

Attachment 10 Acceptable Toxicity Studies for the Selection of Mammal Dietary Toxicity Reference Values

ANALYTE	CHEMICAL FORM	TEST SPECIES	NOAEL (mg/kg bw/day)	LOAEL (mg/kg bw/day)	EXPOSURE ROUTE	EXPOSURE DURATION	ENDPOINT	EFFECT ENDPOINT	SOURCE
Metals									
Antimony	Sb ₂ O ₃	rat	1,489	na	food	90 days	growth, survival	body weight	Hext et al. (1999)
Arsenic	Sodium arsenite-NaAsO ₂	Osborne-Mendel rat	na	5.4	food	2 years	growth	female body weight	Byron et al. (1967)
Arsenic	Sodium arsenite-NaAsO ₂	Osborne-Mendel rat	2.6	na	food	2 years	growth	female body weight	Byron et al. (1967)
Cadmium	CdCl ₂	beagle dog	0.88	na	food	3 mos	growth	female body weight	Loeser and Lorke (1977b)
Cadmium	CdCl ₂	Wistar rat	3.0	na	food	3 mos	survival, growth	adult survival, growth	Loeser and Lorke (1977a)
Cadmium	CdCl ₂	Long-Evans rat	3.5	13	food	10 days (pregnancy)	growth	maternal body weight	Machemer and Lorke (1981)
Cadmium	CdCl ₂	Long-Evans rat	13	na	food	10 days	survival, reproduction	adult survival; fertility, fetus weight/survival/malformations	Machemer and Lorke (1981)
Cadmium	CdCl ₂	shrew	115	na	food	12 wks	growth	female body weight	Dodds-Smith et al. (1992)
Cadmium	CdCl ₂	shrew	na	115	food	12 wks	growth	male body weight	Dodds-Smith et al. (1992)
Cadmium	cadmium	Sprague-Dawley rat	na	189	food	12 wks	growth, reproduction	pup birth weight; adult body weight	Pond and Walker (1975)
Chromium	Cr picolinate	Sprague-Dawley rat	0.14	na	food	12 wks	growth	body weight and growth rate	Hasten et al. (1997)
Chromium	CrCl ₃ or Cr picolinate	Sprague-Dawley rat	8.3	na	food	20 wks	growth, survival		Anderson et al. (1997)
Chromium	chromic oxide green	rat	1,292	na	food	90 days	growth, reproduction	body weight, litter size, pregnancy rate, pup malformation	Ivankovic and Preussman (1975)
Chromium	chromic oxide green	rat	1,466	na	food	2 yrs	growth, survival	body weight	Ivankovic and Preussman (1975)
Cobalt	cobaltous chloride	Sprague-Dawley rat	0.1 ^b	1.0	diet	4 wks	growth	body weight	Chetty et al. (1979)

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Cobalt	cobalt sulfate	guinea pigs	na	1.4	diet	5 wks	survival		Mohiuddin et al. (1970)
Cobalt	cobalt sulfate	guinea pigs	1.4	na	diet	5 wks	growth		Mohiuddin et al. (1970)
Cobalt	cobalt chloride	hooded rats	1.9	10	diet	3 days	growth	body weight	Wellman et al. (1984)
Copper	CuSO ₄	mink	na	26	food	357 days	reproduction	kit survival, litter mass	Aulerich et al. (1982)
Copper	CuSO ₄	mink	18	na	food	357 days	reproduction	kit survival, litter mass	Aulerich et al. (1982)
Copper	CuSO ₄	mink	43	na	food	153-657 d	growth	body weight	Aulerich et al. (1982)
Copper	CuSO ₄ *5H ₂ O	rat	137	na	food	13 wks	survival		NTP (1993)
Copper	CuSO ₄ *5H ₂ O	rat	67	137	food	13 wks	growth	body weight	NTP (1993)
Copper	CuSO ₄ *5H ₂ O	rat	93	197	food	2 wks	growth	body weight	NTP (1993)
Copper	copper chloride	shrew	267	na	food	weanlings for 12 wks	survival, growth	body weight	Dodds-Smith et al. (1992)
Copper	CuSO ₄ *5H ₂ O	rat	305	na	food	2 wks	survival		NTP (1993)
Copper	CuSO ₄ *5H ₂ O	mouse	467	na	food	13 wks	survival		NTP (1993)
Copper	CuSO ₄ *5H ₂ O	mouse	227	467	food	13 wks	growth	body weight	NTP (1993)
Copper	CuSO ₄ *5H ₂ O	mouse	749	na	food	2 wks	survival, growth		NTP (1993)
Lead	Lead acetate	rat	11	90	food	2 years	growth	Offspring weight and kidney damage	Azar et al. (1973)
Mercury	Methylmercuric chloride	Wistar rat	0.0017 ^a	0.0084	food	3 gen	growth		Verschuuren et al. (1976)
Mercury	Methylmercuric chloride	Wistar rat	0.19	na	food	3 gen	survival, reproduction		Verschuuren et al. (1976)
Mercury	Methylmercuric chloride	mink	0.16	0.25	food	93 days	growth, survival		Wobeser et al. (1976)
Mercury	methyl-mercury	mink	na	0.64	food	2 months	growth, survival		Aulerich et al. (1974)
Molybdenum	soluble arsenite	mouse	na	2.58	food and drink water	3 generation	reproduction, survival	decreased litter size	Schroeder and Mitchener (1971)
Nickel	NiCl ₂	Sprague-Dawley rat	20	na	food	14 days + 61 days untreated	growth	body weight	Nation et al. (1985)
Nickel	Ni	Wistar rat	na	20	food	3 generations	reproduction	increased number of stillborns in F1 generation	Ambrose et al. (1976)
Nickel	Ni(SO ₄) ₄	Wistar rat	na	87	food	2 yrs	growth	body weight	Ambrose et al. (1976)

