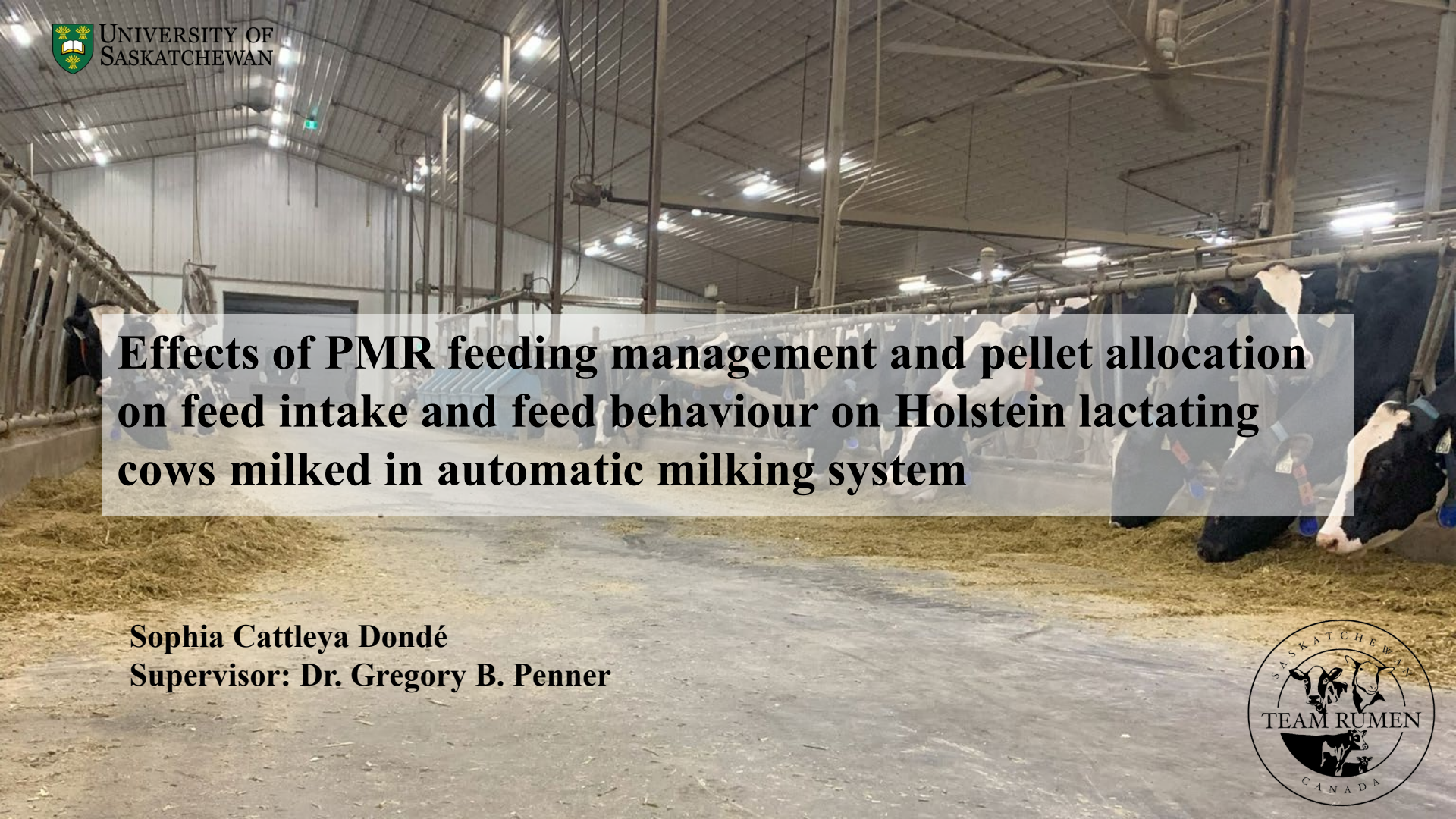
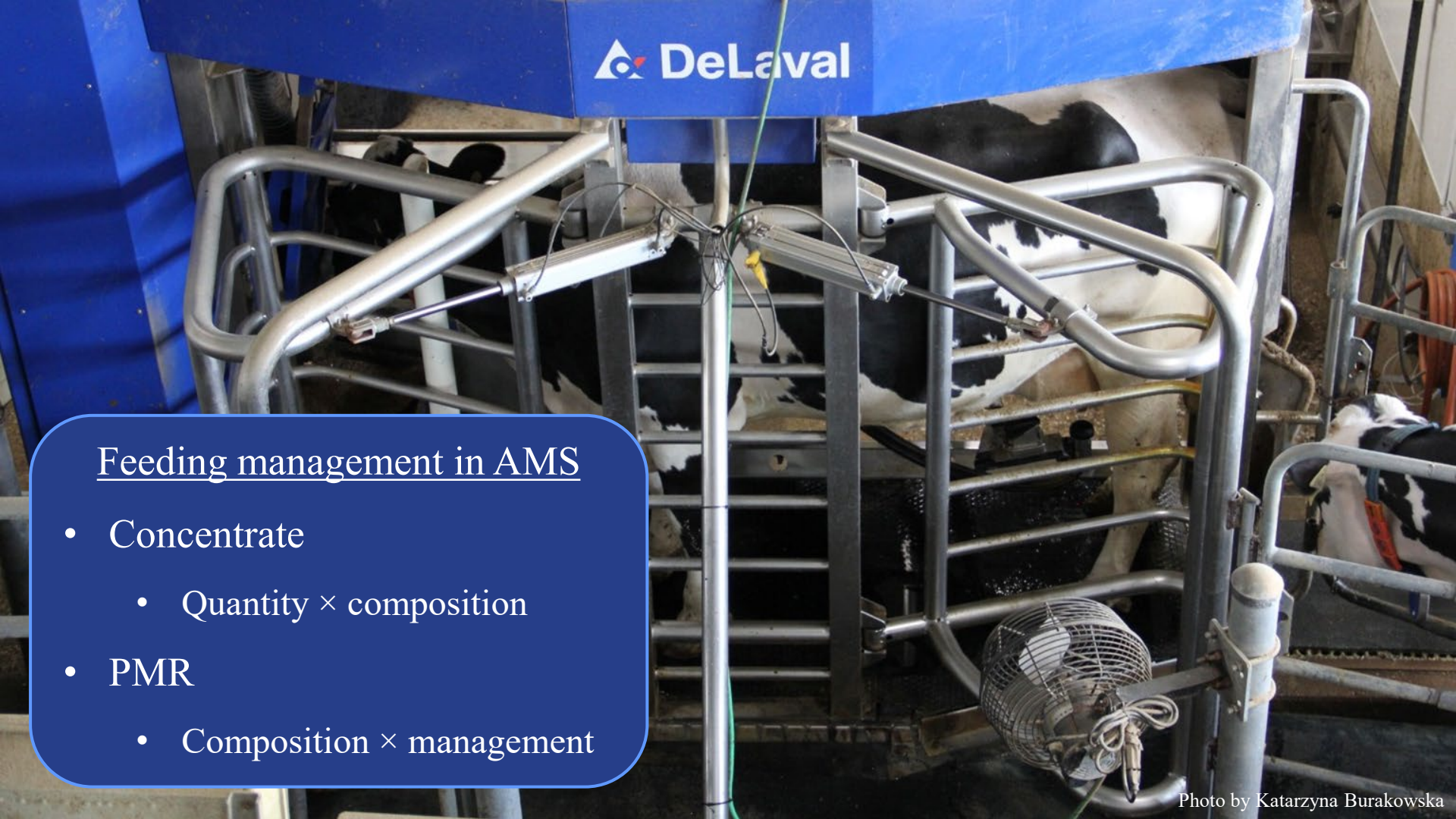


