

MOO

THE MILK OUTPUT OPTIMISER

A management
tool for New
Zealand dairy
farmers

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THE DAIRY INDUSTRY

5 Million



THE DAIRY INDUSTRY

20 Billion



THE DAIRY INDUSTRY

25 %



THE DAIRY INDUSTRY

\$14 billion



THE DAIRY INDUSTRY

**Small improvements are big
improvements**



TELL ME ALL YOUR WORRIES

Cows

Posture



1.5



3



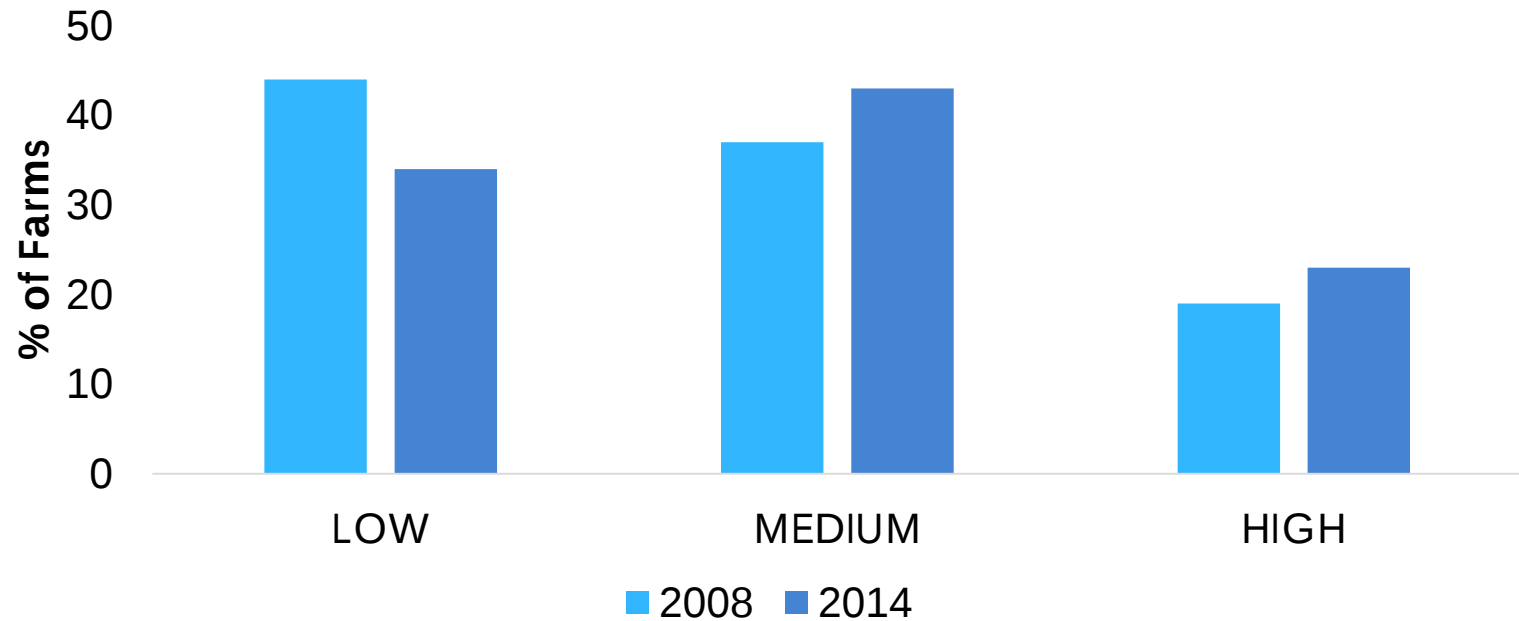
4.5

TELL ME ALL YOUR WORRIES

Cows

Pasture

Supplementation Intensity



TELL ME ALL YOUR WORRIES

Cows

Body Condition

Lactation

Fertility

Stocking Rate

Pasture

Fertiliser

Irrigation

Silage

Supplement

Stochasticity

Weather

Financial

