

MASS ESTIMATES – PREDATORY DINOSAURS+

Mainly from volumetric models of profile-skeletals

ENTRIES LAYOUT

Taxon k model femur length model volume ml x neutral specific gravity = model mass g
specimen (the one modeled listed 1st*):**total mass in kilograms**:femur (or other long bone
length) usually in decimeters

*If profile-skeletal is a composite key specimen/s may be indicated>

ALL DIMENSIONS MASS FORMULA

kg = femur(or other long bone)length(usually in decimeters)³ x k

k = model volume in ml x neutral specific gravity** then divided/model femur(or other long
bone)length³ (in most models femur in decimeters is $0.525^3 = 0.145$), final value is usually
rounded to 0 or 5 if it is three digits, final total mass often rounded off if k is highly approximate
– the higher the k value the more massive the animal relative to femur length.

**Neutral specific gravity is when respiration is at mid breath: values as per Larramendi, Paul &
Hsu 2020 Anatomical Record 304: 1833-1888
anatomypubs.onlinelibrary.wiley.com/doi/full/10.1002/ar.24574

Among dinosaurs with large feathers their mass is added separately; in dinosaurs with flight
ability the mass of the flight muscles is calculated separately as a range of possibilities

All volume and mass estimates are approximate even when based on complete body sections,
when they are based on particularly incomplete body sections the ~ is used to indicate such,
same it true for incomplete or restored femur or other long bone lengths

ug = unnamed or uncertain genus

NA = specimen number unavailable

							x 0.925–1	
							sometimes	
							x 1.03–1.06 feathers	
			femur					
<i>Lagosuchus</i>	1.15	525	126	16	20	162	167	
PVL 3870:0.1:0.44 PVL 3871:~0.19:0.55								
<i>Lewisuchus</i>	~1.65	“	~160	~32	~40	232	238	
MLP XI-14-14:1.9:1.05 PVL 4629:2.5:1.15								
<i>Silesaurus</i>	1.26	“	140	17	~20	~177	182	
ZPAL Ab 111/361:9:2.00								

<i>Staurikosaurus</i> MCZ 1669: 12.6 :2.29	1.05	"	110	~19	21	150	150
<i>Herrerasaurus</i> PVL 2566: 131 :4.73 UNSJ: 218 :5.60	1.24	"	130	20	30	180	180
<i>Eodromaeus</i> PVSJ 562:~ 5.4 :1.60	~1.32	"	~138	~20	~40	~198	~.192
<i>Tawa</i> composite>GR 242: 15.4 :2.15	~1.55	"	~160	~30	~35	~225	~.225
<i>Coelophysis bauri</i> gracile AMNH 7223: 15.9 :2.10	1.72	"	174	36	40	250	250
robust AMNH 7224: 21 :2.10 GR 143:~ 27 :2.30	2.25	"	238	36	54	328	.328
juv composite: 2.7 :1.25	1.38	"	153	15	32	200	.200
<i>C. rhodesiensis</i> QG 1: 13.6 :2.08	1.52	"	160	25	35	220	.220
<i>Panguraptor</i> LFGT-0103: 6.4 :1.64	~1.45	"	~145	~25	~40	~210	.210
<i>Liliensternus</i> MB R.2175: 137 :4.40	1.61	"	172	28	40	240	.233
<i>Dilophosaurus</i> UCMP 37302: 283 :5.50	1.83	"	188	56	30	274	.266
<i>Elaphrosaurus</i> MB R.4960/4996:~ 256 :5.29	~1.54	"				~230	.223
<i>Limusaurus</i>	~1.24	"			~180	~.180	
<i>Ceratosaurus</i> USNM 4735: 572 :6.20	2.4	"	260	36	58	354	.343
<i>Majungasaurus</i> composite>FMNH 2278:~ 724 :~6.00	~3.35	"			~502	~.487	
<i>Skorpiovenator</i> MMCH-PV 48:~ 1770 :~9.30	2.2	"	~258	~39	~30	~327	~.317

