

Cal/Ecotox Exposure Factors for Pallid Bat (*Antrozous pallidus*)*

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Endpoint Type	Endpoint Value	Error	Range	Units	Sex	Life Stage	Location	Note	Reference
Age at Fledging, Metamorphosis, Weaning	7-10			wks	B	Juvenile	Lab	a	1
Age at Sexual Maturity	>1			yr	M	Adult	AZ	b	2
Age at Sexual Maturity	1			yr	F	Yearling	AZ	c	2
Body Weight - Mean	39.2	2.6 SE		g	F	Adult	Lab	d	3
Body Weight - Mean	36.0	1.9 SE		g	F	Adult	Lab	e	3
Body Weight - Mean	21.7	2.03 SD		g	F	Adult	OR	f	4
Body Weight - Mean	25.3		22.3-30.5	g	F	Adult	Lab	g	5
Body Weight - Mean	34.7			g	F	Adult	Kern; San Luis Obispo; CA	h	6
Body Weight - Mean	24.3			g	F	Adult	Kern; San Luis Obispo; CA	i	6
Body Weight - Mean	21.7	0.2 SE		g	M	Adult	Napa; CA	j	3
Body Weight - Mean	32.6	0.9 SE		g	M	Adult	Napa; CA	k	3
Body Weight - Mean	23.0		19.9-27.3	g	M	Adult	Lab	l	5
Body Weight - Mean	25.2			g	M	Adult	Kern; San Luis Obispo; CA	m	6
Body Weight - Mean	20.6			g	M	Adult	Kern; San Luis Obispo; CA	n	6
Body Weight - Mean	33.1	0.9 SE		g	F	Juvenile	Lab	o	3
Body Weight - Mean	23.3		21.0-26.8	g	F	Juvenile	Lab	p	5
Body Weight - Mean	Review				B	NR		q	7
Clutch or Litter Size			1-2	#/litter	F	Adult	Napa; CA	r	8
Clutch or Litter Size	1.8		1-3	young	F	Adult	Kern; San Luis Obispo; CA	s	6
Clutch or Litter Size			1-2	pups	F	Adult	AZ	t	2
Clutch or Litter Size	Review				B	NR		u	9
Clutch or Litter Size	Review				B	NR		v	7
Dietary Composition	Lepidoptera (48%), Coleoptera (25%), Orthoptera (14%), Other (Neuroptera, Chilopoda, Hymenoptera, Isoptera, Arachnida, Diptera, Odonata, Perognathus flavus; 13%)			%	NR	Adult	MEXICO	w	10
Dietary Composition	Review				B	NR		x	9
Dietary Composition	Review				B	NR		y	7
Dietary Composition	Lepidoptera (22.2), Gryllidae or Tettigoniidae (11.1), unident. insects (38.9), unident. Coleoptera (1.7), Cercopidae and Cicadellidae (1.7), Mymeleontidae (8.9), Carabidae (11.1), unident. Orthoptera (4.4)			%	NR	NR	TX	z	11
Dietary Composition	Lepidoptera (20.0), unident. Orthoptera (60.0), unident. insects (20.0)			%	NR	NR	OR	aa	12
Duration of Incubation or Gestation	9			wks	F	Adult	Kern; San Luis Obispo; CA	ab	6