Biological

TELL ME ALL YOUR WORRIES

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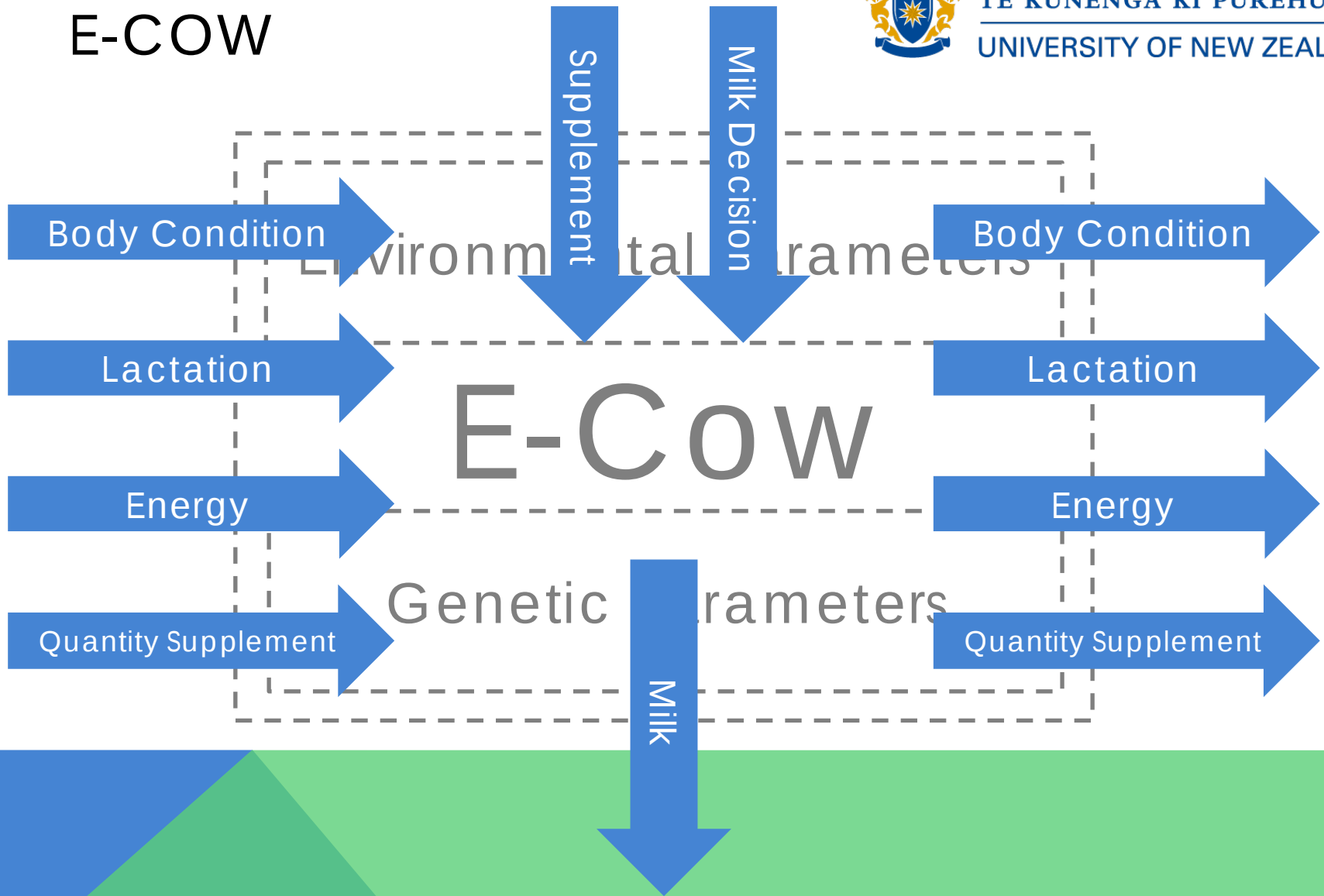
TELL ME ALL YOUR WORRIES

**Farmers make complicated
decisions under uncertainty**





E-COW



E-COW

**E-Cow has been validated for
New Zealand pastoral
farming systems**



MOO I, II AND III

Objective: maximise profit

Subject to: exceeding a Body Condition Score target at the end of the year

By Varying: the quantity of supplement each week and the length of lactation



MOO I, II AND III



MOO I, II AND III

MOO I

A decorative footer at the bottom of the slide consisting of several overlapping triangles in shades of blue and green.

