

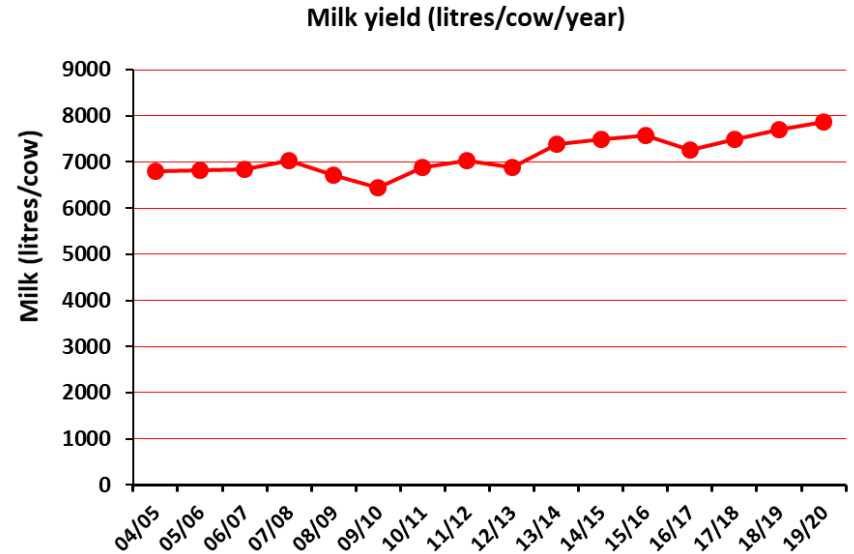
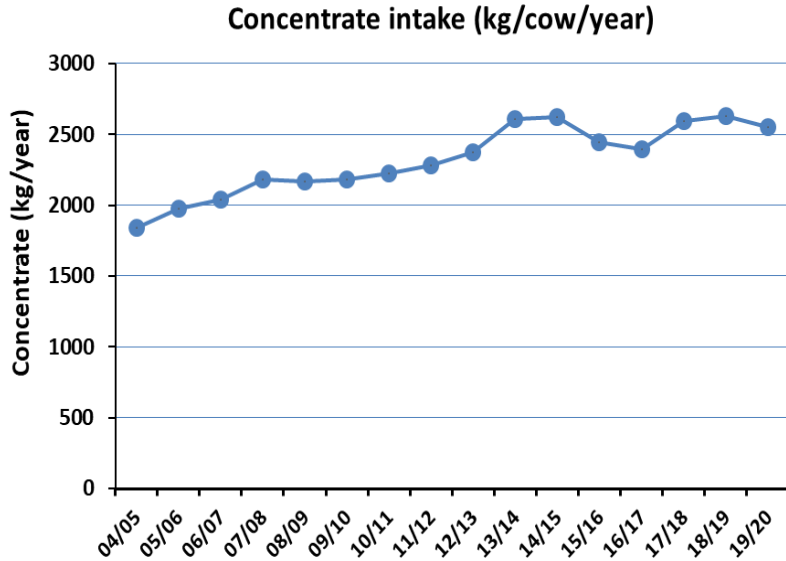
Improving farm
sustainability
through efficient
concentrate usage

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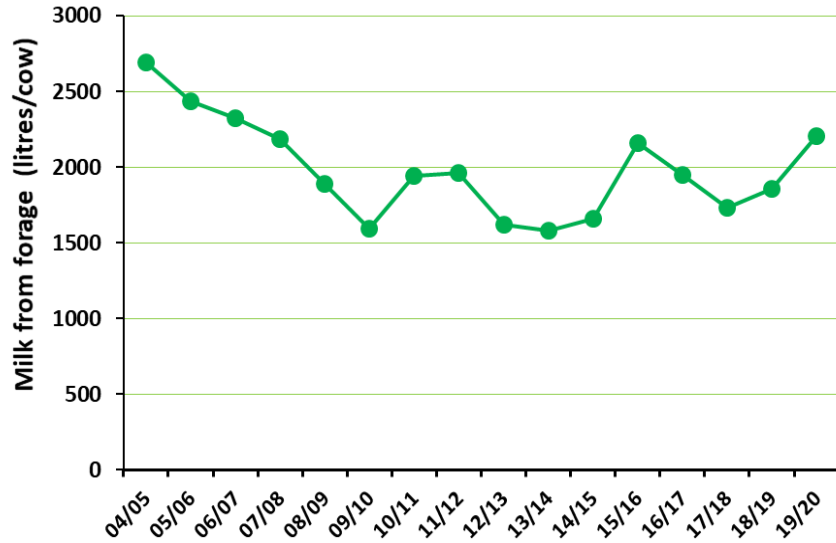


