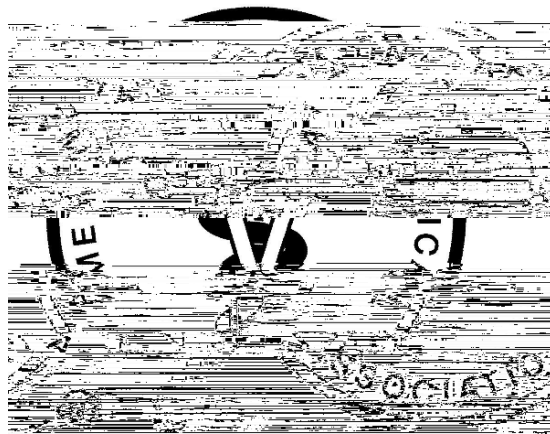


AVMA Guidelines on Euthanasia

(Formerly Report of the AVMA Panel on Euthanasia)

June 2007



Caution - The AVMA Guidelines on Euthanasia (formerly the 2000 Report of the AVMA Panel on Euthanasia) have been widely misinterpreted. Please note the following:

- The guidelines are in no way intended to be used for human lethal injection.
- The application of a barbiturate, paralyzing agent, and potassium chloride delivered in separate syringes or stages (the common method for human lethal injection) is not cited in the report.
- The report never mentions pancuronium bromide or Pavulon, the paralyzing agent used in human lethal injection.

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Table of Contents

PREFACE	1.....
INTRODUCTION	1.....
GENERAL CONSIDERATIONS	3.....
ANIMAL BEHAVIORAL CONSIDERATIONS	4.....
HUMAN BEHAVIORAL CONSIDERATIONS	4.....
MODES OF ACTION OF EUTHANATIZING AGENTS	5.....

AVMA Guidelines on Euthanasia

o f o t h e r (n o n - n o c i c e p t i
n e u r o n s c a n g i v e r i s e t o p
d e r i n o c i m e e d a f n i c e p - o n m g t t h o e i w n o j r u d r e a n
t i v e m e a n i n g t o r e c e i v e , a n d i
i n p u t c a u s e d b y n o x i o u s s
a c t u a l l y d o , d e s t r o y t i s
i n i t i a t e n e r v e i m p u l s e s
a n d o t h e r s e n s o r y n e r v e e
a n d n o n - n o x i o u s s t i m u l i
c h e m i c a l a c t i v i t y . E n d o
a s h y d r o g e n i o n s , p o t a s s
h i s t a m i n e , b r a d y k i n i n ,
e l e c t r i c a l c u r r e n t s , a r
i m p u l s e s i n n o c i c e p t o r
n o c i c e p t i v e p a t h w a y s c a
l y s i l e n t r e c e p t o r s t h a t
p a i ³ n ⁴ c o n d i t i o n s .
N e r v e i m p u l s e a c t i v i t y g
c o n d u c t e d v i a n o c i c e p t o
s p i n a l c o r d o r t h e b r a i n s
t w o g e n e r a l s e t s o f n e u r
r e l a t e d t o n o c i c e p t i v e r
f l e x i o n r e f l e x e s) t h a t a
t h e s e c o n d s e t c o n s i s t s o
r e t i c u l a r f o r m a t i o n , h y
c e r e b r a l c o r t e x (s o m a t o
f o r s e n s o r y p r o c e s s i n g .
a s c e n d i n g n o c i c e p t i v e p
r e d u n d a n t , a n d a r e c a p a b
u n d e r c h r o n i c c o n d i t i o n
M o r e o v e r , e v e n t h e t r a n s
a c t i v i t y i n a g i v e n p a t h w
c e r t a i n c o n d i t i o n s , b o t
t h e a s c e n d i n g p a t h w a y s m
e x a m p l e , i n e p i d u r a l a n e
c o n d i t i o n s , n o c i c e p t i v
a c t i v i t y i n t h e a s c e n d i n

r e c o g n i z e d t h e n e e d f o r
e u t h a n a s i a o f a n i m a l s t o
d i d n o t b e l i e v e t h a t i t s
f o r u m f o r a n i n - d e p t h d i s
I t i s t h e i n t e n t o f A V M A t
f o r m e d i n a c c o r d a n c e w i t h
l o c a l l a w s g o v e r n i n g d r u
p a t i o n a l s a f e t y , a n d m e t
d i s p o s a l o f a n i m a l s . H o w
r e v i e w o f c u r r e n t f e e d e r a
T h e p a n e l w a s a w a r e t h a t
t h a t a r r e e p o t e n t i a l e W a h r e l n y e w e v e s
s i t u a t i o n s a r i s e , a v e t e
s p e c i e s s h o u l d u s e p r o f
k n o w l e d g e o f c l i n i c a l l y
i n g a n a p p r o p r i a t e e u t h a
j u d g m e n t i n t h e s e c i r c u m
e r a t i o n t h e a n i m a l ' s s i z
o l o g i c a n d b e h a v i o r a l c h
s t a n c e s , n t i i 4 1 [(j) - 1 1