<i>Abelisaurus</i> MCF-PVPH-236:~ 737 :~7.00	2.15	“	~262	~37	~24	~323	~.313
<i>Carnotaurus</i> MACN-CH 894: 2190 :10.30	2	"	250	25	~30	305	.295
<i>Masiakasaurus</i> FMNH PR2481:~ 12 :~1.85	~1.9	“	~218	~46	~25	~289	~.277
<i>Cryolophosaurus</i> FMNH PR1821:~ 775 :7.69	~1.7	“	~176	54	~25	~255	~245
<i>Sinosaurus</i> KMV 8701: 330 :5.65	1.85	“	190	59	~25	274	~.266
<i>Chilesaurus</i> SNGM-1935:~ 5.5 :1.42 SNGM-1888:~ 17 :~2.10	~1.85	“				~280	~.269
<i>Monolophosaurus</i> IVPP 84019: 537 :~6.25	2.2	“	239	54	~40	~333	.323
<i>Eustreptospondylus</i> OUM J13558: 240 :5.20	1.7	"	192	32	26	250	.243
<i>Piatnitzkysaurus</i> PVL 4073: 300 :5.50	1.8	"	206	30	32	268	.260
megalosaur composite:~ 1700 :~9.20	~2.2	“				~333	~.323
<i>Baryonyx</i> NHMUK R9951:~ 1320 :8.30	~2.3	“				~340	~.333
<i>Baryonyx (Suchomimus)</i> MNN GDF500:~ 3110 :10.75 unnamed MSNM V4047:~ 13000 :~17.00 <i>Spinosaurus</i> BSP 1912: 5/6000	~2.5	“				~380	~.369
<i>Yangchuanosaurus shangyu</i> CV 00215: 1430 :8.80	2.1	"	242	36	38	316	.305
ZDM 0024: 2070 :9.80 CV 00216:~ 2930 :~11.00	2.2	“	255	40	38	333	.321
<i>Y. dongi</i> IVPP 10600: 1480 :8.76	2.2	"	250	38	~38	~326	.315
<i>Allosaurus jimmadseni</i>	2.2	“	232	50	~44	~326	.315

MOR 963: 921 :7.48							
juv	2.1	“	220	50	~40	~310	.300
DINO 11541: 533 :6.33							
<i>Allosaurus fragilis</i>	2.5	"	274	46	58	378	.365
USNM 4734: 1140 :7.70							
	2.3	"	256	44	50	350	.338
DINO 2560: 1460 :8.60 3694:~ 1700 :9.05							
<i>A. sp?</i>							
AMNH 680:~ 2400 :10.08							
<i>A. maximus</i>	~2.3						
OMNH 01708: 3200 :11.10							
<i>Concavenator</i>	1.9	“	210	41	34	285	.275
MCCM-LH 6666: 333 :5.60							
<i>Acrocanthosaurus</i>	2.35	“	252	52	50	354	.342
NCSM 14345: 4930 :~12.80							
<i>Giganotosaurus</i>	2.7	"	275	70	55	400	.386
MUCPv-CH-1: 7900 :14.30 1365 MUCPv-95:~ 10000 :~15.50							
<i>Guanlong</i>	~2.4	“				355	.353
IVPP V14531:~ 110 :~3.60							
<i>Dilong</i>	1.3	“	~150	26	~13	189	.188
IVPP V14243: 7.7 :1.81							
<i>Yutyrannus</i>	~2.1	“	~ 245	~42	~24	~311	~.309
ZCDM 5000:~ 580 :6.50 ZCDM 5001:~ 1290 :8.50							
<i>Nanotyrannus?</i>	1.43	“	154	23	37	214	.207
BMRP 2002.4.1: 530 :7.20 BMRP 2006.4.4:~ 660 :7.74							
<i>Albertosaurus libratus</i>	2.5	"	275	65	30	370	.357
AMNH 5458: 2690 :10.25							
immature	2.3	“	252	56	36	344	.332
TCM 2001.89.1: 1320 :8.30							
juv	2.3	"	275	40	30	345	.333
AMNH 5664: 790 :7.00							
juv	2.2	“	263	36	35	334	.322
TMP 1991.36.5000: 590 :6.45							
juv	~1.9	“	~235	~30	~26	~291	~.281
TMP 2009.12.14:~ 300 :5.43							
<i>A. sarcophagus</i>	2.7	“				400	.386
ROM 807: 2870 :10.20							
<i>Daspletosaurus</i>	2.75	"	290	80	40	410	.396