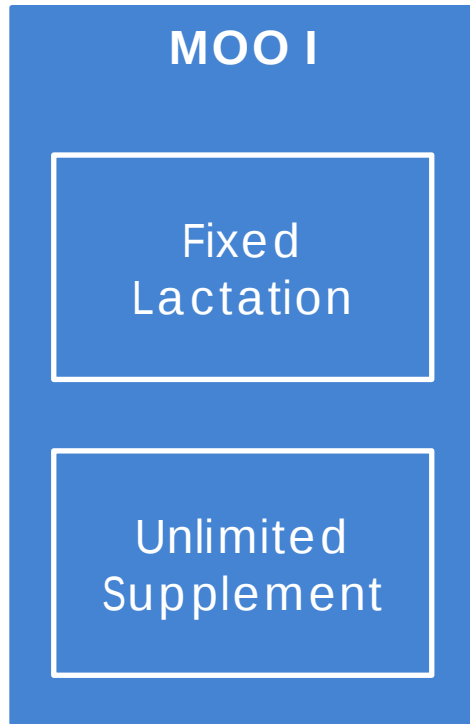
MOO I, II AND III

MOO I

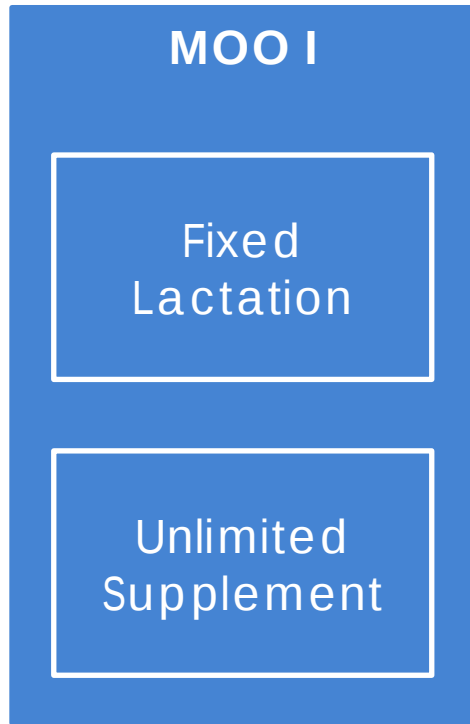
Fixed
Lactation



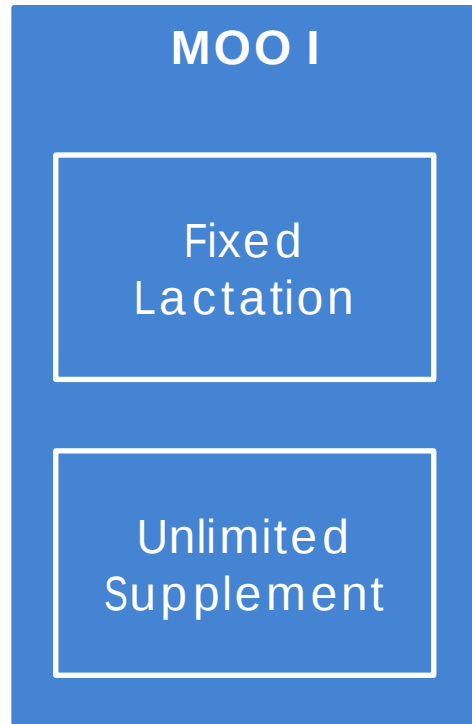
MOO I, II AND III



MOO I, II AND III



