Derivation 1: N_2*

$$\frac{dH^*}{dt} = 0 = \frac{cH(N_1a_1 + N_2a_2)}{1 + b(N_1a_1 + N_2a_2)} - mH$$

$$mH = \frac{cH(N_1a_1 + N_2a_2)}{1 + b(N_1a_1 + N_2a_2)}$$

$$m = \frac{c(N_1a_1 + N_2a_2)}{1 + b(N_1a_1 + N_2a_2)}$$

$$m\big(1 + b(N_1a_1 + N_2a_2)\big) = c(N_1a_1 + N_2a_2)$$

$$m + mb(N_1a_1 + N_2a_2) = c(N_1a_1 + N_2a_2)$$

$$m + mbN_1a_1 + mbN_2a_2 = cN_1a_1 + cN_2a_2$$

$$mbN_2a_2 - cN_2a_2 = cN_1a_1 - m - mbN_1a_1$$

$$N_2(mba_2 - ca_2) = cN_1a_1 - m - mbN_1a_1$$

$$N_2 = \frac{cN_1a_1 - m - mbN_1a_1}{(mba_2 - ca_2)}$$

$$N_2 = \frac{cN_1a_1 - m - mbN_1a_1}{a_2(mb - c)}$$

$$N_2 = \frac{cN_1a_1 - mbN_1a_1}{a_2(mb - c)} - \frac{m}{a_2(mb - c)}$$

$$N_2 = \frac{-N_1a_1(mb - c)}{a_2(mb - c)} - \frac{m}{a_2(mb - c)}$$

$$N_2^* = -\frac{a_1}{a_2}N_1 - \frac{m}{a_2(mb - c)}$$

Parameterize

$$D = \frac{m}{a_2(mb - c)}$$

$$A = -\frac{a_1}{a_2}$$

$$N_2^* = AN_1 - D$$

Derivation 2: *H**

$$\frac{dN_1^*}{dt} = 0 = R_1\left(1 - \frac{N_1 + N_2\beta_{1,2}}{k_1}\right) - \left(\frac{N_1 H a_1}{1 + b(N_1 a_1 + N_2 a_2)}\right)$$

$$\left(\frac{N_1 H a_1}{1 + b(N_1 a_1 + N_2 a_2)}\right) = R_1\left(1 - \frac{N_1 + N_2\beta_{1,2}}{k_1}\right)$$

$$H^* = R_1\left(1 - \frac{N_1 + N_2\beta_{1,2}}{k_1}\right)\left(\frac{1 + b(N_1 a_1 + N_2 a_2)}{N_1 a_1}\right)$$

$$H^* = \frac{R_1\left(1 - \frac{N_1 + N_2\beta_{1,2}}{k_1}\right)\left(1 + b(N_1 a_1 + N_2 a_2)\right)}{N_1 a_1}$$

Substitute equilibrial value for N_2 in terms of N_1

$$H^* = \frac{R_1\left(1 - \frac{N_1 + \left(-\frac{a_1}{a_2}N_1 - \frac{m}{a_2(mb - e)}\right)\beta_{1,2}}{k_1}\right)\left(1 + b\left(N_1 a_1 + \left(-\frac{a_1}{a_2}N_1 - \frac{m}{a_2(mb - e)}\right)a_2\right)\right)}{N_1 a_1}$$

Substitute in composite parameters A and D

$$H^* = \frac{R_1\left(1 - \frac{{N_1}^* + (A{N_1}^* - D)\beta_{1,2}}{k_1}\right)\left(1 + b({N_1}^* a_1 + (A{N_1}^* - D)a_2)\right)}{{N_1}^* a_1}$$

Derivation 3: *N*₁*

$$0 = \frac{dN_2^*}{dt} = R_2\left(1 - \frac{N_2 + N_1\beta_{1,2}}{k_2}\right) - \left(\frac{N_2 H a_2}{1 + b(N_1 a_1 + N_2 a_2)}\right)$$

Substitute equilibrial values for N_2 and H in terms of N_1

$$0 = \frac{dN_2}{dt} = R_2\left(1 - \frac{(AN_1 - D) + N_1\beta_{2,1}}{k_2}\right) - \left(\frac{(AN_1 - D)\left(\frac{R_1\left(1 - \frac{N_1 + (AN_1 - D)\beta_{1,2}}{k_1}\right)\left(1 + b(N_1 a_1 + (AN_1 - D)a_2)\right)}{N_1 a_1}\right)a_2}{1 + b(N_1 a_1 + (AN_1 - D)a_2)}\right)$$

