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Animal Euthanasia

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INTRODUCTION

Euthanatizing agents are commonly categorized into three main categories: inhalant agents, noninhalant pharmacologic agents, and physical methods. The inhalant agents include anesthetic gases, ether, cyclopropane, nitrous oxide, halothane, methoxyflurane, enflurane, isoflurane, nitrogen gas, and hydrogen cyanide gas. They are administered to the animal via a closed chamber, container, or face mask. The noninhalant agents include injectable pharmacologic agents. The preferred route of administration of the noninhalants is by intravenous injection. Physical methods of euthanasia include the use of the captive bolt pistol, gunshot, cervical dislocation, decapitation, electrocution, microwave irradiation, and rapid freezing. The "1993 Report of the AVMA Panel on Euthanasia" (Citation 002) is frequently referred to the veterinary and biomedical community and provides guidelines for recommended euthanitization methods by animal group and species.

Personnel administering an euthanatizing agent must know: 1) whether the agent is appropriate for the species, 2) what route, dose or concentration the agent should be administered, 3) if the agent may result in fear behavior, struggling, or vocalizations, 4) if the animal shows signs of experiencing pain, 5) how rapidly the agent results in unconsciousness, 6) if the agent causes tissue changes, 7) the technical skills for appropriate administration, and 8) if the agent is economical. If the animal is a pet, personnel must also address the emotional needs of the owner. Has the pet owner been informed of alternatives? Has the owner received a complete explanation of the euthanasia procedures? Should the owner be present during euthanasia and should family members be allowed to view the body afterwards?

This Special Reference Brief (SRB) was designed for use by veterinarians, shelter personnel, pet owners, researchers, agriculturists, and zoologists. Bibliographic citations on euthanatizing methods for a variety of animal species in different circumstances are listed. The citations include references from professional journals and books. Selected citations were included from 1981 to present and citations are arranged in chronological order from the most recent to least recent.

This brief is provided for convenience in obtaining access to published material on animal euthanasia. No attempt has been made by the authors or advisors to dictate which method or under what circumstances euthanasia should be performed. That issue remains the responsibility of the professional personnel in each circumstance subject to animal needs, facilities, and the concerns for animal welfare and the reduction in animal suffering. Utilization of this reference list, however, will provide an opportunity to base decisions on published scientific information.

If references are available from the National Agricultural Library Collection (NAL), their call numbers are given. Document delivery information is provided in bulletins 15 and 16 on the Agricultural Library Forum (ALF) for patrons who wish to obtain references through NAL.

The authors wish to express appreciation to Dr. Charles E. Short, Professor of Anesthesiology, at the College of Veterinary Medicine, Cornell University, Ithaca, NY, for his thoughtful insights and review of the initial draft of this special reference brief.