MOO I, II AND III

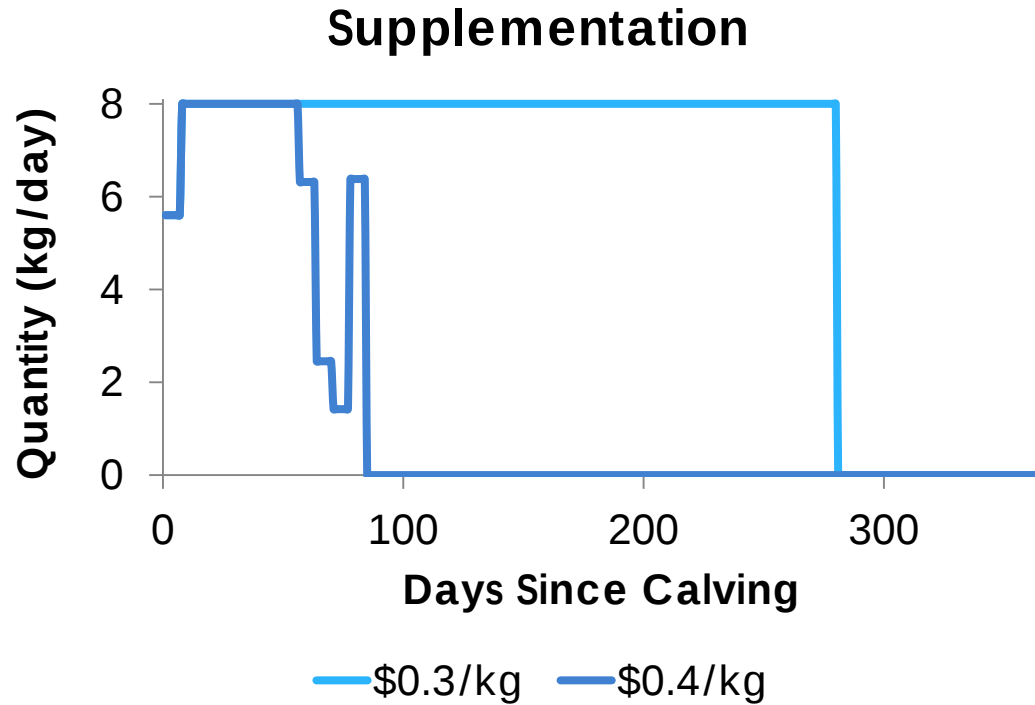


MOO I: FIXED LACTATION, UNLIMITED SUPPLEMENT

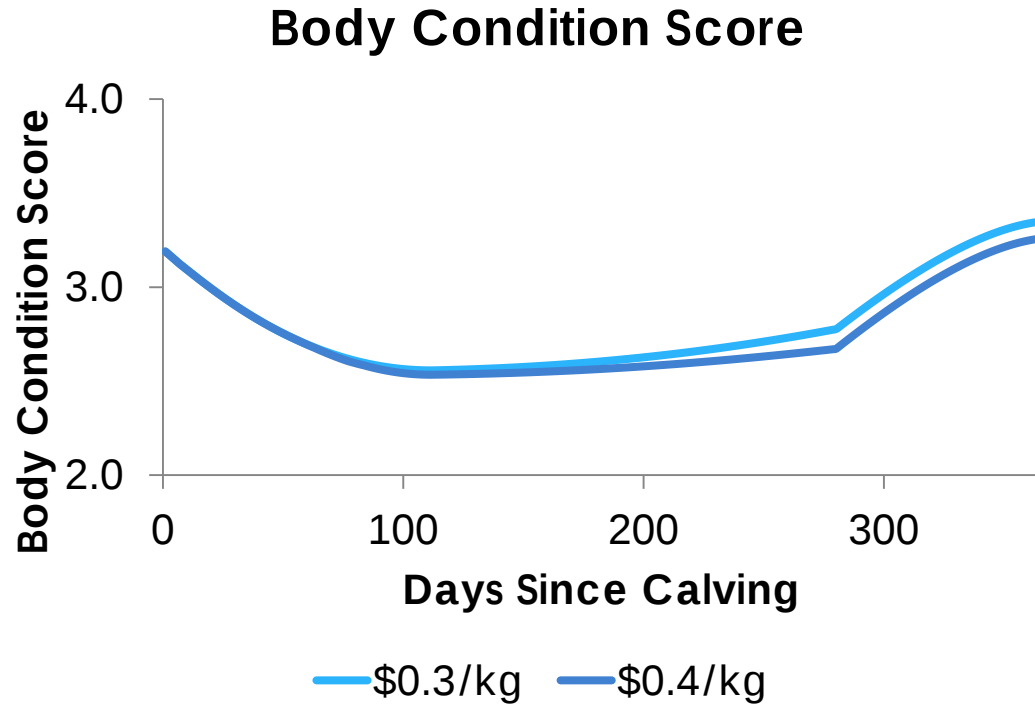
**Q: Is the optimal policy sensitive
to the price of supplement?**



