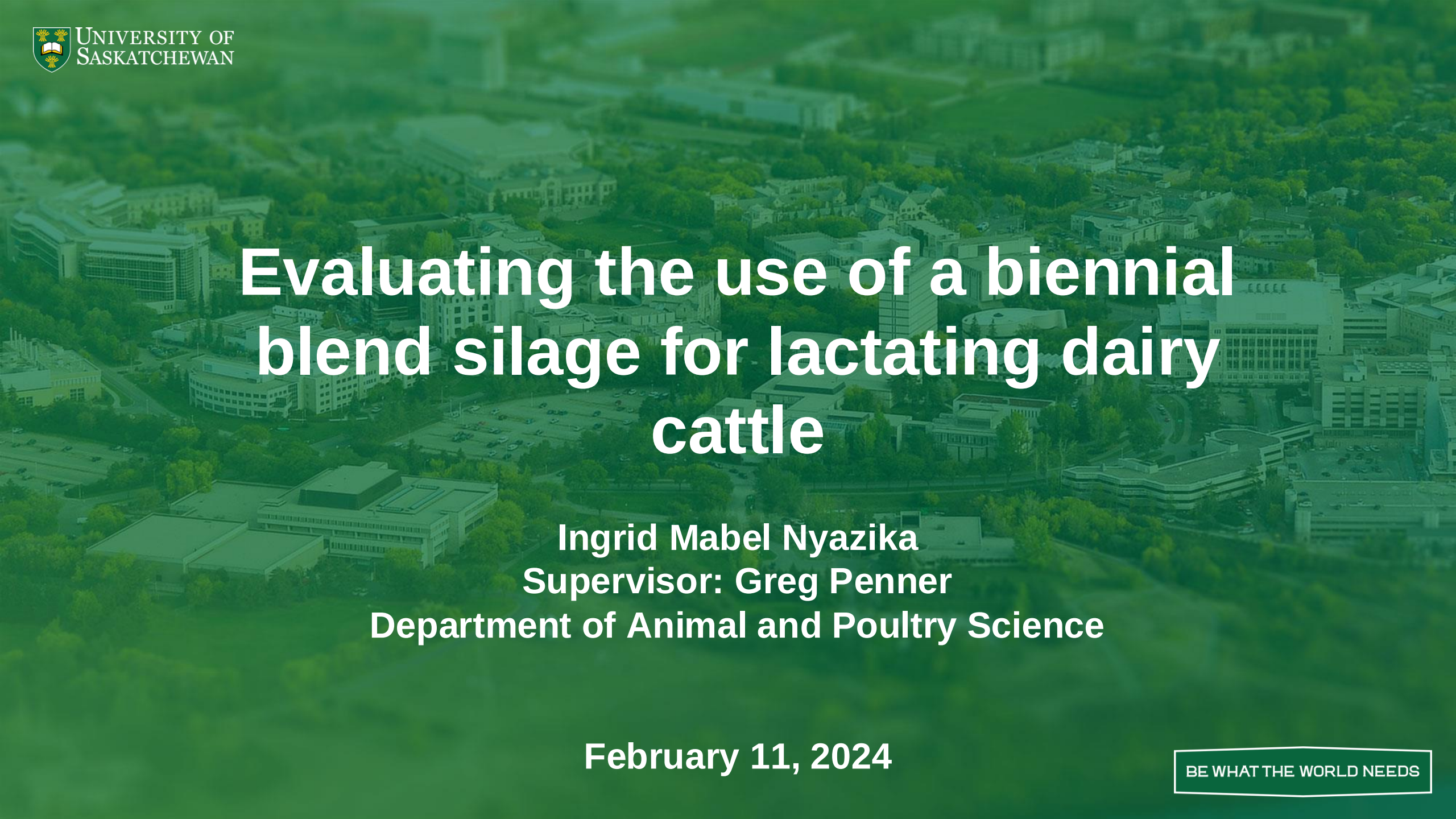

Evaluating the use of a biennial blend silage for lactating dairy cattle

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Forage use in the Canadian dairy industry

- Forage is the primary feed source for dairy cattle in western Canada, providing essential nutrients and fibre (Deak et al.2010; Givens et al. 2004)
- High-quality forage is crucial for optimal milk production, animal health, and profitability.
- Western Canada's diverse climate presents unique challenges for forage production

    I. Drought
    II. Variable moisture levels
    III. Short growing seasons

- These conditions can impact forage quality and this directly affects intake and milk production (McGeough et al. 2017)

Navigating a changing landscape

- With variable climate and extreme weather events increasing in combination with rising input costs, the need for sustainable and resilient forage systems is paramount (Lizarazo et al.2020)
- But, how?