GENERAL VETERINARY USE

- 001 Euthanasia policy and procedures. University of Illinois. BRL Bulletin University of Illinois, Chicago, IL; March 16, 1993, pp. 1-3. Descriptors: AVMA Panel, cerebral cortex, training, humane death.
- 002 1993 Report of the AVMA Panel on Euthanasia. American Veterinary Medical Association. Journal of the American Veterinary Medical Association 202(2):229-249 (January 1993). NAL call number: 41.8 Am3 Descriptors: pharmaceutical agents, physical methods, special considerations, animal behavior, mammals, birds, reptiles, amphibians, fish.
- 003 Comparative physiological responses to stressors in animals. Hattingh, J. and Petty, D. Comparative Biochemistry and Physiology. A: Comparative Physiology 101(1):113-116 (1992). NAL call number: QP1 C6 Descriptors: immobilization, euthanasia, intraspecies, interspecies, SSERTS.
- 004 Euthanasia. Committee on Pain and Distress in Laboratory Animals; Institute of Laboratory Animal Resources (ILAR); Commission on Life Sciences; and National Research Council. Recognition and Alleviation of Pain and Distress in Laboratory Animals National Academy Press, Washington, DC; 1992, pp. 102- 116. NAL call number: SF996 5R43 Descriptors: dogs, cats, ferrets, rabbits, rodents, primates, birds, amphibians, fish, reptiles, methods.
- 005 Euthanasia. Tholhuijsen, L. Tijdschrift voor Diergeneeskunde 117(3):92 (February 1, 1992). NAL call number: 41.8 T431 Descriptors: legislation, veterinary requirements, Netherlands.
- 006 The logical basis in the sense of section 17 number 1 of the Animal Welfare Act. [Der vernunftige grund im sinne des section 17 nr. 1 des Tierschutzgesetzes.] Schwabenbauer, K. (DTW) Deutsche Tierärztliche Wochenschrift 99(1):8-9 (January 1992). NAL call number: 41.8 D482 Descriptors: Germany, "reasonable reasons" for permitting euthanasia, vertebrates.
- 007 Fallen stock. Byrne, D.J. The Veterinary Record: Journal of the British Veterinary Association 129(1):19 (July 6, 1991). NAL call number: 41.8 V641 Descriptors: animal welfare, legislation, euthanasia.
- 008 Guidelines for euthanasia of domestic animals by firearms. Longair, J.A.; Finley, G.G.; and Laniel, M.A. Canadian Veterinary Journal 32:724-726 (1991). NAL call number: 41.8 R3224 Descriptors: stun, pistol, animal welfare.
- 009 Method of euthanasia in animal study. Gregory, S.P.; Waterman, A.E.; and Weaver, B.M. Radiology 179(1):288 (April 1991). ISSN: 0033-8419. Descriptors: tetracaine, ammonium compounds, amides, drug combinations, T-61.
- 010 Veterinarians as members of the humane community. Thornton, G.W. Journal of the American Veterinary Medical Association 198(8):1352-1354 (April 15, 1991). NAL call number: 41.8 Am3 Descriptors: professional standards, animal welfare, United States, ethics.
- 011 Animal euthanasia. Smith, C.P. and Larson, J. Special Reference Brief 91-02 National Agricultural Library, Beltsville, MD; 1990, 31 pp. NAL call number: aS21 D27S64 Descriptors: bibliography, 1988-1990, animal welfare.
- 012 Euthanasia. Bennett, B.T.; Brown, M.J.; and Schofield, J.C. Essentials for Animal Research: A Primer for Research Personnel USDA, National Agricultural Library, Beltsville, MD; 1990, pp. 89-100. NAL call number: aQL55 B36 Descriptors: information resources, euthanasia regulations, methods, multi-species.
- 013 Recognition and alleviation of pain and distress Castello, M.D. Production Plus, Inc., Closter, NJ; 1 videocassette (22 min., 30 sec.), 1990. NAL call number: Videocassette no. 968 Descriptors: animal welfare, veterinarian, study end points.
- 014 On the use of T-61 for euthanasia of domestic and laboratory animals: An ethical evaluation. Hellebrekers, L.J.; Baumans, V.; Bertens, A.P.; and Hartman, W. Laboratory Animals 24(3):200-204 (July 1990). NAL call number: QL55 A1L3 Descriptors: rabbits, dogs, EMG, ECG, end-tidal CO₂, consciousness, butyramide.