Effects of PMR feeding management and pellet allocation on feed intake and feed behaviour on Holstein lactating cows milked in automatic milking system

Sophia Cattleya Dondé
Supervisor: Dr. Gregory B. Penner



Feeding management in AMS

- Concentrate
  - Quantity × composition
- PMR
  - Composition × management

Photo by Katarzyna Burakowska

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Feed bunk management

- Space
  - Competition
- Timing of feeding
- Pushing feed
  - Stimulate DMI
  - Increase milk yield (Matson et al., 2021)

Hypotheses and objectives

- **Hypothesis:** **S**lick bunk management would decrease PMR DMI, reduce milking frequency at the AMS, and that cows provided PMR for slick bunk management would have a greater positive response to the high AMS pellet allocation than those fed PMR for *ad libitum* intake
- **Objectives:** Evaluate whether the PMR feeding management interacts with the AMS pellet allocation on feeding behaviour, ruminal pH, and milking performance of lactating dairy cows in early lactation

Housing and animals

- Rayner Dairy Research and Teaching Facility
  - Free-stall with feed-first guided-flow cow traffic design
- 4 × 4 Latin square design with 21-day periods
  - 14 days of adaptation
  - 7 days for data and sample collection
- Eight Holstein cows in early lactation (67 DIM)
  - Insentec pen

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Feeding management and treatments

- Fed twice daily (60% at 1000 h and 40% at 2100 h)
  - *Ad libitum* (5 to 10% refusal) vs. slick bunk (1 to 3% refusal)
  - Insentec bunk allows feeding behaviour
- AMS pellet allocations
- 2 vs. 4 kg/d DM
  - Dispensing rate = 600 g/min
  - Pellet refusals were measured


WARNING
Multi Hazard area
• See warnings behind cover
• Stay outside of working area
• Only for trained operators
• Remote/automatic startup


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• Only for trained operators
• Remote/automatic startup

Milkings and milking permission

- Milking permission: every 4 h
- Milking behaviour was recorded
- Milk yield at each milking
- Daily milk composition

