

Introduction

- Because of its content of polyphenolic compounds, feeding grape pomace (GP) could alter nitrogen (N) utilization in cattle in a manner that limits urinary N excretion and, thus, reactive N emissions.
- However, the preservation method used for GP, whose shelf-life is limited when fresh, could potentially cause changes in the bioactivity of the polyphenolic compounds (Girard et al., 2018).
- Thus, the objective was to evaluate the effects of feeding ensiled or sun-dried GP on ruminal ammonia-N ($\text{NH}_3\text{-N}$) and plasma urea-N (PUN) concentrations, and route of N excretion in beef heifers.

Material and Methods

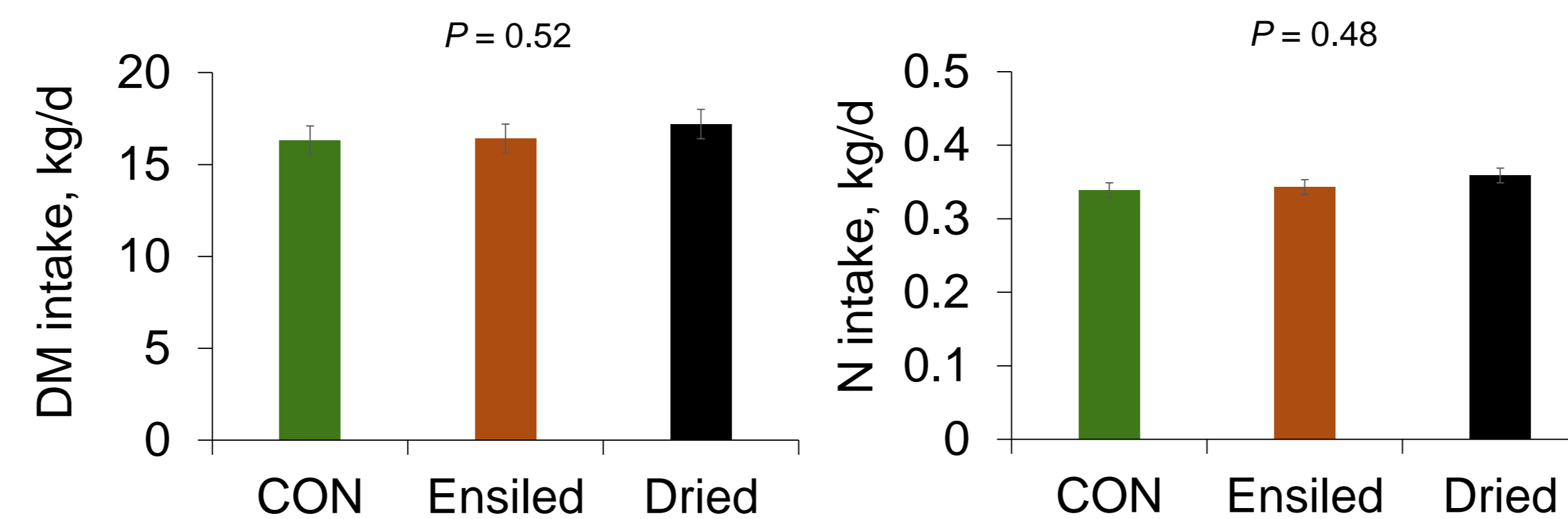
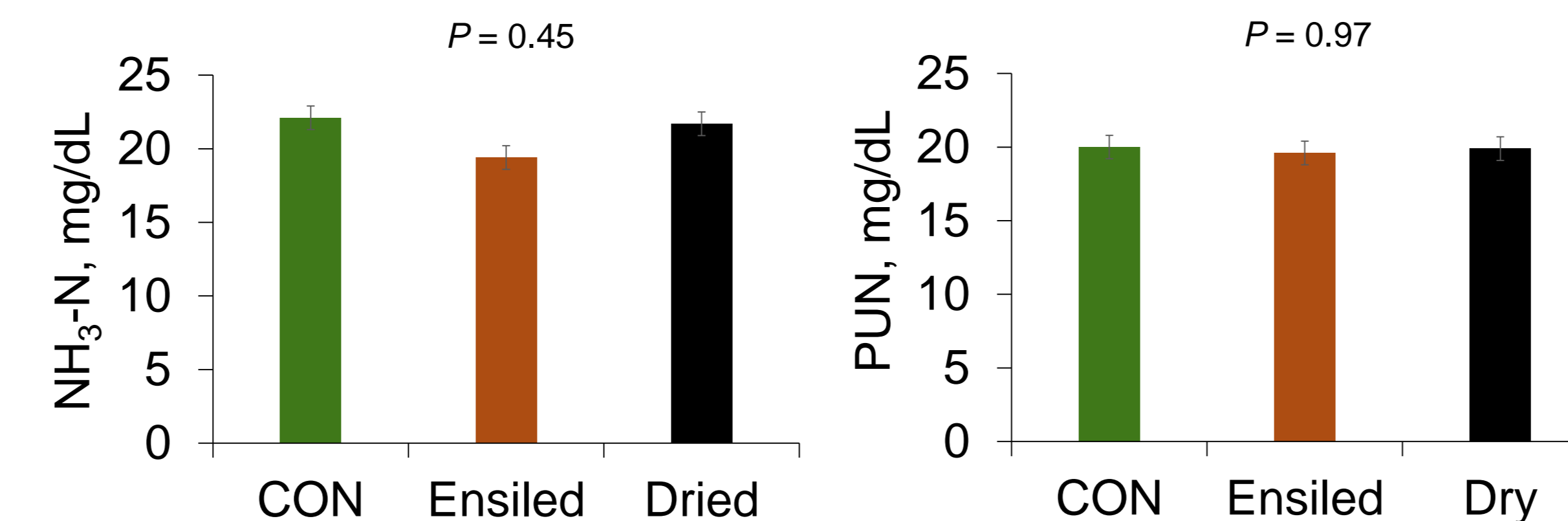
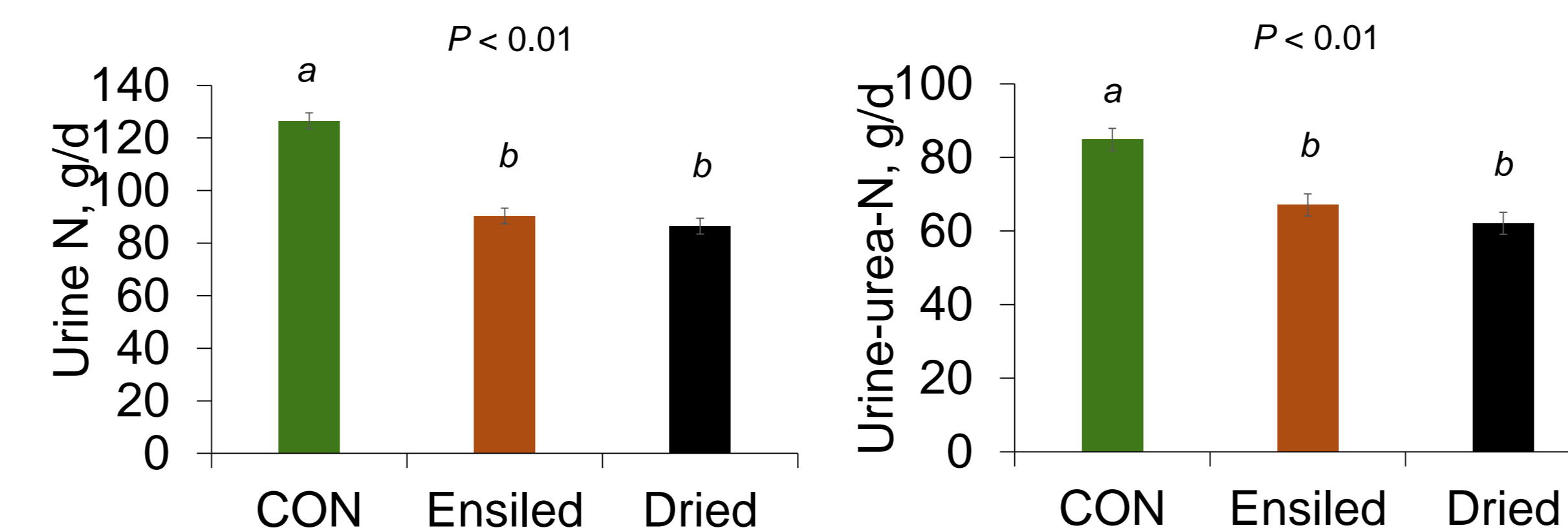
- 6 ruminally-fistulated beef heifers were used in a replicated 3 × 3 Latin square design with 21 d periods.