Trends in concentrate use and milk yields in NI

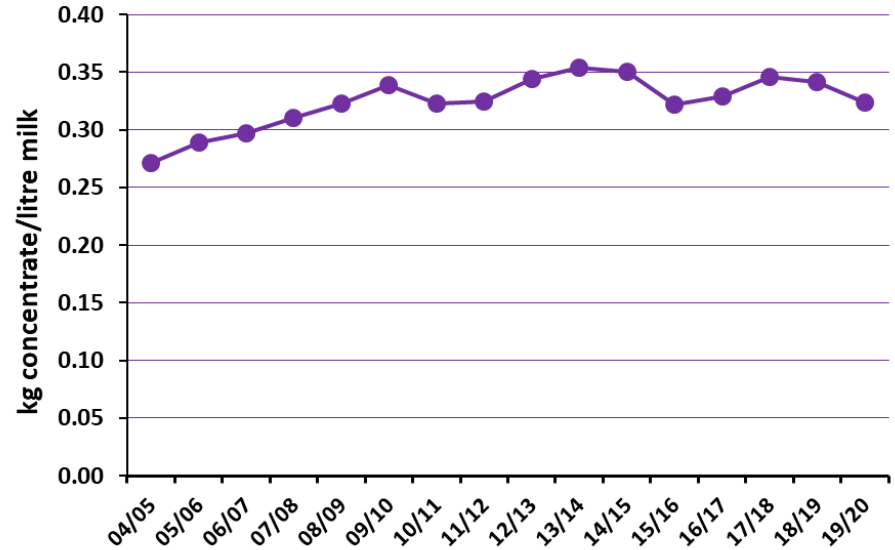


Efficiency of concentrate use in NI

Milk from forage (litres/cow/year)

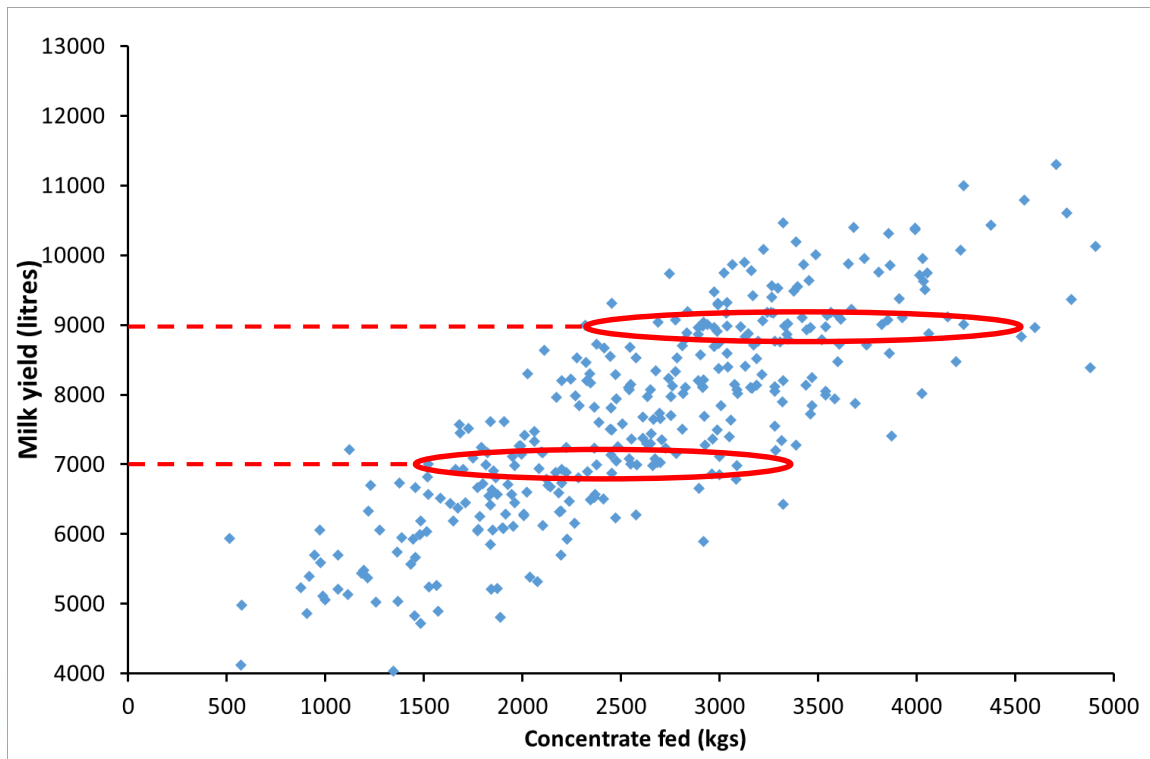


kg concentrate/litre milk



Relationship between annual milk output per cow and concentrate intake

(CAFRE benchmarking, 18-19)



How does concentrate use impact sustainability?