- 015 An anaesthetic or euthanasia chamber for small animals. Applebee, K.A. and Cooper, J.E. *Animal Technology* 40(1):39-43 (1989). NAL call number: QL55 I5 Descriptors: animal welfare, laboratory animals, chamber.
- 016 Handbook of Pentobarbital Euthanasia Greyhavens, T. Humane Society of Wilamette Valley, Salem, OR; 1989, 126 pp. NAL call number: HV4731 G73 Descriptors: injection site, physical restraint, chemical restraint, laws, administration.
- 017 Rectliche und praktische aspekte des tieraerztlichen toetens von wirbeltieren. [Legal and practical aspects of the euthanasia of vertebrates by the veterinary surgeon.] Wormuth, H.J. *Praktische Tierarzt* 70(5):5-8 (1989). NAL call number: 41.8 P882 Descriptors: animal welfare, laws, animal health, destruction of animals.
- 018 The behavior of chickens, mice and rats during euthanasia with chloroform, carbon dioxide and ether. Blackshaw, J.K.; Fenwick, D.C.; Beattie, A.W.; and Allan, D.J. *Lab Animal* 22(1):67-75 (January 1988). NAL call number: QL55 A1L33 Descriptors: inbred strains, induced chemical ataxia, carbon dioxide, chloroform, ether.
- 019 Determination of embutramide in mammalian tissues. Braselton, W.E.; Ray, J.S.; Slanker, M.R.; and Rumler, P.C. *Veterinary and Human Toxicology* 30(6):536-539 (December 1988). NAL call number: SF601 A47 Descriptors: residues, T-61, toxic substances, gas chromatography, mass spectrometry.
- 020 Euthanasia of small animals with nitrogen, comparison with intravenous pentobarbital. Quine, J.P.; Buckingham, W.; and Strunin, L. *The Canadian Veterinary Journal* 29(9):724-726 (September 1988). NAL call number: 41.8 R3224 Descriptors: dogs, cats, rabbits, pentobarbital, nitrogen, animal welfare.
- 021 Euthanatizing agents. Hatch, R.C. *Veterinary Pharmacology and Therapeutics* Booth, N.H. and McDonald, L.E. (eds.), Iowa State University Press, Ames, IA; 6th ed., 1988, pp. 1143-1148. NAL call number: SF915 J6 1988 Descriptors: barbiturates, chloral hydrate, T-61, inhalants, CO, CO₂, electricity, bullets, guillotine, cervical dislocation.
- 022 Experiences in veterinary practice: Knowledge comes but wisdom lingers. Rossdale, P. *The Veterinary Record* 122(3):67- 70 (January 1988). NAL call number: 41.8 V641 Descriptors: educational standards, technological advances.
- 023 Humane Killing of Animals Universities Federation for Animal Welfare, South Mimms, Potters Bar, Herts, England; reprint of the 4th edition, 1988, pp. 1-111. NAL call number: HV4731 H85 Descriptors: animal protection laws, shooting, stunning, cervical dislocation, electrocution, anoxia, asphyxia, chloroform, CO₂, nitrogen, hydrogen cyanide, pentobarbital, cats, deer, ferrets, mink, hedgehogs, otters, rodents, whales, dolphins, crustaceans, reptiles, amphibians.
- 024 Use of the terms euthanasia, euthanatize and killing letter. Rao, G.N. *Laboratory Animal Science* 38(5):558 (October 1988). NAL call number: 410.9 P94 Descriptors: laboratory animals, defining euthanasia.
- 025 Euthanasia. Green, C.J. In: *Laboratory Animals: An Introduction for New Experimenters* Tuffery, A.A. (ed.), Wiley Publishing, Chichester, England; 1987, pp. 171-177. NAL call number: QL55 L274 Descriptors: freezing techniques, carcass disposal, electrocution, anesthetics.
- 026 T-61 use in the euthanasia of domestic animals: A survey. Rowan, A.N. In: *Advances in Animal Welfare Science* 1985 Martinus Nijhoff Publishers, Boston, MA; 1986, pp. 79-86. NAL call number: HV4701 A34 1985 Descriptors: animal welfare, pain, neurotropic drugs, drug combinations, rats, dogs, cats, literature review, horses, adverse reactions.
- 027 Euthanasia by injection. Levine, M.R. *Community Animal Control* 4(1):12, 20-22 (January/February 1985). NAL call number: HV4764 C62 Descriptors: technical training of personnel, methods of injection, physical restraint and handling, ketamine, acepromazine, xylazine, sodium pentobarbital.
- 028 Preanesthesia, anesthesia, analgesia, and euthanasia. Clifford, D.H. In: *Laboratory Animal Medicine* Fox, J.G.; Cohen, B.J.; and Loew, F.M. (eds.), Academic Press Inc., Orlando, FL; 1984, pp.528-563. NAL call number: SF996.5 L33 Descriptors: mammals, birds, reptiles, amphibians, fish, physical methods, inhalants, parenteral methods.

029 Schmerzausschaltung in der experimentellen chirurgie bei hund, katze, schwein, schaf. [Analgesia and anaesthesia for experimental surgery in dogs, cats, pigs and sheep.] Kupper, W. Schriftenreihe Versuchstierkunde Verlag Paul Parey, Berlin, German Federal Republic; 1984, pp. 1-132. Descriptors: sedation, nitrous oxide, halothane, anaesthesia, euthanasia.

030 CO2 euthanasia. Freed, D.L.J. Nature 304(5926):482 (August 1983). NAL call number: 472 N21 Descriptors: carbon dioxide toxicity.

031 Chemical methods for euthanasia (veterinary medicine). Lumb, W.V. and Moreland, A.F. Lab Animal 11(4):29,33,35 (May/June 1982). NAL call number: QL55 A1L33 Descriptors: halothane, isoflurane, methoxyflurane, nitrous oxide, T-61, chloral hydrate, pentobarbital mixtures, undesirable agents-strychnine, magnesium sulfate, potassium chloride, hydrocyanic acid.