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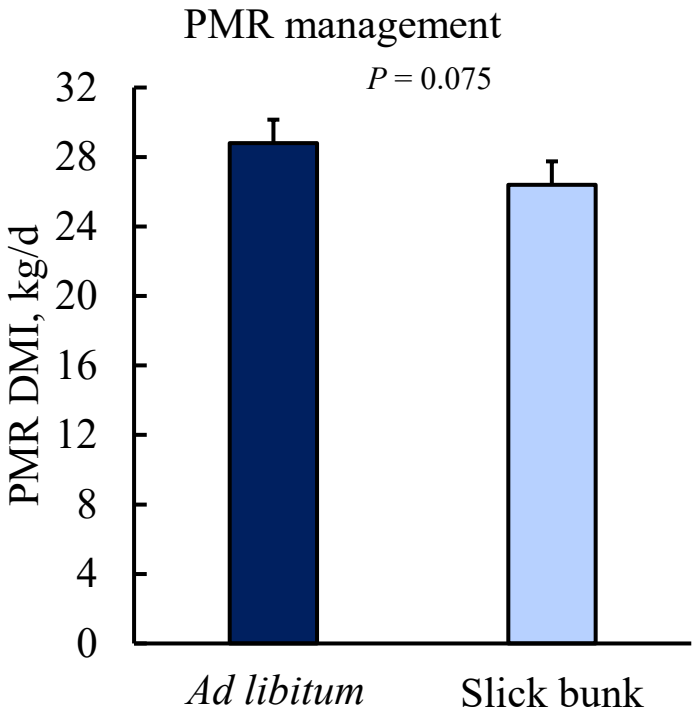
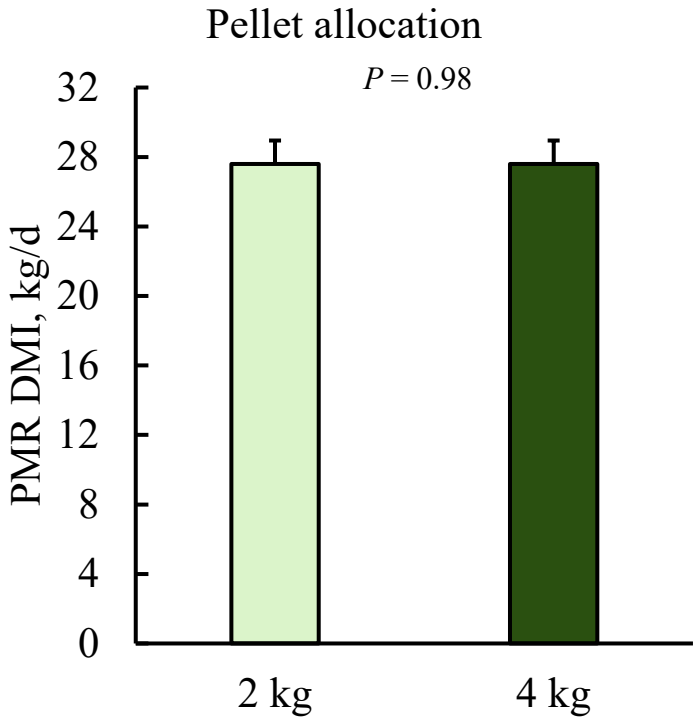
Ingredient and chemical composition of the PMR

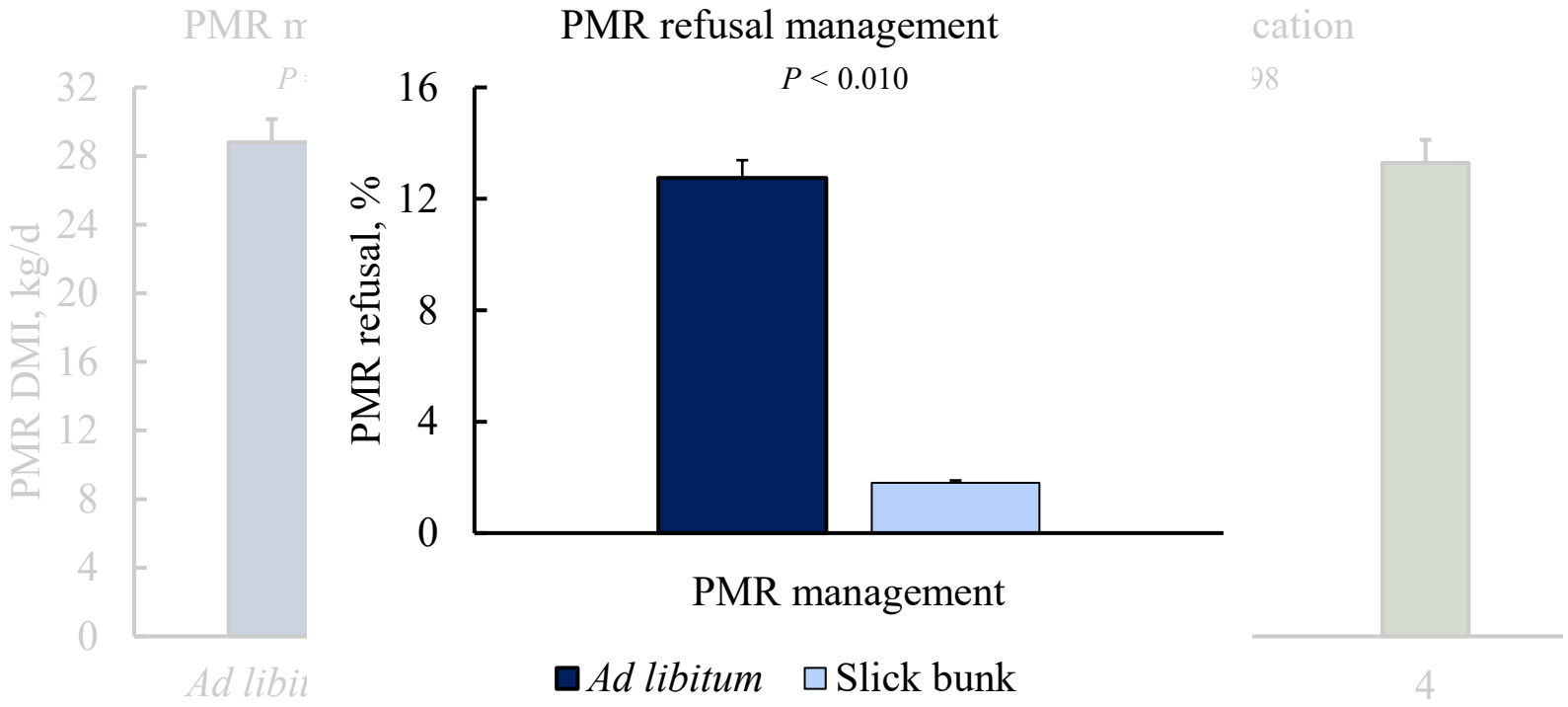
Variable	Ad libitum		Slick bunk	
	2 kg	4 kg	2 kg	4 kg
Formulated PMR DMI, kg/d	26	24	26	24
Formulated pellet intake, kg/d	2	4	2	4
Ingredient inclusion, % DM				
Partial mixed ration				
Barley silage	32.23	29.75	32.23	29.75
Barley grain	15.42	14.24	15.42	14.24
Corn grain	16.36	15.10	16.36	15.10
Canola solvent	11.63	10.73	11.63	10.73
Canola crush	3.77	3.48	3.77	3.48
Beet pulp	8.99	8.30	8.99	8.30
Mineral	3.02	2.78	3.02	2.78
Palmitic acid	1.45	1.34	1.45	1.34
AMS pellet	7.14	14.29	7.14	14.29
Chemical composition				
DM	68.28	69.91	68.28	69.91
OM	87.30	87.69	87.30	87.69
CP	15.36	15.58	15.36	15.58
ADF	16.23	15.93	16.23	15.93
NDF	28.88	28.64	28.88	28.64
Starch	24.83	25.46	24.83	25.46
Ethanol soluble carbohydrates	3.11	3.14	3.11	3.14
Ether extract	5.17	5.08	5.17	5.08
Ca	0.76	0.72	0.76	0.72
P	0.42	0.43	0.42	0.43