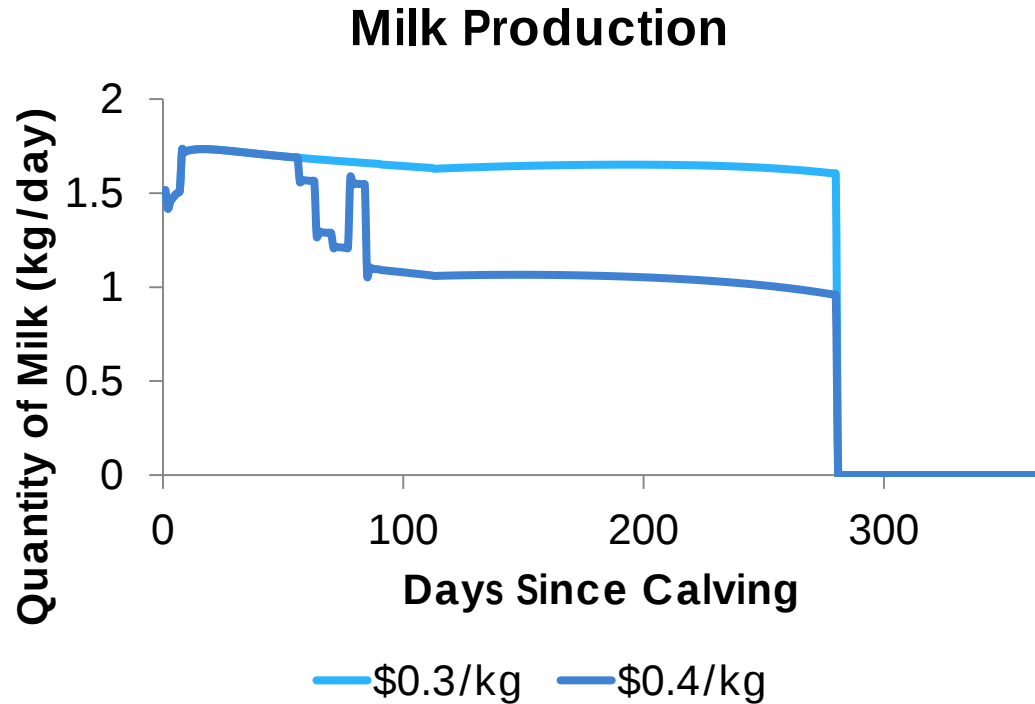
MOO I: FIXED LACTATION, UNLIMITED SUPPLEMENT



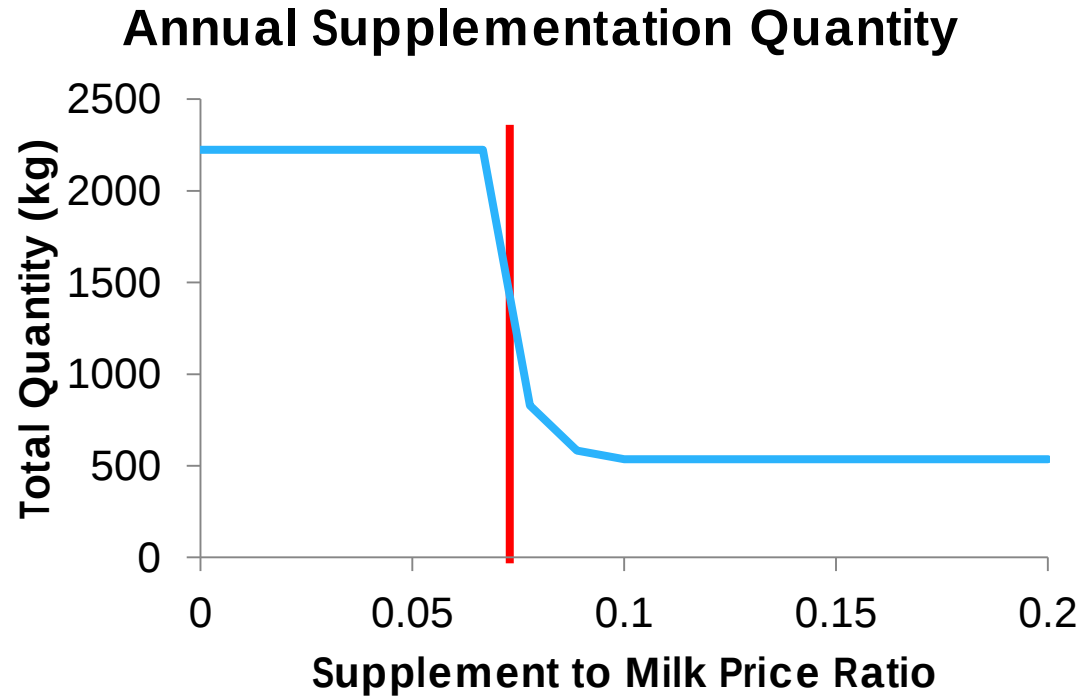
MOO I: FIXED LACTATION, UNLIMITED SUPPLEMENT



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MOO I: FIXED LACTATION, UNLIMITED SUPPLEMENT



MOO I: FIXED LACTATION, UNLIMITED SUPPLEMENT

Q: Is the optimal policy sensitive to the price of supplement?

A: Yes. The ratio of supplement to milk price is critical.