i s p a r t i c u l a r l y l i k e l y i
a l l o w i n g a n a n i m a l ' s m e d
g o u n a t t e n d e d s o t h a t e u t
W h e n o w n e r s c h o o s e t o b e p
t h e y s h o u l d b e p r e p a r e d f
d r u g s a r e b e i n g u s e d a n d
r e s p o n d s h o u l d b e d i s c u s
i z a t i o n , m u s c l e t w i t c h e
u r i n a t i o n , o r d e f e c a t i o
s e r v i c e s f o r g r i e v i n g o w
c o m m u n i t i e t l i e e p s h o n e c o u n s e l
t h r o u . 0 0 3 - 1 . 4 - 2 (t) - 2 2

c e d e l o s s o f m o t o r a c t i v i
m o t o r a c t i v i t y , h o w e v e r



A t d e e p a n e s t h e t i c p l a n e
e f f e c t i v e a g e n t f o r e u t h
a c t i v i t y m a y b e d i s t u r b i
l e s s s o l u b l e t h a n h a l o t h
a n e s t h e s i a m o r e r a p i d l y
p u n g e n t o d o r a n d a n i m a l s
d e l a y i n g o n s e t o f l o s s o f
a l s o m a y r e q u i r e m o r e d r u
w i t h h a l o t h a n e . A l t h o u g
e u t h a n a s i a a g e n t , h a l o t
l e s s s o l u b l e t h a n h a l o t h
o b j e c t i o n a b l e o d o r . I t i
h a l o t h a n e a n d h a s a l o w e r
c o n c e n t r a t i o n s c a n b e a c
D e s f l u r a n e i s c u r r e n t l y
a n e s t h e t i c , b u t t h e v a p o
s l o w i n d u c t i o n . T h i s d r u
d i s p2) l a a n c d e i o n x d y u g c e e n h (y O p o x e m :
i n d u c t 2 i i s o m o i t f p s r u o p v p i l d e e m d e . n t
M e t h o x y f l u r a n e i s h i g h l
i n d u c t i o n w i t h i t s u s e m a

L e a ⁵kr⁶ ee ap m d W a d t h æ e x p e r i r
C 2aO s a n a n e s t h e t i c a g e n t f
o f 3 20 2, % t a Co n 4 e 0 s % C O e s i a w a s i n d
l t o 2 m i n u t e s , u s u a l l y w i
v o m i t i n 2 r g e . s F u o l r t c s a i t n s l , o i s n s h a
o f c o n s c i o u s n e s s w i t h i n
a r r e s ⁵ St i w g i n t æ h o i f n e ⁵ f m f i e n c u t t i e v s e .
a n e s t h e s i a a r e t h o s e a s s
a n e s t h e s i a , s u c h a s l o s s
r e ⁶ T f i l m e x t e o s l o s s o f c o n s c i o
u s e o f h 2 i w g l t d r a n o ⁸ n ⁰ c t e o n t r a t
l 0 0 % c o n c e n t r a t i o n p r o v i
s e c o n 2 i d 2 i n s n O i d n u r c a i t n s g a a n n d e 7 s 0 t % C O s
i n 4 0 ⁶ T t i o ⁶ 2 m 5 e 0 t s o e l c o o s n s d o s f . c o n s c
w i l l b e l o n g e r i f t h e c o n c
r a t h e r t h a n i m m e r s i n g t
c o n c e n t r a t i o n i m m e d i a t
S e v e r a l i n v e s t i g a t o r s h
o f h i g 2 l m æ y o b æ e d n i t s r t a r t e i s o s n i s n g
a n ⁶ b - e n ⁶ a h a s e t h e g a s d i s s o l
n a s a l m u c o s a . T h e r e s u l t
s t i m u l a t e n o c i c e p t o r s i
h u m a n s e x p 2 o s e d t o c o n c e n
r e p o r t t h a t i n h a l i n g t h e
c o n c e ⁶ 7 A t ⁶ f r a i t e i f o s n t s u a d r y e o n f o s x w i i
e x a m i n e e d x t p h o e s a v e ⁶ 9 i a v n e d n a
f o u n 2 w d a t s h a a v t e 9 r 0 s % i C O e t o p i g s
w a s n o t . F o r r a t s (F) 1 D 1 3

