University of Saskatchewan

Effects Of Feeding Progas Hybrid Rye Silage As A Replacement For Barley Silage On Production Performance In Dairy Cows

Bianca Rusawo, Gregory Penner, and Timothy Mutsvangwa

11 February 2025

University of Saskatchewan

Forage production on Canadian prairies

- Barley and corn are major forage crops - spring seeded and harvested mid-late summer for silage
- Risk of reduced yield (pests, diseases, climate variability)
- Need for forage production systems that increase annual forage yield per unit of land and mitigate risk of reduced yields
- Adoption of a winter cereal cover crop to bridge gaps in forage supply

Why cover crops?

- Cover crops can be successfully integrated into silage cropping systems
- Goal is for root and tiller development in fall
- Dormancy through the winter and crop development in the spring
- Provides an opportunity to diversify cropping strategy altering seeding time, plant growth and harvest

KWS Progas hybrid rye

Why KWS Progas hybrid rye?

Triticale vs Hybrid rye

- **Yield:** Hybrid rye produced 1.25 tons more DM/acre than triticale (Conley et al., 2018).
  - No difference in yield when compared to spring-seeded barley (Zhang et al., unpublished).
- **Resilience:** Improved drought resistance and natural weed control (allelopathic effects).

Why hybrid rye?

- **Water efficiency:** Uses 20% less water than winter wheat (Wehrle, 2020).
- **Disease resistance:** High resistance to Fusarium, offering an economic advantage (Meidaner et al., 2018).
- **Crop rotation benefits:** Increases yields of subsequent crops.

University of Saskatchewan

Objective

To evaluate the effects of increasing inclusion of KWS Progas hybrid rye silage as a replacement for barley silage on feed intake, milk yield and milk composition