Rearrange

$$R_2\left(1 - \frac{(AN_1 - D) + N_1\beta_{2,1}}{k_2}\right)$$
$$= a_2(AN_1 - D)R_1\left(1 - \frac{N_1 + (AN_1 - D)\beta_{1,2}}{k_1}\right)\left(1 + b(N_1 a_1 + (AN_1 - D)a_2)\right)\left(\frac{1}{N_1 a_1}\right)\left(\frac{1}{1 + b(N_1 a_1 + (AN_1 - D)a_2)}\right)$$

More rearranging

$$R_2\left(1 - \frac{(AN_1 - D) + N_1\beta_{2,1}}{k_2}\right)$$
$$= a_2\left(\frac{1}{N_1 a_1}\right)R_1(AN_1 - D)\left(1 - \frac{N_1 + (AN_1 - D)\beta_{1,2}}{k_1}\right)\left(1 + b(N_1 a_1 + (AN_1 - D)a_2)\right)\left(\frac{1}{1 + b(N_1 a_1 + (AN_1 - D)a_2)}\right)$$

More rearranging

$$R_2\left(1-\frac{(AN_1-D)+N_1\beta_{2,1}}{k_2}\right)$$
$$=a_2\frac{1}{a_1}\frac{1}{N_1}R_1(AN_1-D)\left(1-\frac{N_1+(AN_1-D)\beta_{1,2}}{k_1}\right)\big(1+b(N_1a_1+(AN_1-D)a_2)\big)\left(\frac{1}{1+b(N_1a_1+(AN_1-D)a_2)}\right)$$

Substitute

$$a_2\frac{1}{a_1}=\frac{a_2}{a_1}=-\frac{1}{A}$$

$$R_2\left(1-\frac{(AN_1-D)+N_1\beta_{2,1}}{k_2}\right)$$
$$=-\frac{1}{AN_1}R_1(AN_1-D)\left(1-\frac{N_1+(AN_1-D)\beta_{1,2}}{k_1}\right)\big(1+b(N_1a_1+(AN_1-D)a_2)\big)\left(\frac{1}{1+b(N_1a_1+(AN_1-D)a_2)}\right)$$

Cancel

$$R_2\left(1-\frac{(AN_1-D)+N_1\beta_{2,1}}{k_2}\right)=-\frac{1}{AN_1}R_1(AN_1-D)\left(1-\frac{N_1+(AN_1-D)\beta_{1,2}}{k_1}\right)$$

Rearrange growth terms

$$R_2\left(\frac{k_2-(AN_1-D)-N_1\beta_{2,1}}{k_2}\right)=-\frac{1}{AN_1}R_1(AN_1-D)\left(\frac{k_1-N_1-(AN_1-D)\beta_{1,2}}{k_1}\right)$$

Rearrange

$$\frac{R_2k_1}{R_1k_2}\big(k_2-(AN_1-D)-N_1\beta_{2,1}\big)=-\frac{1}{AN_1}(AN_1-D)\big(k_1-N_1-(AN_1-D)\beta_{1,2}\big)$$

Start multiplying out the right side

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\left(\frac{D}{AN_1}-1\right)\left(k_1-N_1-(AN_1-D)\beta_{1,2}\right)$$

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\frac{D}{AN_1}\left(k_1-N_1-(AN_1-D)\beta_{1,2}\right)-\left(k_1-N_1-(AN_1-D)\beta_{1,2}\right)$$

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\left(\frac{Dk_1}{AN_1}-\frac{D}{A}-\frac{D}{AN_1}(AN_1-D)\beta_{1,2}\right)-\left(k_1-N_1-(AN_1-D)\beta_{1,2}\right)$$

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\frac{Dk_1}{AN_1}-\frac{D}{A}-D\beta_{1,2}+\frac{D^2\beta_{1,2}}{AN_1}-\left(k_1-N_1-(AN_1-D)\beta_{1,2}\right)$$

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\frac{Dk_1}{AN_1}-\frac{D}{A}-D\beta_{1,2}+\frac{D^2\beta_{1,2}}{AN_1}-k_1+N_1+AN_1\beta_{1,2}-D\beta_{1,2}$$