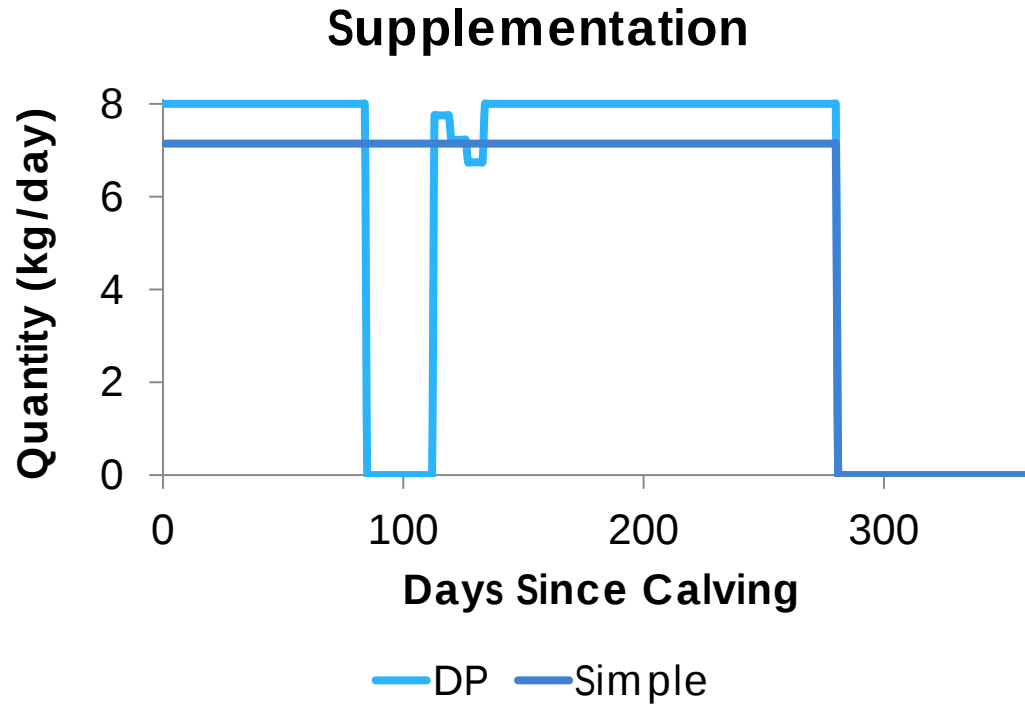


MOO II: FIXED LACTATION, FINITE SUPPLEMENT

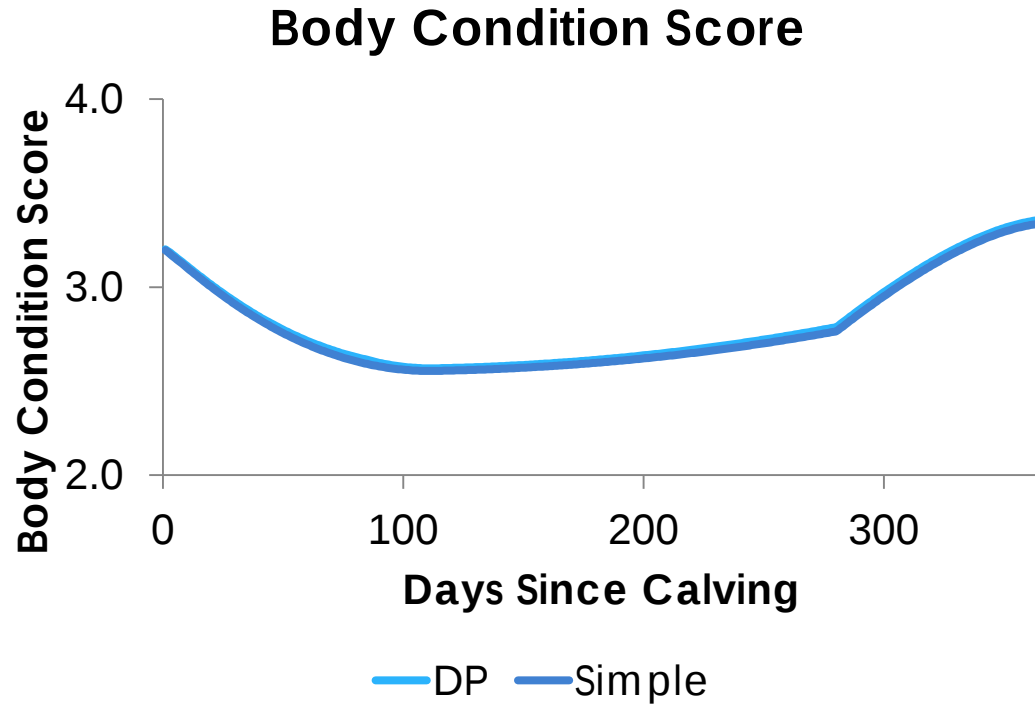
Q: Does optimisation add value?