Feeding PMR for slick bunk reduces PMR DMI

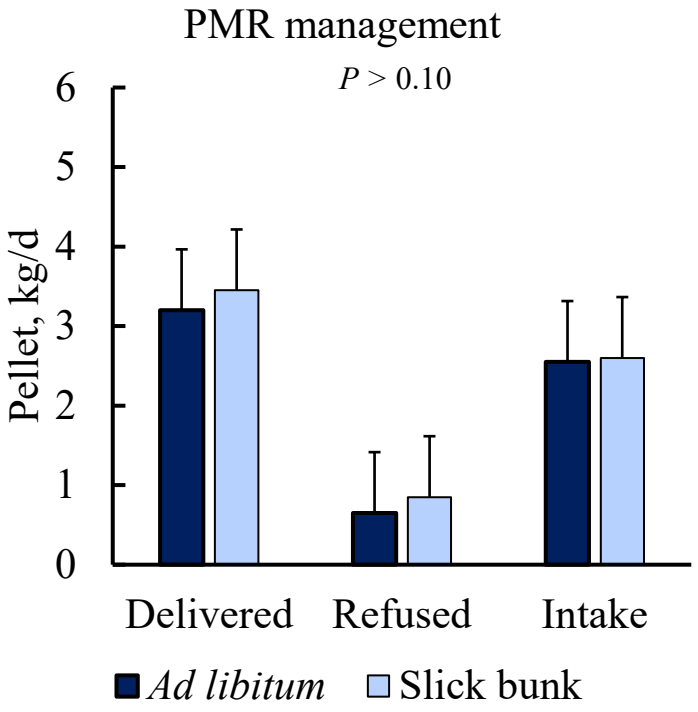


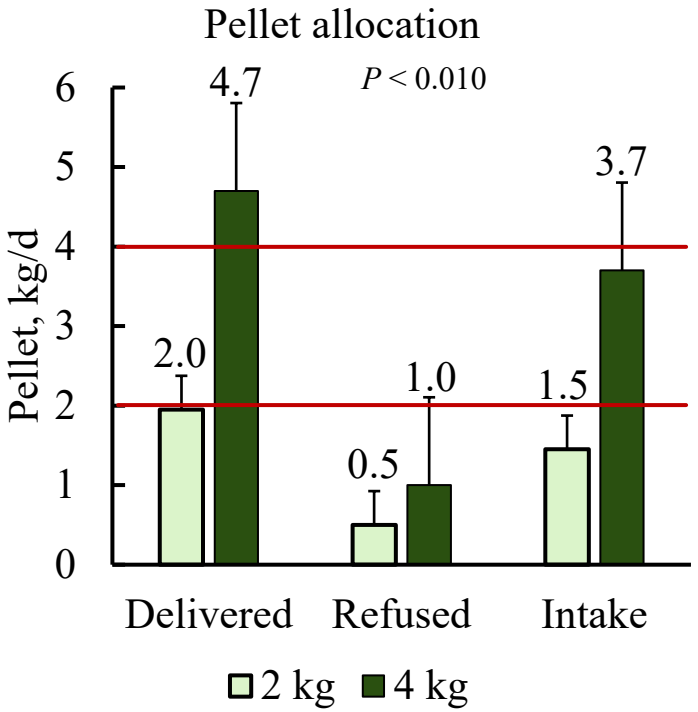


Feeding PMR for slick bunk reduces PMR DMI

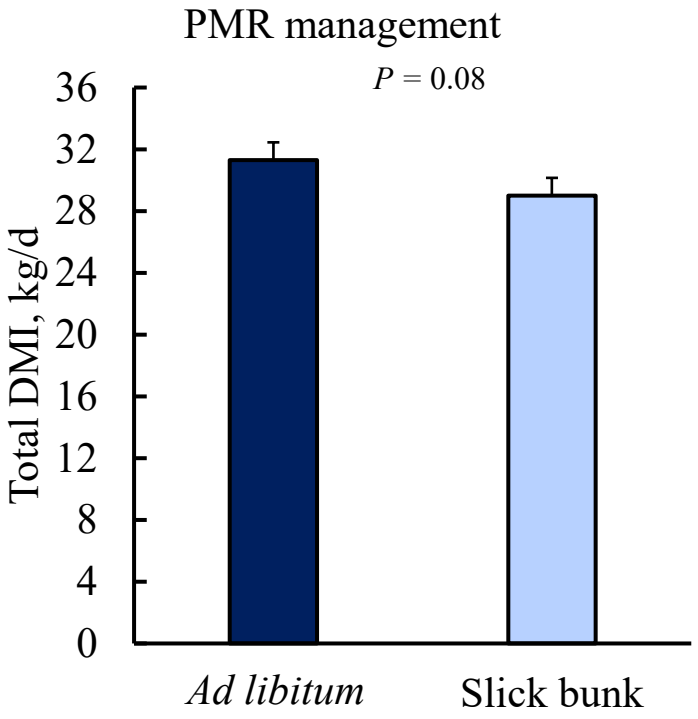


