

GUIDELINES

Center for Food Animal Health CFAH

(Updated May 17, 2010)

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MISSION STATEMENT

CFAH MISSION STATEMENT

To create, apply, and disseminate new knowledge that will enhance the current and future health and well being of food producing animals, promote the safety of foods of animal origin, and provide a healthy environment for food animals and humans.

FACT SHEET

CFAH FACT SHEET

WHAT IS THE CENTER FOR FOOD ANIMAL HEALTH (CFAH)?

The CFAH is an organized research Center of the School of Veterinary Medicine. Established in 1972, and formerly known as the Livestock Disease Research Laboratory, this program serves as the veterinary medical component of the Agricultural Experiment Station and is managed as a non-departmental Center within the School. Its purpose is to organize resources for and conduct research on animal diseases important to the livestock industries, the environment, important food-borne and vector-borne disease problems, and zoonosis associated with diseases of livestock critical to the state of California.

WHO IS RESPONSIBLE FOR THE CFAH?

The Dean serves as Director. Day-to-day activities are the responsibility of the Office of Research and Graduate Education Programs within the School of Veterinary Medicine.

PURPOSE OF FUNDING?

These funds are provided as seed monies to investigators for the purpose of developing preliminary data or to explore new directions on existing projects, and are not intended for long term funding.

WHERE IS RESEARCH IN THE CFAH CONDUCTED?

Research under the umbrella of the CFAH is conducted in various laboratories throughout the School, including Veterinary Medicine Extension, the California Animal Health and Food Safety Laboratory System (CAHFS) including its Satellite Units, and at the Veterinary Medicine Teaching and Research Center (VMTRC).

WHO IS AFFILIATED WITH THE CFAH?

Faculty in the School who have an Agriculture Experiment Station appointment, Veterinary Extension Specialists and other School faculty conducting livestock disease research.

WHO DOES THE CFAH REPORT TO?

CFAH faculty report to the Dean. The Dean in turn reports CFAH activities to the Campus, Agriculture and Natural Resources (ANR), commodity organizations, agencies, and others as appropriate. The Dean reports Veterinary Medicine Extension Unit activities directly to ANR.

WHO REVIEWS ACTIVITIES IN THE CFAH?

- Dean - For adherence to the mission & goals of the program.
- VMDO-Office of Research - For guidance & compliance to School, ANR & Agency requirements.
- Faculty Commodity Advisory Committee - For adherence to commodity issues and needs.
- Scientific Advisory Committee - For evaluation of scientific merit.
- Food Animal Stakeholder Workgroup - Assists with identifying and establishing priorities important to the livestock industry at the state and national levels
- Workgroup: Commodity Advisory Council, an ANR based committee - For identifying & establishing issues & needs important to the California livestock industry.

WHO ARE THE CFAH STAKEHOLDERS?

Representatives of federal/state agencies, commodity organizations, livestock advisors, producers, veterinary organizations and processors.

WHAT IS THE PROCESS FOR FUNDING/REPORTING RESEARCH ACTIVITIES IN THE CFAH?

Depts/Units | VMDO-Office of Research | Dean | ANR | USDA/CSREES

DOES THE CFAH REQUIRE AN EXTERNAL REVIEW?

Yes, every five years a comprehensive review is required by USDA. The review panel consists of a USDA representative, and faculty/administrators from other veterinary and veterinary science institutions throughout the U.S. School faculty affiliated with the CFAH are asked to participate in the review.

CFAH ACADEMIC PLAN

CFAH ACADEMIC PLAN

PURPOSE AND BACKGROUND

The Center for Food Animal Health (CFAH) is an organized research program of the School of Veterinary Medicine. Established in 1972, and formerly known as the Livestock Disease Research Laboratory, this program serves as the veterinary medical component of the Agricultural Experiment Station and is managed as a non-departmental Center within the School. In 1988 Veterinary Medicine Extension became an integral part of the School for the purpose of establishing closer collaborative research efforts between AES faculty and related School programs. The purpose of the CFAH is to organize resources for and conduct research on animal diseases important to the livestock industries, important food-borne and vector-borne disease problems, zoonosis associated with diseases of livestock and environmental health important to the State of California. Although the CFAH program is managed at the Campus level, Agricultural and Natural Resources (ANR) serves as a conduit for the reporting process required by the United States Department of Agriculture (USDA) for many of the resources provided by this Program.

PROGRAMMATIC NEEDS

The emerging issues facing agriculture, food and the environment signal the need for new directions and expertise to address challenges for the 21st century. Agriculture is now global and the role that California and the nation needs to play in this expanding market needs better definition. The quality of food products for U.S. citizens needs to be maintained and the current production systems in the state need to be maintained and protected from emerging threats that come about from increased trade of foreign products. The outbreak in the United Kingdom of bovine spongiform encephalopathy (BSE, mad cow) and the recent foot and mouth disease epidemic are classic examples of the impact of globalization. BSE is a major public health problem that occurred from changed agricultural feeding practices and has now moved to European countries as well as those of the Eastern Block. Continued feeding of meat and bone meal from affected animals, although now banned in the U.K., continues in the E.U. countries. Vigilance needs to be continued here to prevent the contaminated products from reaching our shores. The foot and mouth disease outbreak came about from feeding raw garbage to pigs. These now global diseases need to be kept out of the U.S. In the meantime, expertise needs to be developed here to prevent these and other emerging agricultural diseases from reaching our shores. (Need 3 positions plus support.)

