Results

## Multi-choice feeding trials

In multi-choice trials, snowshoe hares ate an average of 58.4 ± 5.1 g DM/kg^0.75/day across all diets. There was a significant effect of diet on DMI (P = 0.01). DMI of Diet B was 2.9 times that of Diet A (p = 0.01) and 2 times that of Diet D (P = 0.06; Figure 2A). DMIs across all diets during the multi-choice experiment translated to an average daily intake of 6.4 ± 0.8 g DM/kg^0.75/day CP and 1074.7 ± 94.4 kJ/kg^0.75/day of GE (Figure 2B). Average daily intake of CP was 4.3 ± 0.6 g DM/kg^0.75/day and DE was 581.8 ± 54.6 kJ/kg^0.75/day (Figure 2C). When plotted in nutritional space, the target intakes of CP and GE (Figure 2B) and DP and DP (Figure 2C) fell between the nutritional rails of Diets B and C.

## No-choice feeding trials: intake responses

Hares ate and average of 93.6± 3.2 g DM/kg^0.75/day of feed across all diets. DMI for Diet A was significantly higher than all other diets (P < 0.001), whereas there was no difference between diets B, C, and D (Figure 3A). Hares ate about 25% more of Diet A than other diets (Figure 3A). In terms of CP and GE, no-choice daily intakes curved away from the target intake, appearing as though on diets A and B hares aim to meet a minimum CP intake, while aiming to meet a minimum GE intake on diets C and D (Figure 3B). Using more biologically relevant metrics, DP and DE showed that hares appeared to meet a certain intake of DE (~ 900 kJ/kg^0.75/day) regardless of DP (Figure 3C). On Diet A, hares could not achieve the DE intake of the other diets nor the target intake of DP observed in multi-choice trials (Figure 3C).

## No-choice feeding trials: weight change and digestive responses

Diet affected changes in hare weight between the beginning and the end of each 3-day feeding trial (P = 3^{-4}; Figure 4). Hares lost the most weight on Diet A (median = -1.2% per day). On averages, hares maintained weight on the other diets (Figure 4).

Like daily intake and weight change, dry matter digestibility differed across diets (P < 0.001; Figure 5A). Diet D was the most digestible (59.2) and Diet A was the least (35.6). Diet A was 22% less digestible than other diets (P < 0.001), and Diet B was 3.9% less digestible than Diet D (P < 0.01; Figure 5A). CP digestibility increased significantly as diet CP increased from A to D (P < 0.001; Figure 5B). Protein in Diet A was 41.9% digestible while protein in Diet D was 77.3% digestible, 1.84 times greater than that of Diet A.

In terms of daily intake of GE (x-axis) and CP (y-axis), hares generally were able to maintain their weight when CP intake ≥ 9 g DM/kg0.75/day, but only when coincident with low and mid ranges of GE intake, such as occurred between the rails of diets B, C, and D. After GE intake surpassed ~ 2000 kJ/kg0.75/day, weight loss occurred regardless of protein intake. This indicates that hares experience greater protein limitation than energy limitation (Figure 6A; 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 DE and DP intake revealed one area in the centre of the plot, between Diets B and C, where hares were able to maintain their weight, and this also occurred at the highest levels of DP intake, as exemplified by the highest intakes on Diet D (Figure 6B). 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 DE, 14 g DM/kg^0.75 of CP, and 12 g DM/kg^0.75 of DP per day to maintain body weight (Figure 6). The relationship between GE intake and weight change was non-significant (P = 0.48).