Rearrange

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\frac{Dk_1+D^2\beta_{1,2}}{AN_1}-\frac{D}{A}-k_1+N_1+AN_1\beta_{1,2}-2D\beta_{1,2}$$

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)=\frac{Dk_1+D^2\beta_{1,2}}{AN_1}+N_1+AN_1\beta_{1,2}-2D\beta_{1,2}-\frac{D}{A}-k_1$$

Isolate term with N_1 in denominator

$$\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)-N_1-AN_1\beta_{1,2}+2D\beta_{1,2}+\frac{D}{A}+k_1=\frac{Dk_1+D^2\beta_{1,2}}{AN_1}$$

Multiply both sides by AN_1

$$AN_1\left(\frac{R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)-N_1-AN_1\beta_{1,2}+2D\beta_{1,2}+\frac{D}{A}+k_1\right)=Dk_1+D^2\beta_{1,2}$$

$$\frac{AN_1R_2k_1}{R_1k_2}\left(k_2-(AN_1-D)-N_1\beta_{2,1}\right)-AN_1{}^2-(AN_1)^2\beta_{1,2}+2AN_1D\beta_{1,2}+\frac{AN_1D}{A}+AN_1k_1=Dk_1+D^2\beta_{1,2}$$

$$\frac{AN_1R_2k_1}{R_1}-\frac{AN_1R_2k_1}{R_1k_2}(AN_1-D)-\frac{AN_1{}^2R_2k_1\beta_{2,1}}{R_1k_2}-AN_1{}^2-(AN_1)^2\beta_{1,2}+2AN_1D\beta_{1,2}+\frac{AN_1D}{A}+AN_1k_1=Dk_1+D^2\beta_{1,2}$$

$$\frac{AN_1R_2k_1}{R_1}-\frac{(AN_1)^2R_2k_1}{R_1k_2}+\frac{AN_1R_2k_1D}{R_1k_2}-\frac{AN_1{}^2R_2k_1\beta_{2,1}}{R_1k_2}-AN_1{}^2-(AN_1)^2\beta_{1,2}+2AN_1D\beta_{1,2}+\frac{AN_1D}{A}+AN_1k_1=Dk_1+D^2\beta_{1,2}$$

Rearrange

$$-\frac{(AN_1)^2R_2k_1}{R_1k_2}-\frac{AN_1{}^2R_2k_1\beta_{2,1}}{R_1k_2}-AN_1{}^2-(AN_1)^2\beta_{1,2}+\frac{AN_1R_2k_1}{R_1}+\frac{AN_1R_2k_1D}{R_1k_2}+2AN_1D\beta_{1,2}+\frac{AN_1D}{A}+AN_1k_1=Dk_1+D^2\beta_{1,2}$$

$$\left(-\frac{A^2R_2k_1}{R_1k_2}-\frac{AR_2k_1\beta_{2,1}}{R_1k_2}-A-A^2\beta_{1,2}\right)N_1{}^2+\left(\frac{AR_2k_1}{R_1}+\frac{AR_2k_1D}{R_1k_2}+2AD\beta_{1,2}+\frac{AD}{A}+Ak_1\right)N_1=Dk_1+D^2\beta_{1,2}$$

$$\left(-\frac{A^2R_2k_1}{R_1k_2}-\frac{AR_2k_1\beta_{2,1}}{R_1k_2}-A-A^2\beta_{1,2}\right)N_1{}^2+\left(\frac{AR_2k_1}{R_1}+\frac{AR_2k_1D}{R_1k_2}+2AD\beta_{1,2}+\frac{AD}{A}+Ak_1\right)N_1-\left(Dk_1+D^2\beta_{1,2}\right)=0$$

$$\left(-\frac{A^2R_2k_1}{R_1k_2}-A^2\beta_{1,2}-\frac{AR_2k_1\beta_{2,1}}{R_1k_2}-A\right)N_1{}^2+\left(\frac{AR_2k_1}{R_1}+\frac{AR_2k_1D}{R_1k_2}+2AD\beta_{1,2}+D+Ak_1\right)N_1-\left(Dk_1+D^2\beta_{1,2}\right)=0$$