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Nickel	Ni(SO) ₄	Wistar rat	8.4	na	food	2 yrs	growth	body weight	Ambrose et al. (1976)
Nickel	nickel acetate	Webster Swiss mouse	na	169	food	4 wks	growth	body weight	Weber and Reid (1969)
Nickel	nickel acetate	Webster Swiss mouse	210	na	food	weanling thru reprod	reproduction	number of pups weaned	Weber and Reid (1969)
Nickel	Ni(SO) ₄	Wistar rat	230	na	food	2 yrs	survival		Ambrose et al. (1976)
Nickel	nickel acetate	Webster Swiss mouse	na	313	food	weanling thru reprod	reproduction	number of pups weaned	Weber and Reid (1969)
Nickel	Ni(SO) ₄	beagle dog	2500	na	food	2 yrs	survival		Ambrose et al. (1976)
Selenium	NaSeO ₃ or seleniferous wheat	Sprague-Dawley rat	na	0.080	food	6 wks	growth	body weight	Halverson et al. (1966)
Selenium	NaSeO ₃ or seleniferous wheat	Sprague-Dawley rat	0.055	na	food	6 wks	growth	body weight	Halverson et al. (1966)
Selenium	NaSeO ₃ or seleniferous wheat	Sprague-Dawley rat	na	0.14	food	6 wks	survival	survival	Halverson et al. (1966)
Selenium	NaSeO ₃ or seleniferous wheat	Sprague-Dawley rat	0.13	na	food	6 wks	survival	survival	Halverson et al. (1966)
Selenium	L-selenomethionine	Wistar rat	na	0.16	food	110 days	growth	body weight	Behne et al. (1992)
Selenium	selenite	Wistar rat	0.16	na	food	110 days	growth	body weight	Behne et al. (1992)
Selenium	Na ₂ SeO ₃ , Nano-Se, or organic selenium	Sprague-Dawley rat	0.17	0.28	food	13 wks	growth	body weight	Jia et al. (2005)
Selenium	selenomethionine	hamster	0.36	na	food	21d	growth	body weight	Julius et al. (1983)
Selenium	selenomethionine	hamster	na	0.76	food	21d	growth	body weight	Julius et al. (1983)
Selenium	Na ₂ SeO ₃	hamster	na	3.4	food	21d	growth	body weight	Julius et al. (1983)
Selenium	Na ₂ SeO ₃	hamster	na	5.8	food	21 d	survival	female survival	Julius et al. (1983)