032 The history of euthanasia. Brewer, N.R. Lab Animal 11(4):17,19 (May/June 1982). NAL call number: QL55 A1L33 Descriptors: laboratory animals, drug pharmacodynamics, Claude Bernard, strychnine, hypoxia, carbon monoxide poisoning, decompression chambers, reduction of suffering. TEACHING

033 Survival vs. terminal animal laboratories to teach small animal surgery. Bauer, M.S.; Glickman, N.; Salisbury, S.K.; Toombs, J.P.; and Prostedny, J.M. Journal of Veterinary Medical Education 19(2):54-58 (1992). NAL call number: SF601 J62 Descriptors: learning, animal welfare, cadaver, euthanasia.

034 Rodents: Basic Needs, Handling, and Care Hamm, T.E. Production Plus, Inc., Closter, NJ; 1 videocassette (18 min., 21 sec.), 1990. NAL call number: Videocassette no. 967 Descriptors: transport, identification, housing, care, proper euthanasia.

035 Conversations with veterinary students: attitudes, ethics and animals. Herzog, Jr., H.A.; Vore, T.L.; and New, Jr., J.C. Anthrozo's 2(3):181-188 (1989). NAL call number: SF411 A57 Descriptors: veterinary education, animal experiments, euthanasia, professional ethics.

036 Euthanasia workshops - dealing with employee relationships, too. Shelter Sense 11(4):11-12 (April 1988). NAL call number: HV4701 S43 Descriptors: animal welfare, workers, training, hospice.

037 Experiences in veterinary practice: Knowledge comes but wisdom lingers. Rossdale, P. The Veterinary Record 122(3):67- 70 (January 1988). NAL call number: 41.8 V641 Descriptors: educational standards, technological advances.

038 Euthanasia. Green, C.J. In: Laboratory Animals: An Introduction for New Experimenters Tuffery, A.A. (ed.), Wiley Publishing, Chichester, England; 1987, pp. 171-177. NAL call number: QL55 L274 Descriptors: freezing techniques, electrocution, anesthetics.

039 The Oregon certified euthanasia technician program. Greyhavens, T. Community Animal Control 4(1):9, 26-27 (January/February 1985). NAL call number: HV4764 C62 Descriptors: shelter, licenses and permits, technician training, technician stress, legislation, animal welfare.

040 Let's stop playing 'let's pretend'. Smith, B.H. Community Animal Control 4(1):7 (January/February 1985). NAL call number: HV4764 C62 Descriptors: shelter, technical training of staff, societies, animal welfare, interest groups, communication, education.

041 An educator's approach to euthanasia (veterinary medicine). Bustad, L.K. Lab Animal 11(4):37-39 (May/June 1982). NAL call number: QL55 A1L33 Descriptors: central nervous system, ideal agent, education, client-veterinarian interaction.

HUMAN/ANIMAL BOND

042 Absent Friend Lee, L. and Lee, M. Henston Ltd., High Wycombe, Bucks, United Kingdom; 1992, 141 pp. ISBN: 1-85054- 089-6. Descriptors: pet death, grief, mourning.

