Results

## Multi-choice feeding trials

In multi-choice trials, snowshoe hares ate an average of 58.4 ± 4.8 g DM/kg^0.75/day across all diets. There was a significant effect of diet on intake rate (p = 0.01). Intake rate of Diet B was 2.9 times that of Diet A (p = 0.01) and 2 times that of Diet D (p = 0.06). Intake rates across all diets during the multi-choice experiment translated to average intakes of 6.4 ± 0.7 g DM/kg^0.75/day of CP and 1074.7 ± 88.3 kJ/kg^0.75/day of CE (Figure 2A). When plotted in nutritional space (i.e., CP versus CE intake rates), the average feeding response of hares fell between the nutritional rails of Diets B and C (Figure 2B). This represents an estimate of the voluntary target intake of CP and CE for hares under these environmental conditions.

## Single-choice feeding trials: results by treatment

We conducted 44 single-choice feeding trials on 17 individuals. Hares ate on average 93.6± 2.6 g DM/kg^0.75/day of feed across all diets. The intake rate for Diet A was significantly higher than all other diets (p < 0.001), whereas there was no difference between diets B, C, and D. The greatest difference was between Diet A and C, with hares eating 1.27 times more of A than C. This pattern of intake rate resulted in hares on diets B and C having CP and CE intake rates closest to the target intake found in the multi-choice trials Figure 2D). Diet exposure did affect hare weight change during single-choice feeding trials (p = 3^{-4}; trial measures). Diet A caused the greatest weight loss (median = -1.2 %/day) over the three-day feeding trial, what was significantly more weight loss than all other diets (Figures 3). Diet B resulted in a slight weight increase with a median of 0.2 %/day (Figure 3). There was no difference in hare weight change when fed Diets B, C or D (Figure 3).

Based on fecal composition and quantity, diet DMD differed across diets. Diet D was the most digestible and Diet A was the least (p < 0.001; Figure 4A). Diet A had significantly lower DMD than all other diets (p < 0.001), and Diet B was also significantly less digestible than diet D (p < 0.01; Figure 4A). CP digestibility increased significantly as diet CP increased from A to D (p < 0.001; Figure 4B). Diet D had 1.85 times greater protein digestibility than Diet A.

## Single-choice feeding trials: results by nutrient intake

In terms of CE (x-axis) and CP (y-axis), hares lost weight until protein intake reached approximately 9 g DM/kg0.75/day, but only when coincident with low and mid ranges of CE intake, such as occurred between the rails of diets B, C, and D. Once CE intake surpassed ~ 2000 kJ/kg0.75/day, weight loss occurred regardless of protein intake (Figure 5A). This indicates that hares experience greater protein limitation than energy limitation (Figure 5A; rsq = 0.3 ; deviation explained = 0.37). The GAM associated with this surface map showed CP intake to have a significant, non-linear effect on weight change (Table 2).

The surface map for digestible energy and protein intake revealed one area in the centre of the plot, between Diets B and C where weight maintenance can occur, and again at the highest levels of DP intake, toward the highest intakes on Diet D (Figure 5D). The GAM for this map showed DP intake had a significant, non-linear effect on hare weight change (rsq = 0.35 ; deviation explained = 0.42; Table 2)

Based on linear regressions, our feeding trials estimated that hares require 1100 kJ/kg^0.75 of digestible energy and 12 g DM/kg^0.75 of digestible protein per day to maintain body weight.