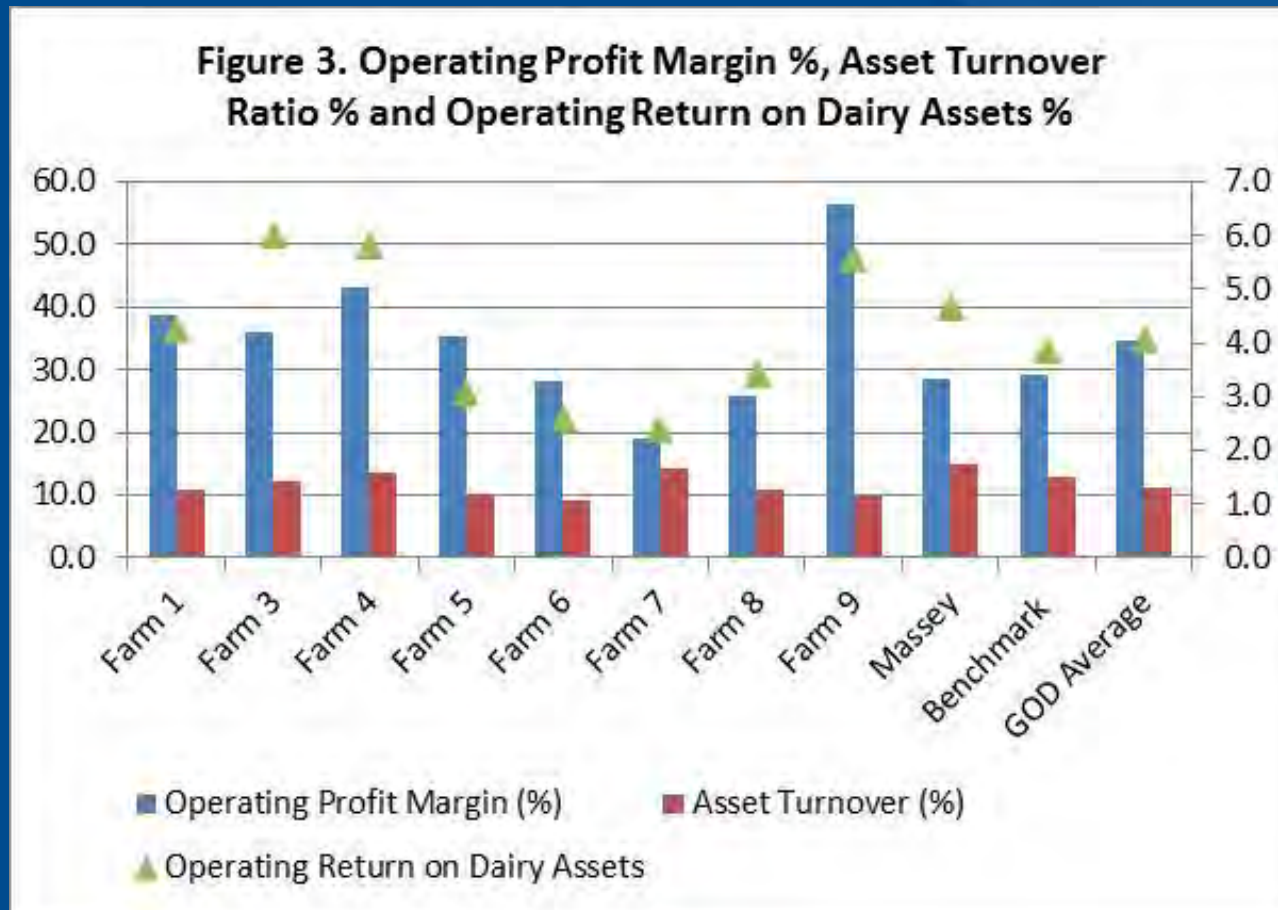
Efficiency drivers and RoA

- GOD operating efficiency **18% greater** than benchmark (34.6% v 29.2%)
- GOD capital efficiency **12% less** than benchmark (11.4% v 13%)
- GOD return on assets **5% higher** than benchmark (4.1% v 3.9%)



Competitive strategy

As expected under their differentiation strategy, the GOD farm average operating profit margin was greater than the benchmark, while the average asset turnover was lesser than the benchmark average. However significant variation exists between farms



Conclusions

The growth of New Zealand's organic dairy sector is strongly influenced by growing overseas demand

While acknowledging the small and biased sample, the data provided enough information to confirm differences already identified in the Massey University comparative systems trial and to make some critical observations about organic dairy farming in New Zealand.

Despite their relatively small size and lower milk production levels, the GOD organic farms were, on average, able to farm sustainably and profitably

Future research could focus on the best practices that deliver operating efficiency and enable organic farms to deliver stronger returns in line with their differentiation strategy.



Thank you