- 043 Bereavement after the death of a pet. Nol de Tilly, J. *Veterinary Technician* 13(3):185-189 (April 1992). NAL call number: SF406 A5 Descriptors: pet death, understanding grief, counseling.
- 044 *Coping With the Loss of a Pet: A Gentle Guide for all Who Love a Pet* Lemieux, C.M. W.R. Clark & Co., Reading, PA; 1992, 52 pp. ISBN: 0-9622158-0-5. Descriptors: grief, pet death, emotion.
- 045 In extremis, pets fare better than people. (They have the right to euthanasia.) Agate, C. *The Los Angeles Times* 111:B7 (August 4, 1992). ISSN: 0458-3035. Descriptors: ethics, legislation, terminally ill.
- 046 Animal illness and human emotions: Cancer. Butler, C.L.; Lagoni, L.; Dickinson, K.L. and Withrow, S.J. *Problems in Veterinary Medicine* 3(1):21-37 (March 1991). NAL call number: SF601 P76 Descriptors: oncology, pets, psychological effects, emotion, euthanasia.
- 047 Animal illness and human emotions: Death and bereavement. Harris, J.M. *Problems in Veterinary Medicine* 3(1):111-117 (March 1991). NAL call number: SF601 P76 Descriptors: grief, pet death, counseling, support.
- 048 Animal illness and human emotions: Suffering and euthanasia. Cohen, S.P. and Sawyer, D.C. *Problems in Veterinary Medicine* 3(1):101-109 (March 1991). NAL call number: SF601 P76 Descriptors: pets, euthanasia, pain, psychological effects.
- 049 Cancer. Butler, C.L.; Lagoni, L.; Dickinson, K.L.; and Withrow, S.J. *Problems in Veterinary Medicine* 3(1):21-37 (March 1991). NAL call number: SF601 P76 Descriptors: treatment, emotion, dog, cat, neoplasm, euthanasia.
- 050 Coping with euthanasia: A case study of shelter culture. Arluke, A. *Journal of the American Veterinary Medical Association* 198(7):1176-1180 (April 1991). NAL call number: 41.8 Am3 Descriptors: cat, dog, shelter employees, emotion.
- 051 Death and bereavement. Harris, J.M. *Problems in Veterinary Medicine* 3(1):111-117 (March 1991). NAL call number: SF601 P76 Descriptors: grief, pet death, euthanasia, children, counseling.
- 052 Neurologic problems. Joseph, R. *Problems in Veterinary Medicine* 3(1):95-99 (March 1991). NAL call number: SF601 P76 Descriptors: communication, therapy, costs, euthanasia, dog, cat.
- 053 'Rescued' animals killed: Animal-rights group defends euthanasia. Okie, S. and Jennings, V. *The Washington Post* 114:A1 (April 13, 1991). ISSN: 0190-8286. Descriptors: ethics, society, policy.
- 054 Suffering and euthanasia. Cohen, S.P. and Sawyer, D.C. *Problems in Veterinary Medicine* 3(1):101-109 (March 1991). NAL call number: SF601 P76 Descriptors: pets, choices, pain, emotion, euthanasia.
- 055 Veterinarians as members of the humane community. Thornton, G.W. *Journal of the American Veterinary Medical Association* 198(8):1352-1354 (April 15, 1991). NAL call number: 41.8 Am3 Descriptors: professional standards, animal welfare, United States, ethics.
- 056 Wills requiring the destruction of pets--the veterinarian's position. Hannan, H.W. *Journal of the American Veterinary Medical Association* 199(9):1156-1157 (November 1, 1991). NAL call number: 41.8 Am3 Descriptors: ethics, legislation, animal welfare, jurisprudence.
- 057 The animal technicians' role in the euthanasia of laboratory animals. Martinic, G. *Animal Technology: Journal of the Institute of Animal Technicians* 41(2):145-150 (August 1990). NAL call number: QL55 I5 Descriptors: survey, perceived role, training.
- 058 Humane euthanasia and companion animal death: Caring for the animal, the client, and the veterinarian. Hart, L.A.; Hart, B.L.; and Mader, B. *Journal of the American Veterinary Medical Association* 197(10):1292-1299 (November 15, 1990). NAL call number: 41.8 Am3 Descriptors: emotion, pets, ethics.