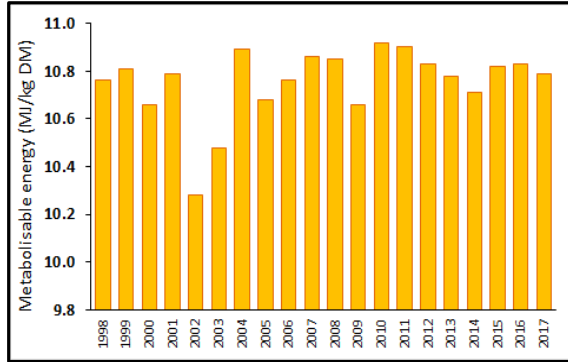
Tackling concentrate sustainability issues

- 1) Feeding the correct amount of concentrates
- 2) Getting the chemical composition correct
- 3) Using the correct ingredients

1) Feeding the correct amount of concentrates

-Forage quality

Metabolisable energy



1% Increase in silage D-value:
...can result in a concentrate saving of
0.47 kg/day (Keady et al., 2013)

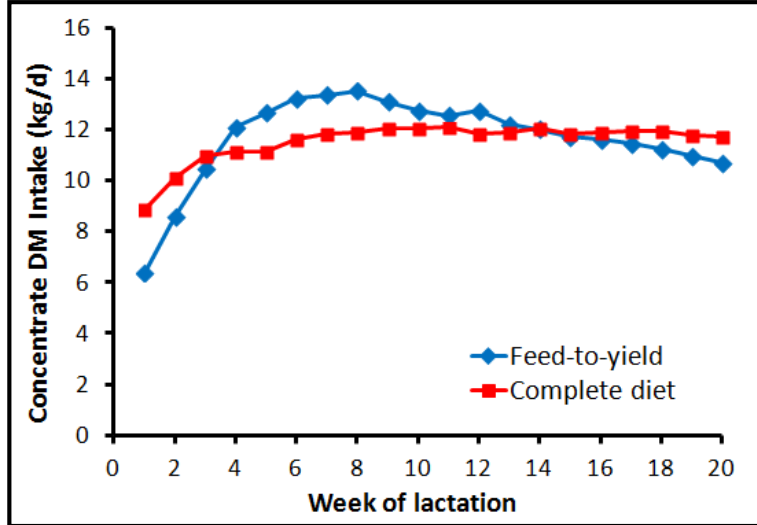
Survey of 180 dairy farmer - factors limiting improvements in silage quality ?



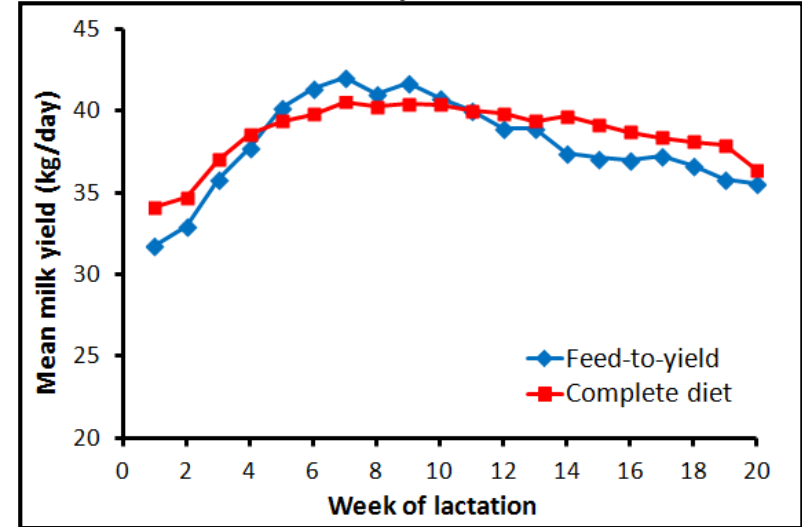
1) Feeding the correct amount of concentrates

