* Vertebrate Animals *

students conduct research with animal subjects, the health and both animal subjects and the student researcher. When researchers adhere to the federal regulations governing professional scientists and to, therefore, protect the welfare of well-being of the animal subjects must be considered. The following rules were developed to help pre-college student

depending on the nature of the study and the research site. rules below AND to either Section A or Section B rules All projects involving vertebrate animals must adhere to the

Vertebrate Animals Rules for ALL Studies Involving

- or fetuses, tadpoles, bird and reptile eggs within three days defined as live, nonhuman vertebrate mammalian embryos allowable under the conditions and rules in the following The use of vertebrate animals in science projects is (including fish) at hatching or birth (72 hours) of hatching, and all other nonhuman vertebrates sections. Vertebrate animals, as covered by these rules, are
- 12 Alternatives to the use of vertebrate animals for research Alternatives include the following "3 R's" must be explored and discussed in the research plan.
- Replace vertebrate animals with invertebrates, lower
- Reduce the number of animals without compromising statistical validity life forms, tissue/cell cultures or computer simulations
- Refine the experimental protocol to lessen pain or distress to the animals.
- euthanasia is permitted under certain conditions when the Research projects which cause more than momentary pair to kill vertebrate animals are prohibited. (Note: Humane or suffering to vertebrate animals or which are designed research is conducted at a regulated research institution.

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- 4 The following types of studies on vertebrate animals are
- a. All induced toxicity studies involving a poison or alcohol, acid rain, insecticide, herbicide, or heavy toxin that could impair health or destroy life, including
- Behavioral experiments involving operant separation or induced helplessness conditioning with aversive stimuli, mother/infant
- Predator/vertebrate prey experiments
- S Because weight loss is one significant sign of stress, the (compared to controls) of any experimental or control animal is 15%. maximum permissible weight loss or growth retardation

- 9 If an experimental design requires food or water restriction it must be appropriate to the species, but may not exceed
- ك If there are unexpected deaths in either the experimental or terminated. A death rate of 30% or greater in any group or for the deaths, the experiment must be immediately investigated. If the experimental procedure is responsible control groups, the cause of the death must be subgroup is not permitted and the project will fail to qualify
- ∞ Students performing vertebrate animal research must follow local, state, country and U.S. federal regulations.
- و involving vertebrate animals Designated Supervisor must directly supervise all research Except for observational studies, a Qualified Scientist or
- ē A Scientific Review Committee (SRC) and/or an plan for vertebrate animal studies must include the must approve all research before experimentation begins. research institution for all animal studies.) The research (An IACUC is the review and approval body at a regulated Institutional Animal Care and Use Committee (IACUC)
- contribution this research may have on the broad fields Justify why animals must be used, including the reasons of biology or medicine. unacceptable. Explain the potential impact or considered, and the reasons these alternatives were used. Describe any alternatives to animal use that were for the choice of species and the number of animals to be
- methods and procedures, such as experimental design and data analysis. Describe the procedures that will Describe in detail, how the animals will be used. Include weight, source and number of animals proposed for use. experimentation. Identify the species, strain, sex, age, injury to the animals during the course of minimize the potential for discomfort, distress, pain and
- 11) Studies involving behavioral observations of animals are exempt from prior SRC review if ALL of the following apply:

There is no interaction with the animals being

- There is no manipulation of the environment in any
- regulations are followed way and All federal or state fish, game and wildlife laws and
- Certain types of vertebrate animal studies may be rules and site descriptions. at a regulated research institution. See A. Non-regulated Research Site and B. Regulated Research Site below for research sites, whereas other studies must be conducted conducted at home, school or other non-regulated

A. Additional Rules for Projects Conducted in a Non-regulated Site

includes: research site (home, school, farm, ranch, in the field, etc.). Vertebrate animal studies may be conducted at a **non-regulated** This

- Studies involving animals in their natural environment
- Studies involving animals in zoological parks
- · Studies involving livestock that use standard agricultural
- _ These projects must adhere to BOTH of the following guidelines:
- The research involves agricultural, behavioral, observational or supplemental nutritional studies on

The research involves only non-invasive and non-intrusive methods that do not negatively affect an animal's health or well-being.

conducted at a Regulated Research Institution. See (Note: All studies not meeting the above criteria must be