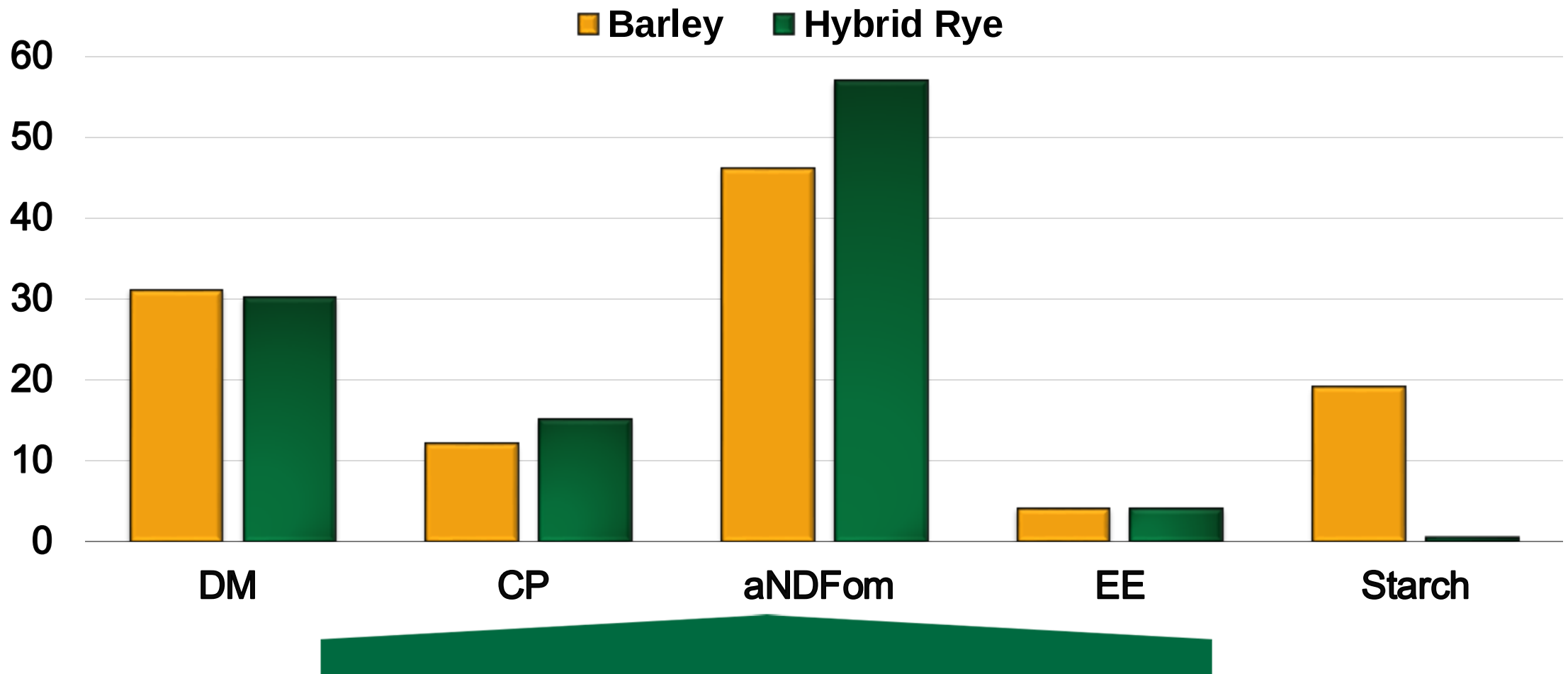
UNIVERSITY OF SASKATCHEWAN

Experimental design

- Replicated 4 × 4 Latin square design, 28 d periods
- 12 lactating Holstein cows
  - 4 primiparous (DIM = 43.5)
  - 8 multiparous (DIM = 64.8)

KWS Progas hybrid rye silage vs barley silage, % of DM

KWS Progas hybrid fall rye – Seeding: 18 August 2021; Harvest: 30 June 2022
Barley Alberta advantage – Seeding: 13 May 2023; Harvest: 19 July 2023



University of Saskatchewan

Experimental diets

The forage: concentrate ratio of the TMR was 46:54

Table 1. Ingredients for experimental diets

Ingredient, % of DM	Control (0)	Low (33)	Medium (67)	High (100)
Barley silage	46.43	31.11	15.32	0.00
Progas hybrid rye silage	0.00	15.32	31.11	46.43
Canola meal (mechanical)	7.25	6.66	6.05	5.46
Canola meal (solvent)	6.07	5.36	4.64	3.93
Barley grain	25.00	29.13	33.38	37.50
Beet pulp	10.71	7.89	4.97	2.14
Lactating mineral	3.11	3.11	3.11	3.11
Palmitic acid	1.43	1.43	1.43	1.43

UNIVERSITY OF SASKATCHEWAN

Experimental diets

Table 2. Ingredients for experimental diets

Ingredient, % of DM	Control (0)	Low (33)	Medium (67)	High (100)
Barley silage	46.43	31.11	15.32	0.00
Rye silage	0.00	15.32	31.11	46.43
Canola meal (mechanical)	7.25	6.66	6.05	5.46
Canola meal (solvent)	6.07	5.36	4.64	3.93
Barley grain	**25.00**	**29.13**	**33.38**	**37.50**
Beet pulp	10.71	7.89	4.97	2.14
Lactating mineral	3.11	3.11	3.11	3.11
Palmitic acid	1.43	1.43	1.43	1.43

UNIVERSITY OF SASKATCHEWAN

Experimental diets

Table 3. Chemical composition of experimental diets

Chemical Composition	Control (0)	Low (33)	Medium (67)	High (100)
DM %	47.0	46.51	45.32	44.2
CP, % of DM	**16.1**	**16.13**	**16.16**	**16.2**
aNDFom, % of DM	35.96	36.31	36.66	37.0
Starch, % of DM	**23.48**	**23.45**	**23.42**	**23.39**
Ether extract, % of DM	4.81	4.82	4.84	4.85
ME allowable milk, kg/d	38.2	38.53	38.88	39.2
MP allowable milk, kg/d	38.2	38.53	38.88	39.2