Complete diet vs feed to yield

Concentrate DM intake



Milk yield

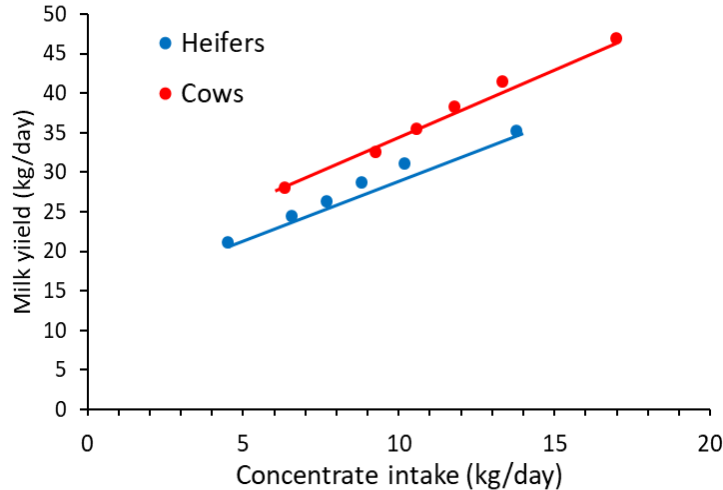


Different feeding systems can be equally effective, provided each are managed correctly

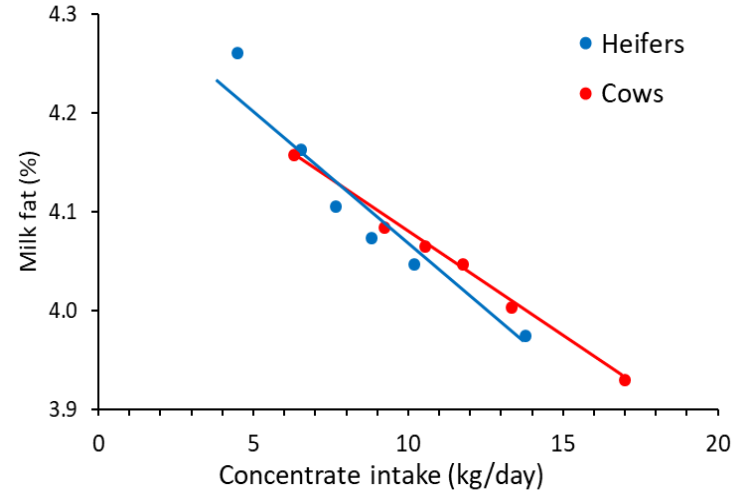
1) Feeding the correct amount of concentrates