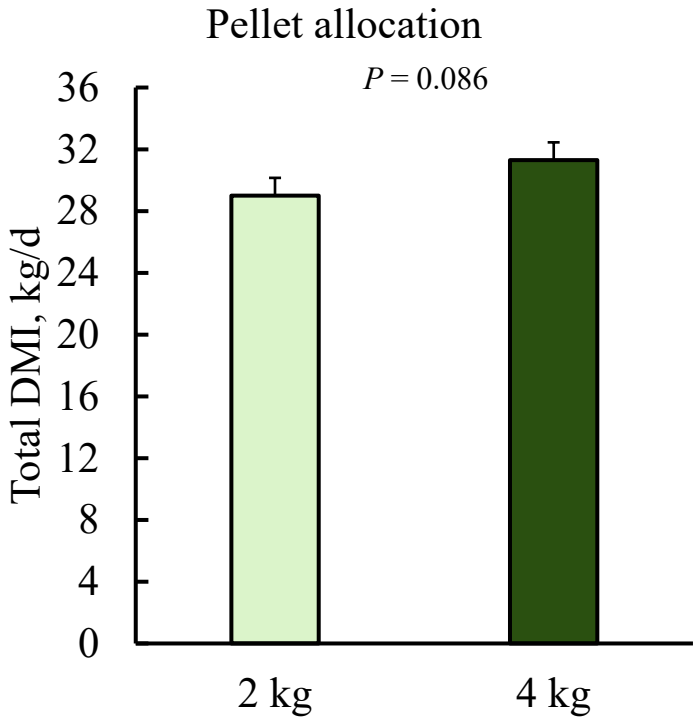
Feeding more pellet in the AMS increases intake and refusals



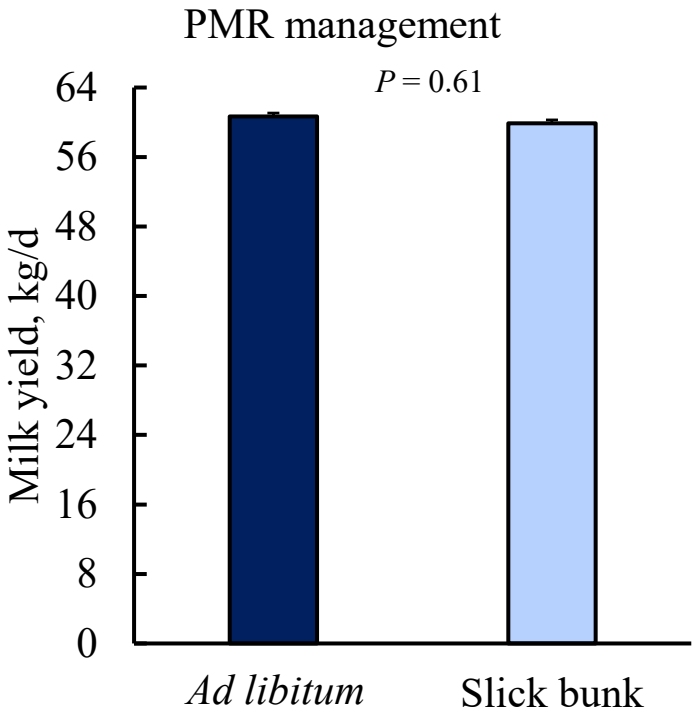


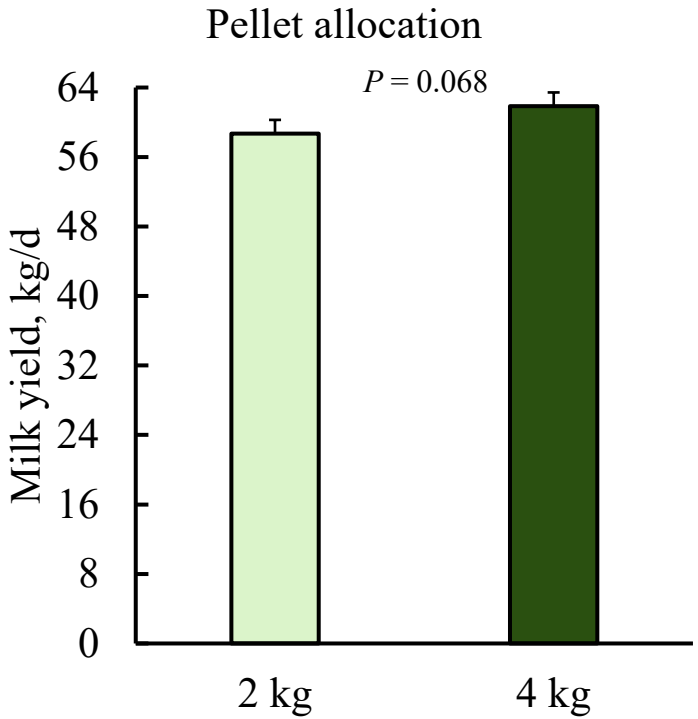
Total DMI was not affected by treatments