m a i n t a i n e d f o r a t l e a s t 1
d ⁸ e I ⁶ a t t i h s . i m p o r t a n t t o v e r i f
b e f o r e r e m o v i n g i t f r o m t
n o t n d a e r a c d o , s G Q m u s t b e f o l l o
m e t h o d 2 t o o f 2 m e a h u y e t o C h r O a n a s i a . A d

c o m b u s t i o n e n g i n e s , a n d
C O i n c y l i n d e r s . T h e f i r s t
w i t h p r o b l e m s s u c h a s p r
a c h i e v i n g i n a d e q u a t e c o
i d e , i n a d e q u a t e c o o l i n g
e q u i p m e n t . T h e r e f o r e , t
c o m p r e s s e d C O i n c y l i n d e
I n a s t u d ⁸ y % B Q R a m s e y a n d E
c a u s e d g u i n e a p i g s t o c o l
u t e s , a n d ⁸ d e a t h o c c u r r e d
m o n o x i d e ⁸ h a n ⁹ s d b e e n u s e d t o
c h i n c h i l l a s . T h e s e a n i m
b r e a t h i n g c e a s e d i n 2 m i n
b e a t i n g i n 5 t o 7 m i n u t e s .
I n a s t u d y e v a l u a t i n g t h e
c h a r a c t e r i s t i c s o f d o g s
C h a l ⁹ i ⁵ f w h u d n o t d a t e n i r e

NONINHALANT PHARMACEUTICAL
AGENTS

T h e u s e o f i n j e c t a b l e e u



preceded by gasping, muscle spasms, and vocalization. The potassium ion is cardiotoxic, and rapid intravenous or intracardiac administration of 2 to 4 mmol/kg of body weight will cause cardiac arrest. Chloral hydrate is conditionally acceptable for euthanasia of large animals only when administered intravenously, and only after sedation to decrease the aforementioned undesirable side effects. This is a preferred injectable technique for euthanasia of livestock or wildlife species to reduce the risk of toxic reactions. Chloral hydrate is not acceptable for dogs, cats, and other small animals because the side effects may be severe, reactions can be aesthetically objectionable, and other products are better choices.

T-61

T-61 is an injectable, nonbarbiturate, narcotic mixture of 3 drugs used for euthanasia. The drugs provide a combination of general anesthetic, curari form, and local anesthetic actions. T-61 has been withdrawn from the market and is no longer manufactured or commercially available in the United States. It is available in Canada and other countries. T-61 should be used only intravenously and at carefully monitored rates of injection, because there is some question as to the differential absorption and onset of action of the active ingredients when administered by other routes.

TRICAIN METHANE SULFONATE (MS 222, TMS)

MS 222 is commercially available as tricaine methane sulfonate (TMS), which can be used for the euthanasia of amphibians and fish. Tricaine is a benzoic acid derivative and, in water of low alkalinity (< 50 mg/L as CaCO₃); the solution should be buffered with sodium bicarbonate. A 10 g/L stock solution can be made, and sodium bicarbonate added to saturation, resulting in a pH between 7.0 and 7.5 for the solution. The stock solution should be stored in a dark brown bottle, and refrigerated or frozen if possible. The solution should be replaced monthly and any time a brown color is observed. For euthanasia, a concentration of 250 mg/L is recommended and fish should be left in this solution for at least 10 minutes following cessation of opercular movement. In the United States, there is a 21-day withdrawal time for MS 222; therefore, it is not appropriate for euthanasia of animals intended for food.

POTASSIUM CHLORIDE IN CONJUNCTION WITH PRIOR GENERAL ANESTHESIA

Although unacceptable and condemned when used in unanesthetized animals, the use of a supersaturated solution of potassium chloride injected intravenously or intracardially in an animal under general anesthesia is an acceptable method to produce cardiac

i n s t a n t a n e o u s m a n n e r a r
G u i l l o t i n e s a r e n o t c o m
n e o n a t a l r o d e n t s , b u t s h
p u r p o s e .

Advantages—(1) D e c a p i t a t i o n i s a t e
a p p e a r s t¹ 2^o (7 i 2 1 n)² d u c e r a p i d l
I t d o e s n o t c h e m i c a l l y c o
r a p i d l y a c c o m p l i s h e d .

Disadvantages—(1)

l a b i l e c h e m i c a l s .