Globalization of the food supply has brought many new diseases to the U.S. constituents. This trend will continue and the risks associated with these new sources of foods remains very high. Part of our obligation as food suppliers and as public health officials is to maintain a healthy human population. Research training is essential for the U.S. to maintain a strong program in the Masters of Preventative Veterinary Medicine and Epidemiology Graduate group. These new challenges require additional research faculty to carry out the research needed to keep us abreast of these new problems. (Need two positions plus support).

I. STATEMENT OF OBJECTIVES FOR THE CFAH

- Develop vaccines and other biosecurity countermeasures to protect animal herds and flocks.
- Address the animal, public and environmental health of food animal agriculture.
- Address disease in California livestock production and provide for the well-being of livestock in production units.
- Establish monitoring and surveillance systems to identify and manage exotic pests.
- Develop and implement integrated monitoring and surveillance systems for reducing the risks of acquiring food-borne illnesses.
- Develop waste management systems for environmentally safe animal production systems.
- Establish networks with federal and state animal and human health agencies to investigate new and emerging diseases of food animals with human significance.
- Assist livestock producers in meeting international standards for trade, and protecting agriculture from foreign diseases.
- Determine the underlying mechanisms of disease and host protection.
- Develop better diagnostic tests for agent detection and methods of disease, prevention and resolution.
- Establish methods to characterize, manage and reduce the risks associated with chemical and microbial problems affecting livestock/food and their environment.
- Address microbial and animal genomics and their impact on animal health, well being, environmental and human health.
- Explore and develop new sources of funding for food animal resources.

II. DESCRIPTION OF CURRENT OPERATIONS

A. Programs

- The Director of the CFAH (Dean of the School of Veterinary Medicine) administers the CFAH, although day-to-day activities are delegated to the VM Office of Research and Graduate Education Programs. A Faculty Commodity Advisory Committee provides counsel on general policy. A Scientific Advisory Committee reviews projects for scientific merit. The Faculty Commodity Advisory Council then recommends to the Director/Dean research projects addressing high priority issues of the commodity and recommends to the Director projects for funding based on current priorities and issues.
- Although the CFAH is primarily State supported, this program serves as an umbrella for a broad range of resources supporting food animal research. Since its inception, the School's Agricultural Experiment Station (AES) and Instruction & Research (I&R) budgets have been handled as separate entities. Future funding will require additional extramural support.
- State support and related FTE are distributed among members of the faculty chosen on the basis of their interest in and competency in livestock disease research. Funds provide support for the needs of investigators for projects or programs designed to provide solutions to livestock industry problems. Those funds are allocated directly to research projects and/or programs, not to individuals or departments.

- Research in the CFAH is currently organized along commodity lines with programs in the following areas: 1) environmentally sound production practices leading to safe food from dairy and beef cattle, sheep, goats, swine, fish, poultry and other food animals, 2) new and emerging diseases and 3) delivery of animal health services, and 4) genomics impact on animal health, well being, environmental and human health.
- Research Program Groups are comprised of investigators focusing on the highest priority issues important to the State of California who participate in active research projects relating to the areas listed above and extension veterinarians working with these species. Each group focuses its efforts on maximizing the cost effectiveness of research programs through collaborative effort, sharing of facilities, equipment and other resources.

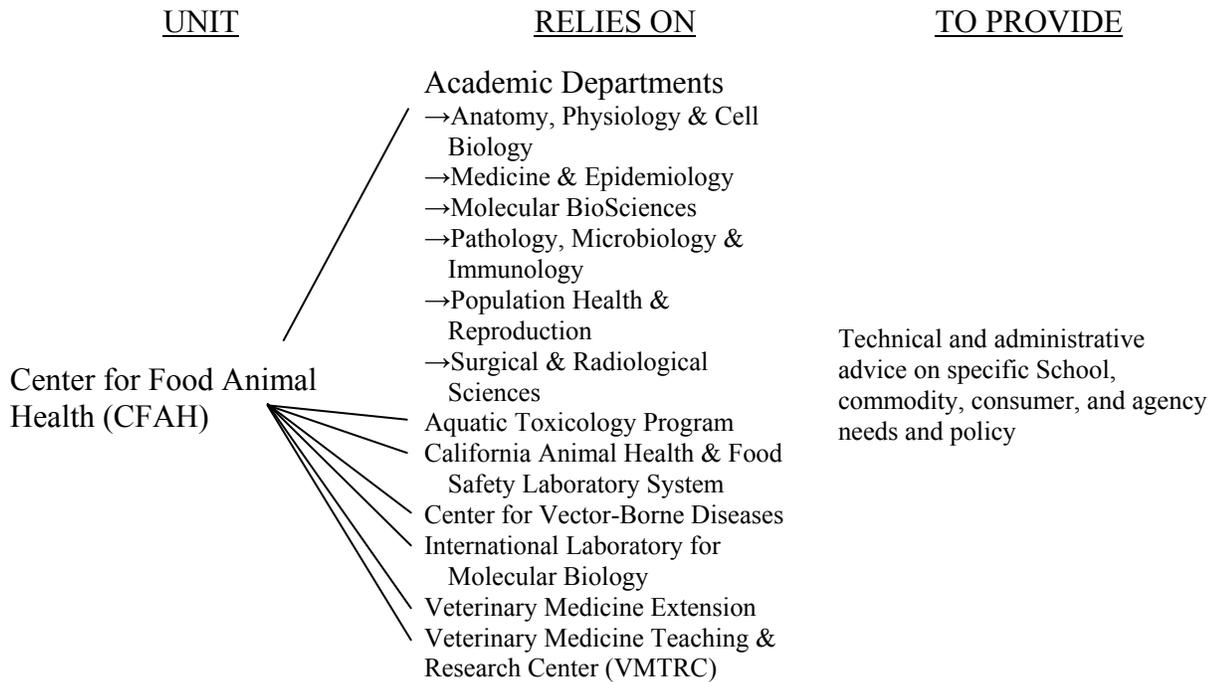
B. [Campus Interactions- see Attachment 1](#)

