

Do Reindeer (*Rangifer tarandus tarandus*) (*M. longissimus dorsi*) Prefer Disturbed or Undisturbed Lichen Mats?

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Introduction

- *Rangifer tarandus* populations depend on the consumption of various fruticous lichen species for winter survival.
- Lichen mats consist of a live growth layer underlain by an organic layer of dead lichen and litter material of various thicknesses.
- Typically, the ratio of dead organic material to live increases through time if the lichen mat goes undisturbed.
- Reindeer kick up lichen mats prior to consuming presumably to break up mats into smaller particles to be able to select and consume live lichen.
- Undisturbed vs. disturbed lichen mats may influence caribou/reindeer production depending on which lichen they prefer and which type would be more nutritionally beneficial.
- This would implicate what degree of lichen management is needed.



Photos by: Emily Garrett

Methods

- Lichen was collected, sorted, and air dried for at least 8 hours.
- Four two year old reindeer steers were placed in separate adjacent pens.
- Steers were trained to eat from randomized buckets before the samples were taken away.
- Three, five minute preference trials were replicated with the four steers using disturbed and undisturbed lichen of the genus *Cladina*.
- Lichen-offered weights were measured as air dried pre-fed and air dried post-fed.
- Preference was determined by measuring lichen intake.

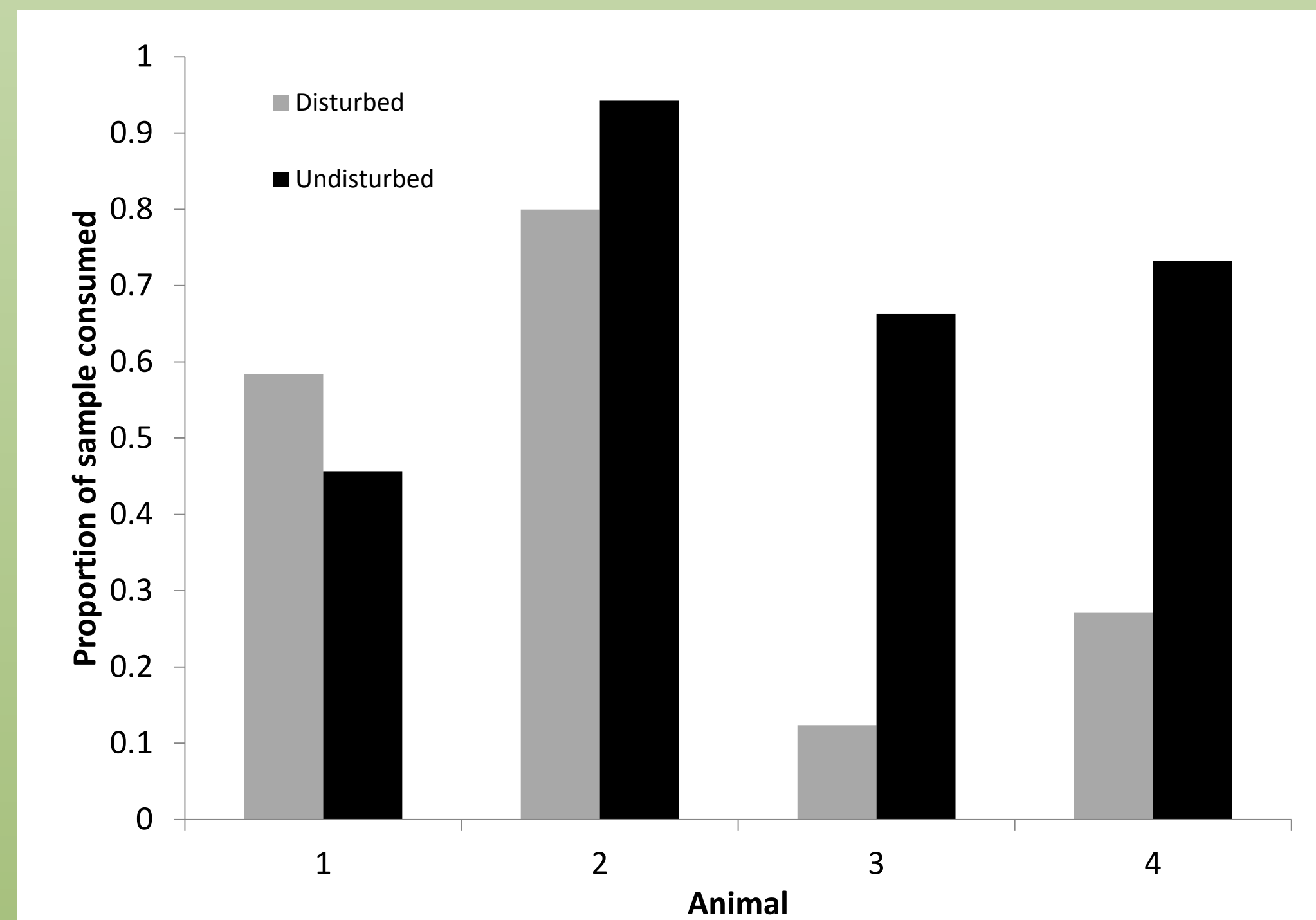


Figure 1. Proportion of total sample consumed for disturbed and undisturbed lichen by animal