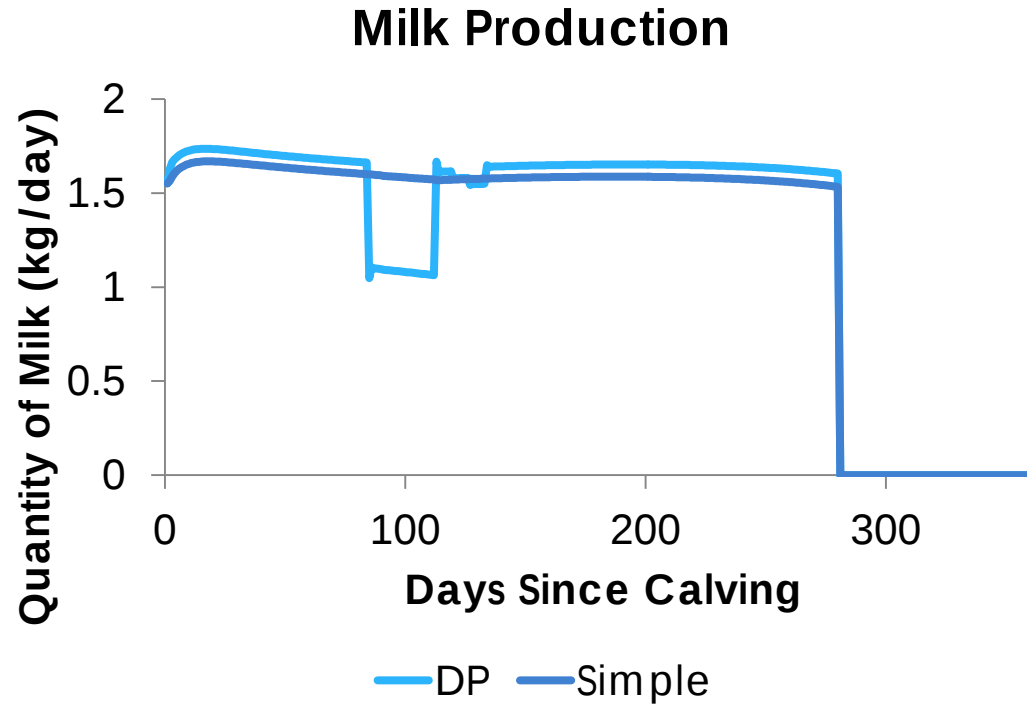
MOO II: FIXED LACTATION, FINITE SUPPLEMENT



MOO II: FIXED LACTATION, FINITE SUPPLEMENT



MOO II: FIXED LACTATION, FINITE SUPPLEMENT



MOO II: FIXED LACTATION, FINITE SUPPLEMENT

+\$4.50 / year

MOO II: FIXED LACTATION, FINITE SUPPLEMENT

Q: Does optimisation add value?