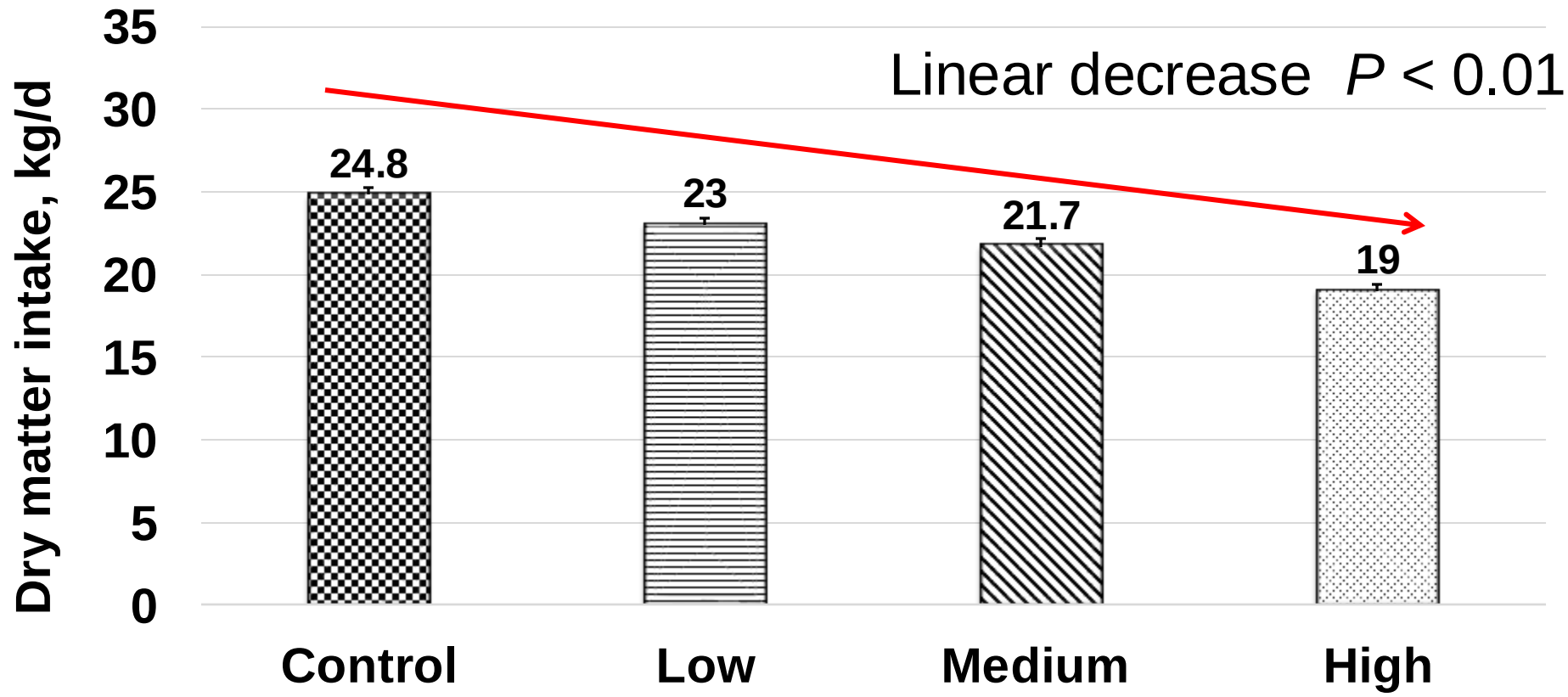
Formulation strategy: Balancing for ME and MP allowable milk

University of Saskatchewan

What did we measure?

