

# Supplementary material for "Physics of chewing in terrestrial mammals"

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The online videos that we have used are listed in the tables below (table S1, table S2 and table S3).

Animal	Youtube link	frequency $\pm$ std (Hz)	weight range (kg)	reference for the estimation of the weight
Chihuahua	v=llOwgyKj4M	2.53 $\pm$ 0.44	0.91 - 2.72	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Opossum	v=gkofwx2iIHM	3.08 $\pm$ 0.52	1.30 - 5.00	R.M. Nowak, Walker's Mammals of the World (1999)
Opossum	v=Pv0AJWZr4h4	2.55 $\pm$ 0.25	1.30 - 5.00	R.M. Nowak, Walker's Mammals of the World (1999)
Opossum	v=VWwNkIRGNrk	3.18 $\pm$ 0.93	1.30 - 5.00	R.M. Nowak, Walker's Mammals of the World (1999)
Pomeranian	v=wXSYbfv-ss	2.24 $\pm$ 0.34	1.36 - 3.18	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Cat	v=7srW-W3FLJE	2.18 $\pm$ 0.17	4.00 - 5.00	M.Y. Matern, D.A. McLennan, Phylogeny and Speciation of Felids, Cladistics 16 (2000)
Dachshund	v=rcrHj_EDf-s	2.66 $\pm$ 0.28	4.08 - 4.99	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Tasmanian Devil	v=MKbMGe7CyII	2.43 $\pm$ 0.29	5.5 - 11.8	R.M. Nowak, Walker's Mammals of the World (1999)
Tasmanian Devil	v=pD9xQTKkXTw	2.41 $\pm$ 0.33	5.5 - 11.8	R.M. Nowak, Walker's Mammals of the World (1999)
Jack Russell Terrier	v=8QfatAs8FwE	2.87 $\pm$ 0.45	6.30 - 6.50	D.C. Coile, Jack Russell Terriers (2000)
Shih-Tzu	v=Hknt4e_Hzg	2.09 $\pm$ 0.25	6.35 - 8.16	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Beagle	v=h9wbed3MAN4	2.44 $\pm$ 0.65	8.2 - 13.6	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Beagle	v=vvh7n1kUqQw	2.94 $\pm$ 2.06	8.2 - 13.6	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Otter	v=2msCA_3FuII	2.93 $\pm$ 0.38	9.1 - 12.7	R. Link, Living with Wildlife in the Pacific Northwest (2005)
Bobcat	v=qq4_eoEFYDU	1.74 $\pm$ 0.56	9.8 - 10.6	V.T. Sparano, Complete Outdoors Encyclopedia (1998)
Cocker Spaniel	v=DLTINXElyCe	2.01 $\pm$ 0.25	11.8 - 15.4	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Dingo	v=5Qx549wFK0	2.01 $\pm$ 0.57	13.0 - 20.0	L. Boitani, Simon & Schuster's Guide to Mammals (1984)
Border Collie	v=yywB_H-1949c	2.48 $\pm$ 0.43	15.9 - 25.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Border Collie	v=Laloc0fpt8	2.70 $\pm$ 0.32	15.9 - 25.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Husky	v=js_Rgh-L2jo	2.24 $\pm$ 0.60	15.9 - 27.2	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Dalmatian	v=Hknt4e_Hzg	2.21 $\pm$ 0.55	16.0 - 32.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Dalmatian	v=JsAeUfjC5WE	2.81 $\pm$ 0.41	16.0 - 32.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Lynx	v=jmba6EWIdT8	1.56 $\pm$ 0.39	16.8 - 17.9	M. Sunquist, F. Sunquist, Wild Cats of the World (2002)
Golden Retriever	v=DaxkL75c-8	2.32 $\pm$ 0.21	25.0 - 34.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Golden Retriever	v=xIC3vFOKEWM	2.52 $\pm$ 0.32	25.0 - 34.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Golden Retriever	v=9ZzgxMmkqg0	2.47 $\pm$ 0.17	25.0 - 34.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
German Shepherd	v=ma4C7gmMIS_E	1.80 $\pm$ 0.22	29.5 - 43.1	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
Wolf	v=iYpkwqBJV80	2.42 $\pm$ 0.49	31.3 - 40.4	B.H. Lopez, Of Wolves and Men (1978)
Jaguar	v=m9wC3xQK8H0	1.71 $\pm$ 0.28	36 - 158	R.M. Nowak, Walker's Mammals of the World (1999)
Jaguar	v=Br9-Sy4AdQ	1.53 $\pm$ 0.33	36 - 158	R.M. Nowak, Walker's Mammals of the World (1999)
Great Dane	v=c-FkLRG8lpI	1.69 $\pm$ 0.41	45.4 - 59.0	S.L. Gerstenfeld, J.L. Schultz, ASPCA Complete Guide to Dogs (1999)
English Mastiff	v=m-OasV9LcXE	1.49 $\pm$ 0.27	77.0 - 91.0	Guinness Book of World Records (1991)
American Mastiff	v=6-fFeBLWcDo	1.98 $\pm$ 0.29	77.0 - 91.0	Guinness Book of World Records (1991)
Tiger	v=IoWXoB5ao8w	1.24 $\pm$ 0.43	180 - 306	R.M. Nowak, Walker's Mammals of the World (1999)
Lion	v=NpCmoHFlhZSw	1.43 $\pm$ 0.41	272 - 313	K. Nowell, P. Jackson, Wild cats (1996)