**A: Not always. Simple solutions
may be close to optimal.**

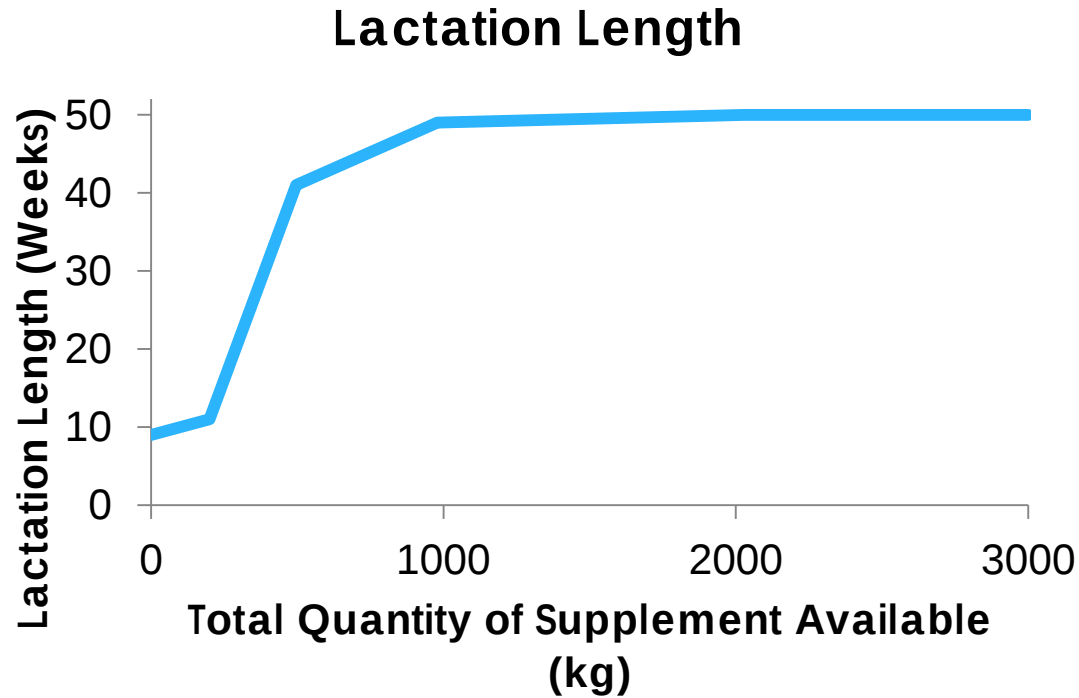


MOO III: VARIABLE LACTATION, FINITE SUPPLEMENT

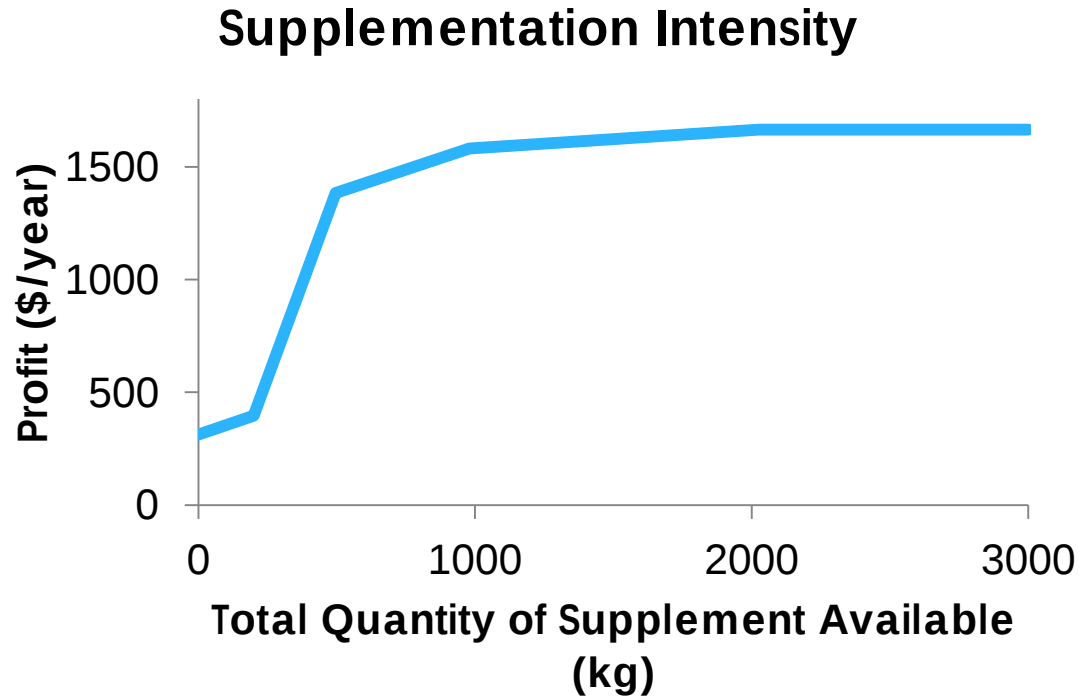
**Q: Are high intensity farms more
profitable than low intensity
farms?**



MOO III: VARIABLE LACTATION, FINITE SUPPLEMENT



MOO III: VARIABLE LACTATION, FINITE SUPPLEMENT



MOO III: VARIABLE LACTATION, FINITE SUPPLEMENT

Q: Are high intensity farms more profitable than low intensity farms?

A: Yes. But there is a diminishing return.



CONCLUSIONS

With the assumptions and parameters contained in MOO:

1. We can optimise supplementation and lactation length
2. Optimisation does add value, although simple policies may be just as good
3. At current prices, supplementation for milk production may have small returns
4. At current prices, supplementation to increase lactation length is beneficial





QUESTIONS