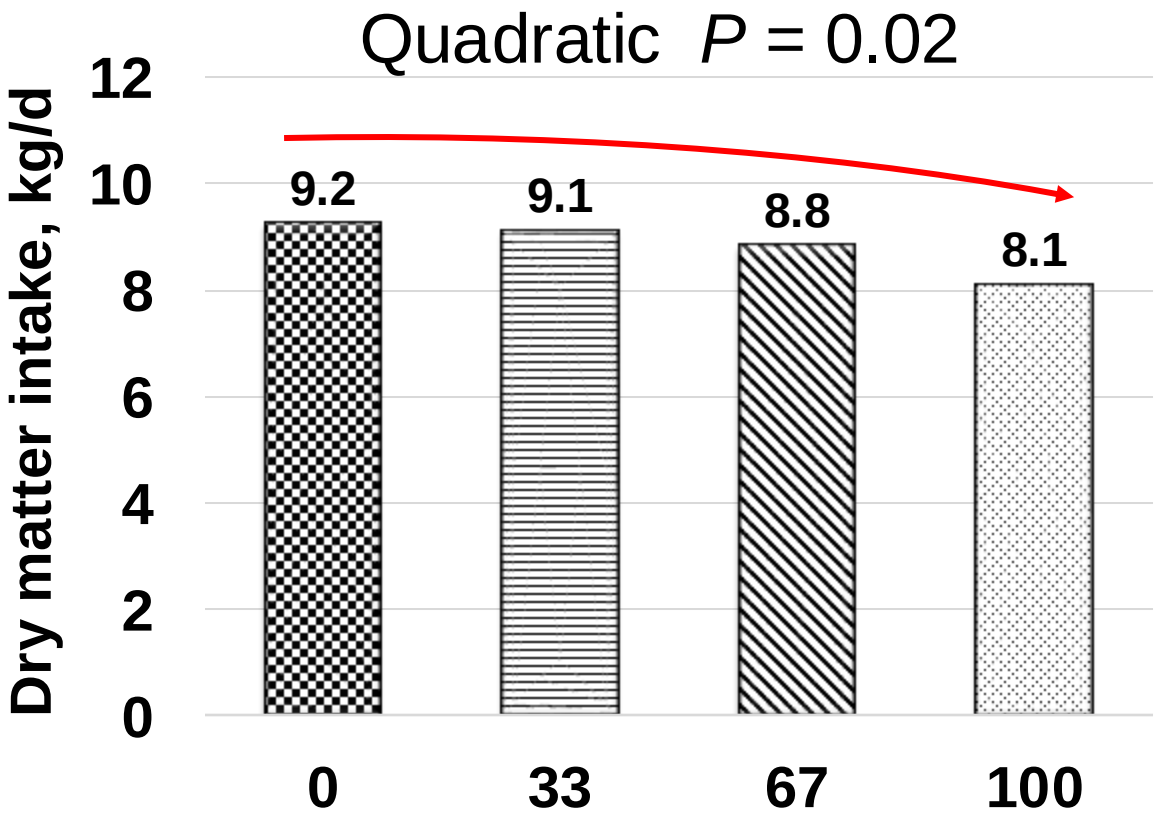
UNIVERSITY OF SASKATCHEWAN

Increasing levels of Progas hybrid rye silage decreased dry matter intake

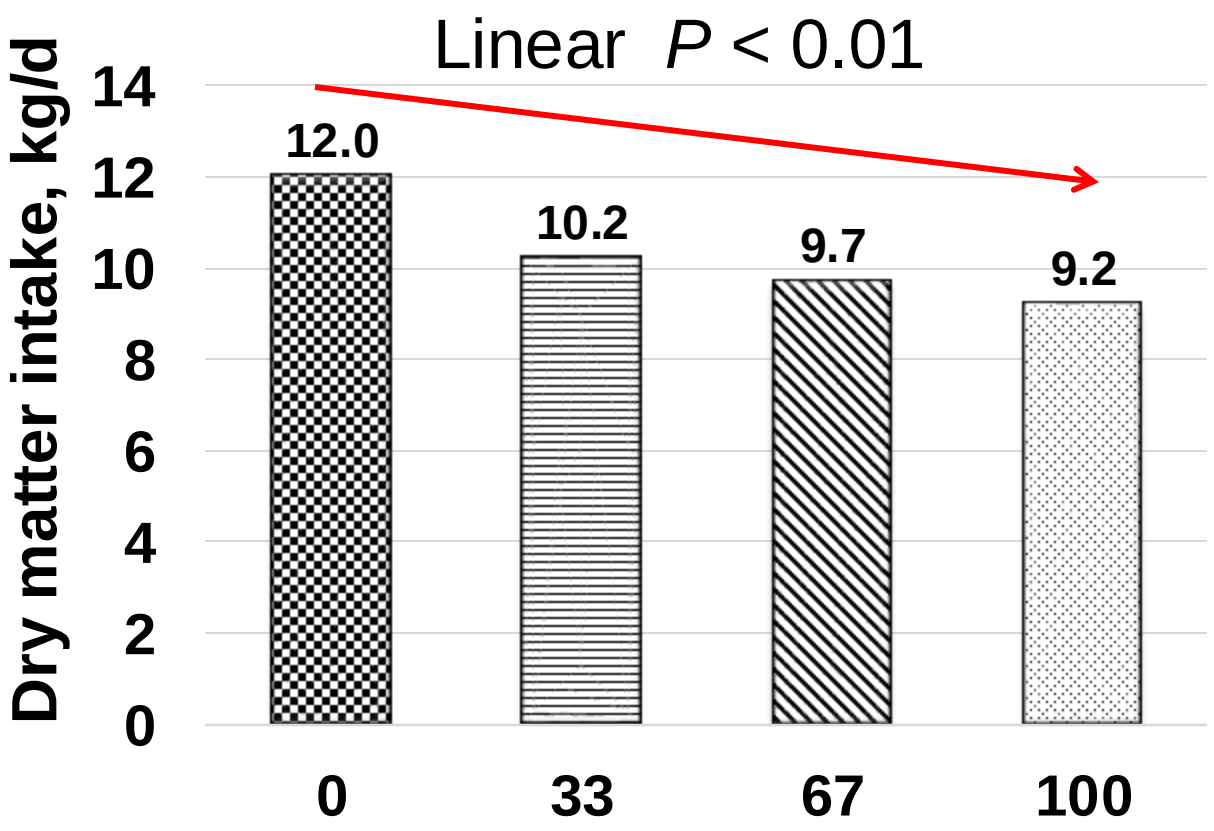


Other studies have also reported reduced intake

Growing beef heifers in a performance study; Zhang et al., (unpublished)