Disadvantages—(1) n s t r u m e n t s a r e e x p

O n l y a n i m a l s t h e s i z e o f m

MACERATION

M a c e r a t i o n , v i a u s e o f a
m e c h a n i c a l a p p a r a t u s h a
p r o j e c t i o n s , c a u s e s i m m
o f d a y - o l d² ¹p⁷ o u l t r y a n d e m
o f t h e u s e o f c o m m e r c i a l l
e u t h a n a s i a o f c h i c k s , p o
t h a t d e a t h b y m a c e r a t i o n
i m m e d i a t e l y w i t h m i n i m a
i s a n a l t e r n a t i v e t o t h e
e u t h a n a s i a o f d a y - o l d p o
b e e q u i v a l e n t t o c e r v i c a
c o m p r e s s i o n a s t o t i m e e l
a n a c c e p t a b l e m e a n s o f e u
p o u l t r y b y t h e F e d e r a t i
S o² ² ⁰ ^g ^e ⁱ² ^W^c ¹ ^o ^u ^r ^k ^l t d u G r e g C a a n n i a z d a a t , i o
f o r A² ⁿ ^a² ⁱ² ⁿ ^m ^d ^a ^E² ^l ² ^u³ H r e o a p l e t a h n (U O n I i E o) n , .
Advantages—(1) D e a t h i s a l m o s t i n s t a
T h e m e t h o d i s s a f e f o r w o r
a n i m a l s c a n b e k i l l e d q u i
Disadvantages—(1) p e c i a l e q u i p m e n t i
(M 2 a) c e r a t e d t i s s u e s m a y p r
Recommendations M a c e r
e q u i p m e n t t h a t m u s t b e k e
C h i c k s m u s t b e d e l i v e r e d
a t a r a t e t h a t p r e v e n t s a b
e n t r y i n t o t h e m a c e r a t o r
s u f f o c a t i o n , o r a v o i d a b
m a c e r a t i o n .

ADJUNCTIVE METHODS

S t u n n i n g a n d p i t h i n g , w
l o s s o f c o n s c i o u s n e s s b
T h e r e f o r e , t h e s e m e t h o d
j u n c t i¹ ^s^o ³ u n c w h i a t s h p o h t a h r e m r a p c r o o - c
l o g i c a g e n t s , e x s a n g u i n
n a t i z e t h e a n i m a l .

Exsanguination

E x s a n g u i n a t i o n c a n b e u
s e q u e n t t o s t u n n i n g , o r i
m a l s . B e c a u s e a n x i e t y i s

a s f r o g s , w i t h a n a t o m i c f
t o t h e c e n t r a l n e r v o u s s y
s o l e m e a n s o f e u t h a n a s i a
m o r e s u i t a b l e m e t h o d .

SPECIAL CONSIDERATIONS

EQUINE EUTHANASIA

P e n t o b a r b i t a l o r a p e n t
t h e b e s t c h o i c e f o r e q u i n
v o l u m e o f s o l u t i o n m u s t b
v e n o u s c a t h e t e r p l a c e d i
t h e p r o c e d u r e . T o f a c i l i
e x c i t a b l e o r f r a c t i o u s a
a c e p r o m a z i n e , o r a n a l p h
a d m i n i s t e r e d , b u t t h e s e
l o s s o f c o n s c i o u s n e s s b e
c i r c u l a t i o n a n d m a y r e s u
m u s c u l a r a c t i v i t y a n d a g
o r a g o n i s t / a n t a g o n i s t s
a d r e n e r g i c a g o n i s t s m a y
I n c e r t a i n e m e r g e n c y c i
e u t h a n a s i a o f a h o r s e w i t
t r a c k , i t m a y b e d i f f i c u l
o r o t h e r l a r g e a n i m a l f o r
a n i m a l m i g h t c a u s e i n j u r
b e f o r e a s e d a t i v e c o u l d t
a n i m a l c a n b e g i v e n a n e u r
s u c h a s s u c c i n y l c h o l i n e
n a t i z e d w i t h a n a p p r o p r i
a n i m a l c a n b e c o n t r o l l e d
w i t h o u t s u f f i c i e n t a n e s
e u t h a n a s i a .

P h y s i c a l m e t h o d s , i n c l u
e r e d c o n d i t i o n a l l y a c c e
e u t h a n a s i a . T h e p e n e t r a
w i t h a p p r o p r i a t e r e s t r a

ANIMALS INTENDED FOR HUMAN OR ANIMAL FOOD

I n e u t h a n a s i a o f a n i m a l s
m a l f o o d , c h e m i c a l a g e n t

Wildlife

F o r w i l d a n d f e r a l a n i m a
m e a n s o f e u t h a n a s i a f o r c
b l e . T h e p a n e l r e c o g n i z e
f r e e - r a n g i n g w i l d l i f e w
f r o m t h e a n i m a l o r h u m a n
k i l l i n g m a y b e n e c e s s a r y
a l t h o u g h m o r e c h a l l e n g i
t r o l l e d , d o n o t i n a n y w a y

gunshot or penetrating pneumatic bolt followed by exsanguination.