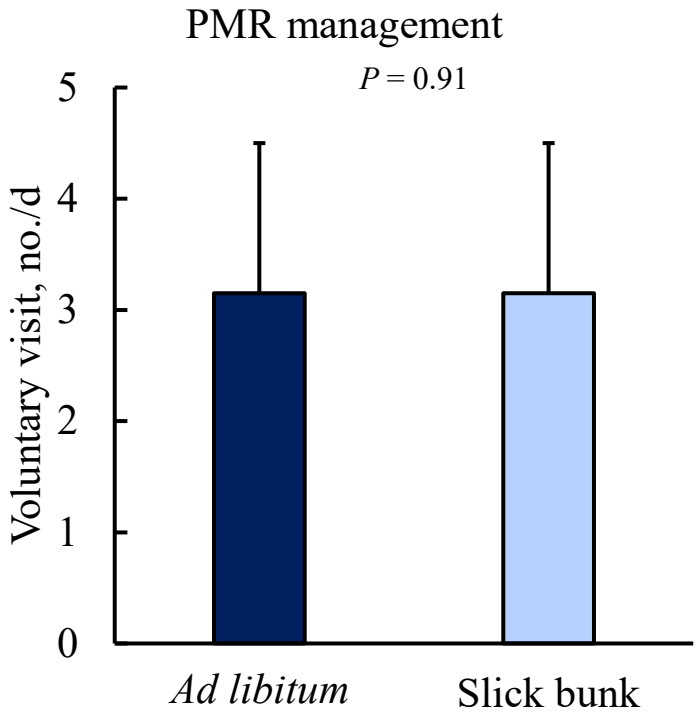


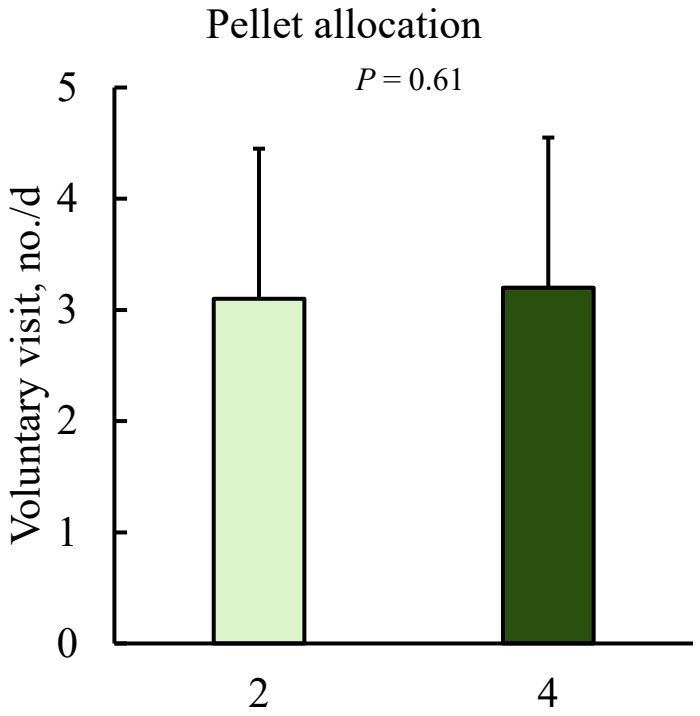
Higher pellet allocation may increase milk yield



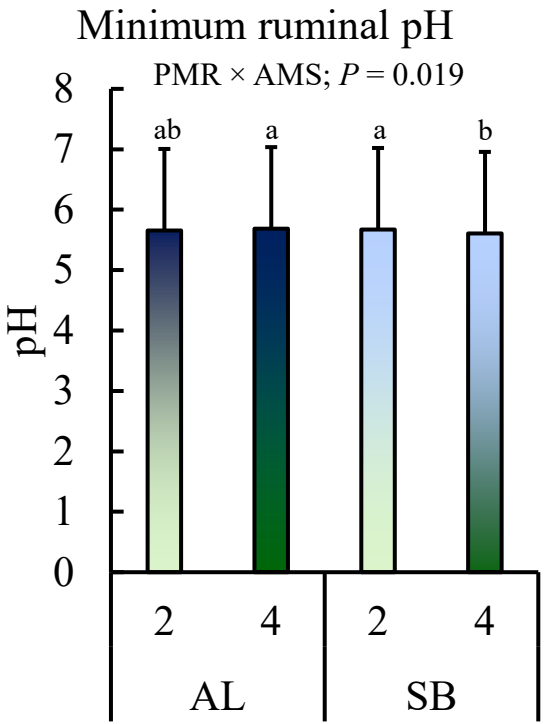


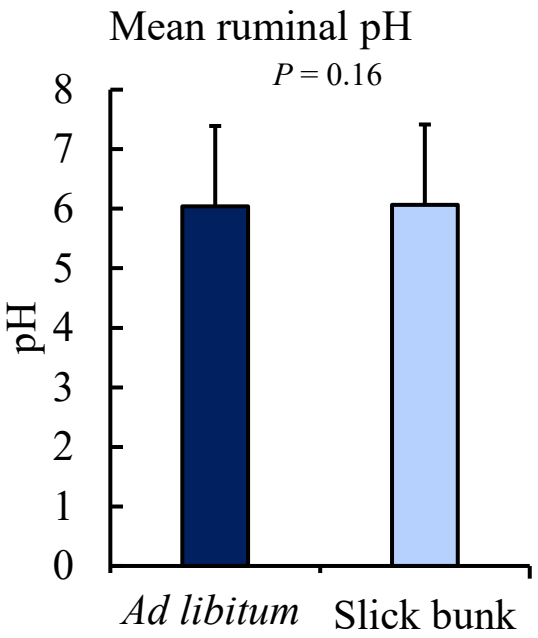
Increasing pellet allocation did not increase voluntary visits