- 059 Conversations with veterinary students: attitudes, ethics and animals. Herzog, Jr., H.A.; Vore, T.L.; and New, Jr., J.C. *Anthrozo's* 2(3):181-188 (1989). NAL call number: SF411 A57 Descriptors: veterinary education, animal experiments, euthanasia, professional ethics.
- 060 Client services for geriatric pets. Hancock, G. and Yates, J. *The Veterinary Clinics of North America Small Animal Practice* 19(1):187-196 (January 1989). NAL call number: SF601 V523 Descriptors: attachment, human-pet bonding.
- 061 Insensitivity toward clients. Rider, H.E. *Journal of the American Veterinary Medical Association* 195(7):852 (October 1989). NAL call number: 41.8 Am3 Descriptors: cat, client's response to witnessing euthanasia.
- 062 A client's perspective. Balaban, B. and Hart, L.A. *Companion Animal Practice* 2(2):20-24 (February 1988). NAL call number: SF981 C64 Descriptors: veterinary practice, public relations, pets, euthanasia.
- 063 Convenience euthanasia revisited. Antelyes, J. *Journal of the American Veterinary Medical Association* 193(8):906-908 (October 1988). NAL call number: 41.8 Am3 Descriptors: dogs, ethics, decision making, alternatives, shelter, client-veterinarian relationships, ethics.
- 064 Coping with blindness: A survey of 50 blind dogs. Chester, Z. and Clark, W.T. *The Veterinary Record: Journal of the British Veterinary Association* 123(26-27):668-671 (December 1988). NAL call number: 41.8 V641 Descriptors: dog diseases, behavior, aggression, decision to euthanize, coping with the blind pet.
- 065 The euthanasia decision. Mitchener, K.L. *Companion Animal Practice* 2(12):3-6 (December 1988). NAL call number: SF981 C64 Descriptors: owner support, when to euthanize, attachment, medical advice, options, case history, dog.
- 066 Euthanasia workshops - dealing with employee relationships, too. *Shelter Sense* 11(4):11-12 (April 1988). NAL call number: HV4701 S43 Descriptors: animal welfare, workers, training, hospice.
- 067 Patient death and dying. Lagoni, L.S.; Arguello, S.; Withrow, S.J.; and Pike, C. In: *Veterinary Practice Management* McCurnin, D.M. (ed.), Lippincott, Philadelphia, PA; 1988, pp. 308-319. NAL call number: SF756.4 V47 Descriptors: dogs, veterinary practice, euthanasia, attachment behavior.
- 068 Trauer um ein Tier. [Grief over an animal.] Durr, U.M. *Du und das Tier* 18(5):20-23 (1988). Descriptors: pets, man, psychology, euthanasia.
- 069 The veterinarian as a counselor - handling pet owner grief. Olson, D. and Greene, L. *Veterinary Reports* 1(3):10,12 (1988). Descriptors: pets, veterinary practice, owner grief.
- 070 Euthanasia: Helping clients cope with the decision and the event. Fudin, C.E. *Veterinary Technician* 8(2):98-101 (March 1987). NAL call number: SF406 A5 Descriptors: emotional attachment, reasons for requesting euthanasia, decision making, clients presence during euthanasia.
- 071 Thoughts on euthanasia. Dorsey, W.A. *Journal of the American Veterinary Medical Association* 190(10):1252-1253 (May 1987). NAL call number: 41.8 Am3 Descriptors: clients, pets, euthanasia on demand, medically necessary euthanasia, editorial.
- 072 Breaking the human-animal bond: Helping clients cope with euthanasia. Knodel, K.J. and Beran, G. *Iowa State University Veterinarian* 48(2):96-98 (1986). NAL call number: 41.8 V6425 Descriptors: stages of grief: denial, anger, depression, resolution, decision making, client relations.
- 073 When companion animals die: Caring for clients in their time of sorrow. Carmack, B.J. *Veterinary Medicine* 81(4):311- 314 (April 1986). NAL call number: 41.8 M69 Descriptors: bereaved pet owners, dying pets, decision to euthanize, understanding, sensitivity, attachment, financial burden.
- 074 Laboratory animal technicians: Their role in stress reduction and human-companion animal bonding. Wolfle, T.L.

The Veterinary Clinics of North America. Small Animal Practice 15:449-454 (1985). NAL call number: SF601 V523
Descriptors: attitude, animal care, discussion groups, grief.

075 Pet Loss and Human Bereavement Kay, W.J. Iowa State University Press, Ames, IA; 1st edition, 1984, 198 pp.
NAL call number: SF411.47 P48 Descriptors: meeting clients needs, communication between client and veterinarian,
decision making, grief, separation and loss, human psychology.

076 Thanatology: Death of a pet. Kay, W.; Fudin, C.; and Cohen, S. In: Dynamic Relationships in Practice: Animals in
the Helping Professions Arkow, P. (ed.), Latham Foundation, Alameda, CA; 1984, pp. 107-122. NAL call number:
SF411.5 D9 Descriptors: animal welfare, mortality, euthanasia, pain, grief.

077 The veterinarian's role in the human/animal bond. Harris, J.M. In: Dynamic Relationships in Practice: Animals in
the Helping Professions Arkow, P. (ed.), Latham Foundation, Alameda, CA; 1984, pp. 271-286. NAL call number:
SF411.5 D9 Descriptors: bonds, emotions, euthanasia, veterinarian's responsibilities.

078 Incidence of euthanasia and euthanasia alternatives in veterinary practice. McCulloch, M.J. and Bustad, L.K. In:
New Perspectives on Our Lives With Companion Animals Katcher, A.H. and Beck, A.M. (eds.), University of
Pennsylvania Press, Philadelphia, PA; 1983, pp. 366-369. NAL call number: SF411 5N48 Descriptors: pets, number of
animals euthanatized, counseling owners, euthanasia decision, veterinary survey.