**Table 1.** Carnivores. Information relative to the online Youtube videos (the general structure of the link is: [www.youtube.com/watch?v=...](http://www.youtube.com/watch?v=...)).

Animal	Youtube link	frequency $\pm$ std (Hz)	weight range (kg)	reference for the estimation of the weight
Bunny	v=A9HV508Un6k	4.18 $\pm$ 0.38	0.91 - 1.13	Fur from Rabbits - A Collection of Articles
Rabbit	v=O-XlVzmY00	2.77 $\pm$ 0.44	1.81 - 4.08	Nutrient Requirements of Rabbits (1966)
Red Panda*	v=Yp1xqOpYGnE	3.43 $\pm$ 0.65	3.18 - 6.35	D. Burnie, D.E. Wilson, Animal: The Definitive Visual Guide to the World's Wildlife (2005)
Sloth	v=xjE5AQHKj.Y	1.78 $\pm$ 0.37	3.63 - 4.99	F.B. Golley, E. Medina, Tropical Ecological Systems (1975)
Koala	v=AjFepCUX5Us	2.95 $\pm$ 0.88	4.0 - 15.0	R. Nowak, R. Walker's Mammals of the World (2005)
Deer	v=2q91dUDYkU	2.10 $\pm$ 0.24	45.3 - 68.0	S. Gallina, H. Lopez Arevalo, <i>Odocoileus virginianus</i> (2008)
Panda*	v=kCJujDysSPo	1.82 $\pm$ 0.32	70 - 160	G. Brown, Great Bear Almanac (1996)
Panda*	v=k-TFsd4768U	2.21 $\pm$ 0.32	70 - 160	G. Brown, Great Bear Almanac (1996)
Panda*	v=PMgN6-CUol.Q	1.69 $\pm$ 0.42	70 - 160	G. Brown, Great Bear Almanac (1996)
Panda*	v=4n0xNbfLLR8	1.74 $\pm$ 0.35	70 - 160	G. Brown, Great Bear Almanac (1996)
Mountain Goat	v=HvKVLEm18iI	1.79 $\pm$ 0.20	80 - 100	A. Ganeri, North America's Most Amazing Animals (2008)
Mountain Gorilla	v=6OnOrp4gcwQ	1.41 $\pm$ 0.10	100 - 195	G. Wood The Guinness Book of Animal Facts and Feats (1983)
Gorilla	v=FCADw-eS5.s	1.82 $\pm$ 0.45	102 - 147	P. Miller, Patricia Gorillas (1997)
Llama	v=QMwRo5ad19w	1.70 $\pm$ 0.34	110 - 120	R.B. Land, D.W. Robinson, Genetics of Reproduction in Sheep
Shetland Pony	v=hP05BgYyz-g	1.67 $\pm$ 0.29	180 - 270	S. Green, The Shetland Pony (2012)
Pony	v=N8go26IXgKc	1.73 $\pm$ 0.22	250 - 300	J. L. Falvey, An Introduction to Working Animals (1985)
Pony	v=oo2Wh20lyf4	1.63 $\pm$ 0.18	250 - 300	J. L. Falvey, An Introduction to Working Animals (1985)
Pony	v=kXBMU9gXvjs	1.31 $\pm$ 0.26	250 - 300	J. L. Falvey, An Introduction to Working Animals (1985)