Table 1. Dietary and ingredient composition of experimental diets

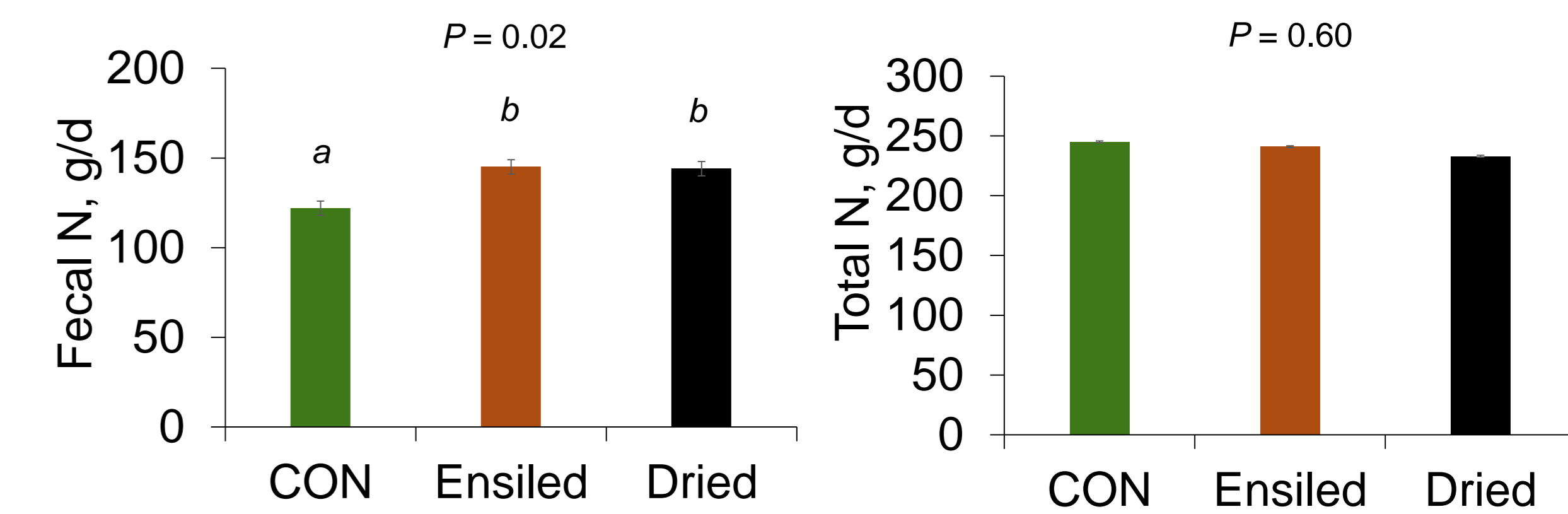
	CON	Ensiled	Dried
Ingredient, % DM			
Triticale silage	54.3	40.8	40.8
Grape pomace, ensiled	–	15.0	–
Grape pomace, dry	–	–	15.0
Corn grain, dry rolled	30.0	30.0	30.0
Canola meal	14.5	13.0	13.0
Mineral vitamin mix	1.16	1.16	1.16
Chemical composition			
DM, %	64.6 ± 3.67	62.7 ± 2.47	71.2 ± 3.00
CP, % of DM	13.0 ± 0.25	13.1 ± 0.30	13.0 ± 0.25

- Ruminal fluid (d 19 at 3 h post-feeding), N excretion (d 19 to 21), & blood (d 19 at 3 h post-feeding).

Results


Fig 1. DM and N intake for heifers fed a typical backgrounding diet (CON) or CON + ensiled GP and CON + dry GP

Fig 2. Ruminal $\text{NH}_3\text{-N}$ and PUN concentration for heifers fed a typical backgrounding diet (CON) or CON + ensiled GP and CON + dry GP

Fig 3. Urine N and urea-N excretion for heifers fed a typical backgrounding diet (CON) or CON + ensiled GP and CON + dry GP

Results


Fig 4. Fecal and total N excretion for heifers fed a typical backgrounding diet (CON) or CON + ensiled GP and CON + dry GP

- There was no diet effect ($P \geq 0.48$) on DM and N intake (Fig 1).
- Ruminal $\text{NH}_3\text{-N}$ and PUN concentrations at 3-h post-feeding did not differ ($P \geq 0.45$) across diets (Fig 2).
- Urine N (g/d) and urea-N (g/d) output were lower ($P < 0.01$) for heifers fed GP-containing diets than the CON diet (Fig 3).
- Fecal N excretion (g/d) was greater ($P = 0.02$) for heifers fed GP-containing diets than the CON diet, whereas total N excretion did not differ ($P = 0.60$) across diets (Fig 4).

Summary

- Although there was no diet effect on ruminal $\text{NH}_3\text{-N}$ and PUN concentrations, feeding GP irrespective of preservation method was effective in changing the route of N excretion from urine to feces, which is beneficial from an environmental standpoint.

References

- Girard, M., F. Dohme-Meier, S. A. Kragten, A. G. Brinkhaus, Y. Arrigo, U. Wyss, and G. Bee. 2018. Biotechnology in Animal Husbandry. 34:1-19. doi: 10.2298/bah1801001g