C. [Organization Chart - see Attachment 2](#)

III. FUTURE PLANS

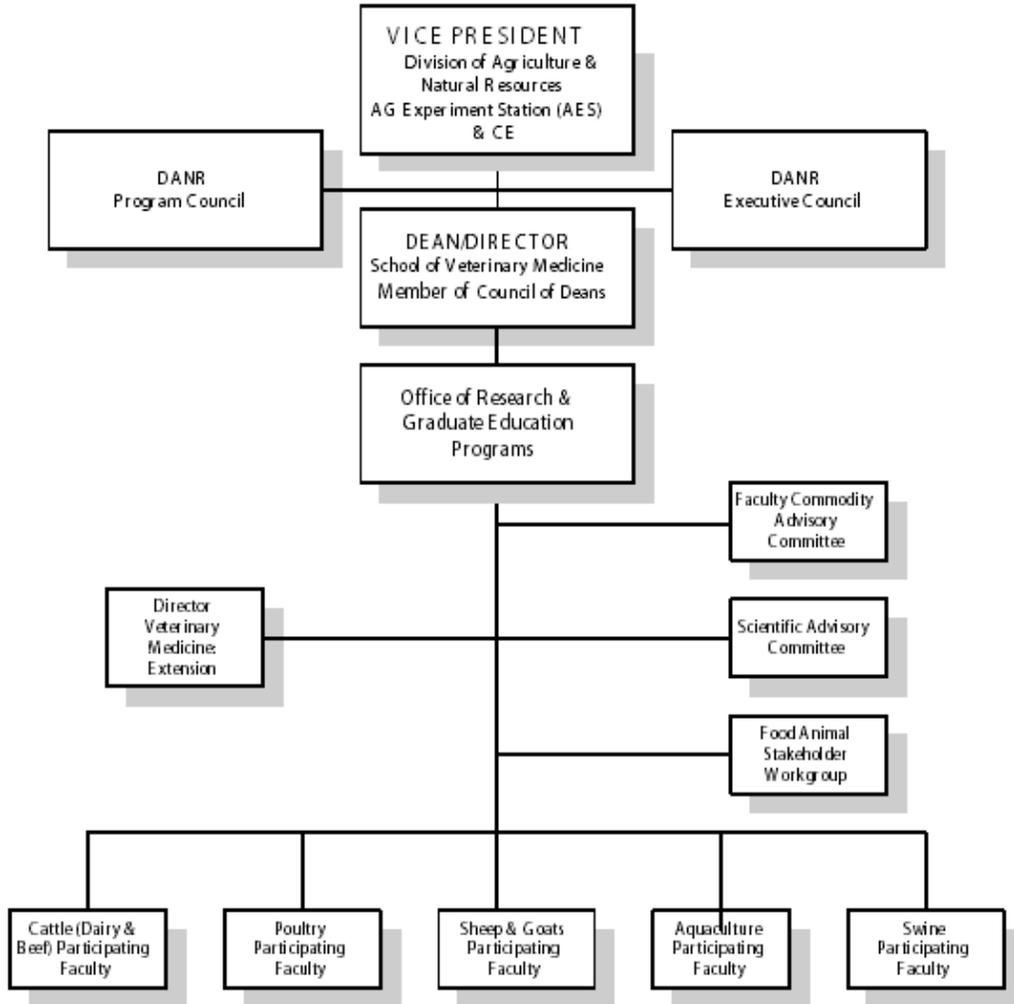
- To ensure state-of-the-art approaches and technology for addressing production efficiently; to develop new strategies for controlling, reducing and eliminating hazards; devising new management systems for developing public policy such as Hazard Analysis and Critical Control Point (HACCP) and Total Quality Management (TQM).
- Approaches to be taken will include the application of molecular biology/genomics of microorganisms, embryos, immunobiology and integrated systems management, including use of computers and monitors for addressing genetics, food-borne and public health, animal welfare and well-being, environmental and production issues.
- To foster research collaborative efforts between AES and cooperative extension faculty to improve quality, value and marketability of agricultural products, enhance understanding of basic biological processes in animals, increase understanding of the principles of biotechnology/genomics, improving the environment and increase public awareness through improved marketing practices.
- To include Stakeholder input as an integral part of the proposal review and allocation process for all state and federal appropriations as a means of ensuring that research target areas address the critical issues of strategic importance. Stakeholders include representatives of federal/state agencies, policy makers, commodity organizations, livestock advisors, veterinary organizations, producers and processors.
- To encourage linkages through research collaborations (multistate and regional) with other colleges and universities that will facilitate the unique capacity to address specific identified agricultural issues of concern and importance.
- To enhance School programs in microbial genomics as a means of developing new approaches to medical therapies and correcting genetic diseases.
- To enhance public understanding of the concepts of animal genetics and the role of molecular genetics in improving the quality, efficiency, and safety of producing foods of animal origin.
- To develop animal production systems that are not environmental threats to humans, and to address animal ecosystem issues through the development of stronger safeguards for better management of water resources, animal waste, and wildlife/animal interface.
- To focus on better control measures for all aspects of the food chain, from production to consumption, through the development of a greater understanding of chemical, physical and biological hazards relating to food safety.