- 2 husbandry information documents offer space requirements and additional the daily husbandry of the animals. The following well-being. A Designated Supervisor is required to oversee Animals must be observed daily to assess their health and including weekends, holidays, and vacation periods frequently. Proper care must be provided at all times be given a continuous, clean (uncontaminated) water and Animals must be treated kindly and cared for properly. food supply. Cages, pens and fish tanks must be cleaned requirements appropriate for the species used. They must environment compatible with the standards and Animals must be housed in a clean, ventilated, comfortable
- Federal Animal Welfare Regulation
- Guide for the Care and Use of Laboratory Animals
- Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (Ag-Guide)
- ω encountered in the animal's daily life. nutrition and/or activities that would not be ordinarily approval. It is highly recommended that a veterinarian be required before experimentation and the prior SRC animal husbandry are appropriate. This certification is The Scientific Review Committee must determine when a consulted in experiments that involve supplemental vetermarian is required to certify that the research plan and
- 4 steps are taken to eliminate the causal factors. related to the experimental procedures and if appropriate only be resumed if the cause of illness or death is not death in the experimental subjects. The experiment can to stop experimentation if there is significant weight loss or animals must have proper medical and nursing care that is directed by a veterinarian. A student researcher is expected If an unexpected illness or emergency occurs, the affected

- S and regulations. proper license, and adheres to state and local fishing laws only if the researcher releases the fish unharmed, has the regulatory officials. Fish may be obtained from the wild wild without approval of authorized wildlife or other Animals may not be captured from or released into the
- 9 is not permitted for a project conducted in a non-regulated Euthanasia for tissue removal and/or pathological analysis and explained on Vertebrate Animal Form (5A). The final disposition of the animals must be considered
- ٦ After initial SRC approval, a student with any proposed laboratory experimentation/data collection resumes. of the project must repeat the approval process before changes in the Student Checklist (1A) and Research Plan
- The following forms are required:

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- Checklist for Adult Sponsor (1)
- Student Checklist (1A)
- Research Plan
- Approval Form (1B)
- Vertebrate Animal Form (5A)
- Qualified Scientist Form (2), if applicable

₽. **Additional Rules for Projects** Institution Conducted in a Regulated Research

this definition. structured in compliance with U.S. federal laws are included in Institutional Animal Care and Use Committee and program biotechnology companies that utilize research animals that are Centers For Disease Control. In addition, pharmaceutical and and is licensed to use animals covered by the Animal Welfare teaching institution that is regularly inspected by the USDA research institution is defined as a professional research/ conducted in a regulated research institution. A regulated All studies not meeting the criteria in Section A. must be not covered by the Animal Welfare Act but have an operational Institutes of Health, Veteran's Affairs Medical Centers and the Act. Also included are all federal laboratories such as National

research institutions is not appropriate for pre-college (NOTE: Some research that is permissible for professionals in

The Institutional Animal Care and Use Committee (IACUC) This SRC review should occur before experimentation certify that the research project complies with ISEF Rules investigator. The local SRC must also review the project to conducted under the responsibility of a principal experimentation begins. Such research projects must be must approve all student research projects before

- 2 Qualified Scientist or an institutional representative may removal and/or pathological analysis is permitted. Only the Proper euthanasia at the end of experimentation for tissue adhere to current AVMA Guidelines. perform the euthanasia. All methods of euthanasia must
- \mathfrak{S} Research projects that cause more than momentary pain or of studies for science fair projects. suffering to vertebrate animals are prohibited. The following table relates the USDA Pain Categories and the permissibility

PROHIBITED	Live animals will experience significant/severe pain or distress, without benefit of anesthetics, tranquilizers or analossics	Category E
for high school students.	TO ALLE VIATE PAIN OR DISTRESS.	
projects would be deemed	any type and some studies which would	
rules. Most Category D	procedures. Examples include, but are not	
The project must adhere to all ISEF	physiological changes spontaneously or as	
and certification.	develop discernable clinical signs	
permitted with	allowed to recover and/or animals will	
Limited Category D procedures are	Live animals will have manipulations performed while anesthetized and are	Category D
	procedure without regaining consciousness.	
certification	euthanized at the termination of the	
with proper	manipulations, surgery, etc., performed while anesthetized. The animals will be	
Permitted only	Live animals will have significant	Category C
	husbandry practices.	
	injections, field trapping/tagging, blood sampling and standard agricultural	
	Examples include but are not limited to:	
	which results in a short-term response.	
Permitted	Live animals will receive momentary pain or stressful stimulus without anesthesia	Category B
	to obtain tissues, cells, etc.	
	manipulation. Animals may be euthanized	
Permitted	Live animals will receive non-painful	Category A
Guidelines		Categories
ISEF	Definition	USDA Pain

- 4 exposure to unknown or potentially hazardous materials or drugs is permitted to proceed only to the point where the first Research in nutritional deficiency, ingestion, inoculation or such action is feasible. If not, the animal(s) must be sign of the deficiency or effect appear. Appropriate measures must then be taken to correct the deficiency or drug effect, if
- S The following forms are required:

euthanized.

