Relationship between body mass and bite force

For various species of *Canidae* (dogs, foxes and wolves) the average body mass (kg) and bite force at the canine (N) were measured. Is there a relationship between the size of the animal and the bite force? Source: Christiansen and Wroe (2007), "Bite Forces and Evolutionary Adaptations to Feeding Ecology in Carnivores," *Ecology*, 88(2), pp. 347-358.

BiteForce_Canidae

BiteForce_Canidae
Source

Columns (4/0)
Family
Species
Body Mass (kg)
BFca (N)

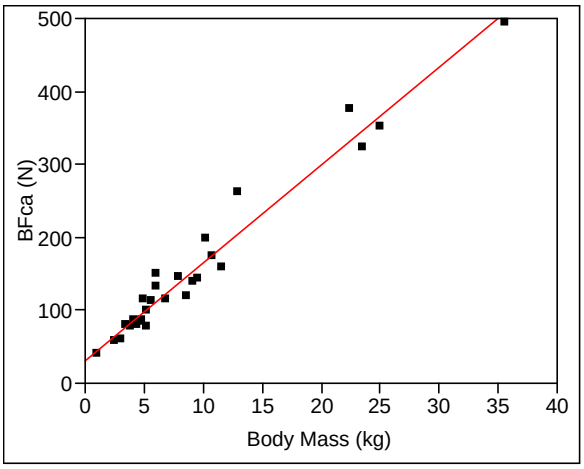
Rows
All rows 28
Selected 0
Excluded 0
Hidden 0
Labelled 0

	Family	Species	Body Mass (kg)	BFca (N)
1	Canidae	Alopex lagopus	4.8	82.3
2	Canidae	Atelocynus microtis	10.2	197.5
3	Canidae	Canis adustus	9.5	142.1
4	Canidae	Canis aureus	9.1	138.2
5	Canidae	Canis familiaris	25.0	351.5
6	Canidae	Canis latrans	10.7	173.4
7	Canidae	Canis lupus	35.5	493.5
8	Canidae	Canis mesomelas	8.5	117.8
9	Canidae	Cerdocyon thous	6.8	114.6
10	Canidae	Chrysocyon brachyurus	23.4	323.0
11	Canidae	Cuon alpinus	12.9	261.5
12	Canidae	Fennecus zerda	1.0	39.0
13	Canidae	Lycalopex vetulus	4.1	85.3
14	Canidae	Lycaon pictus	22.4	374.6
15	Canidae	Nyctereutes procynoides	5.1	98.0
16	Canidae	Otocyon megalotis	5.2	76.2
17	Canidae	Pseudalopex culpaeus	11.5	158.4
18	Canidae	Pseudalopex griseus	5.9	131.0
19	Canidae	Pseudalopex gymnocerus	5.6	111.4
20	Canidae	Speothos venaticus	6.0	150.0
21	Canidae	Urocyon cineroargenteus	4.8	85.8
22	Canidae	Vulpes bengalensis	3.8	75.8
23	Canidae	Vulpes chama	4.3	78.4
24	Canidae	Vulpes ferrilata	4.9	113.3
25	Canidae	Vulpes pallida	3.0	60.3
26	Canidae	Vulpes rueppellli	2.5	57.4
27	Canidae	Vulpes velox	3.4	78.5
28	Canidae	Vulpes vulpes	7.9	144.0

Fit Y by X

Y, Response: BFca (N)
X, Factor: Body Mass (kg)
Block:
Weight:
Freq:
By:

JMP Analysis of Bite Force By Body Mass



Linear Fit

Predicted BFca (N) = 30.391172 + 13.428422 Body Mass (kg)

Summary of Fit

RSquare	0.961822
RSquare Adj	0.960353
Root Mean Square Error	21.85478
Mean of Response	154.0286
Observations (or Sum Wgts)	28

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	30.391172	6.355742	4.78	<.0001
Body Mass (kg)	13.428422	0.524686	25.59	<.0001

Residual by Predicted Plot