CAMPUS INTERACTIONS



(Attachment 1)

ORGANIZATIONAL CHART CENTER FOR FOOD ANIMAL HEALTH



(Attachment 2)

CFAH
ADVISORY
COMMITTEES

CFAH ADMINISTRATIVE ADVISORY COMMITTEES

FACULTY COMMODITY ADVISORY COMMITTEE (FCAC)

Members of this Committee are appointed by the Dean and consists of five members of the faculty who represent each of the major program areas, Beef Cattle, Dairy Cattle, Poultry, Swine, Small Ruminants and Aquaculture, plus a representative from Veterinary Medicine Extension. To maintain continuity in representing the School's livestock commodity based research, committee members are appointed to serve a three-year term on a staggered basis.

Committee Responsibility

Provides assistance to the Dean by serving as commodity based liaison among the CFAH faculty. In addition, the Committee represents the School's livestock commodity-based research activities at the Food Animal Stakeholder Workgroup meetings held semi-annually for the purpose of developing research priorities and commodity related reporting. The Committee evaluates research proposals for commodity relevance and priority.

SCIENTIFIC ADVISORY COMMITTEE (SAC)

Faculty who serve on this Committee are appointed by the Dean annually, on a need basis for up to two consecutive years of service.

Committee Responsibility

Provides critical and unbiased evaluation of the scientific merit of proposals submitted for funding. This scientific evaluation is considered, in addition to input from the Faculty Commodity Advisory Committee (FCAC), for determining the overall ranking for proposals and developing proposal critiques.

FOOD ANIMAL STAKEHOLDER WORKGROUP

Members of this Workgroup are appointed by the Dean and consists of members of the Faculty Commodity Advisory Committee (FCAC), representatives of federal/state agencies, commodity & veterinary organizations, livestock advisors, producers, and processors.

Committee Responsibility

Members participate on a semi-annual basis at meetings called by the Dean/Director and members of the Faculty Commodity Advisory Committee to identify and establish priorities important to the livestock industry at the state and national levels and to assist in communicating center information to the industries.

FACULTY COMMODITY ADVISORY COMMITTEE GUIDELINES

PURPOSE

The Faculty Commodity Advisory Committee (FCAC) is a committee of SVM faculty who assist the Dean/CFAH Director by serving as commodity-based liaison among the CFAH faculty. The Committee members coordinate commodity planning with faculty to address and assure that proposals adhere to ANR and USDA Strategic Directions, address commodity priorities and report commodity research outcomes annually. In addition, the Committee represents the SVM's livestock commodity-based research activities at the CFAH Commodity Advisory Council.

SELECTION OF COMMITTEE MEMBERS

Five faculty members each serve 3-year terms on the FCAC. Each member is appointed by the Dean/CFAH Director. Potential Committee members are considered based on their activities in the Dairy, Beef, Poultry, Small Ruminant, Swine, or Aquaculture/other commodity areas. One member of the FCAC is from VM CES. Members should rotate in staggered terms of membership.

Faculty members have included faculty investigators as well as unit leaders/administrators. Members of the FCAC, the SVM Associate Dean for Research and the CFAH Director (the Dean) comprise the faculty representative(s) to the SVM CFAH Commodity Advisory Council, which provides an important link with food animal stakeholders.

RESPONSIBILITIES OF COMMITTEE MEMBERS

The FCAC is charged with leading efforts of faculty interested in the various commodities to adhere to ANR's Strategic Directions and commodity priority needs. The Committee is responsible for reviewing grants to make sure the ANR directives are adhered to and to assess the bonus points for CES involvement in grants and for multi-institutional involvement.

FCAC members present faculty research activities and discuss perceived industry research needs at meetings of the CFAH Commodity Advisory Council. Two meetings of the Commodity Advisory Council are typically held each year. FCAC members report faculty activities from their assigned areas (although the format and species grouping assignments have varied). Faculty representatives also listen to presentations by food animal stakeholders regarding industry needs. Information from these meetings are discussed with commodity faculty and a strategy is developed to address commodity priority needs.

The function of the FCAC in planning activities may be changing as indicated in the following excerpt from an 11/99 Dean's Update to SVM Faculty: This planning is in progress and once finalized to meet ANR requirements, it will be integrated into the FCAC operations.

SPECIFIC CRITERIA THAT FCAC ADDRESSES FOR EVALUATION OF GRANTS FOR CFAH FUNDING

ANR Strategic Directions

- Importance to the State of California
- Existence of a Significant Comparative Advantage for ANR in Addressing the Challenges in Question
- The Capacity of ANR to Add Value in Solving the Range of Problems Subsumed in Each of the Strategic Areas, and
- Strategic Programmatic Areas Which are Expected to Remain Important Over the Long-term (more than 10 years).

Areas of Immediate Attention by ANR

- Genomics Research
- Management of Exotic Pests
- Waste Management

High Priority Issues (List is alphabetical and all are considered equally important)

- Animal Well-Being, including methods and evaluation of euthanasia techniques, risk factors for down cows, 3rd party validation systems and clarification of terms used.
- Antibiotic, Hormones, and Pesticide Resistance (Including Education, Outreach, and Policy Focus)
- Disease Control & Surveillance (Including Animal ID, Trace-Back Programs, Molecular Typing, Diagnostic Tests)
- Education of students and practitioners about issues associated with food animals and animal agriculture (for recruitment to careers and acknowledging they do a lot of public education; tours)
- Emerging Diseases (Including Infectious, Zoonotic, Exotic, and Vector borne Diseases)
- Environmental & Ecosystem Health Issues (Including Land, Air, Water, Nutrient, & Microbial Management)/Livestock and Poultry Carcass Disposal (Including Routine Mortality & Catastrophic Losses)
- Food & Feed Systems Security (Including Biodefense of the Food Systems, Quality of Foods, Modeling, Rapid/Accurate Diagnostics & Vaccinations, and Delivery Systems)
- Sustainable Production Systems (Including Endemic/Production Diseases, Profitability, Industry/Manure Management, & Nutrition/Nutrient Management)