What is a biennial blend?

- Refers to a mixture of plant species that require two years to complete their biological life cycle.
- Species include:

Triticale

Sweet clover

Hairy vetch

Red clover

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Biennial forage blends: A potential solution?

- Biennial species for forage present potential advantages over annuals (Ladd et al. 2016)
  a) Drought tolerance- deeper root systems
  b) Resilience to extreme events – better establishment in second year
  c) Extended growing seasons utilisation- variable growing seasons
  d) Improved water efficiency- different root systems
- They can be a more stable and reliable feed source (Jensen et al. 2017)
- However, realising this potential requires careful selection of appropriate species and blends, as well as rigorous research to validate their performance as forage sources.

Potential advantages as forage

- Increase in digestible nutrients for cattle
- Studies report:
-  in crude protein content, NDF
-  in ADF and lignin content (Dean et al. 2009)

Study objective

- To assess the effects of a biennial forage blend relative to barley silage on DMI, and milk and milk component yields for lactating dairy cows

Planting and harvesting

- Biennial blend consisted of an oat base with a 14 plant species mix
- Oat and the blend seeded at 61.5 kg/ha and 12.3 kg/ha, respectively in June 2023
- Mixture included:
  a) Oat
  b) Winter triticale
  c) Sweet clover
  d) Hairy vetch
  e) Red clover
  f) Phaecilia
  g) Forage collards
  h) Faba bean
  i) Forage peas
  j) Turnip
  k) Beet
  l) Japanese millet

Planting and harvesting

- Biennial blend harvested in 2023 and allowed to regrow
- Forage for this study was harvested in July 2024, consisting of triticale, vetch, and clover
- Barley (CDC Rosser) seeded the 1st week of June 2023 at 123 kg/ha, and harvested in August 2023

Biennial blend before cutting

Experimental design

- 8 cannulated, multiparous Holstein cows
- 112 DIM
- Fed twice a day (1030hrs and 1700hrs)
- 4 dietary treatments (Control, P33, P66, P100)

Dietary Treatments DM inclusion (kg)

- Diets formulated to support 45L/d of milk with 4.3% fat and 3.3% protein at 28kg of DMI

Variable	Diets			
Ingredient, % DM	CON	P33	P66	P100
Barley silage	42.99	28.11	14.05	0.00
Biennial blend silage	0.00	14.05	28.14	41.03
Canola crush	7.40	9.99	11.47	12.20
Canola meal	7.12	4.18	1.48	0.00
Beet pulp	1.11	0.00	0.00	0.00
Barley grain	37.49	39.78	40.97	42.88
Palmitic acid	0.74	0.74	0.74	0.74
Rayner lactating mineral	3.15	3.15	3.15	3.15
TOTAL	100.00	100.00	100.00	100.00