On-farm responses within Feed-to-yield systems

Milk yield vs concentrate intake



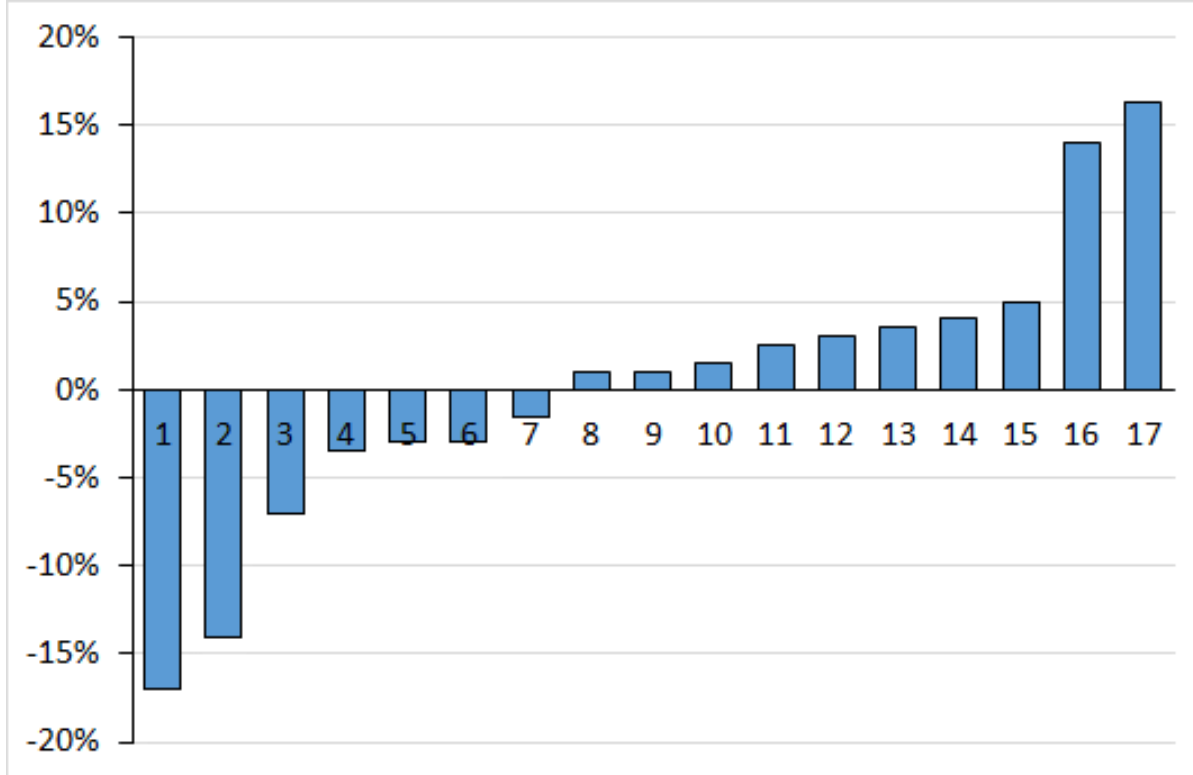
Milk fat vs concentrate intake



Monitor milk composition of cows offered high levels of concentrates

1) *Feeding the correct amount of concentrates*

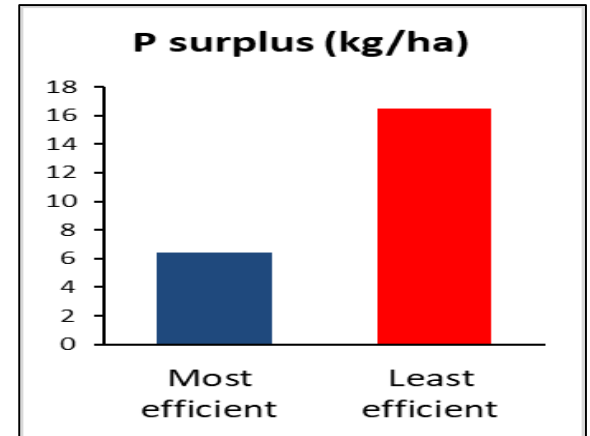
-In-parlour feeder accuracy



- Accuracy of concentrate feeders tested on 17 farms
- Many feeders highly inaccurate
- Check feeders regularly!

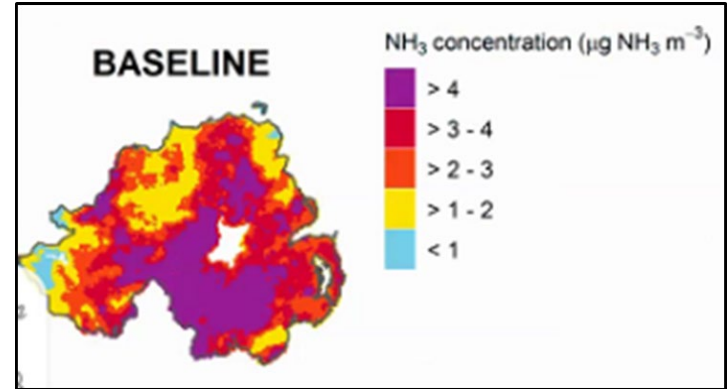
2) Getting the chemical composition correct! - Phosphorus

- Historically dairy cow concentrates contained excess P
 - 2001 concentrates contained 6.2 g P/kg
 - AFBI research demonstrated that we could reduce this to 3.8 g P/kg (38% reduction)
 - Industry has made progress – but we can reduce further
- Farms with efficient concentrate use also have a lower P surplus (7000 – 8000 litre farms)



2) Getting the chemical composition correct! - Protein

- Excess protein in the diet increases N excretion in urine and faeces:
 - Lost as ammonia
 - Lost as nitrous oxide
 - Lost via leaching
- Dietary protein levels can be reduced: major new DAERA/Industry co-funded research project recently established at Hillsborough
 - Target: to reduce diet protein levels from 17.5% to 15.5% in early lactation



3) Using the correct ingredients?

- High reliance on imported ingredients eg soyabean meal
 - Environmental impact in country of origin
 - Long supply chains – reliability
 - Carbon footprint
- Can locally grown protein crops replace imported protein?

	0 kg field beans	4.7 kg field beans
Dry matter intake (kg/day)	21.7	21.5
Milk yield (kg/day)	28.0	28.1

- Reducing the use of 'human foodstuffs' in dairy diets
 - World population 2050: 9 – 10 billion
 - Use of cereal grains in ruminant diets is increasingly being questioned
 - Challenge is to make more use of by-products (from industry and human food processing) and new feed sources...?

What does sustainable concentrate use look like?

..feeding the correct amount of concentrate, of the correct composition, produced from the 'correct' ingredients, to supply nutrients that cannot be met with high quality forage

Thank you