Lower Priority Issues

- Identification, Detection, & Elimination of Residues (Including Hormones)
- Zoonoses

Technologies

- Ecosystem Health Technologies
- Genomics/Biotechnologies/Proteomics
- Modeling
- Rapid & Validated Diagnostics

Strategies

- Biosecurity for Disease Control (including on-farm and protecting the supply chain of feed and other products that enter or interface with the food chain)
- Certification/Quality Assurance
- Educational Outreach (Just-in-Time Education Delivery)
- Emergency Planning & Response (Including Business Continuity)
- Marketing (Including Science-Based Information to Inform Policy & Consumers)
- Production Systems Management
- Improving the Quality of Foods Through Diagnostics Prevention & Treatment (Consumer Education)

Bonus Points

- Describe how Veterinary Medicine Extension has been intellectually involved in the development and planning of the project; what portions, if any, of project implementation will include Extension activity; what outreach activities, if any, will be delivered by Extension Faculty. Alternatively describe and justify an alternative plan for designing research and communicating outcomes and impacts important to California stakeholders. (Up to 10 bonus points for approved collaborations.)
- Describe if this project includes multi-institutional and/or multi-state involvement. (Up to 5 bonus points will be given for this type of collaborative effort.)

**FACULTY COMMODITY ADVISORY
REVIEW SHEET
CENTER FOR FOOD ANIMAL HEALTH
ANR STRATEGIC DIRECTIONS**

- Importance to the State of California
- Existence of Significant Comparative Advantage for ANR in Addressing the Challenges in Question
- The Capacity of ANR to Add Value in Solving the Range of Problems Subsumed in Each of the Strategic Areas, and
- Strategic Programmatic Areas Which are Expected to Remain Important Over the Long-term (more than 10 years)

PRIORITY ISSUES

High Priority Issues (List is alphabetical and all are considered equally important)

- Animal Well-Being, including methods and evaluation of euthanasia techniques, risk factors for down cows, 3rd party validation systems and clarification of terms used.
- Antibiotic, Hormones, and Pesticide Resistance (Including Education, Outreach, and Policy Focus)
- Disease Control & Surveillance (Including Animal ID, Trace-Back Programs, Molecular Typing, Diagnostic Tests)
- Education of students and practitioners about issues associated with food animals and animal agriculture (for recruitment to careers and acknowledging they do a lot of public education; tours)
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- Sustainable Production Systems (Including Endemic/Production Diseases, Profitability, Industry/Manure Management, & Nutrition/Nutrient Management)

Lower Priority Issues

- Identification, Detection, & Elimination of Residues (Including Hormones)
- Zoonoses

Technologies

- Ecosystem Health Technologies
- Genomics/Biotechnologies/Proteomics
- Modeling
- Rapid & Validated Diagnostics

Strategies

- Biosecurity for Disease Control (including on-farm and protecting the supply chain of feed and other products that enter or interface with the food chain)
- Certification/Quality Assurance
- Educational Outreach (Just-in-Time Education Delivery)
- Emergency Planning & Response (Including Business Continuity)
- Marketing (Including Science-Based Information to Inform Policy & Consumers)
- Production Systems Management
- Improving the Quality of Foods Through Diagnostics Prevention & Treatment (Consumer Education)

To Be Used by Commodity Reviewer Only

P.I. _____

Project Title: _____

Commodity Relevance (*Indicate how this fits with listed priorities*) _____

Project Progress (*If applicable*) _____

Commodity Ranking (*Circle one*): High Medium Low
 Bonus Points: Involvement of CES (*0-10 points*) _____ Multi-Institutional/State (*0-5 points*) _____

Reviewer's Signature

SCIENTIFIC ADVISORY COMMITTEE GUIDELINES

PURPOSE

The Scientific Advisory Committee (SAC), through its members, provides critical and unbiased evaluation of the scientific merit of proposals submitted for funding. This scientific evaluation is considered in determining an overall ranking for proposals. Scientific ranking is an important criteria for the likelihood and level of funding.

SELECTION OF COMMITTEE MEMBERS

SAC members are appointed by the Director of the CFAH, following recommendation of a list of candidates by the FCAC, on an ad-hoc basis to meet specific programmatic needs. Usually the committee will consist of 8 to 10 members from the School of Veterinary Medicine (SVM) who will serve a 2-year term, with the possibility of reappointment.

Some of the criteria to be considered in the selection of SAC members:

- a) previous demonstrated ability to write and obtain extramural grant funding
- b) participation in food-animal research
- c) willingness to serve and fulfill the responsibilities
- d) publication on topics related to food-animal health

Usually two members will have served on USDA and/or NIH Competitive Grants Review Panels or have been successful in obtaining extramural funding through the USDA Competitive Grants program or through NIH. The remaining committee members will include a broad representation of research interests, disciplines, and departmental affiliations to ensure a balance in the review process. Junior faculty will be encouraged to participate because the experience will aid them in further developing high-quality proposals for future funding cycles. It is expected that all faculty members in the SVM and who are actively involved in food animal research and apply for CFAH funding will be asked to serve on the committee on a regular basis (e.g. with an 8-member committee and about 40 faculty, this service would occur about every 5 years).

RESPONSIBILITIES OF COMMITTEE MEMBERS

Primary responsibilities of each member are to:

1. Review grants as either a primary or secondary reviewer and provide timely written comments to the Director of the CFAH on the scientific merits of the grant.
2. Read other submitted proposals for scientific merit, provide comments at the review meeting, and vote on the ranking of all proposals.
3. Return a grant proposal to the Director of the CFAH if there is a possible conflict of interest or another circumstance where it may be impossible to do an unbiased review.
4. Maintain the confidentiality of reviews and reviewers until meetings where grants are discussed and ranked.
5. Provide comments to the Director of the CFAH and to the FCAC on ways to improve the efficiency of the review process, including the scientific evaluation sheet.