Birds

Many techniques discussed previously in these guidelines are suitable for euthanasia of captive birds accustomed to human contact. Free-ranging birds may be collected by a number of methods, including nets and live traps, with subsequent euthanasia. For collection by firearm, shotguns are recommended. The bird should be killed outright by use of ammunition loads appropriate for the species to be collected. Wounded birds should be killed quickly by appropriate techniques previously described. Large birds should be anesthetized prior to euthanasia, using general anesthetics.

Amphibians, Fish, and Reptiles

Euthanasia of ectothermic animals must take into account differences in their metabolism, respiration, and anesthesia requirements.

M o s t a m p h i b i a n s , f i s h e
e u t h a n a t i z e d b y c r a n i a l
b y d e c a p i t a t i o n , p i t h i n
S e v e r i n g t h e s p i n a l c o r
p i t h i n g i s a n e f f e c t i v e
e c t o t h e r m s . D e a t h m a y n o
t h e b r a i n a n d s p i n a l c o r d
p i t h i n g o f t h e s p i n a l c o r
i t a t i o n a n d p i t h i n g o f t h
p r o c e d u r e . P i t h i n g r e q u
s h o u l d o n l y b e d o n e b y t r a
s i t e i n f r o g s i s t h e f o r a m
b y a s l i g h t m i d l i n e s k i n d
w i t h ¹ ⁸ ⁷ h e n e c k f l e x e d .
Cooling— I t h a s b e e n s u g g e s t e d
p h y s i c a l m e t h o d s o f e u t h
c o o l i n g t o ⁴ C w i l l d e c r e a
h a n d l i n g , b u t t h e r e i s n l



U s e o f a n b o a s l e o - n t e o - t a i l o r n
m a y k i l l t h e a n i m a l b y i n d
t h e a n i m a l m a y b e c o n s c i o



REFERENCES

- 1 Andrews E J, Bennett B T, Clark J
A V M A p J Am Vet Med Assoc 1909; 3: 202-203.
- 2 Webster's ninth new collegiate dictionary.
Merriam - Webster Inc, 1990.
- 3 Wall PD. Defining pain in animals
Animal pain. New York: Guilford Press, 1992.
- 4 Vierck CJ, Cooper B Y, Ritz LA,
Sittler F. Issues in pain measurement.
C R, Issues in pain measurement. New York: Raven Press, 1989; 93-115.
- 5 Brazier JE, Kitchell RL. Evaluation
Fed Proc 1969; 28: 1577-1579.
- 6 Zimmersman M. Neurophysiological correlates of pain.
C o , 1984; 15-35.
- 7 Kitchell RL, Erickson NH, Carr
pain: perception and alleviation.
S o c i e t y , 1983.
- 8 Kitchell N, Aronson AL, Bittler
c o l l o q u i u m o n r e c o g n i t i o n a n d
t J Am Vet Med Assoc 1987; 191: 1186-1191.
- 9 Nattio Recognition and alleviation of
pain and distress in laboratory animals.
A c a d e m y P r e s s , 1992.
- 10 Brazier JE. Physiological basis
i n J Am Vet Med Assoc 1987; 191: 1212-1215.
- 11 McMillan FD. Comfort as a therapeutic
m e d J Am Vet Med Assoc 1987; 191: 1212-1215.
- 12 Gr. E. Euthanasia guide (for animal shelters).
A m e s , I o w a : M o s s C r e e k P u b l i c a
13 Cooper Euthanasia of amphibians and reptiles.
L o n d o n : U F A W / W S P A , 1989.
- 14 Gr. E. Handbook of pentobarbital euthanasia.
S a l e m , O r e : H u m a n e S o c i e t y o f W
15 Operational guide for animal care and control agencies.
D e n v e r : A m e r i c a n H u m a n e A s s o c
16 Fowler Zoo and wild animal medicine:
current therapy 4

5 L3 e. c Waste anaesthetic gases in operating room air.

a suggested program to reduce personnel exposure P a n k R i d g e , I l l :

5 S i . m o n s e n H B , T h o r d a l - C h r i s t
m o n o x i d e a n d c a r b o n d i o x i d e e u
b e B r V e t J h 9 8 b r l 3 7 : 2 7 4 - 2 7 8 .

5 K l . e m m W R . A m J V e t R e s
1 9 6 4 ; 2 5 : 1 2 0 1 - 1 2 0 5 .

5 L e . a k e C D , W a t e r s R M . T h e a n e s t
d i C u r r e s A n e s t h e s i o l A n a l g 9 . 2 9 ; 8 : 1 7 - 1 9 .