Horse	v=n-8YRILHoM4	1.49 $\pm$ 0.20	380 - 550	M. Bongiammi, Simon & Schuster's Guide to Horses and Ponies (1987)
Arabian Horse	v=giC0W9Upm0	1.60 $\pm$ 0.44	408 - 544	M. Bongiammi, Simon & Schuster's Guide to Horses and Ponies (1987)
Rhino	v=EBOU9j0BcmQ	0.93 $\pm$ 0.10	800 - 1200	M. Fitzpatrick, K. Armstrong, South Africa, Lesotho & Swaziland (2006)
Rhino	v=sEoOrdGTRY	1.05 $\pm$ 0.07	800 - 1200	M. Fitzpatrick, K. Armstrong, South Africa, Lesotho & Swaziland (2006)
Giraffe	v=wiuNqeKdzyU	1.39 $\pm$ 0.22	828 - 1192	J.D. Skinner, R.H.M. Smithers, The mammals of the southern African subregion (1990)
Giraffe	v=pk-yOIQNMuk	1.19 $\pm$ 0.15	828 - 1192	J.D. Skinner, R.H.M. Smithers, The mammals of the southern African subregion (1990)
Giraffe	v=tBkheRtiXQ	1.13 $\pm$ 0.32	828 - 1192	J.D. Skinner, R.H.M. Smithers, The mammals of the southern African subregion (1990)
Hippo	v=OxNXQ9bzYT0	0.67 $\pm$ 0.11	1300 - 1500	R. N. Owen-Smith Megaherbivores: The Influence of Very Large Body Size on Ecology (1995)
Hippo	v=wq-xVYmVva8	0.47 $\pm$ 0.10	1300 - 1500	R. N. Owen-Smith Megaherbivores: The Influence of Very Large Body Size on Ecology (1995)
Hippo	v=86vpgweBtGI	0.84 $\pm$ 0.06	1300 - 1500	R. N. Owen-Smith Megaherbivores: The Influence of Very Large Body Size on Ecology (1995)
White Rhino	v=4UJ744ko3Y	0.76 $\pm$ 0.10	1600 - 2400	J. D. Skinner, C. T. Chimimba, The Mammals Of The Southern African Subregion (2005)
Elephant	v=4LwRehYGRE	0.54 $\pm$ 0.07	3000 - 5000	J. Shoshani, Elephants: Majestic Creatures of the Wild (2000)
Elephant	v=6umRDWnfvI	0.57 $\pm$ 0.06	3000 - 5000	J. Shoshani, Elephants: Majestic Creatures of the Wild (2000)
African Elephant	v=M7RA-hFz6s0	0.64 $\pm$ 0.07	4000 - 7000	J. Shoshani, Elephants: Majestic Creatures of the Wild (2000)

**Table 2.** Herbivores. Information relative to the online Youtube videos (the general structure of the link is: [www.youtube.com/watch?v=...](http://www.youtube.com/watch?v=...)). \* Strictly speaking, pandas have a digestive system of carnivores and food habits of herbivores.