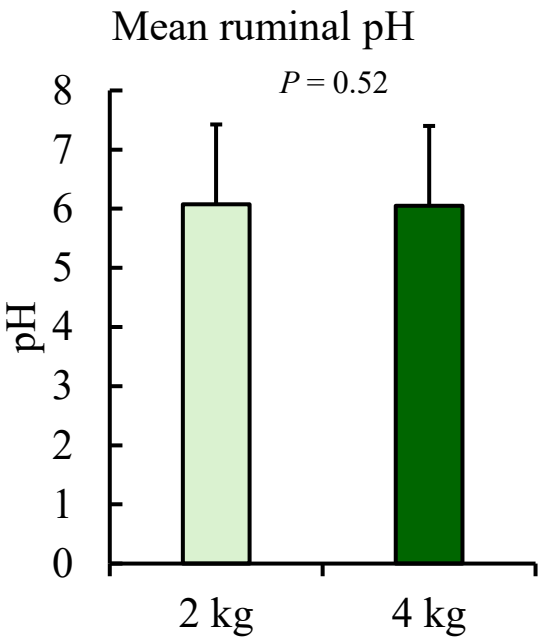




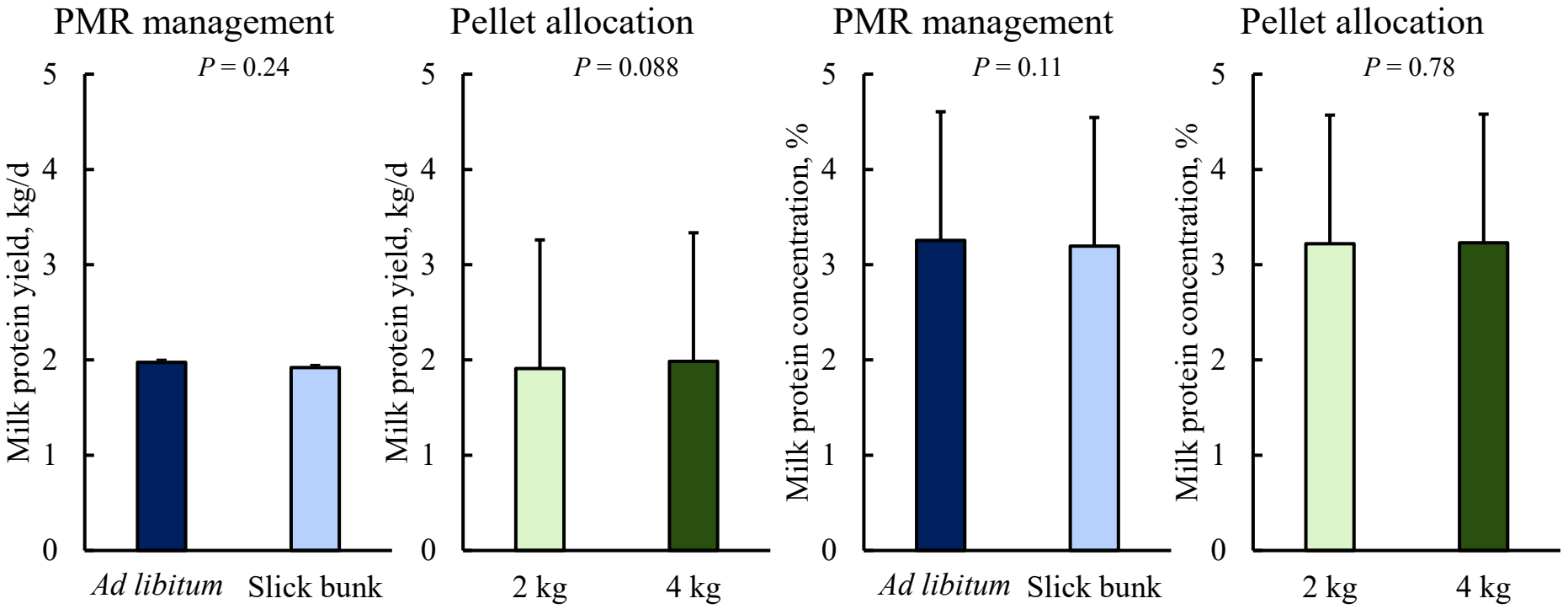
Minimum ruminal pH were affected by an interaction



