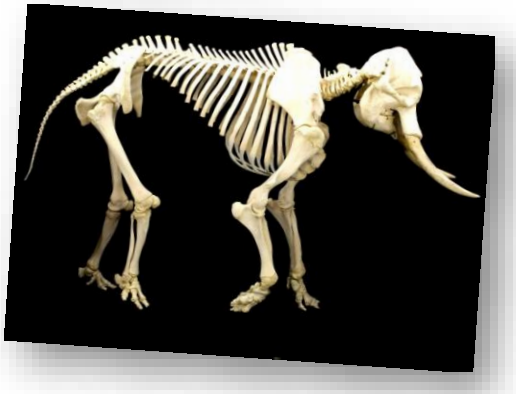
Vertebrate Animal Research



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CREST-Jane Goodall
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Supplemental

Guidelines & Requirements

for your

ISEF Research Plan

The use of animals in your project is a privilege that carries special responsibilities, whether you are doing an observational study, experimental treatment, or engineering something involving animals. When doing research with vertebrate animals, you need to follow all the local, state and federal rules and guidelines that apply to university-level studies. Your research plan must include information that shows how you will follow those guidelines. A special committee will review your plan, evaluate the risk level, and approve your project before you begin experimenting. This committee is called the Scientific Review Committee (SRC), and includes teachers, scientists and veterinarians who have volunteered to review student projects to make sure animals and researchers are not harmed in any way by the research. University-level projects are reviewed by an Institutional Animal Use and Care Committee, and you may see some guidelines and regulations refer to this "IACUC". Our SRC takes the place of the IACUC for ISEF studies.

In this packet, you'll find:

1. A list of extra requirements that must be included in your research plan, from the Society for Science and the Public's ISEF rulebook.
2. An explanation of all the rules that apply to all projects involving vertebrate animals.
3. Information about how to treat animals humanely in research. This information is written for Behavioral Science projects by the American Psychological Association, but it applies to all types of projects. For further information about We strongly encourage you to read through the full packet before you start writing your research plan.

CHECKLIST: Requirements for ISEF research plans involving vertebrate animals

Adapted from: https://member.societyforscience.org/document.doc?id=642

The following items must be covered in the <u>procedure</u> and <u>risk assessment</u> sections of your research plan. Be sure you have covered all the points in this checklist BEFORE you turn in your plan for review!:

Procedure

- ☐ Detail all procedures to be used ◊
    - Include methods used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation ◊
    - Detailed chemical concentrations and drug dosages
    - Detail animal numbers, species, strain, sex, age, source, etc. ◊
- ☐ Describe housing and oversight of daily care (everything about their habitat, food, how often they will be observed and who will be observing them. Include how you will care for them on weekends and holidays.)
- ☐ Discuss disposition of the animals at the termination of the study (what will happen to them when you are done)

Risk Assessment

- ☐ Briefly discuss potential ALTERNATIVES to vertebrate animal use and present a detailed justification for use of vertebrate animals (could you use invertebrates, plants, simulations, or previously-collected datasets, for example?). Also justify the number of animals you plan to use in your study - why do you need that many?
- ☐ Explain why this research is important (this is a bit of a repeat but important to explain here as a justification for using vertebrate animals in your research).

MORE INFO: How will the SRC committee evaluate the approvability for your project?

https://student.societyforscience.org/vertebrate-animals

Use this information to see whether your project follows the ISEF rules. If there are areas of special concern, please talk with Amy or Danielle about this as soon as possible. Note that if you do your study at a research institution (instead of home, school or farm) there may be some additional requirements.

Rules for ALL Vertebrate Animal Studies

1) The use of vertebrate animals in science projects is allowable under the conditions and rules in the following sections. Vertebrate animals, as covered by these rules, are defined as:

a. Live, nonhuman vertebrate mammalian embryos or fetuses

b. Tadpoles

c. Bird and reptile eggs within three days (72 hours) of hatching

d. All other nonhuman vertebrates (including fish) at hatching or birth.

Exception: Because of their delayed cognitive neural development, zebrafish embryos are not considered vertebrate animals until 7 days (168 hours) post- fertilization.