AMNH 5438:**2750**:10.00

<i>Tarbosaurus</i>	2.65	“				392	.378
PIN 551-1, etc.:~ 4580 :~12.00							
subadult	2.7	"				401	.387
PIN 551-3: 2460 :9.70							
juv	2.5	"				375	.362
MgD-1/3: 860 :7.00							
juv	2.3	“				335	.323
PIN 552-2: 600 :6.40							
<i>Raptorex?</i> juv	1.95	“	224	33	~30	287	.285
LH PV18: 75 :3.38							
<i>Tyrannosaurus rex</i>	3.2	“	315	90	53	479	.462
CM 9380: 6540 :12.69							
	3.15	“	330	91	52	473	.456
RSM P2523.8: 7460 :13.33							
<i>T. imperator</i>	3.2	“	335	93	50	478	.461
FMNH PR2081: 7380 :13.21							
<i>T. regina</i>	3.05	“	334	77	46	457	.441
NHMAD(exBHI 3033): 7500 :13.50							
	2.9	“	310	73	51	434	.419
USNM 555000: 6080 :12.80							
<i>T. sp.</i>	3.4	"	350	92	53	495	.498
AMNH 5027: 6960 :~12.70							
<i>Ornitholestes</i>	~1.54	"	~188	8	~32	~228	.223
AMNH 619:~ 13.7 :2.07							
<i>Scipionyx</i> juv	~2.25	"	190	110	~33	~333	.326
SAS: 0.11 :0.37							
<i>Compsognathus longipes</i> juv	2.1	"	232	30	46	308	.302
BSP 1563: 0.63 :0.67							
<i>C. corallestris</i>	1.55	“	192	13	28	233	.228
MNHN CNJ79: 2.1 :1.09							
<i>Juravenator</i> juv.	2.1	“	217	52	~40	309	.302
JME Sch 200: 0.3 :0.52							
<i>Sinosauropteryx prima</i> juv	1.82	"	203	35	31	269	.264
GMV 2123: 0.27 :0.53 NIGP 127587:~ 1.2 :0.86							
<i>Sinosauropteryx?</i>	1.15	“	140	20	11	171	.168
GMV 2124: 1.25 :1.03							

<i>Sinocalliopteryx</i> JMP-V—05-8-01: 21 :2.52	1.31	“	156	24	14	194	.190
<i>Huaxiagnathus</i> CAGS-IG01-301:~ 6 :~1.52	1.7	“	189	27	~36	252	.247
<i>Haplocheirus</i> IVPP V15988: 21 :2.14	2.1	“	280	27	307	.301	
<i>Deinocheirus</i> MPC-D100/127: 5520 :13.20 MPC-D 100/128: ~ 2300 :9.80 MPC-D 100/18:~ 4600 :~12.40	2.4	“	330	36	366	.353	
<i>Sinornithomimus</i> IVPP 11797-10: 51 :3.23	1.52	“	212	20	232	.220	
<i>Gallimimus</i> DSP 100/11: 510 :6.60	1.76	"	225	35	260	.255	
juv MgD-1/94: 31 :2.67 MPC-D100/10:~ 11 :1.92	1.62	"	215	25	240	.235	
<i>Struthiomimus</i> AMNH 5339: 175 :4.80	1.59	"	210	25	235	.230	
“ <i>O.</i> ” <i>samueli</i> ? TMP 1995.110.0001: 194 :5.00	1.55	“	215	25	233	228	
“ <i>O.</i> ” <i>edmontonicus</i> ROM 851: 131 :4.35 ?CMN 12441:~ 210 :5.07	1.6	"	205	25	230	.225	
<i>Dromicieomimus ingens</i> CMN 12228: 164 :4.68	1.6	"	217	20	237	.232	
<i>Scansoriopteryx</i> juv IVPP V12653: 0.0036 :0.130 CAGS 607:~ 0.0075 :0.165	1.67	“	129	98	20	247	.242
<i>Yi</i> STM 31-2:~ 0.17 :0.47	~1.65	“	“	“	“	“	“
<i>Epidexipteryx</i> IVPP V15471: 0.25 :0.51	1.9	“	198	82	1	281	.275
<i>Caihong juji</i> PMoL-B00175: 0.33 :~0.71	0.91	“	88	40	3	131	.132
<i>Anchiornis</i> LPM-B00169: 0.3 :0.66	1.06	“	102	44	6	152	.153
<i>Eosinopteryx</i>	1.08	“	104	46	6	156	.157