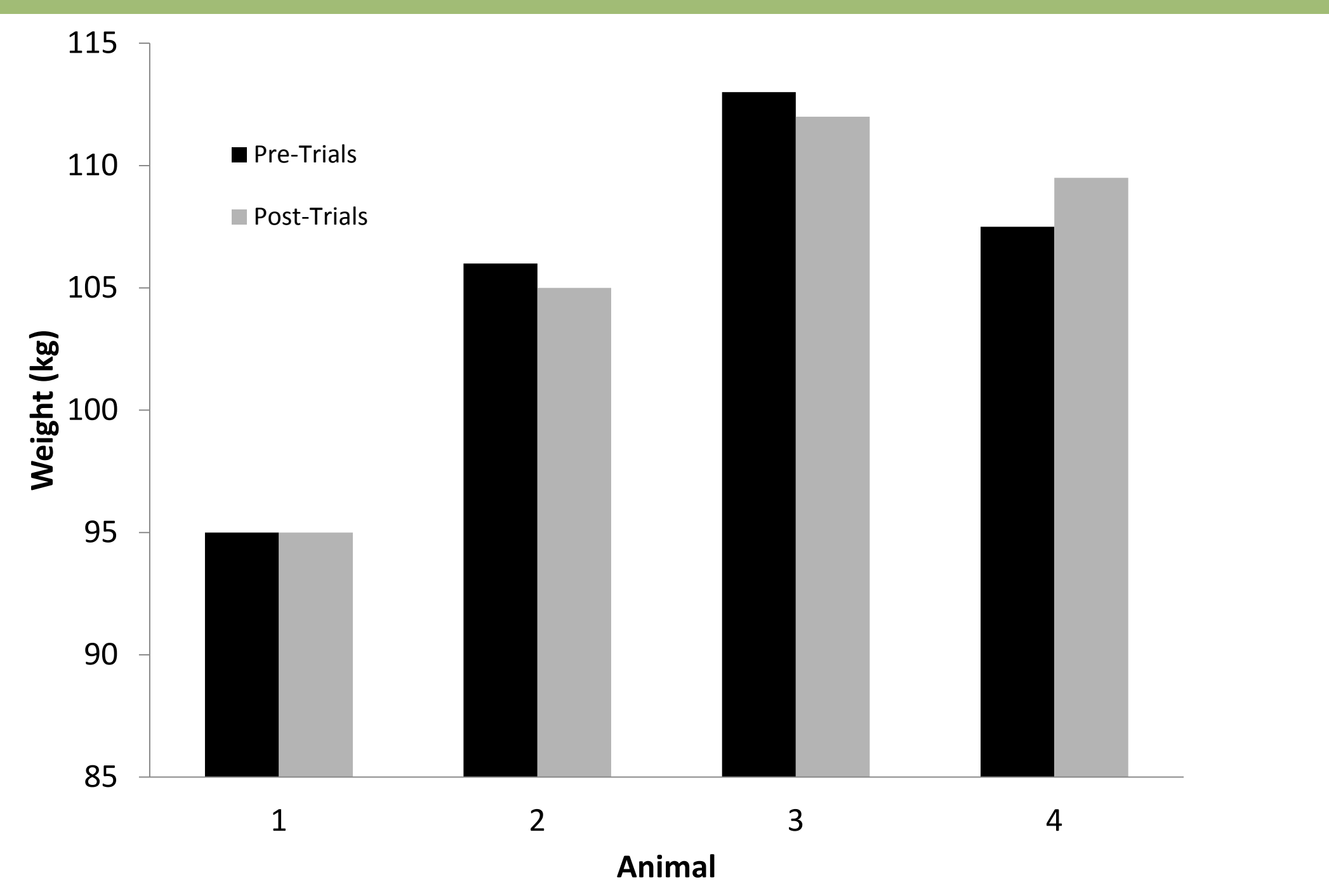


Figure 2. There was no change in animal weight averages of 105.4 kg through out the study.



Results and Discussion

- While not significant ($P > 0.1$), my data shows that reindeer exhibit preference for undisturbed lichen mats (Figure 1).
- Animal weights maintained the same average of 105.4 kilograms throughout the study (Figure 2). This ensures all steer were in comparable health before and after the study was finished.
- Data suggests that reindeer will not show a high degree of use preference to either area.
- Nutrient analysis is currently pending
- Future management practices should prevent fire disturbance to lichen habitats to allow lichen mats to grow to maximum biomass.

References

1. Arseneault, D. N. V., Boismenu, C., Leblanc, Y. and Deshayé, J. (1997). "Estimating lichen biomass and caribou grazing on the wintering grounds of northern Quebec: an application of fire history and Landsat data." *Journal of Applied Ecology* 34: 15.
2. Collins, W. B., et al. (2011). "Fire, grazing history, lichen abundance, and winter distribution of caribou in Alaska's taiga." *The Journal of Wildlife Management* 75(2): 369-377.
3. Festa-Bianchet, M., et al. (2011). "Conservation of caribou (*Rangifer tarandus*) in Canada: an uncertain future." *Canadian Journal of Zoology* 89(5): 419-434.
4. Finstad, G. PhD, (2013) *Information from a personal advisory meeting.* Email: glfinstad@alaska.edu
5. Gaare, E. (1997). "A hypothesis to explain lichen-Rangifer dynamic relationships." *Rangifer* 17((1)): 3-7.

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