5 M a t t s s o n J L , S t i n s o n J M , C l a r
p o w e r - s p e c t r a l c h a n g e s c o i n c
n a r c o A m J V e t R e s 9 i 7 n 2 r ; h 3 e 3 s : u 2 s 0 m 4 o 3 n - k 2 e 0 y 4 . 9 .

5 W a o d b u r y D M , R o l l i n s L T , G a r d
c a r b o n d i o x i d e o n b r a i n e x c i t a
1 9 5 8 ; 1 9 2 : 7 9 - 9 0 .

5 G l . e n J B , S c B r o t t W N . C a r b o n d i o x
V e t J l 9 7 3 ; 1 2 9 : 4 7 1 - 4 7 9 .

6 B l . a c k m o r e D K , N e w h o o k J C . T h e
i n s h e d e r p i , n c g a s l v a e u s g a h n t d e p r i . g I s n : E i k
Stunning of animals for slaughter B o s t o n : M a r t i n u s N i j h o

6 C l e n e n A M L , D r i n k e n b u r g W H I M
C a r b o n d i o x i d e e u t h a n a s i a i n r
s i g n s . L a b A n i m l a 9 g 9 i 5 t ; a 2 t 9 i : o 2 n 6 a 2 n - d 2 a 6 s 8 p . h y x i

6 K a h l e r I , M e i e r R , B u s a t o A , e t
u s e f u l s h o r L a b A n i m a c t i n g a n a e s t h e t
1 9 9 8 ; 3 3 : 1 5 5 - 1 6 1 .

6 H a e n d e r k e n R . E l e c t r i c a l a n d
f l o r s l a S t u n n i n g o f a n i m a l s f o r

6 G r . e g o r y N G , M o s s B W , L e e s o n R H
b o n d i V e t R e d x 9 i 8 d 7 e ; s l t 2 u l n : n 5 i l n 7 g - i 5 n 1 p 8 i . g s .

6 C a r d i n g A H . M a s s e u t h a n a s i a o
a n d / o r c J S m a l l A n i m P r a c t o 9 n 6 d 8 i ; o x i d e : p r e l i m
9 : 2 4 5 - 2 5 9 .

6 B r i t t D P . T h e h u m a n e n e s s o f c a
e u t h a n E u t h a n a s i a o f u n w a n t e d , i n j u r e d
o r d i s e a s e d a n i m a l s f o r e d u c a t i o n a l o r s c i e n t i f i c p u r p o s e s P o t t e r s

6 D a n n e m a n P J , S t e i n S , W a l s h a w
B a r , U K : U F A W , 1 9 8 7 ; 1 9 - 3 1 .

6 D a n n e m a n P J , S t e i n S , W a l s h a w
i m p l i c a t i o n s o f u s i n g c a r b o n d
t h e s i L a b A n i m S c i r 9 e 9 u 7 t ; h 4 a 7 n : a 3 7 i 6 a - o 3 f 8 r 5 a . t s .

6 A n t o n F , E u c h n e r I , H a n d w e r k e
i n a t i o n o f p a i n i n d u c e d b y d e f i
m u P a i n 1 o 9 s 9 a 2 . ; 4 9 : 5 3 - 6 0 .

6 R a j A B M , G r e g o r y N G . W e l f a r e i
p i g s l . D e t e r m i n a t i o n o f a v e r s
d i o A n i m W e l f a r e 9 9 5 ; a 4 : g 2 7 3 - 2 8 0 .

7 H a I n t J S t u d A n i m P r o b a K r 1 8 i l h r H L a 2 A n i m C a r e 2 p 1 0 p o e c a r u 2 V e t R e h 5 , 9 A B W o 2 , V h ; D n 9 H e 0 e t
7 B l . a c k s h a w J K

1 Animal(mammal) traps-part 4: methods for testing killing
trap systems used on land or underwater T C 11 09 91 9, 01 -S 40 E/ .D I S
I n t e r n a t i o n a l S t a n d a r d i z a t i o n
1 5 i0 l. b e r t F F . A s s e s s m e n t o f f u r
d e v i c e s Worldwide furber: C h a p m a n J A , P u r s l
conference proceedings F r o s t b u r g , M d : 1 9 8 1 ; 1 5 9 9
1 5 1 .