Dietary treatment chemical composition

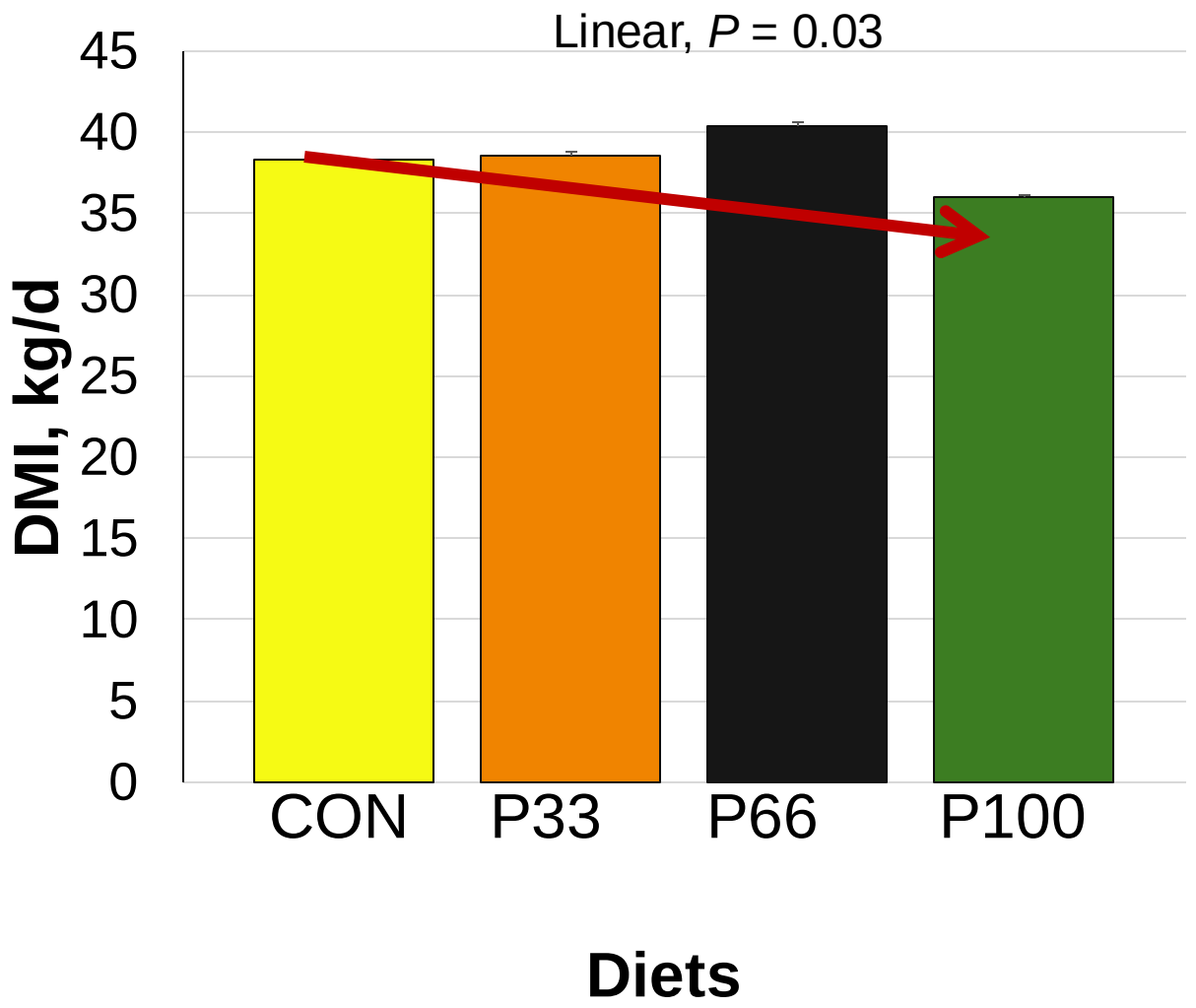
	Diet			
Item	CON	P33	P66	P100
Composition, % of DM				
DM	53.65	48.70	44.98	42.42
CP	17.12	17.19	17.03	17.01
aNDFom	31.51	32.50	33.84	34.71
ADF	18.31	18.8	19.60	20.05
Forage aNDFom	20.2	21.21	22.60	23.31
Starch	26.75	26.94	26.53	26.56
Ether extract	4.91	4.98	4.91	4.73