Each year performance/participation of reviewers will be assessed by the Associate Dean for Research. Reviewers can be removed from service if they have failed to perform their duties in a timely and correct fashion.

PREPARATION OF REVIEWERS

At the time of announcement of the call for grant applications, a meeting will be held of all potential applicants and SAC members (some of these people will be the same). At this meeting the grant review format will be distributed and discussed. Expectations will be addressed as well as numerical scoring, so that those writing grants are clearly aware of the criteria used in the scoring of their grant.

There will be a set of instructions prepared for reviewers which clearly states the criteria to be used in evaluation and scoring of grants and the necessity for justification of scores with appropriate comments, suggestions and/or criticisms.

CFAH SCIENTIFIC REVIEW GUIDELINES

PROJECT TITLE _____

1. INTRODUCTION *(25 Points)*
 - a. Problem to be addressed (including brief literature review)
 - b. Justification for doing the project
 - c. Experience of investigators and/or preliminary data to support the proposed project
 - d. Documented importance to California (Indicate how this fits in with listed targeted priority issues.)
 - e. Expected Impacts & Outcomes

2. RESEARCH HYPOTHESES *(10 Points)*
 - a. Clearly Stated
 - b. Testable

3. OBJECTIVES (to prove/disprove hypothesis) *(15 Points)*

4. PROJECT DETAILS *(45 points)*
 - a. Design (to show how the experiments address the proposed objectives)
 - b. Anticipated results
 - c. Data analysis

5. LITERATURE CITED

6. QUALITY OF GRANT PREPARATION *(5 Points)*

CFAH SCIENTIFIC REVIEW SHEET

1. P.I.
2. PROJECT TITLE
3. INTRODUCTION (*Maximum of 25 Points*)
4. RESEARCH HYPOTHESES (*Maximum of 10 Points*)
5. OBJECTIVES - to prove/disprove hypothesis (*Maximum of 15 Points*)
6. PROJECT DETAILS (*Maximum of 45 Points*)
7. QUALITY OF GRANT PREPARATION (*Maximum of 5 Points*)
8. TOTAL POINTS _____

FOOD ANIMAL STAKEHOLDER WORKGROUP

PURPOSE

The Food Animal Stakeholder Workgroup is a committee of individuals representing the various producer commodity groups and components of the food animal industry in California, farm advisors, including livestock owners, industry organizations, private veterinary practitioners, CDFA, Veterinary Extension, FDA and USDA. The Food Animal Stakeholder Workgroup provides input on commodity needs, perspectives, and opportunities for food animal research to assist the CFAH Director and faculty in developing current and long-term research planning. The Food Animal Stakeholder Workgroup provides input to the review of research proposals submitted through CFAH.

SELECTION OF ADVISORY COUNCIL MEMBERS

Members will be appointed by the CFAH Director, in consultation with the FCAC faculty and the Associate Dean for Veterinary Extension. In addition, membership will include a representative from the California Veterinary Medical Association, California Department of Food and Agriculture, Farm Advisors, USDA, APHIS & FSIS, a food processor, and an active food-animal practitioner licensed in California. Appointment will be based on their extensive knowledge, understanding, and experience in one of the five areas and on an understanding of animal health, food safety and environmental health issues and of food animal and food safety research.

RESPONSIBILITIES

Responsibilities of the Commodity Advisory Council include

Recognize and understand faculty research expertise, interests, and activities in each of the five commodity areas. To be effective, the CAC will need to foster communications with the FCAC to understand the breadth and depth of faculty expertise, interests, and research activities that will maximize food animal research effectiveness.

At the CFAH Commodity Advisory Council meetings (jointly held with the FCAC, the Director, and the Associate Dean for Research), discuss state and national research needs and priorities for each commodity group, ANR areas of research emphasis, including those for long-standing endemic diseases, new or emerging diseases, and exotic or foreign animal diseases. Identification of specific research needs should consider input from individuals outside the FCAC and AC who have extensive experience and knowledge, including those involved with public policy, private practice, research, extension, and allied industries. In addition, proposed new areas of research should consider the research expertise and interests of CFAH faculty.

Communicate to the CFAH Director, the specific needs for food animal research, as considered jointly by the FCAC and CAC. The CAC is responsible for timely reporting to the CFAH Director and faculty the discussions, ideas, and recommendations presented at joint meetings of the FCAC and the CAC.

Propose funding initiatives aimed at directed research in new or emerging areas (e.g. Johne's disease in cattle).

Provide input during the research proposal review process. Each member of the CAC is responsible for providing non-scientific input to the CFAH Scientific Review Committee during the process of reviewing research proposals in his/her specific commodity area. For members with involvement in several commodity areas (e.g. CDFA, USDA, Extension, CVMA), input will be provided in the appropriate areas.