2) Alternatives to the use of vertebrate animals for research must be explored and discussed in the research plan. The guiding principles for the use of animals in research include the following "Four R's":

a. Replace vertebrate animals with invertebrates, lower life forms, tissue/cell cultures and/or computer simulations where possible.

b. Reduce the number of animals without compromising statistical validity.

c. Refine the experimental protocol to minimize pain or distress to the animals.

d. Respect animals and their contribution to research.

3) All vertebrate animal studies must be reviewed and approved before experimentation begins. An Institutional Animal Care and Use Committee, known as an IACUC, is the institutional animal oversight review and approval body for all animal studies at a Regulated Research Institution. The affiliated fair SRC serves in this capacity for vertebrate animals studies performed in a school, home or field. Any affiliated fair SRC serving in this capacity must include a veterinarian or an animal care provider with training and/or experience in the species being studied.

4) All vertebrate animal studies must have a research plan that includes:

a. Justification why animals must be used, including the reasons for the choice of species, the source of animals and the number of animals to be used; description, explanation, or identification of alternatives to animal use that were considered, and the reasons these alternatives were unacceptable; explanantion of the potential impact or contribution this research may have on the broad fields of biology or medicine.

b. Description of how the animals will be used. Include methods and procedures, such as experimental design and data analysis; description of the procedures that will minimize the potential for discomfort, distress, pain and injury to the

animals during the course of experimentation; identification of the species, strain, sex, age, weight, source and number of animals proposed for use.

5) Studies involving behavioral observations of animals are exempt from prior SRC review if ALL of the following apply:
a. There is no interaction with the animals being observed,
b. There is no manipulation of the animal environment in any way, and
c. The study meets all federal and state agriculture, fish, game and wildlife laws and regulations.

6) Students performing vertebrate animal research must satisfy US federal law as well as local, state, and country laws and regulations of the jurisdiction in which research is performed.

7) Research projects which cause more than momentary or slight pain or distress are prohibited. Any illness or unexpected weight loss must be investigated and a veterinarian consulted to receive required medical care. This investigation must be documented by the Qualified Scientist, Designated Supervisor who is qualified to determine the illness or a veterinarian. If the illness or distress is caused by the study, the experiment must be terminated immediately.

8) No vertebrate animal deaths due to the experimental procedures are permitted in any group or subgroup.
a. Studies that are designed or anticipated to cause vertebrate animal death are prohibited.
b. Any death that occurs must be investigated by a veterinarian, the Qualified Scientist or the Designated Supervisor who is qualified to determine if the cause of death was incidental or due to the experimental procedures. The project must be suspended until the cause is determined and then the results must be documented in writing.
c. If death was the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

9) All animals must be monitored for signs of distress. Because significant weight loss is one sign of stress, the maximum permissible weight loss or growth retardation (compared to controls) of any experimental or control animal is 15%.

10) Students are prohibited from designing or participating in an experiment associated with the following types of studies on vertebrate animals:
a. Induced toxicity studies with known toxic substances that could cause pain, distress, or death, including but not limited to, alcohol, acid rain, pesticides, or heavy metals.
b. Behavioral experiments using conditioning with aversive stimuli, mother/infant separation or induced helplessness.
c. Studies of pain.
d. Predator/vertebrate prey experiments.

11) Justification is required for an experimental design that involves food or fluid restriction and must be appropriate to the species. If the restriction exceeds 18 hours, the project must be reviewed and approved by an IACUC and conducted at a Regulated Research Institution.

12) Animals may not be captured from or released into the wild without approval of authorized wildlife or other

regulatory officials. All appropriate methods and precauthions must be used to decrease stress. Fish may be obtained from the wild only if the researcher releases the fish unharmed, has the proper license, and adheres to state, local and national fishing laws and regulations. The use of electrofishing is permissible only if conducted by a trained supervisor; students are prohibited from performing electrofishing.

13) A Qualified Scientist or Designated Supervisor must directly supervise all research involving vertebrate animals, except for observational studies.

14) After initial SRC approval, a student with any proposed changes in the Research Plan of the project must repeat the approval process before laboratory experimentation/data collection resumes.