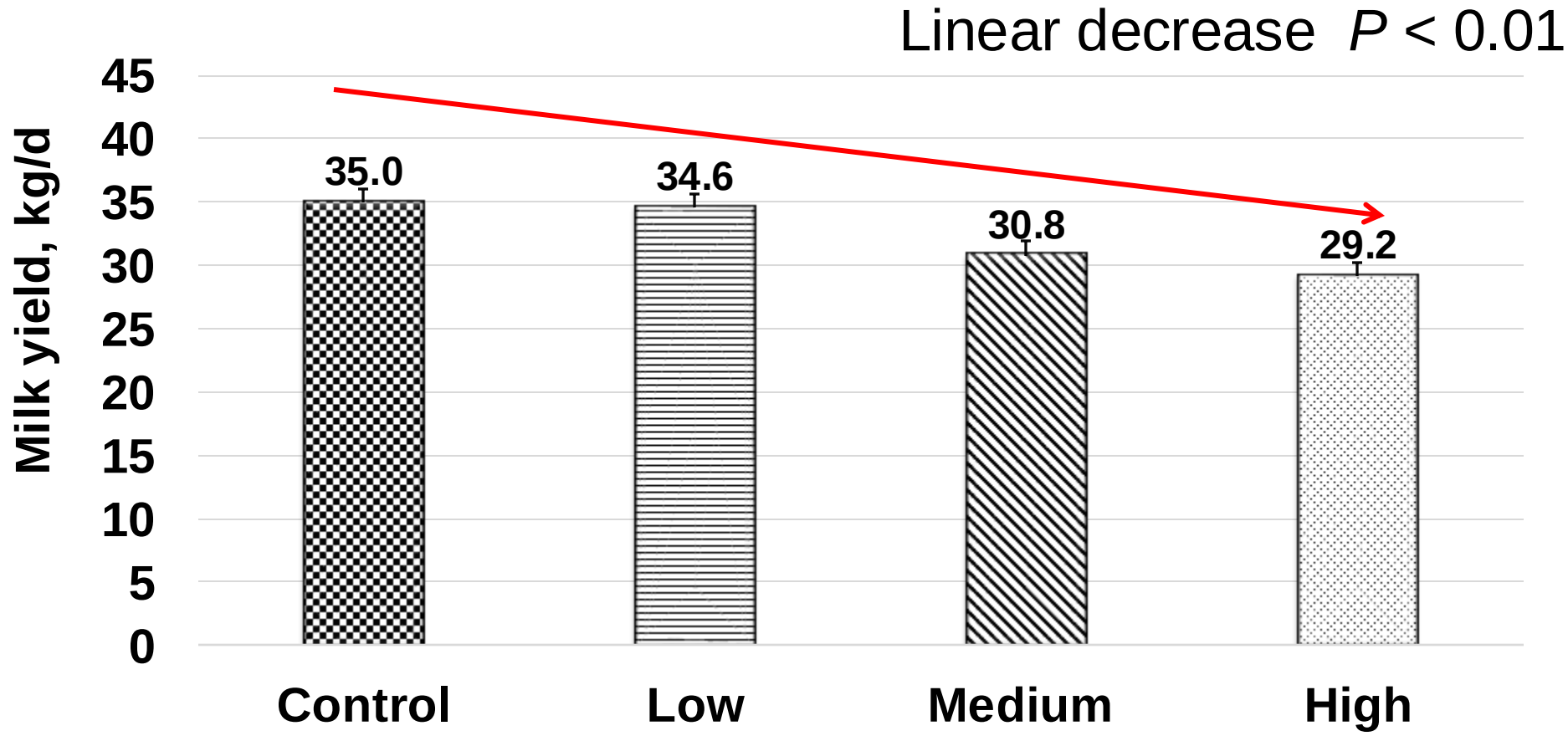


Growing beef heifers in a metabolism study; Zhang et al., (unpublished)