TARGETED PRIORITY ISSUES

**Center for Food Animal Health
School of Veterinary Medicine
University of California, Davis**

High Priority Issues (List is alphabetical and all are considered equally important)

- Animal Well-Being, including methods and evaluation of euthanasia techniques, risk factors for down cows, 3rd party validation systems and clarification of terms used.
- Antibiotic, Hormones, and Pesticide Resistance (Including Education, Outreach, and Policy Focus)
- Disease Control & Surveillance (Including Animal ID, Trace-Back Programs, Molecular Typing, Diagnostic Tests)
- Education of students and practitioners about issues associated with food animals and animal agriculture (for recruitment to careers and acknowledging they do a lot of public education; tours)
- Emerging Diseases (Including Infectious, Zoonotic, Exotic, and Vector borne Diseases)
- Environmental & Ecosystem Health Issues (Including Land, Air, Water, Nutrient, & Microbial Management)/Livestock and Poultry Carcass Disposal (Including Routine Mortality & Catastrophic Losses)
- Food & Feed Systems Security (Including Biodefense of the Food Systems, Quality of Foods, Modeling, Rapid/Accurate Diagnostics & Vaccinations, and Delivery Systems)
- Sustainable Production Systems (Including Endemic/Production Diseases, Profitability, Industry/Manure Management, & Nutrition/Nutrient Management)

Lower Priority Issues

- Identification, Detection, & Elimination of Residues (Including Hormones)
- Zoonoses

Technologies

- Ecosystem Health Technologies
- Genomics/Biotechnologies/Proteomics
- Modeling
- Rapid & Validated Diagnostics

Strategies

- Biosecurity for Disease Control (including on-farm and protecting the supply chain of feed and other products that enter or interface with the food chain)
- Certification/Quality Assurance
- Educational Outreach (Just-in-Time Education Delivery)
- Emergency Planning & Response (Including Business Continuity)
- Marketing (Including Science-Based Information to Inform Policy & Consumers)
- Production Systems Management
- Improving the Quality of Foods Through Diagnostics Prevention & Treatment (Consumer Education)

CFAH Stakeholders Mtng – 02/17/2010
Revised 02/17/2010

INTRAMURAL
FUNDING
SOURCES

CFAH RESOURCES DESCRIPTION

PERMANENT HATCH

Core funding from USDA/Cooperative States Research, Education and Extension Service (CSREES) programs. A joint Federal/State Program; funds are used primarily for CFAH faculty salaries.

TEMPORARY HATCH

These funds are part of the federal Hatch Act and are earmarked for project plans which have been reviewed and approved by the School, Agricultural and Natural Resources (ANR) and the USDA/CSREES. The annual appropriation to the School is determined by ANR in its evaluation of research programs and annual progress of these programs at the Davis, Riverside and Berkeley Campuses.

MULTI-STATE RESEARCH

This program is also part of the State/Federal Program. In order to be a part of Multi-State Programs, faculty must develop projects that fit into a 5-year program plan on a targeted subject matter area. Participating faculty are expected to attend an annual meeting where progress of projects that fit within the targeted objectives of the 5-year program plan are evaluated. Project approval and funding is through ANR and USDA/CSREES. The annual appropriation to the School is determined by ANR in its evaluation of research programs and annual progress of programs at the Davis, Riverside and Berkeley Campuses.

BOVINE ABORTION

Funding for this program is the result of a mandate to the State of California for the purpose of addressing Epizootic Bovine Abortion studies. This annual appropriation appears as a line item in the School's State (AES) support budget.

ENDEMIC DISEASES

These funds represent an annual appropriation to the School and appears as a line item in the School's State (AES) budget. This appropriation is earmarked for the purpose of addressing animal health issues, such as food safety, genomics, and environmental health and problems of livestock and poultry producers in California. Core support for faculty salaries and some administration costs of the CFAH are included in this program.

ANIMAL HEALTH (1433)

Funding for this program comes from Federal appropriations for the USDA's Animal Health and Disease Formula Base Program. Funding is determined upon a formula that consists of 50% from livestock and poultry census of the state; 25% on research capacity, i.e., the number of research scientists in the School; and 25% based upon research awards generated by faculty through a variety of extramural funding programs. All projects established under this program must have had prior approval by the USDA/CSREES in order to be eligible for funding.

The School receives funding from two separate appropriations under this program. One appropriation referred to as AES is routed by USDA through ANR for distribution to three (3) campuses, e.g., Davis, Berkeley, and Riverside. These funds are only available to faculty with AES appointments.

Funding through the ANR Program is based upon research funding generated and research capacity of faculty with AES appointments. Based on ANR's appropriation from USDA, ANR then allocates funds to the three UC campuses mentioned above. This decision is based on an annual evaluation of established projects and demonstrated progress.

The second appropriation is directed specifically for the School through ANR. This requires that an annual Plan of Research be developed and submitted to USDA/CSREES that justifies the research capacity and research project support generated by School faculty through a wide variety of extramural activities. Based on this information, USDA/CSREES reviews and evaluates the plan and directs a formula based appropriation to the School. All projects funded through this program require prior approval by USDA/CSREES to be eligible for funding. Faculty without AES appointments, but who have an interest in food animal research, are eligible to participate in this program. The percentage of research funding allocated per commodity is based on California Statistics (cash income by commodity) as reflected in the annual California Department of Food Agriculture Resources Directory.

STATE APPROPRIATED PROGRAMS

AQUACULTURE HEALTH PROGRAM

This program is part of a line item budget to the campus which is to provide support for California aquaculture. The School's emphasis is focused on health issues that are of importance to the aquaculture industries in the State. The program supports 1.0 FTE which is divided between two positions, 0.50 for infectious diseases and 0.50 for toxicology.

CENTER FOR VECTORBORNE DISEASES

The Center for Vectorborne Diseases is a line item appropriation to the School with close affiliation to ANR. The Center's main emphasis is to address mosquito and tick-borne infections of zoonotic and public health importance. Its core budget consists of 4.0 permanent FTEs. The Center has a Director, a Scientific Advisory Committee, and an External Advisory Committee that help to set policy and guide scientific direction.