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Duration of Incubation or Gestation	Review				B	NR		ac	7
Food Ingestion Rate			3.5-4.7	g/d	B	Adult	Lab	ad	6
Food Ingestion Rate			4-12	g/mo	M	Adult	Lab	ae	13
Food Ingestion Rate	Review				B	NR		af	9
Foraging Distance	3			km	NR	Adult	MEXICO	ag	10
Growth Rate	2.569	r ² =0.94		%/d	B	Juvenile	Napa; CA	ah	8
Growth Rate	25			g/2-3 mo	B	Juvenile	Lab	ai	1
Growth Rate	11			g/7 wks	M	Juvenile	AZ	aj	2
Inhalation Rate	0-52			respirations /min	B	Adult	Lab	ak	6
Inhalation Rate	see citation				NR	Adult	Lab	al	14
Inhalation Rate			550-680	breaths/min	NR	Adult	Lab	am	15
Inhalation Rate			100-150	breaths/min	NR	Adult	Lab	an	15
Longevity	57			mo	NR	Adult	Lab	ao	16
Metabolic Rate	see citation				F	Adult	Napa; CA	ap	17
Metabolic Rate	0.47			ml O2/g BW/hr	NR	Adult	Lab	aq	14
Metabolic Rate			0.78-5.0	ml O2/g BW/hr	NR	Adult	Lab	ar	14
Metabolic Rate	see citation				NR	Adult	Lab	as	15
Metabolic Rate	see citation			ml O2/g/hr	B	Both Adult and Juv.	Lab	at	5
Metabolic Rate	see citation				B	Juvenile	Napa; CA	au	17
Survival/ Mortality	Review				B	NR		av	9
Survival/ Mortality	Review				B	NR		aw	7
Time of Hatching or Parturition	late May through June				B	Adult	AZ	ax	18
Time of Hatching or Parturition	May 27-June 18				F	Adult	Napa; CA	ay	17
Time of Hatching or Parturition	June 17 (initiation)				F	Adult	OR	az	4
Time of Hatching or Parturition	mid-June				F	Adult	AZ	ba	2
Time of Hatching or Parturition	Review				B	NR		bb	9
Time of Hatching or Parturition	Review				B	NR		bc	7
Time of Mating/ Laying	late Oct.-Nov.				B	Adult	Kern; San Luis Obispo; CA	bd	6
Time of Migration or Dispersal	mid-Oct.				B	Both Adult and Juv.	Kern; San Luis Obispo; CA	be	6
Time of Migration or Dispersal	August				B	Juvenile	AZ	bf	18
Time of Migration or Dispersal	Review				B	NR		bg	9
Time of Molt	May-Aug.				B	Adult	Kern; San Luis Obispo; CA	bh	6
Time of Torpor or Hibernation	late Mar.-early Apr.				B	Adult	Kern; San Luis Obispo; CA	bi	6

Notes

- a age at weaning; N=20 bats
- b N=NR
- c N=NR
- d N=3; Apr-May; bats were collected in Napa county, CA

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e N=6; August; bats were collected in Napa county, CA
f mean body weight for lactating females; N=39; Condition=breeding; Apr.-Jul.; John Day River Valley, 44deg 55' N, 120deg 27' W
g N=5
h N=10; Condition=late pregnancy; June
i N=15; Condition=ovulating; April
j N=135; Apr.-Sept.
k N=10; Oct., Dec.
l N=5
m N=16; June
n N=NR; N=2; April
o N=8; August; bats were collected in Napa county, CA
p N=5
q N=NR
r N=40 bats; Napa, CA
s N=28 bats
t N=50; 66% of observed females had twins
u N=NR
v N=NR
w percent occurrence in diet based on on culled parts and scat analysis; N=150 bats; Condition=breeding; Jun-Aug; Hidalgo county
x N=NR
y N=NR
z percent volume of stomach contents; N=9; Jun.-Sept.; Big Bend National Park
aa Percent volume of stomach contents; N=5 bats
ab estimation based on observations in wild and captive bats; N=NR
ac N=NR
ad range of mean daily intake of mealworms by captive bats; N=3 bats
ae range of mean monthly rates of ingestion of mealworm diet, measured over three years; N=NR; bats collected in Napa, CA
af N=NR
ag max. distance travelled from roost during foraging; N=150 bats; Condition=breeding; Jun-Aug
ah slope of growth curve of % adult forearm length per d, 0-22 d of age; N=63 bats; Napa, CA
ai increase in body weight over time (to adult weight); N=20 bats; see paper for growth curves
aj body weight increase over time in males; N=9-18 bats; growth rate of females was not different from males; see citation for growth curves
ak respiration rate in dormant bats at 40 deg F; N=NR
al figure of breaths/minute over time; N=NR
am breathing rate of active animals at 25 C; N=NR; 50 mi. NE of Berkeley (capture location)
an breathing rate of resting animals at 25 C; N=NR; 50 mi. NE of Berkeley (capture location)
ao captive longevity record; N=NR
ap no values reported; see figures in paper; N=30; Condition=breeding; Napa Valley
aq estimated oxygen consumption of resting animals at 25 C; N=NR; animals captured at San Joaquin Experimental Range, CA
ar estimated oxygen consumption of animals with wings extended, at 25-27 C; N=NR; animals captured at San Joaquin Experimental Range, CA
as figure of metabolic heat production; N=NR; 50 mi. NE of Berkeley (capture location)
at figure of O2 consumption at varying ambient temperatures; N=5 bats/group
au no values reported; see paper for figures; N=30; Napa Valley
av N=NR
aw N=NR
ax time of parturition through time when young begin to fly; N=NR; Camp Verde, Yavapai County
ay N=30; Condition=breeding; Napa Valley; pregnant females were captured in the field and gave birth in captivity
az date of first capture of a lactating female; N=39; Condition=breeding; Apr.-Jul.; John Day River Valley, 44deg 55' N, 120deg 27' W; lower spring temperatures correlated with lower number of reproducing females
ba N=NR