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Thallium	thallium sulfate	rat	0.74	na	drink water	60 d	growth		Formigli et al. (1986)
Vanadium	vanadium sulfate	mouse	1.05	na	food and drink water	lifetime (1 yr)	growth	body weight	Schroeder and Balassa (1967)
Vanadium	sodium meta-vanadate	Wistar rat	na	2.7	food	10 weeks	growth	body weight	Adachi et al. (2000)
Vanadium	sodium meta-vanadate	Sprague-Dawley rat	na	6.5	food	reproduction period	growth, reproduction	maternal body weight, offspring body weight gain and survival	Elfant and Keen (1987)
Zinc	zinc oxide	Sprague-Dawley rat	160	320	food	gestation	reproduction	fetal growth, number of resorptions	Schlicker and Cox (1968)
Zinc	zinc oxide	ferret	149	433	food	2wks-6 mos	growth		Straube et al. (1980)
Zinc	zinc carbonate	rat	400	799	food	gestation	growth	body weight	Sutton and Nelson (1937)
Organometals									
TBT	tributyltin chloride	Wistar rat	0.4	2.0	food	multi-generational	reproduction	pup body weight	Omura et al. (2001)
TBT	tributyltin chloride	Wistar rat	na	2.0	food	reproduction period	reproduction	pup body weight	Makita et al. (2003); Makita et al. (2004)
TBT	bis (tri-n-butyltin) oxide	Wistar rat	0.21	2.1	food	106 wks	growth, survival	body weight (male), survival	Wester et al. (1990)
TBT	tributyltin chloride	Wistar rat	2.0	10	food	multi-generational	reproduction	pup body weight, percentage of live pups	Ogata et al. (2001)
DBT	dibutyltin dichloride	Wistar rat	3.8	7.6	gavage	3 days during pregnancy	growth	maternal body weight	Harazono and Ema (2003)
DBT	dibutyltin dichloride	Wistar rat	1.5	7.6	gavage	3 days during pregnancy	reproduction, growth	reduced no. implantations, no. of females pregnant, increased rate of postimplantation loss, reduced maternal body weight	Ema et al. (2003)
PAHs									
Benzo(a)pyrene	benzo(a)pyrene	mouse	2.0 ^a	10	gavage	gestation (10 days)	reproduction	pup body weight, testes weight	MacKenzie and Angevine (1981)
Benzo(a)pyrene	benzo(a)pyrene	mouse	33.3	na	food	up to 115 days	survival	survival	Neal and Rigdon (1967)
Naphthalene	Naphthalene	mouse	133	na	gavage	90 d	survival, growth	body weight, adult survival	Shopp et al. (1984)
Naphthalene	Naphthalene	mouse	na	300	gavage	8 days of pregnancy	survival, reproduction	maternal survival; litter size	Plasterer et al. (1985)

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1-methylnaphthalene	1-methylnaphthalene	B6C3F1 mouse	150	na	food	81 weeks	growth	body weight	Murata et al. (1993)
2-methylnaphthalene	2-methylnaphthalene	mouse	54	114	food	81 wks	growth	body weight	Murata et al. (1997)
Phthalates									
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, CD-1	44	na	food	17 days (pregnancy)	reproduction	fetal abnormalities increased	Tyl et al. (1988)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, CD-1	na	91	food	17 days (pregnancy)	reproduction	fetal abnormalities increased	Tyl et al. (1988)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	guinea pig	93	na	food	1 yr	survival, growth	life expectancy, body weight	Carpenter et al. (1953)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, COBS	14	136	food	>24 wks (2 generations)	reproduction	number of litters, viability	Lamb et al. (1987)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, ICR-JCL	na	190	food	18 days (pregnancy)	reproduction	fetal death	Shiota et al. (1980)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, ICR-JCL	70	na	food	18 days (pregnancy)	reproduction	fetal death	Shiota et al. (1980)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, CD-1	na	191	food	17 days (pregnancy)	growth	maternal body weight	Tyl et al. (1988)
Bis (2-ethylhexyl) phthalate	BEHP: di(2-ethylhexyl) phthalate	mouse, CD-1	91	na	food	17 days (pregnancy)	growth	maternal body weight	Tyl et al. (1988)
Butyl benzyl phthalate	BBP: butyl benzyl phthalate	rat	250	750	food	multi-generational (2 generations)	growth, reproduction	body weight, reduced no. live pups/litter and no. implantations, reduced offspring body weight, delayed onset of puberty	Tyl et al. (2004)
Butyl benzyl phthalate	BBP: butyl benzyl phthalate	rat, Fisher 344	831	na	food	14 days	growth	male body weight	Agarwal et al. (1985)
Butyl benzyl phthalate	BBP: butyl benzyl phthalate	Wistar rat	na	845	food	11 days (pregnancy)	reproduction	maternal weight; post-implantation embryo loss	Ema et al. (1994)