079 Euthanasia of pets: Especially difficult for elderly people. Messonnier, S. VM/SAC, Veterinary Medicine & Small
Animal Clinician 77(3):363-364 (March 1982). NAL call number: 41.8 M69 Descriptors: case report, poodle,
explanation of euthanasia procedures, clients options, client responsibility.

080 Managing the guilt of companion pet euthanasia. Chastain, C.B. Feline Practice 12(2):7-8, 10-11 (March/April
1982). NAL call number: SF985 F4 Descriptors: emotional attachment, veterinarian-client relationships, anticipated loss
of pet, relieving suffering, owner support, owners presence during euthanasia.

RODENTS AND RABBITS

081 Comparison of effects of decapitation and anesthesia on metabolic and hormonal parameters in Sprague-Dawley
rats. Bhatena, S.J. Life Sciences 50(21):1649-1655 (1992). NAL call number: 442.8 L62 Descriptors: plasma glucose,
triglyceride, cholesterol, insulin, glucagon.

082 Euthanasia by decapitation: Evidence that this technique produces prompt, painless unconsciousness in laboratory
rodents. Holson, R.R. Neurotoxicology and Teratology 14(4):253-257 (July/August 1992). ISSN: 0892-0362.
Descriptors: EEG, comparison to anesthesia effects, brain, pain perception.

083 Morphometric studies of the proximal tubules of the rat kidney considering the effect of the method of killing.
[Morphometrisch untersuchungen am proximalen tubulus der rattenniere unter dem einfluss der totungsart.] Messow,
C.; Heider, J.J.; Hackbarth, H.; and Korn, W.D. Berliner und Munchener Tierarztliche Wochenschrift 105(9):294-299
(September 1, 1992). NAL call number: 41.8 B45 Descriptors: Wistar, Sprague-Dawley, decapitation, nembutal
overdose, exsanguination.

084 Ethanol euthanasia and its effect on the binding of antibody generated against an immunogenic peptide construct.
Lord, R.; Jones, G.L.; and Spencer, L. Research in Veterinary Science 51(2):164-168 (September 1991). NAL call
number: 41.8 R312 Descriptors: mice, immunization, sodium pentobarbitone, 70% ethanol.

085 Killing of experimental rabbits with captive bolt guns according to animal welfare regulations. [Tierschutzgerechtes
toten von versuchskaninchen mit bolzenschussgeraten.] Holtzmann, M. Journal of Experimental Animal Science 34(5-
6):203-206 (1991). NAL call number: QL1 J687 Descriptors: Germany, technique, animal welfare, shooting.

086 Pain perception in decapitated rat brain. Derr, R.F. Life Sciences 49(19):1399-1402 (1991). NAL call number:
442.8 L62 Descriptors: humane, oxygen consumption, EEG activation, consciousness.

- 087 Rat brain free glucose and lactate measurement by a novel method using bisecting decapitation-extrusion and enzyme denaturation at five seconds. Oldendorf, W.H. and Stoller, B.E. *Journal of Neurochemistry* 56(2):611-614 (1991). NAL call number: QP351 J6 Descriptors: decapitation, enzyme inactivation, method comparison, males.
- 088 Rodent euthanasia. Lord, R. *Nature* 350:6318-6456 (April 11, 1991). NAL call number: 472 N21 Descriptors: rats, mice, 70% ethanol, central nervous system depressant, barbituate alternative.
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FARM ANIMALS AND HORSES

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- 162 Euthanasia of day-old male chicks in the poultry industry. Jaksch, W. *International Journal for the Study of Animal Problems* 2(4):203-213 (July/August 1981). NAL call number: HV4701 I49 Descriptors: decapitation, homogenization, decompression, carbon dioxide gassing, nitrogen gassing, electrocution, euthanasia criteria.
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SHELTER EUTHANASIA AND CATS AND DOGS

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- 176 Euthanasia of healthy pets letter. Journal of the American Veterinary Medical Association 194(1):6 (January 1989). NAL call number: 41.8 Am3 Descriptors: animal welfare, veterinary medicine standards.
- 177 Euthanasia workshops-dealing with employee relationships, too. Shelter Sense 11(4):11-12 (April 1988). NAL call number: HV4701 S43 Descriptors: animal welfare, workers, training, hospice.
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AMPHIBIANS, REPTILES, AND FISH

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