UNIVERSITY OF SASKATCHEWAN

Increasing levels of Progas hybrid rye decreased milk yield

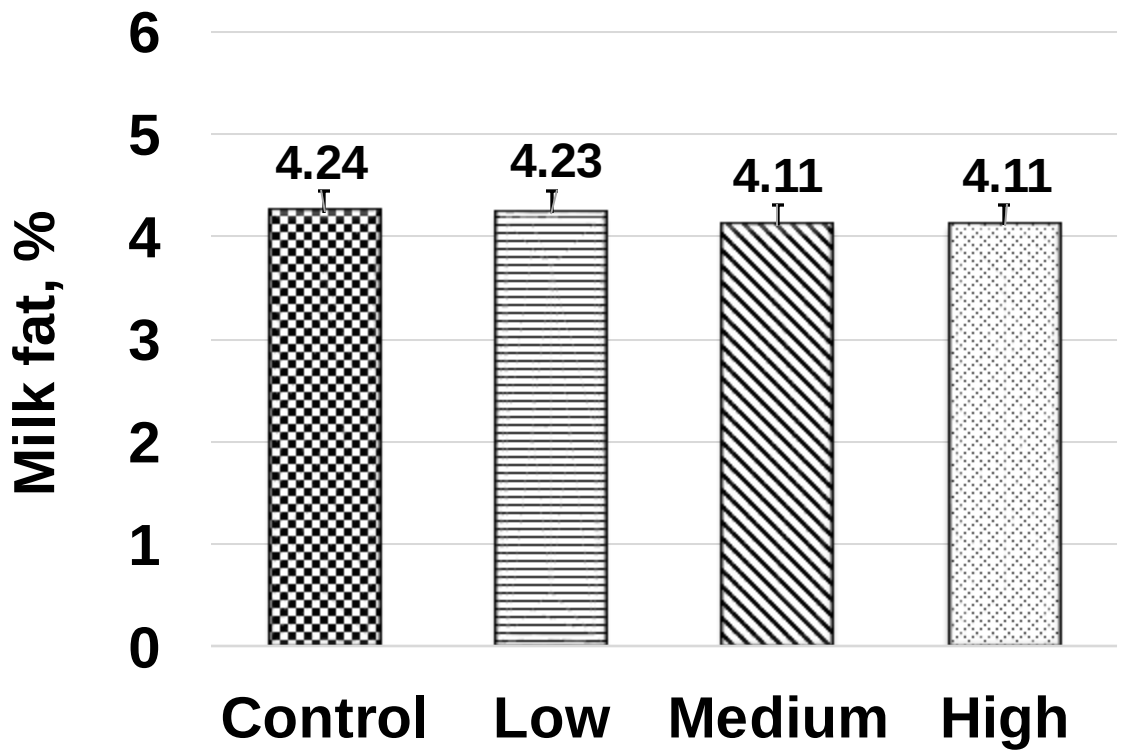


UNIVERSITY OF SASKATCHEWAN

Increasing levels of Progas hybrid rye decreased milk fat % and yield (kg/d)