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Butyl benzyl phthalate	BBP: butyl benzyl phthalate	Wistar rat	991	na	food	20 days (pregnancy)	survival	maternal mortalities	Ema et al. (1992a; 1992b)
Butyl benzyl phthalate	BBP: butyl benzyl phthalate	Wistar rat	na	991	food	20 days (pregnancy)	reproduction	fetal death, fetal weight, malformations and resorptions	Ema et al. (1992a)
Butyl benzyl phthalate	BBP: butyl benzyl phthalate	rat, Fisher 344	na	1325	food	14 days	growth	male body weight	Agarwal et al. (1985)
Butyl benzyl phthalate	BBP: butyl benzyl phthalate	rat, Fisher 344	1570	na	food	14 days	survival	male	Agarwal et al. (1985)
Dibutyl phthalate	DBP: di-n-butyl phthalate	rat, Sprague-Dawley	16 ^a	80	food	~24 wks (2 gen)	reproduction	fertility, pup weight, pup viability, mating	Wine et al. (1997)
Dibutyl phthalate	DBP: di-n-butyl phthalate	rat, Sprague-Dawley	641	na	food	~24 wks (2 gen)	survival		Wine et al. (1997)
Dibutyl phthalate	DBP: di-n-butyl phthalate	rat, Sprague-Dawley	320	641	food	~24 wks (2 gen)	growth	body weight	Wine et al. (1997)
Dibutyl phthalate	DBP: di-n-butyl phthalate	mouse, ICR-JCL	660	na	food	18 days (pregnancy)	growth	maternal weight	Shiota et al. (1980)
Dibutyl phthalate	DBP: di-n-butyl phthalate	mouse, ICR-JCL	na	660	food	18 days (pregnancy)	reproduction	decrease in male fetal weight	Shiota et al. (1980)
Dibutyl phthalate	DBP: di-n-butyl phthalate	mouse, ICR-JCL	350	na	food	18 days (pregnancy)	reproduction	decrease in male fetal weight	Shiota et al. (1980)
Dibutyl phthalate	DBP: di-n-butyl phthalate	rat, Sprague-Dawley	200	999	food	1 yr	survival		Smith (1953)
Diethyl phthalate	DEP: diethyl phthalate	mouse, COBS	3721	na	food	>24 wks (2 gen)	survival		Lamb et al. (1987)
Diethyl phthalate	DEP: diethyl phthalate	mouse, COBS	1860	3721	food	>24 wks (2 gen)	growth, reproduction	body weight; number of live pups per litter in F1 generation	Lamb et al. (1987)
Di-n-octyl phthalate	DNOP: di-n-octyl phthalate	rat, Sprague-Dawley	377	na	food	13 wks	growth, survival	body weight	Poon et al. (1997)
Di-n-octyl phthalate	DNOP: di-n-octyl phthalate	mouse, CD-1	7500	na	food	~ 26 wks	survival, growth, reproduction	survival; body weight; fertility, number of litters, viability, sex ratio, pup weights	Heindel et al. (1989)
Other SVOCs									
1,4-dichlorobenzene	1,4-DCB	Wistar rat	3.5	na	food	42 days	growth, reproduction	offspring body weight, average litter size, sex ratio, pup viability	Makita (2005)