Animal	Youtube link	frequency $\pm$ std (Hz)	weight range (kg)	reference for the estimation of the weight
Chinchilla	v=IQXee2yLgA	4.24 $\pm$ 0.59	0.41 - 0.42	A.E. Spotorno et al., Mammalian Species 758
Skunk	v=TteE3dKirac	4.08 $\pm$ 0.48	1.80 - 5.50	G. Feldhamer, B. Thompson, J. Chapman, Wild Mammals of North America (2003)
Skunk	v=9-myK_W4HFs	3.39 $\pm$ 0.79	1.80 - 5.50	G. Feldhamer, B. Thompson, J. Chapman, Wild Mammals of North America (2003)
Coati	v=6lit35gGUy	2.83 $\pm$ 0.63	2.00 - 8.00	K. M. Helgen et al., Small Carnivore Conservation 41 (2009)
Coati	v=6lit35gGUy	3.91 $\pm$ 0.54	2.00 - 8.00	K. M. Helgen et al., Small Carnivore Conservation 41 (2009)
Baby Raccoon	v=DjAo_9eSPWI	4.36 $\pm$ 1.44	3.50 - 9.00	S.I. Zveloff, Raccoons: A Natural History (2002)
Raccoon	v=PxaW5jSyjY	2.93 $\pm$ 0.55	3.50 - 9.00	S.I. Zveloff, Raccoons: A Natural History (2002)
Raccoon	v=0jwCq0l4xEY	4.04 $\pm$ 0.65	3.50 - 9.00	S.I. Zveloff, Raccoons: A Natural History (2002)
Raccoon	v=RavcwqH0Ou0	3.42 $\pm$ 0.40	3.50 - 9.00	S.I. Zveloff, Raccoons: A Natural History (2002)
Rock Hyrax	v=iKJcZ3e8E6Y	3.63 $\pm$ 0.34	5.00 - 6.00	T. Parkinson, M. Phillips, W. Gourlay, Kenya (2006)
Coyote	v=qLH2qFx-jB4	2.97 $\pm$ 0.35	12.5 - 14.0	M. Bekoff M., Mammalian Species 79 (1977)
Coyote	v=VACqjNShFE	2.62 $\pm$ 0.29	12.5 - 14.0	M. Bekoff M., Mammalian Species 79 (1977)
Coyote	v=Uv58Kk9BsxM	2.63 $\pm$ 0.19	12.5 - 14.0	M. Bekoff M., Mammalian Species 79 (1977)
Pig	v=DyatXlWjNyc	2.46 $\pm$ 0.40	30.0 - 33.0	M.M. Swindle, A.C. Smith, Swine in the Laboratory (2016)
Baby Pig	v=7qpETkG3vjA	2.45 $\pm$ 0.41	30.0 - 33.0	M.M. Swindle, A.C. Smith, Swine in the Laboratory (2016)
Sumatran Orangutan	v=APt4b3fWRnE	1.21 $\pm$ 0.24	37.0 - 75.0	C.P. Groves, Mammalian Species 4 (1971)
Human	v=KQfDBZlIMOc	1.71 $\pm$ 0.42	80.6 - 80.8	S.C. Walpole et al., The weight of nations: an estimation of adult human biomass (2012)
Bear	v=TfHmBLhDJY8	1.94 $\pm$ 0.24	115 - 360	M. Pasitschniak-Arts, Mammalian Species (1993)
Russian Bear	v=SHaZqBrrI20	2.07 $\pm$ 0.53	650 - 700	M. Pasitschniak-Arts, Mammalian Species (1993)

**Table 3.** Omnivores. Information relative to the online Youtube videos (the general structure of the link is: [www.youtube.com/watch?v=...](http://www.youtube.com/watch?v=...)).