Substitute in composite parameters

$$P=\frac{R_2}{R_1}$$

$$\left(-\frac{A^2Pk_1}{k_2}-A^2\beta_{1,2}-\frac{APk_1\beta_{2,1}}{k_2}-A\right)N_1{}^2+\left(APk_1+\frac{APk_1D}{k_2}+2AD\beta_{1,2}+D+Ak_1\right)N_1-\left(Dk_1+D^2\beta_{1,2}\right)=0$$

$$G=\frac{APk_1}{k_2}$$

$$\left(-GA - A^2\beta_{1,2} - G\beta_{2,1} - A\right){N_1}^2 + \left(APk_1 + GD + 2AD\beta_{1,2} + D + Ak_1\right)N_1 - \left(Dk_1 + D^2\beta_{1,2}\right) = 0$$

Rearrange

$$\left(-A^2\beta_{1,2} - A - GA - G\beta_{2,1}\right){N_1}^2 + \left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)N_1 - \left(Dk_1 + D^2\beta_{1,2}\right) = 0$$

Quadratic formula

$$N_1^* = \frac{-y \pm \sqrt{y^2 - 4xz}}{2x}$$

$$x = -A^2\beta_{1,2} - A - GA - G\beta_{2,1}$$

$$y = APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D$$

$$z = -Dk_1 - D^2\beta_{1,2}$$

$$N_1^* = \frac{-\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right) \pm \sqrt{\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)^2 - 4\left(-A^2\beta_{1,2} - A - CA - C\beta_{2,1}\right)\left(-Dk_1 - D^2\beta_{1,2}\right)}}{\left(2\left(-A^2\beta_{1,2} - A - GA - G\beta_{2,1}\right)\right)}$$

Expand

$$N_1^* = \frac{-APk_1 - 2AD\beta_{1,2} - Ak_1 - GD - D \pm \sqrt{\begin{matrix}\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)^2 + \\ \left(\begin{matrix} -4A^2\beta_{1,2}Dk_1 - 4ADk_1 - 4GADk_1 - 4G\beta_{2,1}Dk_1 - \\ 4A^2\beta_{1,2}D^2\beta_{1,2} - 4AD^2\beta_{1,2} - 4GAD^2\beta_{1,2} - 4G\beta_{1,2}D^2\beta_{1,2}\end{matrix}\right)\end{matrix}}}{\left(2\left(-A^2\beta_{1,2} - A - GA - G\beta_{2,1}\right)\right)}$$

Expand y^2 term

$$y^2 = \left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)^2$$

$$= APk_1\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right) + 2AD\beta_{1,2}\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)$$

$$+ Ak_1\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right) + GD\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)$$

$$+ D\left(APk_1 + 2AD\beta_{1,2} + Ak_1 + GD + D\right)$$

$$y^2 = \left(A^2P^2{k_1}^2 + 2A^2D\beta_{1,2}Pk_1 + A^2P{k_1}^2 + APk_1GD + APk_1D\right) + \left(+2A^2D\beta_{1,2}Pk_1 + 4A^2D^2{\beta_{1,2}}^2 + 2A^2D\beta_{1,2}k_1 + 2AD^2\beta_{1,2}G + 2AD^2\beta_{1,2}\right)$$

$$+ \left(A^2P{k_1}^2 + 2A^2k_1D\beta_{1,2} + A^2{k_1}^2 + Ak_1GD + Ak_1D\right) + \left(GDAPk_1 + GD2AD\beta_{1,2} + GDAk_1 + G^2D^2 + GD^2\right)$$

$$+ \left(DAPk_1 + 2AD^2\beta_{1,2} + DAk_1 + GD^2 + D^2\right)$$

$$y^2 = A^2P^2{k_1}^2 + 2A^2P{k_1}^2 + A^2{k_1}^2 + 4A^2D^2{\beta_{1,2}}^2 + 4A^2D\beta_{1,2}Pk_1 + 4A^2D\beta_{1,2}k_1 + 4AD^2\beta_{1,2}G + 4AD^2\beta_{1,2} + 2APk_1GD + 2APk_1D$$

$$+ 2Ak_1GD + 2Ak_1D + G^2D^2 + 2GD^2 + D^2$$

Combine everything under the radical ($y^2 - 4xz$)