1 9 of Fish disease. Diagnosis and treatment S t L o u i s :
M o s b y , 1 9 9 6 .
1 B r a n n i a n R E , K i r k E , W i l l i a m s

Species	Acceptable* (refer to Appendix 2 and text for details)	Conditionally acceptable† (refer to Appendix 3 and text for details)
R o d e n t	B a n d i o t t u h r C a O t, s e p s o , l w i t h g e n e r a l a n	M e r s m t h a h i m d u n x a n y r t f t, h l a t u o r e r 2 e 0 s 0 t g h) e , s i d a c a m p i
R u m i n a	B t a s r b i t u r a t e s , p e n e t r a t i n g c a	Q h o l t c a r s a s l i h y n d t r h e p l t e i c v t e r b o o c l u t t i
S w i n e	B a r , b p i d t u a r s a s t i e u s m p e n e t r a t i n g c a	C h O h a f a d e a n e s p e t d a v t e i b o o n l) t , e g w e e k s o f a g e)
Z o o a n i	B a i b i t u r C a O t, e p s o , t w i t h g e n e r a l a n	N a, r s A h s r a i , l u p a m e n c n t h e a l t n o r e r e s t h e s i a
F r e e - r	B a g i v n o g r w l i P a , d i e n s h f a w i t h g e n e r a l a n	E l , O a G, n O A t , r a N, n p e e s n t e h t e t e r s a t p h s e (s s i c a i e n
* A c c e p t a b l e m e t h o d s a r e t h o s e t h o † C o n d i t i o n a l l y a c c e p t a b l e m e t h o d h u m a n e d e a t h o r a r e m e t h o d s n o t w e l		

Appendix 2—Acceptable agents and methods of euthanasia

A c c e p t a b l e a g e n t s a n d m e t h o d s

Agent	Classification	Mode of action	Rapidity	Ease of performance	Safety for personnel	Species suitability	Efficacy and comments
B a r b	H i y t p u o a t t r d e p r c e n t	r D x a i i t r a e e o i f b c u e s e u s b s c s e t r r s u c e n t d e p r m u s c	R s c a t p d i t a r a n e b e b l s i o o r n t o c t u e r s e s s l e	A d p o i n e n r e t a t h k o t c i p f c e v a r i l s r s e k s i , l ; I V i i r n i o n o	S a a i f i m e s a o i b a u i t s t D o Æ n l A n - s a u a b d s e j c e t c f h e	M e n o x t s c t b e e x p d o ; e c l o m n u v t i o a t p n a e t i o n a r t	H e s p p g e l h t w e n t n t a s r d t o m b l i c a l r e c f c o e r p s m a l l I V
B e n z h y d r	H o y c p a o a o t c t h r d e p r c e n t	i D x n e i e p a r l i o b r u i e s s e r s	V e e s r s y t d d a e e b p l e i o n o	i E r a a n s p o e n t o f v i	S f d C f N e n g o n t a l	F e d h d o s	E , f a f m e e x p e
C a r b (b o t	H o y n p d o a t t l t e r d e p r c e n t	i D x o i x a i e d o i g b a c u s e t s e u s b s c s e t r r s u c e n t d e p r m u s c	M d o e d d e t o a n b b l i o o r n t o c t u e r s e s s l e	U r p a e t e y e) t h o t c i f c v a i l r e s , ; d i r i o n o	e M s i l i s n y n i c i r o i r n t a l a n d e c t f h e	O S a n n o p a s i l e e a m , i m s m a l l v n i i t n a k c o n c a n i m a m p h s o m e s w i n	D E l d f l f a a r a e l q s u , i l p l r d o o l g o i l (m h m i a g t n e e n o t n r a a i r e d) a l s , i b i a r r e p t e
C a r b (b o t	H o y n p m o t l e	C x n i o n a b d h g a n o p r e v c o m b o x y g	M i o d d e e t g i h m o e s e o n a t n u i n n a a w e n	s R r w a i q t u l a , i p b n p u , r i m i m m g i a n t e a i q r o u e n i	e E h a r n e s t h o a p n r a s h t n s a d i d d p f e m t e e a	s M e o t m s e t i i i a n d t c o e l n c i e a f d f s h c s t h t e i t n r e p t a m p h a n i m	I E s y f m f a e a l u s c y d s c i t e i w , d r e o h p c r h o i p l e l a i n l d e o s p , i b i a r a l s ,