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1,4-dichlorobenzene	1,4-DCB	rat	54	107	gavage	1,4 or 13 wks	growth	body weight	Lake et al. (1997)
1,4-dichlorobenzene	1,4-DCB	mouse	429	na	gavage	1,4 or 13 wks	growth	body weight	Lake et al. (1997)
Dibenzothiophene	dibenzothiophene	mouse	47 ^b	470	gavage	<72 hrs	survival	LD50	Leighton (Leighton 1989)
Benzoic acid	Sodium benzoate	hamster	300	na	diet		survival, reproduction	no maternal toxicity or fetal toxicity	FDRL 1972 (as cited in IRIS (EPA 2006))
Benzoic acid		rat	80	na	diet	18 months	survival, growth	body weight, survival	Ignat'ev 1965 (as cited in IRIS (EPA 2006))
Benzoic acid		rat	50	750	diet	long-term	growth	body weight	Marquardt 1980 (as cited in IRIS (EPA 2006))
Phenol		rat	60	120	gavage	Gestational days 6 - 15	growth	maternal body weight	Argus Research Laboratories 1997 (as cited in IRIS (EPA 2006))
Phenol		rat	60	120	gavage		reproduction	decreased fetal body weight	Charles River Laboratories 1988 and NTP 1983a (as cited in IRIS (EPA 2006))
Phenol		mouse	140	280	gavage	Gestational days 6 - 15	survival, growth	survival and reduced body weight	NTP 1983b (as cited in IRIS (EPA 2006))
Biphenyl		rat	50	250	diet	3-generation	survival	longevity	Ambrose et al. 1960 (as cited in IRIS (EPA 2006))
PCBs									
PCBs (Clophen A50)	Clophen A50	mink	0.018 ^a	0.089	food	18 months	reproduction	kit growth	Brunström et al. (2001)
PCBs (Aroclor 1254)		mink	na	0.13	food	6 mos	reproduction	reduced kit growth rate	Wren et al. (1987)
PCBs (Aroclor 1254)		mink	na	0.22	food	4 and 9 months prior to giving birth	reproduction	number of offspring per female, decrease in pup body weight	Ringer (1983)
PCBs (Aroclor 1254)		mink	0.13	0.26	food	4 months	reproduction	Number of kits born alive (0% at 4 wks)	Aulerich and Ringer (1977)
PCBs (Clophen A50)	Clophen A50	mink	0.27	na	food	18 months	growth	maternal body weight	Brunström et al. (2001)
PCBs (Aroclor 1254)		mink	na	0.39	food	88-102 days	reproduction	number of kits whelped and born alive (0%)	Aulerich et al. (1985)

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PCB (mixture composition not reported)		mink	na	0.51	food	66 days	reproduction	number of kits born alive	Jensen et al. (1977)
PCBs (Aroclor 1242)		mink	na	0.65	food	8 months	reproduction	reproductive failure	Bleavins et al. (1980)
PCBs (Aroclor 1254)		mink	na	1.31	food	4 wks	weight gain in adults	weight gain in adults	Hornshaw et al. (1986)
PCBs (Aroclor 1254)		mink	na	1.64	food	3 months	reproduction	all whelps stillborn	Kihlstrom et al. (1992)
PCBs (Aroclor 1254)		mink	1.2	1.8	food	28 days	growth	female growth	Aulerich et al. (1986)
PCBs (Clophen A50)		mink	na	2.0	food	3 months	reproduction	all whelps stillborn	Kihlstrom et al. (1992)
PCBs (Aroclor 1254)		mink	1.5	2.4	food	28 days	growth	male and female growth	Aulerich et al. (1986)
PCBs (Aroclor 1016)		mink	na	2.6	food	8 months	reproduction/survival	birth weight and growth rate of kits, and 25 % adult female survival	Bleavins et al. (1980)
Organochlorine Pesticides									
Aldrin		Osborne-Mendel rat	0.8	4.1	diet	2 years	survival	increased survival	Reuber (1980)
beta-hexachloro cyclohexane (beta-BHC)	beta-HCH	Wistar rat	5.7	na	food	13 wks	growth, survival	body weight, survival	Van Velsen et al. (1986)
beta-hexachloro cyclohexane (beta-BHC)	beta-HCH	Wistar rat	na	31	food	13 wks	growth, survival	body weight, 50% survival	Van Velsen et al. (1986)
beta-hexachloro cyclohexane (beta-BHC)	beta-HCH	Wistar rat	64	na	food	2 wks	growth	body weight	Srinivasan et al. (1991)
Chlordane	tech chlordane	mouse	0.18	0.92	food	104 wk	growth	body weight-males	Khasawinah and Grutsch (1989)
Chlordane	tech chlordane	mouse	2.3	na	food	104 wk	survival		Khasawinah and Grutsch (1989)
Chlordane	tech chlordane	Osborne-Mendel rat	na	8.0	food	104 wk	growth, survival, reproduction	body weight, adult survival, viability of offspring	Ingle (1952)
Chlordane	tech chlordane	Osborne-Mendel rat	1.5	na	food	104 wk	growth, survival, reproduction	body weight, adult survival, viability of offspring	Ingle (1952)
Chlordane	tech chlordane	albino rat	na	11	food	407 d	growth	body weight-males	Ambrose et al. (1953)