Sampling

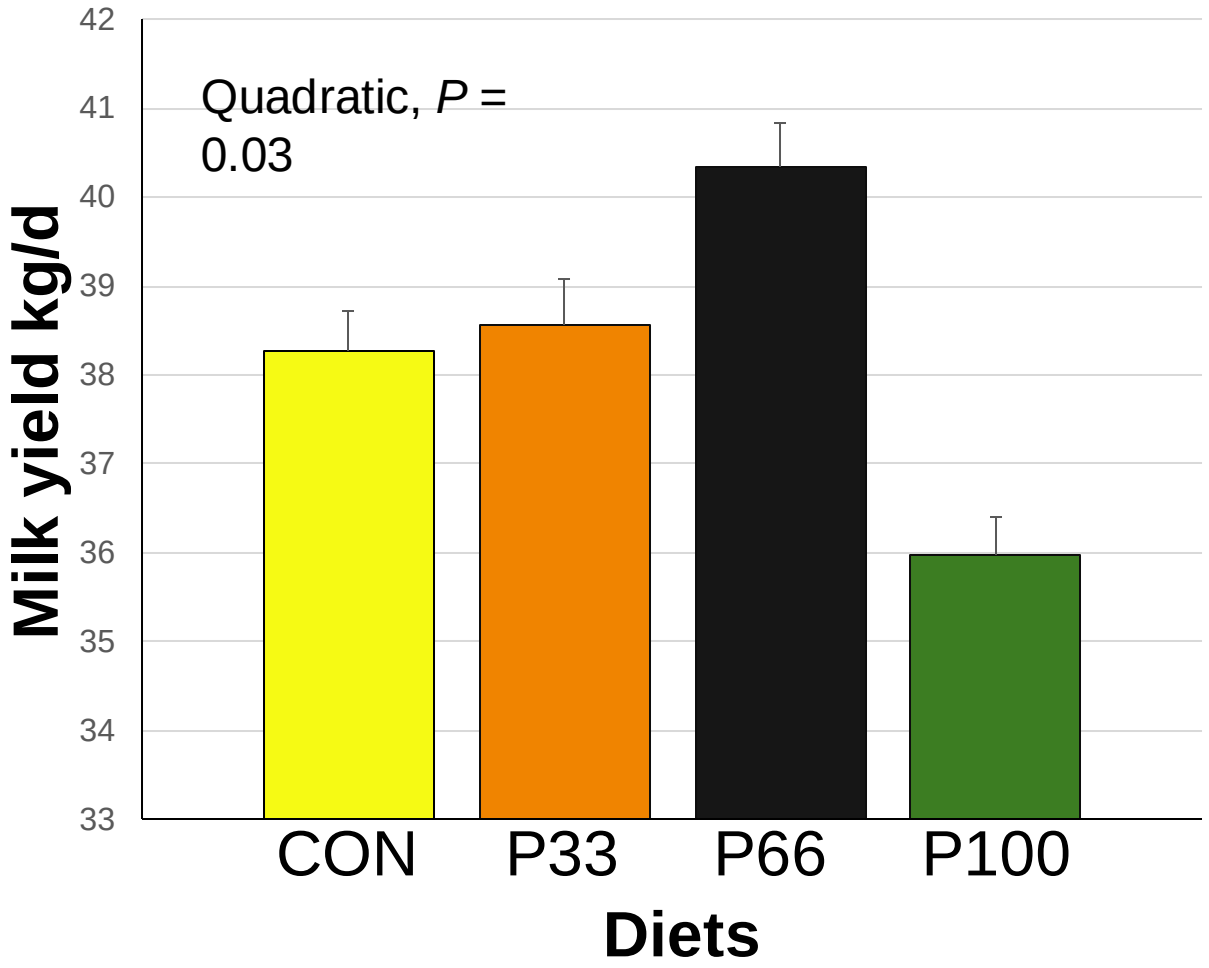
- DM measured weekly for all ingredients excluding silage (done twice weekly)
- DMI measurements daily & BW, BCS on the 1st and last day of each period
- Milk and milk component data collected from d 21 to 25

Findings?