$y^2 - 4xz$

$$= \begin{pmatrix} A^2P^2{k_1}^2 + 2A^2P{k_1}^2 + A^2{k_1}^2 + 4A^2D^2{\beta_{1,2}}^2 + 4A^2D\beta_{1,2}Pk_1 + 4A^2D\beta_{1,2}k_1 + 4AD^2\beta_{1,2}G + 4AD^2\beta_{1,2} + 2APk_1GD + 2APk_1D + 2Ak_1GD \\ +2Ak_1D + G^2D^2 + 2GD^2 + D^2 - 4A^2\beta_{1,2}Dk_1 - 4ADk_1 - 4GADk_1 - 4G\beta_{2,1}Dk_1 - 4A^2\beta_{1,2}D^2\beta_{1,2} - 4AD^2\beta_{1,2} - 4GAD^2\beta_{1,2} - 4G\beta_{2,1}D^2\beta_{1,2} \end{pmatrix}$$

$$y^2 - 4xz = A^2P^2{k_1}^2 + 2A^2P{k_1}^2 + A^2{k_1}^2 + 4A^2D\beta_{1,2}Pk_1 + 0A^2D\beta_{1,2}k_1 + 2APk_1GD + 2APk_1D - 2Ak_1D + G^2D^2 + 2GD^2 + D^2 - 2GADk_1$$

$$- 4G\beta_{2,1}Dk_1 - 4G\beta_{2,1}D^2\beta_{1,2}$$

Combine quadratic terms back into equation

$$N_1{}^* = \frac{\left(\begin{array}{c}\left(-APk_1 - 2AD\beta_{1,2} - Ak_1 - GD - D\right) - \\ \sqrt{\begin{array}{c}A^2P^2{k_1}^2 + 2A^2P{k_1}^2 + A^2{k_1}^2 + 4A^2D\beta_{1,2}Pk_1 + 2APk_1GD + 2APk_1D \\ -2Ak_1D + G^2D^2 + 2GD^2 + D^2 - 2GADk_1 - 4G\beta_{2,1}Dk_1 - 4G\beta_{1,2}D^2\beta_{1,2}\end{array}}\end{array}\right)}{\left(2\left(-A^2\beta_{1,2} - A - GA - G\beta_{2,1}\right)\right)}$$

Appendix 3

Parameter estimates (highlighted) with supporting values listed beneath

Model param.	Description	Units	Est.* (min-max)	Est. units	Study	Location	Source	Model value used
N_1	Plant 1 (*Amorpha*) mass	Plant mass	294000-441000	g/ha				—
			25300	stems/ha	*Amorpha* densities in the presence of cattle grazing	Tallgrass prairie, Kansas	Hickman and Hartnett 2002	
			11.6-17.4	g/stem	*Amorpha* min/max mass per stem	Tallgrass prairie, Kansas	Towne and Knapp 1996	
N_2	Plant 2 (*Dalea*) mass	Plant mass	229-582	g/ha				—
			200	stems/ha	*Dalea* densities in presence of voles	Tallgrass prairie, Kansas	Howe et al 2002	
			1.14-2.91	g/stem	*Dalea* min/max mass per stem	Tallgrass prairie, Kansas	Towne and Knapp 1996	
H	Herbivore mass	Herbivore mass	72-6200	g/ha				—
			2-172	ind/ha	*Microtus ochrogaster* and *pennsylvanicus* densities	Range-wide, North America	Taitt and Krebs 1981	
			35.972	g/ind	*Microtus ochrogaster* and *pennsylvanicus* mean mass	Tallgrass prairie, Iowa	Pers. obs.	