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Chlordane	tech chlordane	albino rat	4.9	na	food	407 d	growth	body weight-males	Ambrose et al. (1953)
Chlordane	tech chlordane	albino rat	11	22	food	407 d	survival		Ambrose et al. (1953)
trans-Nonachlor	trans-nonachlor	Sprague-Dawley rat	2.5	25	gavage	28 days	growth, survival	body weight- female	Bondy et al. (2000)
Chlordane	tech chlordane	Sprague-Dawley rat	25	na	food	28 days	growth	body weight	Bondy et al. (2000)
Chlordane	tech chlordane	Sprague-Dawley rat	40	na	food	reproduction period	growth	body weight	Cassidy et al. (1994)
DDT	o,p'-DDT	Sprague-Dawley rat	0.24	na	food	2 generation	reproduction	litter size and weight and uterine involution	Duby et al. (1971)
DDT	p,p'-DDT	mouse	0.6	na	food	5 generation	survival, growth, reproduction	adult survival, growth, number of pregnancies, number of births, litter size, pup growth/survival	Tarjan and Kemeny (1969)
DDT	p,p'- DDT	Sprague-Dawley rat	1.0	na	food	2 generation	reproduction	litter size and weight and uterine involution	Duby et al. (1971)
Total DDT	tech DDT	Sprague-Dawley rat	1.2	na	food	2 generation	reproduction	litter size and weight and uterine involution	Duby et al. (1971)
Total DDT	"DDT"- chem form not specified, likely DDT mixture	mouse	na	1.3	food	120 days	reproduction	litter size	Ware and Good (1967)
Total DDT	"DDT"- chem form not specified, likely DDT mixture	mouse	1.3	na	food	120 days	survival		Ware and Good (1967)
Total DDT	tech DDT	Sprague-Dawley rat	1.6	na	food	23 mos	growth, survival, reproduction	adult survival, growth, viable litter size, reproductive life-span	Ottoboni (1972)
Total DDT	tech DDT	Sprague-Dawley rat	na	2.0	food	7.5 wks	reproduction	fertility	Nickerson and Sniffen (1973)
Total DDT	"DDT"- chem form not specified, likely DDT mixture	rat	0.8	4.0	food	2 yrs	reproduction	number of young surviving to weaning (63% vs. 87% lower dose and 88% in control)	Fitzhugh (1948)
Total DDT	tech DDT	Sprague-Dawley rat	na	13.4	food	36 wks	reproduction	litter size, mating and reproductive success	Jonsson et al. (1976)
DDT	p,p'-DDT	Wistar rat	1.6	16	food	6 mos	reproduction	offspring growth	Clement and Okey (1974)

ANALYTE	CHEMICAL FORM	TEST SPECIES	NOAEL (mg/kg bw/day)	LOAEL (mg/kg bw/day)	EXPOSURE ROUTE	EXPOSURE DURATION	ENDPOINT	EFFECT ENDPOINT	SOURCE
Total DDT	"DDT"- chem form not specified, likely DDT mixture	white lab mouse	na	37	food	F0 mating, gestation and weaning+F1 breeding	survival		Cannon and Holcomb (1968)
Total DDT	tech DDT	Oldfield mouse	2.4	na	food	15 mos	survival, reproduction	adult survival, litter size, litters per pair	Wolfe et al. (1979)
DDT	o,p'-DDT	Wistar rat	4.0	na	food	18-23 wks	reproduction	offspring survival, fertility, fecundity, growth	Wrenn et al. (1971)
Total DDT	tech DDT	Sprague-Dawley rat	6.7	na	food	36 wks	reproduction	litter size, mating and reproductive success	Jonsson et al. (1976)
Total DDT	tech DDT	mouse	9.2	46	food	6 generation	survival, reproduction	lifespan, pup survival	Turusov et al. (1973)
Total DDT	tech DDT	Sprague-Dawley rat	13	na	food	37 wks	survival		Jonsson et al. (1976)
Total DDT	tech DDT (DDD, DDE, DDT)	Sprague-Dawley rat	16	na	food	3 generation	survival, growth, reproduction	adult survival, growth, fertility, viability, stillbirths, litter size, abnormalities, pup survival	Ottoboni (1969)
DDT	p,p'-DDT	mouse	18	na	food	2 yrs	survival		Thorpe and Walker (1973)
Total DDT	pp'-DDT, '-DDD, -DDE	Wistar rat	21	na	food	6 wks	growth, survival	survival, body weight (males only)	Banerjee et al. (1996)
Dieldrin	dieldrin	Carworth rat	0.038 ^a	0.19	food	3 generations	reproduction	offspring survival	Treon and Cleveland (1955)
Dieldrin	dieldrin	CFE rat	0.50	na	food	2 yrs	survival, growth		Walker et al. (1969)
Dieldrin	tech dieldrin	CFS Swiss mouse	0.92	na	food	120 d	survival		Good and Ware (1969)
Dieldrin	tech dieldrin	CFS Swiss mouse	na	0.92	food	120 d	reproduction	litter size	Good and Ware (1969)
Dieldrin	dieldrin	mouse	na	0.92	food	4 wks prior to mating through gestation	reproduction	18% pup survival	Virgo and Bellward (1977)
Dieldrin	dieldrin	Carworth rat	2.2	na	food	6 mos	growth		Treon and Cleveland (1955)
Dieldrin	dieldrin	Osborne-Mendel rat	0.8	4.1	food	2 yrs	survival		Fitzhugh et al. (1964)
Dieldrin		Osborne-Mendel rat	0.8	4.1	diet	2 years	survival	increased survival	Reuber (1980)
Dieldrin	dieldrin	Carworth rat	6.6	na	food	6 mos	survival		Treon and Cleveland (1955)