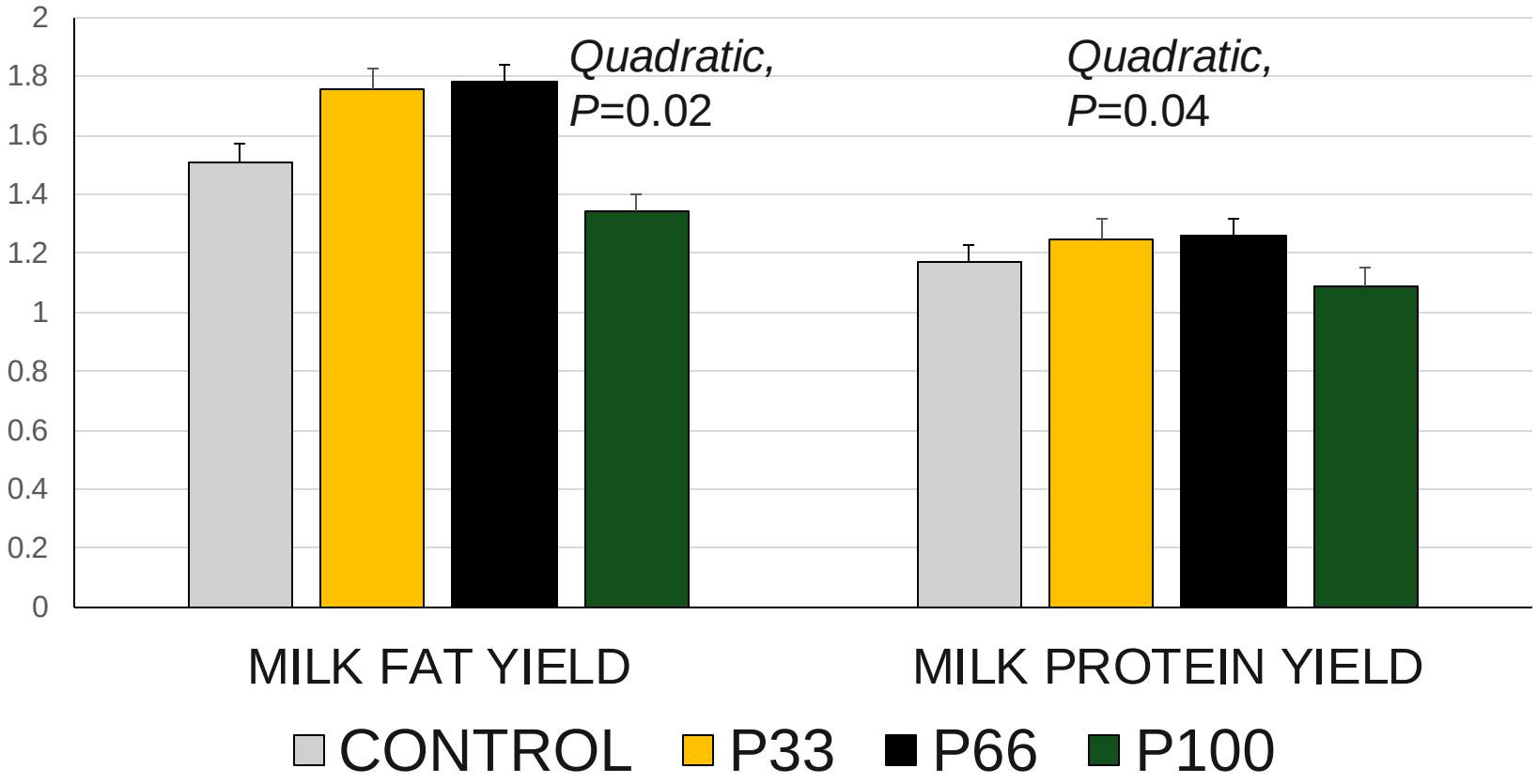
Increasing inclusion of the biennial blend decreased DMI



Increasing inclusion of the biennial blend affected milk yield



Increasing inclusion of the biennial blend affected milk fat and protein yields



Take home messages

- Despite decreased DMI, including the biennial blend between 14 and 28% of the dietary DM increased milk, milk fat, and milk protein yields.
- Overall, the results from the experiment are encouraging and suggest that biennial blends could provide a valuable silage source for dairy cattle.
- Further research and on farm trials will be essential to refine recommendations and ensure consistent results across different farming conditions.

Acknowledgements

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Thank you!

Questions?

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