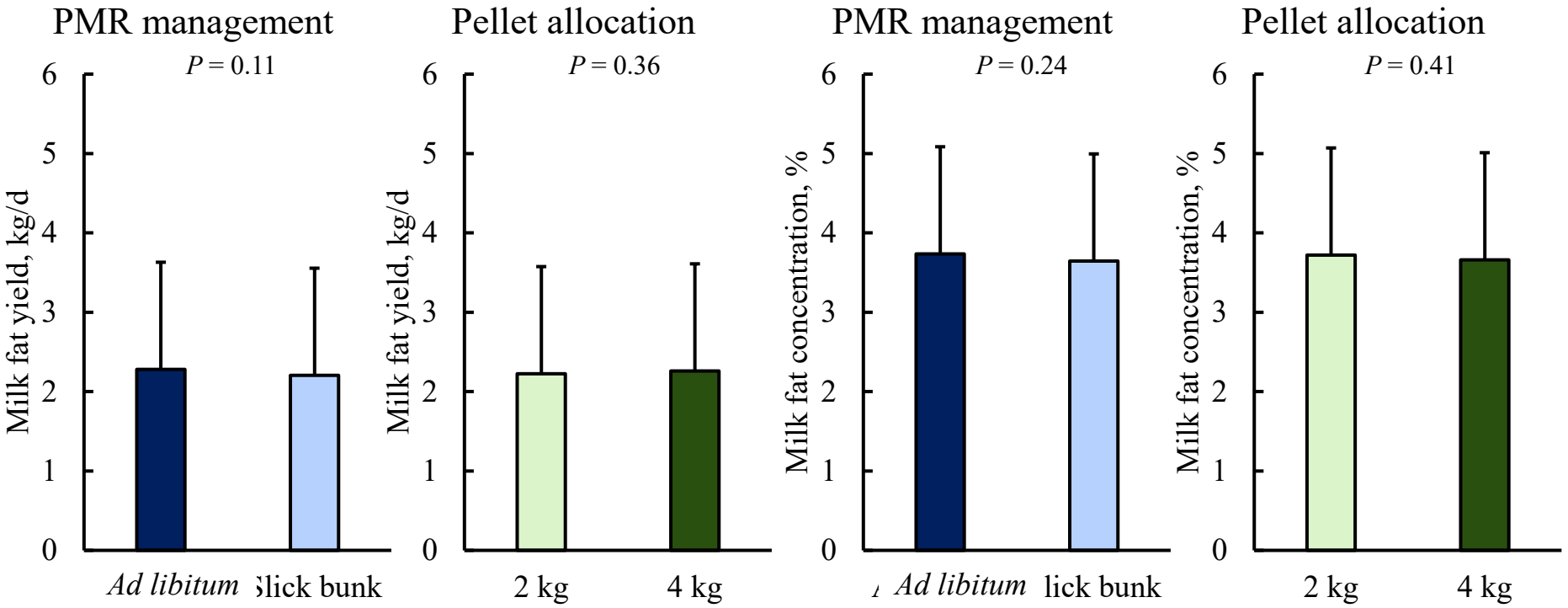




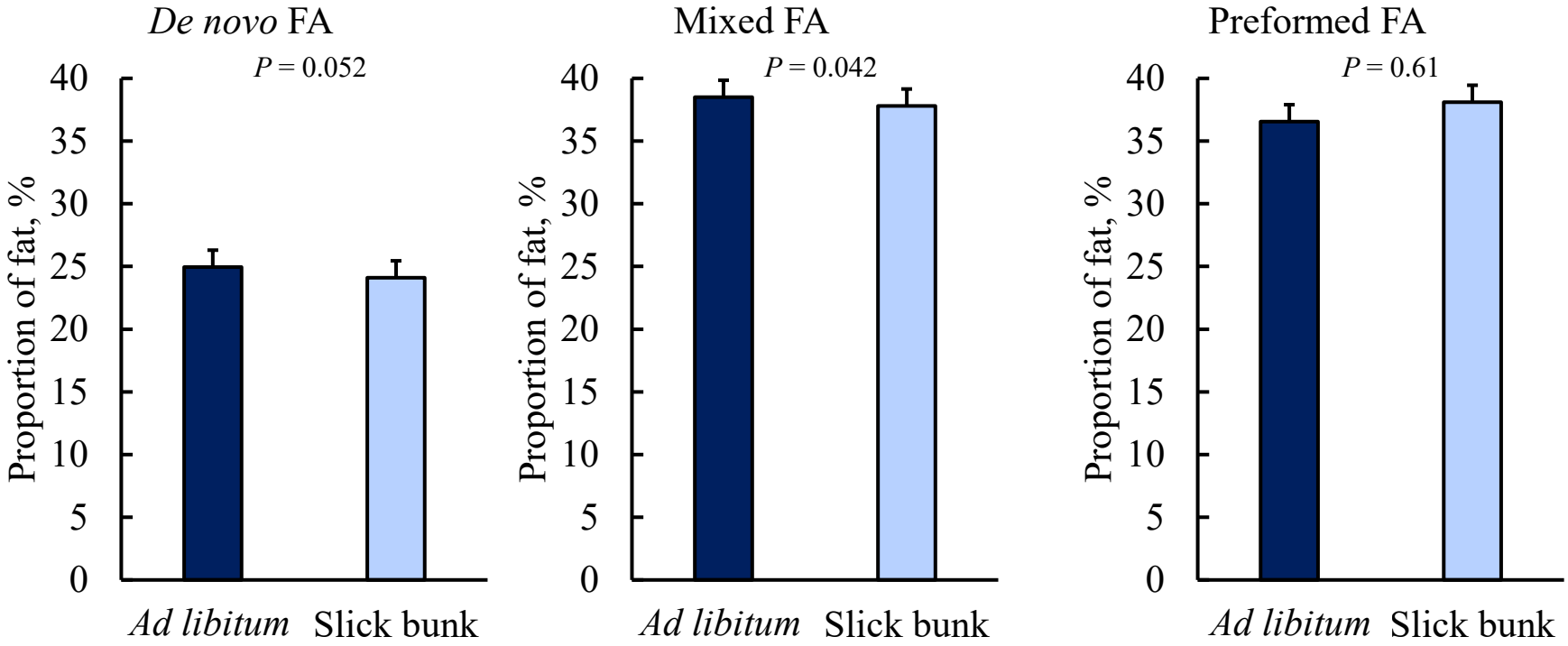
Higher pellet allocation may increase milk protein yield



Milk fat yield and concentration were not affected



Slick bunk management may decrease *de novo* and mixed milk fatty acids



Take home message

- Employing SB PMR management
  - Reduces DMI
  - Reduces the proportion *de novo* and mixed fatty acids
- Feeding a greater quantity of pellet in the AMS
  - May increase total DMI
  - May increase milk yield
  - May increase pellet refusals
  - Did not affect voluntary milkings

Thank you!
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