ANALYTE	CHEMICAL FORM	TEST SPECIES	NOAEL (mg/kg bw/day)	LOAEL (mg/kg bw/day)	EXPOSURE ROUTE	EXPOSURE DURATION	ENDPOINT	EFFECT ENDPOINT	SOURCE
Dieldrin	dieldrin	Osborne-Mendel rat	12	na	food	2 yrs	growth	body weight	Fitzhugh et al. (1964)
Dieldrin	dieldrin	Carworth rat	na	26	food	6 mos	survival		Treon and Cleveland (1955)
Dieldrin	dieldrin	Carworth rat	1.9	na	food	2 yrs	survival		Treon and Cleveland (1955)
Endosulfan	technical endosulfan	mouse	0.84	2.5	food	24 mos	survival, growth	male survival (males more sensitive than females), body weight	Hack et al. (1995)
Endosulfan	technical endosulfan	rat	0.65	3.3	food	104 wks	growth		Hack et al. (1995)
Endosulfan	technical endosulfan	rat	3.5	na	food	104 wks	survival		Hack et al. (1995)
Endrin	endrin	Swiss mouse	na	0.92	food	120 days	survival, reproduction	adult survival, litter size, number of young/day	Good and Ware (1969)
Endrin	endrin	deer mouse	1.7	na	food	68 days over 7 mos	reproduction	litter survival, 3 weaned, breeding pair availability	Morris (1968)
Endrin	endrin	deer mouse	0.97	1.7	food	68 days over 7 mos	survival		Morris (1968)
Endrin	endrin	Carworth rat	0.40	2.0	food	106 wks	survival, growth	female survival; male body weight	Treon et al. (1955)
gamma-Hexachloro-cyclohexane	gamma HCH	NZ white rabbit	0.80	na	gavage	12-15wks; 3/wk	reproduction	fertilization rate, implant, embryo loss	Seiler et al. (1994)
gamma-Hexachloro-cyclohexane	gamma HCH	rat	1.00	na	gavage	6 days lactation	survival, growth	maternal survival; maternal growth	Dalsenter et al. (1997a)
gamma-Hexachloro-cyclohexane	gamma HCH	CD strain rat	6.1	na	food	3 generations	survival, growth, reproduction	adult survival, body weight, pregnancy rate, gestation period	Palmer et al. (1978)
gamma-Hexachloro-cyclohexane	gamma HCH	beagle dog	9.3	na	food	32 wks	survival, growth		Rivett et al. (1978)
gamma-Hexachloro-cyclohexane	gamma HCH	Wistar rat	10	na	gavage	7 days 1st or 2nd wk postnatal	growth	body weight until age 29 days	Rivera et al. (1990)
gamma-Hexachloro-cyclohexane	gamma HCH	Wistar rat	30	na	gavage	single dose at day 15 post-conception	reproduction	litter size, offspring survival, offspring body weight, fertility	Dalsenter et al. (1997b)
gamma-Hexachloro-cyclohexane	gamma HCH	Wistar rat	64	na	food	2 wks	growth		Srinivasan et al. (1991)
Heptachlor	tech heptachlor	mink	1.0	na	food	181 days	survival, growth, reproduction	adult survival, female body weight, kit body weight	Crum et al. (1993)
Heptachlor	tech heptachlor	mink	na	1.8	food	181 days	survival, growth, reproduction	adult survival, female body weight, kit body weight	Crum et al. (1993)