Continued on next page

Appendix 3—Conditionally acceptable agents and methods of euthanasia

C o n d i t i o n a l l y a c c e p t a b l e a g

Agent	Classification	Mode of action	Rapidity	Ease of performance	Safety for personnel	Species suitability	Efficacy and comments
B l o w	P t h o y t s b r a i	D i e c r h a e e o n f b r	R c a d t d p c m a i n	R a l n g q e u a d e q a n d a f o r c	S i a s f i e e u m æ t p p r e	Y n o k i n e e k o p r i	M g u l p s , i t a s p r o p a l l i d i n h a u t m e a n e f f e c
C a r b (b o t	H o y n p d o d t e l p e r c e n t	D x o i x a e d e f s a c s s e s e u r b s c s t r u c e n t d e p r m u s c	M d w e d d e i o o n b o o r t c t u e r s e s s l e	D o p a e t e y f v h i t i c a l r e s a ; d i r i o n o	e M s i l i s n y n i c i t a a i r l n n d v e c t f h e	o N a n n o p s i l e e p x , i m r a n g i t a l a r t	E u d f m f a a n c r a e t q e u s i , p i r n o g l w o i m m a t n e o n a
C a r b (b o t	H o y n p m o t l e	C x o i o n a b d h g a n o p r e v c o m b o x y g	M i o d d e e t g i h m o e s e o n a t n u i n n a a w e n	S r r w a i q t u b a , i p b n p u , r i m i n a m g i a n t e a i q r o u e n i	e E h a r n e s t h o a p n r a k t n s d i d d p f e m t e a	s N e o t m n e h i p i a r d t i o e m r r i e a f d n f g h s t e t	I E u y f m f a e n c u l a s c y t s e e s o , i w i d n u g h w t e p r o p e a n d o p
C e r v	H i y c p a o d i s r c e n t	D x d i i r a e o u f p b t r e r s	M c w o d d e i a o i n n o	R a o t p a i q t o u a f n v d i s	e S n i l a s y f i e e t k a i l l	o P a n o p n i a l a b o r a t s c (a < n 2 o 0 c r a b b c i e t r s v (i	d i t r n r i y e n v g m r u a s t c o l r c i e t r s v (i
C h l o	H r y a p l o d e p r r e s p	D x y i d a e o e f s b s r i r a	R a n t p e d m i a o i n n o t o r y	P d p r e s f k i l I c V e i n t	S o a n f i n e l e d j e e r c	o H h o m u s t o w i p e t i o n	A e n s i b m e a s e f d o a r t r a d m i n

Continued on next page

Agent	Classification	Mode of action	Rapidly	Ease of performance	Safety for personnel	Species suitability	Efficacy and comments
D e c a	H p y i p t o d i s r c e n t	D x t i i r a e o u f p b t r e r s	R c a t p d i i a o i n n o	R o p r q e a f n v d i s	G i u s i e l t p k a i l t l e i n j u	o L l n o b t o k n m t a i l s r o y m h e a m p h r e (p l t a w i t h	i l i r r a e r i p a m l l u r s a m a f z i a s r o d i e b c i a i t l t e e p i t
E l e c	H t y r p o o	D x u i t r a i e o f b r f i b r	C o c a n t n d b a i n i l l	N e p r t a e e p a n d f c a i t n i s t	H s a i s s z i i a p o a e r r r n d s m a n c	o U r n s d e o d e s o d n i e n n e m s i n k d i s l r u m i > 5 k g	u V p s i r t o i o e c p a l o l n k t a (t w s i a t m o o f c c a o t n i n a n t s
G u n s	H h y o p t o d i s r c e n t	D x i i r a e o u f p b t r e r s	R c a t p c i i a o i n n o	R o n q u a f p v p i s	M i a s y e b t a a p l r	e e n s d k a i i a t e	n l g l e a r f i r
						o f b <	f 2 E M

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Appendix 4—Some unacceptable agents and methods of euthanasia

S o m e u n a c c e p t a b l e a g e n t s

Agent or method	Comments
A i r e m b o l i s	A i r e m b o l i s m m a y b e a c c e p t a b l e i n a n e s t h e t i z e d a n i m a l
B l o w t o t h e h	U n a c c e p t a b l e f o r m o s
B u r n i n g	C h e m i c a l o r t h e r m a l b
C h l o r a l h y d	U n a c c e p t a b l e i n d o g s
C h l o r o f o r m	C h l o r o f o r m i s a k n o w n
C y a n i d e	C y a n i d e p o s s e s a n e x t r
D e c o m p r e s s	D e c o m p r e s s i o n i s u n a c c e p t a b l e (l) M a n y c h a m b e r s a r e a s o p t i m u m f o r a n i m a l s

Agent or method	Comments
H y p o t h e r m i	H y p o t h e r m i a i s n o t a n
N e u r o m u s c u s u l f a t e , p o	W h e r e b u t c e l l i a n l g o a n g e n t t h s e (s p a i s n i a u n m c d h i l s o t r r i e d s e s , a a f l t l e
R a p i d f r e e z	R a p i d f r e e z i n g a s a s o a n e s t h e t i z e d p r i o r t o
S m o t h e r i n g	