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bb	N=NR
bc	N=NR
bd	period over which copulation occurs; N=1 male, 5 females
be	time of dispersal of summer roost colonies; N=NR
bf	juvenile dispersal; N=NR; Camp Verde, Yavapai County
bg	N=NR
bh	N=NR; peak molt observed in June and July
bi	end of winter dormancy period; N=NR

References

- 1 Brown, Patricia. 1976. Vocal communication in the pallid bat, *Antrozous pallidus*. *Z. Tierpsychol.* 41:34-54.
- 2 Davis, Russell. 1969. Growth and development of young pallid bats, *Antrozous pallidus*. *J. Mammal.* 50:729-736.
- 3 Beasley, Laura J., Kimberly M. Pelz and Irving Zucker. 1984. Circannual rhythms of body weight in pallid bats. *Am. J. Physiol.* 246(6):R955-R958.
- 4 Lewis, Susan E. 1993. Effect of climatic variation on reproduction by pallid bats (*Antrozous pallidus*). *Can. J. Zool.* 71:1429-1433.
- 5 Trune, Dennis R., and C.N. Slobodchikoff. 1976. Social effects of roosting on the metabolism of the pallid bat (*Antrozous pallidus*). *J. Mammal.* 57(4):656-663.
- 6 Orr, Robert T. 1954. Natural history of the pallid bat, *Antrozous pallidus* (LeConte). *Proc. Calif. Acad. Sci.* 28(4):165-246.
- 7 Hermanson, John W. and Thomas J. O'Shea. 1983. *Antrozous pallidus*. *Mamm. Species.* 213:1-8.
- 8 Bassett, John E. 1984. Litter size and postnatal growth rate in the pallid bat, *Antrozous pallidus*. *J. Mammal.* 65(2):317-319.
- 9 Barbour, R.W. and W.H. Davis. 1969. *Bats of America*. Lexington, KY: University of Kentucky Press. 285 p.
- 10 Bell, G.P. 1982. Behavioral and ecological aspects of gleaning by a desert insectivorous bat, *Antrozous pallidus* (Chiroptera: Vespertilionidae). *Behav. Ecol. Sociobiol.* 10(3):217-223.
- 11 Easterla, David A. and John O. Whitaker, Jr. 1972. Food habits of some bats from Big Bend National Park, Texas. *J. Mammal.* 53:887 - 890.
- 12 Whitaker, John O., Jr., Chris Maser, and Stephen P. Cross. 1981. Food habits of eastern Oregon bats, based on stomach and scat analysis. *Northwest Sci.* 55(4):.
- 13 Beasley, L.J. 1985. Seasonal cycles of pallid bats (*Antrozous pallidus*): proximate factors. *Myotis.* 23-24:115-123.
- 14 Chew, Robert M. and Harold E. White. 1960. Evaporative water losses of the pallid bat. *J. Mammal.* 41(4):452-58.
- 15 Licht, Paul, and Philip Leitner. 1967. Physiological responses to high environmental temperatures in three species of microchiropteran bats. *Comp. Biochem. Physiol.* 22:371-387.
- 16 Jones, Marvin L. 1982. Longevity of captive mammals. *Zool. Gart.* 52(2):113-128.
- 17 Beasley, Laura J. and Michael Leon. 1986. Metabolic strategies of pallid bats (*Antrozous pallidus*) during reproduction. *Physiol. Behav.* 36(1):159-166.
- 18 O'Shea, Thomas J. and Terry A. Vaughn. 1977. Nocturnal and seasonal activities of the pallid bat, *Antrozous pallidus*. *J. Mammal.* 58(3):269-284.

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