ANALYTE	CHEMICAL FORM	TEST SPECIES	NOAEL (mg/kg bw/day)	LOAEL (mg/kg bw/day)	EXPOSURE ROUTE	EXPOSURE DURATION	ENDPOINT	EFFECT ENDPOINT	SOURCE
Heptachlor	tech heptachlor	mink	3.1	na	food	28 days	growth	body weight	Aulerich et al. (1990)
Heptachlor	tech heptachlor	mink	na	5.7	food	28 days	growth	body weight	Aulerich et al. (1990)
Heptachlor	tech heptachlor	mink	5.7	na	food	28 days	survival		Aulerich et al. (1990)
Heptachlor	tech heptachlor	mink	na	6.2	food	28 days	survival		Aulerich et al. (1990)
Hexachlorobenzene	HCB	mink	0.026 ^a	0.13	food	331 days	reproduction	birth weight	Bleavins et al. (1984)
Hexachlorobenzene	HCB	ferret	0.026 ^a	0.13	food	332 days	reproduction	birth weight	Bleavins et al. (1984)
Hexachlorobenzene	HCB	Sprague-Dawley rat	na	0.80	food	4 generation	reproduction	weanling weight	Grant et al. (1977)
Hexachlorobenzene	HCB	Wistar rat	1.28	na	food	>120 d	reproduction, behavior	number of pups and weights	Lilienthal et al. (1996)
Hexachlorobenzene	HCB	rat	3.2	na	food	2 generation	survival, growth		Arnold et al. (1985)
Hexachlorobenzene	HCB	rat	0.64	3.2	food	2 generation	reproduction	decreased viability	Arnold et al. (1985)
Hexachlorobenzene	HCB	Sprague-Dawley rat	na	4.8	food	~200 d days	reproduction	pup survival	Kitchin et al. (1982)
Hexachlorobenzene	HCB	Sprague-Dawley rat	11	na	food	> 100 days	survival, growth		Kitchin et al. (1982)
Hexachlorobenzene	HCB	ferret	3.2	16	food	332 days	survival		Bleavins et al. (1984)
Hexachlorobenzene	HCB	mink	3.3	16	food	331 days	survival		Bleavins et al. (1984)
Hexachlorobenzene	HCB	Sprague-Dawley rat	13	26	food	4 generation	survival		Grant et al. (1977)
Methoxychlor	methoxychlor	Sprague-Dawley rat	na	56	food	gestation day 0 to postnatal day 22 (adult); postnatal day 28 to 100 (young)	growth, reproduction	body weight; offspring growth rate, litter size, sex development of offspring	You et al. (2002)
Methoxychlor	methoxychlor	Sprague-Dawley rat	17	86	food	gestation day 15, postnatal day 10	reproduction, growth	maternal body weight, offspring body weight, delayed onset of puberty	Masutomi et al. (2003)

ANALYTE	CHEMICAL FORM	TEST SPECIES	NOAEL (mg/kg bw/day)	LOAEL (mg/kg bw/day)	EXPOSURE ROUTE	EXPOSURE DURATION	ENDPOINT	EFFECT ENDPOINT	SOURCE
Methoxychlor	tech methoxychlor	Sprague-Dawley rat	na	80	food	parents treated, weanlings treated 8 wks thru mating	reproduction	% mated, % littered	Harris et al. (1974)
Methoxychlor	tech methoxychlor	Sprague-Dawley rat	na	168	food	pre-mating thru weaning	reproduction	% mated, litter production and size	Harris et al. (1974)

^a NOAEL estimated using an uncertainty factor of 5 (chronic LOAEL to chronic NOAEL)

^b NOAEL estimated using an uncertainty factor of 10 (acute/subchronic LOAEL to chronic NOAEL)

LOAEL – lowest-observed-effect concentration

NOAEL – no-observed-effect concentration

PAH – polycyclic aromatic hydrocarbon

PCB – polychlorinated biphenyl

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