YFGP-T5197:**0.13**:0.49

<i>Daurlong</i> IMMNH PV00731: 5.5 :1.80	0.94	“	104	29	6	139	.136
<i>Tianyuraptor</i> UPM-0008: 8.6 :1.93	~1.19	“	106	55	~15	176	.172
STMI-3:~ 11 :~2.00	~1.38	“	~125	~60	~20	~205	~.201
<i>Halszkaraptor</i> MDC D-102/109: 0.61 :0.76	~1.4	“	~120	66	22	208	~204
<i>Buitreraptor</i> MOCA 24.5: 3.6 :1.44	1.22	“	98	58	~25	181	.177
<i>Bambiraptor</i> juv FIP 001: 2.4 :1.19 FIP 002:~ 7 :1.70	1.42	"	110	85	15	210	.206
<i>Sauornitholestes</i> UALVP 55700: 16.5 :2.15	1.66	“	147	78	~20	245	.240
<i>Deinonychus</i> composite>YPM 5232:~ 40 :~2.65 YPM 5210:~ 60 :~3.00	~2.19	"	~208	94	32	~334	~.317
ug MCZ 4371:~ 80 :3.36	~2.2	“					
<i>Velociraptor mangas</i> IVPP V 16923:~ 21 :2.30	~1.72				~254	~249	
<i>V. mongoliensis</i> MPC-D 100/25: 13 :1.85 100/986:~ 28 :2.38 AMNH 6515:~ 8 :~1.60	2.05	"	182	86	34	302	.296
<i>Jinfengopteryx</i> CAGS IG 04 0801: 0.5 :0.74	1.23	“	112	60	10	182	.178
<i>Lianoningvenator</i> DNHM D3012:~ 1.8 :1.11	~1.28	“	~113	~62	~14	~189	.185
<i>Mei</i> IVPPV12733: 0.49 :0.81	0.93	“	88	43	7	138	.135
<i>Sinornithoides</i> IVPP V9612: 2.9 :1.40	1.06	“	102	41	13	156	.153
<i>Sinovenator</i>	0.85	“	87	28	10	125	.123

NA:26.5:3.15

<i>Jianianhualong</i> juv DLXH 1218:2:1.16	1.26	“	116	50	20	186	182
<i>Gobivenator</i> MPC-D 100/86:10:2.00	1.28	“	120	50	20	190	.186
<i>Stenonychosaurus?</i> MOR 7.24.8.64:~75:~3.50 MOR:~39:2.80 GI 100/1:~25:????? AMNH 6516:~14:~2.00	~1.76	“				~260	~.255
<i>Jaculinykus</i> MPC-D 100/209:~1.6:1.14	~1.05	“	~139		~16	~155	~152
<i>Shuvuuia</i> MPD 100/120:~0.8:0.82	1.5	“	~210		~13	~223	~.219
protarchaeoptygid composite>GMV 2125:1.7:1.20	~1	“				~150	~.147
<i>Caudipteryx</i> GMV 97-9-A:2.5:1.49	0.77	"	110		3	113	.111
<i>Avimimus</i> PIN 3907-1:~13.7:2.05	~1.59	“				~236	~.231
<i>Anzu</i> composite>CM 78000:~265:5.25 CM 780001:~230:~:5.02	~1.83	“				~270	.265
<i>Gigantoraptor</i> LH V0011:~2340:11.00	~1.76	“				~260	~.255
<i>Oviraptor</i> AMNH 6517:~25:~2.60	~1.42	“				~210	~.206
<i>Citipati</i> MPC-D 100/42:~86:~3.50	2	“	282		12	294	.288
juv MPC-D 100/1127 & 1002:~5.2:1.45	1.69	“	242		8	250	.245
<i>Conchoraptor</i> MPC-D 100/30:18 :2.40	1.28	“	180		10	190	.186
<i>Oksoko</i> juv composite>MPC-D 100:30:2.78	~1.4	“				~210	.206