Model param.	Description	Units	Est.* (min-max)	Est. units	Study	Location	Source	Model value used
R_1	Growth rate of plant 1	N_1 mass/time	3270-60100	g/ha/day	Tallgrass prairie forb growth rates	Tallgrass prairie, Kansas	Briggs and Knapp 2001	4000
R_2	Growth rate of plant 2	N_2 mass/time	3270-60100	g/ha/day	Tallgrass prairie forb growth rates	Tallgrass prairie, Kansas	Briggs and Knapp 2001	4000
k_1	Plant 1 carrying capacity	N_1 mass	172000-288000	g/ha	*Amorpha* biomass in unburned fields	Tallgrass prairie, Kansas	Towne and Knapp 1996	6000
k_2	Plant 2 carrying capacity	N_2 mass	1960-14100	g/ha	*Dalea* biomass in unburned fields	Tallgrass prairie, Kansas	Towne and Knapp 1996	6000
$\beta_{1,2}$	Per unit mass effect of plant 2 on plant 1 relative to the effect of plant 1 on itself	N_2 mass/N_1 mass	1.7	g/g	*Dalea* competition coefficient on *Amorpha* (1.39, 2.19; upper and lower 95% confidence intervals)	Greenhouse	Pers. obs.	0.56
$\beta_{2,1}$	Per unit mass effect of plant 1 on plant 2 relative to the effect of plant 2 on itself	N_1 mass/N_2 mass	0.56	g/g	*Amorpha* competition coefficient on *Dalea* (0.42, 0.69; upper and lower 95% confidence intervals)	Greenhouse	Pers. obs.	0.56
a_1	Per unit mass herbivore attack rate on plant 1	1/(H mass * time)	0.033	1/g/day				0.033
			0.05	1/ind/hour	Bank vole (*Clethrionomys glareolus*) attack rates on willow shoots	Controlled environment	Lundberg 1988	
			35.972	g/ind	*Microtus ochrogaster* and *pennsylvanicus*	Tallgrass prairie, Iowa	Pers. obs.	

Model param.	Description	Units	Est.* (min-max)	Est. units	Study	Location	Source	Model value used
a_2	Per unit mass herbivore attack rate on plant 2	1/(H mass * time)	0.033	1/g/day	Bank vole (*Clethrionomys glareolus*) attack rates on willow shoots			0.033
			0.05	1/ind/hour	Bank vole (*Clethrionomys glareolus*) attack rates on willow shoots	Controlled environment	Lundberg 1988	
			35.972	g/ind	*Microtus ochrogaster* and *pennsylvanicus* mean mass	Tallgrass prairie, Iowa	Pers. obs.	
b	Herbivore handling time	(H mass)(time)/ (N mass)	1.16	g*days/g	*Microtus pennsylvanicus* digestion rates	Old field, Michigan	Golley 1960	1.16
m	Per unit mass herbivore mass rate of loss from mortality and respiration	H mass/ (H mass)(time)	0.54	g/g/day				0.54
			0.518	g/g/day	*Microtus pennsylvanicus* daily mass loss from respiration			
			90.31	kJ/day/g	*Microtus pennsylvanicus* respiration rate	Old field enclosures, Québec	Berteaux et al. 1996 reported in Speakman 1999	
			35.972	g/ind	*Microtus ochrogaster* and *pennsylvanicus* mean mass	Tallgrass prairie, Iowa	Pers. obs.	

Model param.	Description	Units	Est.* (min-max)	Est. units	Study	Location	Source	Model value used
			5.22	kJ/g	*Microtus pennsylvanicus* live energy content	Field sites in Ellis County, Kansas	Fleharty et al. 1973	
			0.023	g/g/day	*Microtus pennsylvanicus* daily loss from mortality	Field sites in Ellis County, Kansas	Fleharty et al. 1973	
			0.12	kJ/g/day	*Microtus pennsylvanicus* energy loss from mortality	Old field, Michigan	Golley 1960	
			5.22	kJ/g	*Microtus pennsylvanicus* live energy content	Field sites in Ellis County, Kansas	Fleharty et al. 1973	
c	Herbivore conversion efficiency	(H mass)/(P mass)	0.70-0.78	g/g				0.7
			0.7	kJ/kJ	*Microtus pennsylvanicus* assimilation efficiency ((Production+Respiration)/Consumption)	Old field, Michigan	Golley 1960	
			0.78	kJ/kJ	*Microtus arvalis* assimilation efficiency ((Production+Respiration)/Consumption)	Flood-plain forest, Czechoslovakia	Zejda 1985	
			5.22	kJ/g	Old field, standing green crop energy content	Old field, Michigan	Golley 1960	

Model param.	Description	Units	Est.* (min-max)	Est. units	Study	Location	Source	Model value used
			5.22	kJ/g	*Microtus pennsylvanicus* live energy content	Field sites in Ellis County, Kansas	Fleharty et al. 1973	

*All mass values are calculated as fresh (*i.e.*, wet) mass. Plant mass was determined by assuming fresh plant material contains 69.4% water based on water content of prairie forbs (pers. obs.).

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