- Student Checklist (1A)
- ċ Research Plan

- ûå
- Þ. Checklist for Adult Sponsor (1)

- Regulated Research Institution Form (1C)
- Vertebrate Animal Form (5B)

- r e Approval Form (1B)
- đ
- Qualified Scientist Form (2)

Animal Care and Use Sources of Information for

- 1) Guide for the Care and Use of Laboratory Animals, Commission on Life Sciences, National Research Institute of Laboratory Animal Research (ILAR), http://dels.nas.edu/ilar_n/ilarhome/reports.shtml
- 2) Principles and Guidelines for the Use of Animals in Precollege Education (a free pamphlet from ILAR)

Can be found online:

http://dels.nas.edu/ilar_n/ilarhome/reports.shtml

3 Guidelines for the Care and Use of Mammals in for Laboratory Animal Research (ILAR). Neuroscience and Behavioral Research (2003), Institute

To order these ILAR publications contact:

fax: 202-334-2451; http://www.nap.edu Washington, DC 20055 phone: 888-624-8373 or 202-334-3313 500 Fifth Street, NW National Academies Press

 Federal Animal Welfare Act (AWA) 7 U.S.C. 2131-2157

Subchapter A - Animal Welfare (Parts I, II, III) http://www.nal.usda.gov/awic/legislat/awicregs.htm

Above document is available from: USDA/APHIS/AC

4700 River Road, Unit 84 Fax: (301) 734-4978 Riverdale, MD 20737-1234 http://awic.nal.usda.gov Tel: (301) 734-7833 email: ace@aphis.usda.gov

- S Guide for the Care and Use of Agricultural Animals in Savoy, IL 61874 http://www.fass.org email: fass@assochq.org Federation of Animal Science Societies (FASS) phone: (217) 356-3182 1111 N. Dunlap Avenue Agricultural Research and Teaching (Agri-Guide)
- 9 Guidelines for the Use of Fish in Research (2004), http://www.fisheries.org/afs/publicpolicy.html American Fisheries Society.
- ك Euthanasia Guidelines euthanasia.pdf American Veterinary Medical Association. AVMA Guidelines on Euthanasia (June 2007) http://www.avma.org/issues/animal_welfare/

and Animal Welfare Sources of Information for Alternative Research

- 1) The National Library of Medicine provides computer searches through MEDLINE: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi (301) 594-5983; email: custserv@nlm.nih.gov 1-888-FIND-NLM or 1-888-346-3656 Bethesda, MD 20894 8600 Rockville Pike Reference & Customer Services http://www.nlm.nih.gov National Library of Medicine
- National Agriculture Library (NAL) provides reference

service for materials that document a) Alternative

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Procedures to Animal Use and b) Animal Welfare. http://www.nal.usda.gov/awic Beltsville, MD 20705-2351 Animal Welfare Information Center email: awic@nal.usda.gov phone: (301) 504-6212, fax: (301) 504-7125 10301 Baltimore Avenue, Room 410 National Agriculture Library

3) Institute of Laboratory Animal Resources (ILAR) provides a Journal annotated bibliographies published quarterly in ILAR handling standards, and alternatives to animal use through variety of information on animal sources, housing and

ILAR

The Keck Center of the National Academies 500 Fifth Street, NW, Keck 687 phone: (202) 334-2590, fax: 202-334-1687 Washington, DC 20001 http://dels.nas.edu/ilar/ email: ILAR@nas.edu

obtained from: Vertebrates in Biomedical Research and Testing may be Quarterly bibliographies of Alternatives to the Use of Live

6707 Democracy Blvd., MSC 5467 2 Democracy Plaza, Suite 510 Ph: 301-496-1131; Fax: 301-480-3537 Bethesda, MD 20892-5467 NLMNIH Specialized Information Services Email: tehip@teh.nlm.nih.gov Toll Free: 1-888-FIND NLM or 1-888-346-3656

http://toxnet.nlm.nih.gov/altbib.html

http://www.sis.nlm.nih.gov;

http://caat.jhsph.edu/ email: caat@jhsph.edu necessary tests to eliminate pain and distress. experiments, reduce the number of animals tested, and refine methods to replace the use of laboratory animals in (CAAT) has worked with scientists since 1981 to find new John's Hopkins Center for Alternatives to Animal Testing

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