THERIZINOSAURS

<i>Falcarius</i> UMNH:117:3.45	~2.85	“		~412	.412
<i>Jianchangosaurus</i> 41HIII-0308A:~26:2.07	~2.9	“		~424	~.424
<i>Beipiaosaurus</i> IVPP V11559:48:2.65	~2.6	“		~375	~.375
<i>Alxasaurus</i> IVPP 88402L:~500:5.55	~2.9	“		425	~.425
<i>Nothronychus</i> UMNH VP16420:~990:~7.15	~2.7	“		~390	~.390
<i>Nanshiungosaurus</i> Type:~720: ~5.70	~3.9	“		~560	~.560

VOLANT AVEPODS	k		main body	flight muscles	total	x 0.925 x 1.06 feathers
<i>Archaeopteryx</i> <i>siemensii</i> MB AV.101:0.22-0.23:0.525	1.54- 1.61	"	211	17-27	228- 238	.223-.233
<i>A. lithographica</i> NHMUK 37001:0.32-0.34:0.605	1.45- 1.52	"	199	16-26	215- 225	211-.221
<i>A. grandis</i> juv JM 2257:0.060-0.064:0.37	1.19- 1.25	"	164	13-21	177- 185	.173-.181
<i>Sinornithosaurus</i> <i>millenii</i> IVPP V12 811:2.95-3.1:1.48	0.91- 0.97	“	78/39/7=124	11-19	135- 143	.132-.140
<i>S. zhaoianus</i> IVPP V13352:0.62-0.65:0.97 LVH 0026:0.91-0.95:1.10	0.68- 0.71	“	91	9-13.5	100- 105	.99-.103
<i>Jeholraptor</i> DNHM D2140:2.7-2.9:1.40	1-1.05	“	81/37/~16=134	14-21	148- 155	.145-152

<i>Wulong</i> juv?	1.1- 1.15	“ 80/48/20=148	15-22	163- 170	.160-167
DNHM D2933:	0.7-0.73 :0.86				
<i>Jeholornis</i>	1.92	“ 246	38	284	.278
IVPP V13274:	0.81 :0.75				
<i>Sapeornis</i>	1.82	“ 251	39	270	.264
IVPP V12698 & CAGS IG 02 609:	1 :0.81				
<i>Confuciusornis</i>	1.68	“ 212	36	248	.243
0.19 :0.48					
<i>Sinornis</i>	1.63	“ 207	35	242	.237
BPV 538:	0.015 :0.21	IVPP V9769:	0.02 :0.23		
<i>Yixianosaurus</i>	2.25	“ 298	32	330	.323
IVPP V13631:	0.17 :0.42				
<i>Longipteryx</i>	3.35	“ 393	102	495	.485
IVPP					
V12325:	0.075 :0.28				
<i>Ichthyornis</i>	7.8	“ 940	214	1154	1.131
FHSM18702:	0.58 :0.42				

FLIGHTLESS BIRDS

tibia

<i>Hesperornis regalis</i>	0.6	.75	234	30	264	.251
YPM 1200 etc:	12.9 :2.78					
“ <i>H.</i> ” <i>rossicus</i>						
VPM 26306/2:~	23 :~3.30					
<i>Emeus</i>	0.82	“			384	.346
CM viiic:	87 :4.73					
<i>Dinornis</i>	0.39	”			182	.165
CM 1.2.15:	252 :8.65	NHMUK A608:~	274 :8.89	:~	380 :9.90	
<i>Aepyornis</i>	0.7	“			330	.297
MNHN:	320 :7.70	MNHN:~	370 :8.10			
<i>Dromornis</i>	~0.8	“			~375	~.338
UCMP composite:	~	380 :7.80				