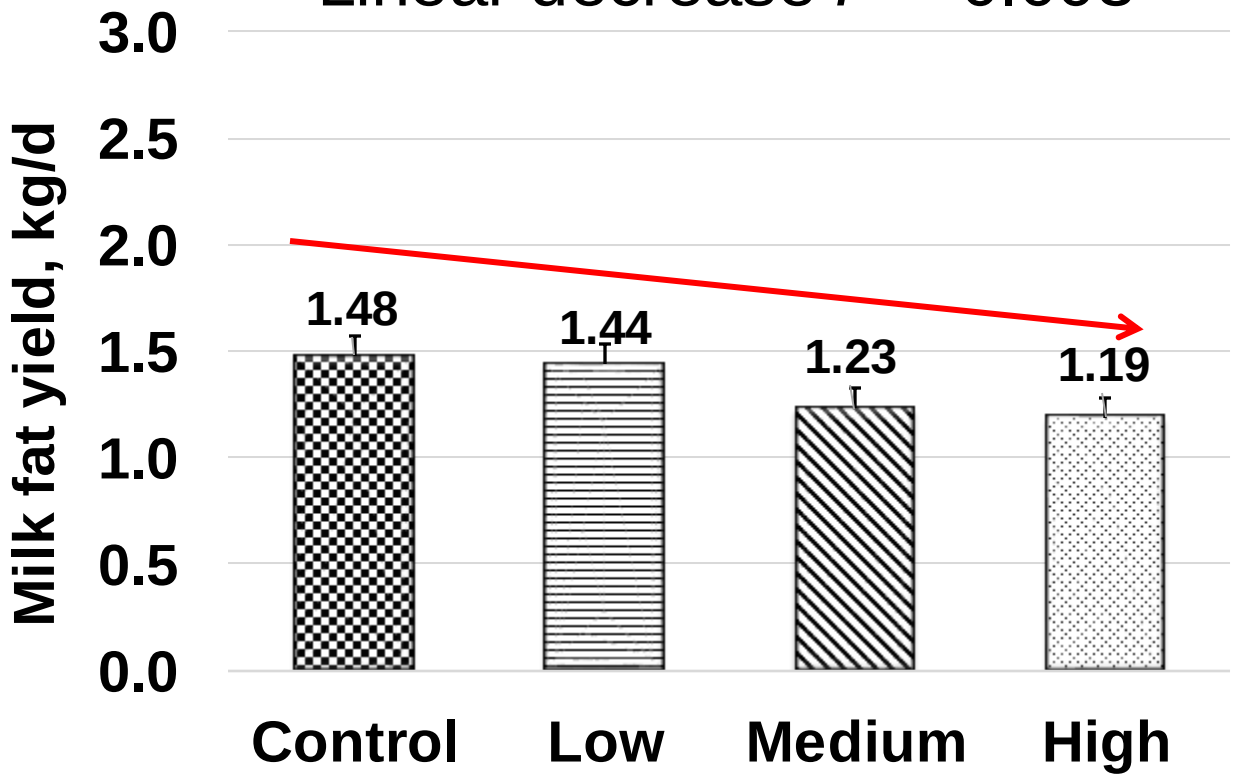
Milk fat, %

P = 0.87



Milk fat yield, kg/d

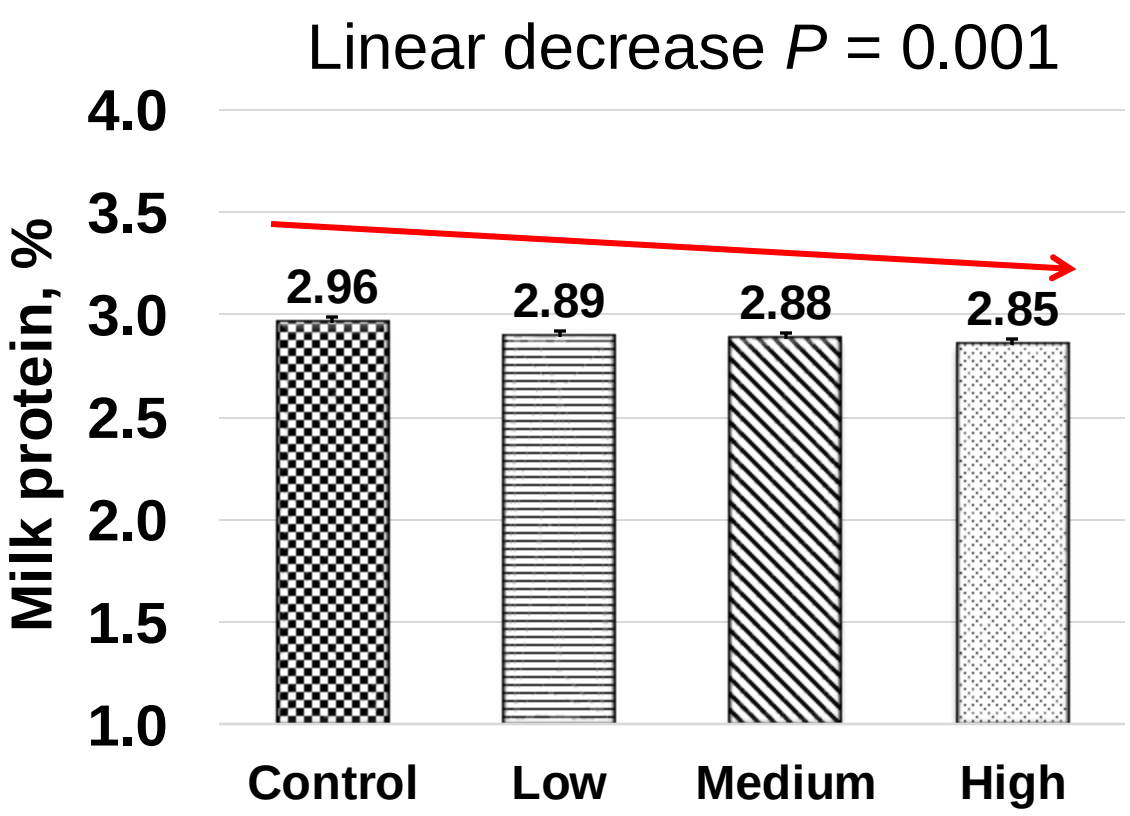
Linear decrease *P* = 0.003



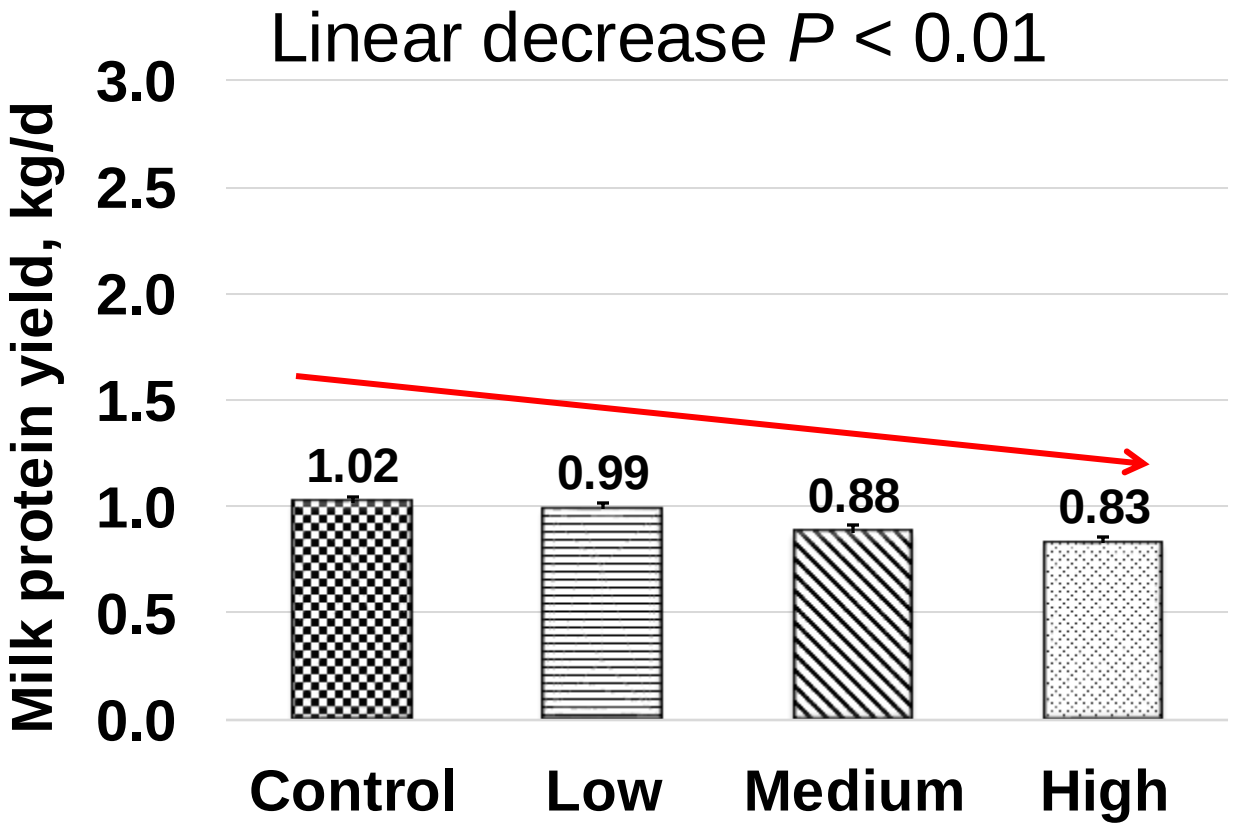
UNIVERSITY OF SASKATCHEWAN

Increasing levels of Progas hybrid rye decreased milk protein % and yield (kg/d)

Milk protein, %



Milk protein yield, kg/d



University of Saskatchewan

Take home points

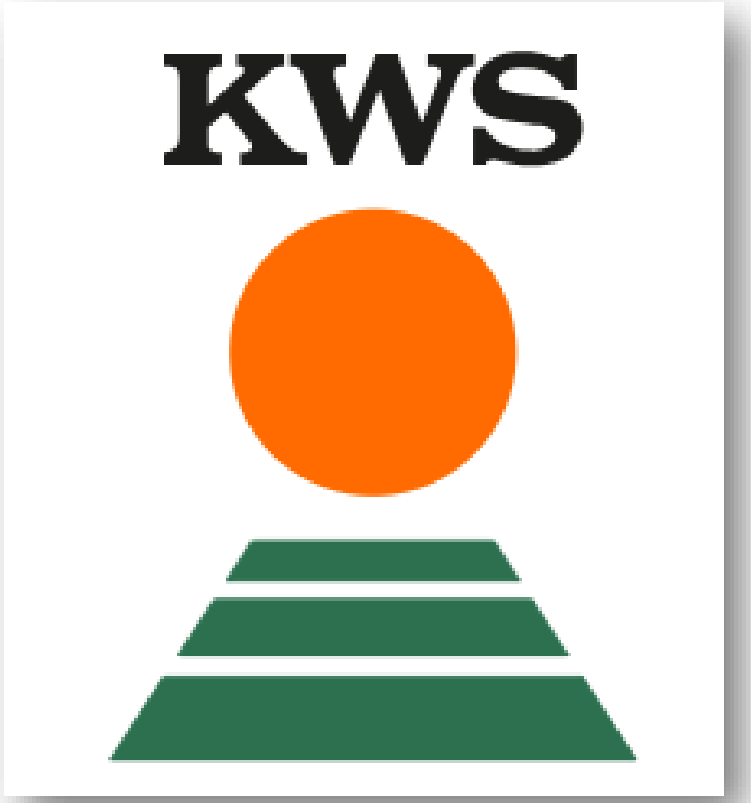
While Progas hybrid rye may offer benefits in crop rotation and forage diversification:

1. Replacing barley silage with Progas at 15%, 31%, and 46% in dairy cow diets led to a **linear decrease** in dry matter intake

2. Increasing Progas hybrid rye inclusion resulted in a **linear decrease** in milk yield, as well as milk fat and protein yield

3. However, this does not mean that hybrid rye cannot be included in dairy cow diets. Lower inclusion levels (below 15%) were not tested in this study and may still be viable

Acknowledgements



University of Saskatchewan

Thank you!

Questions?