OTHER SUPPORT PROGRAMS (EXTRAMURAL)

American Association of Bovine Practitioners
California Beef Council
California Dairy Research Foundation
California Dept. of Fish & Game
California Dept. of Food & Agriculture
California Water Resources Control Board
Harold Wetterberg Foundation
Pacific Egg & Poultry Association
USDA Cooperative State Research, Education & Extension Service
USDA/CSREES National Research Initiative
US Environmental Protection Agency

Pharmaceutical & Biological Companies
Private Corporations
Individual Donors

FUNDING STRUCTURE FOR USDA 1433 FORMULA FUNDS

CFAH - SCHOOL OF VETERINARY MEDICINE

USDA Animal Health Formula Funds (1433) are allocated to faculty as a means of supporting new ideas/concepts and developing preliminary data for extramural research proposals which will attract larger awards.

INTRAMURAL

Type of Project: Umbrella

Title: General/Broad

Fund Source: USDA Formula Funds

Purpose: Seed Monies to Develop Preliminary Data or to Explore New Directions on Existing Projects

EXTRAMURAL

Type of Project: Can be Different than Umbrella

Title: Specific

Fund Source: Fed Agencies
NRI Grants (USDA)
Fund for Rural America
Special Grants
Competitive Grants
Small Business Innovation
USDA Cooperative Agreements
State Agreements
Private Industry (Business Contracts)
California Dairy Research Foundation
Other

Purpose: To Enable Investigators to Provide Established Preliminary Data as a Means of Attracting Larger Extramural Awards

CRITERIA
FOR
GRANT REVIEWS
&
ALLOCATIONS

GUIDELINES FOR CFAH GRANT REVIEW PANEL

- Grants are assigned to a primary reviewer and a secondary reviewer. Only the primary and secondary reviewers will be responsible for writing up reviews. Each person on the panel will receive a copy of the abstract which should be read prior to the panel meeting.
- Commodity representatives will comment about the relevance and importance of each grant to commodity research priorities.
- The commodity reviewers vote separately on priorities (High, Medium, Low).
- Each proposal will be presented by the primary scientific reviewer. He/she will state the objectives, etc., followed by his/her critique. The secondary reviewer will then read his/her critique.
- The Scientific panel will then discuss the grant. The grant score will be determined based on scores provided by all of the scientific panel.
- All scores will be presented at a subsequent meeting. Each grant will then be considered by the entire panel relative to grants placed above and below it in score to be sure that the ranking reflects where each grant should be relative to other grants.
- For each grant, the primary reviewer will be responsible for compiling a summary of the panel discussion including constructive criticisms and the rationale for placement. Staff from the Office of Research will assist the reviewers with this task, whenever possible, and ensure that grant comments are returned to the PI. The primary and secondary reviews will be returned verbatim to the PI with the panel summary.
- Bonus points are awarded for multi-state, multi institutional projects and for projects that demonstrate intellectual collaborations between AES and cooperative extension faculties.

CENTER FOR FOOD ANIMAL HEALTH

ROLE OF THE FACULTY COMMODITY ADVISORY COMMITTEE REPRESENTATIVE

1. Meet with commodity, USDA, California Department of Food and Agriculture (CDFA), & California Department of Health Services (CDHS) representatives to establish research priorities.
2. Meet periodically with faculty working in their respective commodities to establish 3-5 year commodity research plans including important existing and emerging issues affecting the commodity.
3. Establish research priorities based on commodity needs and faculty expertise or ability to address needs.
4. Establish and articulate a plan for faculty to follow for future research funding opportunities including intramural and extramural resources.
5. Participate in grant reviews and assure that research proposals meet the ANR Strategic Directions and commodity priorities/needs.

CRITERIA AND PROCESS FOR REVIEW AND ALLOCATION OF FUNDS

(TO BE COORDINATED BY COMMODITY REPRESENTATIVES)

- Commodity representatives solicit and coordinate the research plan for the commodity(s)
- Top Priority is to be directed to Issues/Problems affecting Agricultural commodities in California (Identified by ANR workgroups and Food Animal Stakeholder Workgroup)
- Research plan is to identify and refine the researchable approaches in concert with faculty and extension that lead to immediate and long-term solutions to problems/issues. The plan is to be updated annually.
- Individual or Program Projects for commodities are then reviewed by the Scientific Advisory Committee.
- Faculty Commodity Advisory Committee (FCAC), The Scientific Advisory Committee, along with Food and Stakeholder Workgroup meet to evaluate and rank research project(s). Office of Research and Graduate Education coordinates the review process and in consultation with the Dean, allocates funding for projects of highest priority.
- Faculty Commodity Advisory Committee (FCAC) representatives assemble an annual report that includes assessments of impact/outcomes of individual/program projects to be distributed to industry, ANR and USDA/CSREES.

CFAH SCIENTIFIC REVIEW SHEET

1. P.I.
2. PROJECT TITLE
3. INTRODUCTION (*Maximum of 25 Points*)
4. RESEARCH HYPOTHESES (*Maximum of 10 Points*)
5. OBJECTIVES -to prove/disprove hypothesis (*Maximum of 15 Points*)
6. PROJECT DETAILS (*Maximum of 45 Points*)
7. QUALITY OF GRANT PREPARATION (*Maximum of 5 Points*)
8. TOTAL POINTS

Reviewer's Signature

COMMODITY REVIEW SHEET

CENTER FOR FOOD ANIMAL HEALTH

Priority Issues

High Priority Issues (List is alphabetical and all are considered equally important)

- Animal Well-Being, including methods and evaluation of euthanasia techniques, risk factors for down cows, 3rd party validation systems and clarification of terms used.
- Antibiotic, Hormones, and Pesticide Resistance (Including Education, Outreach, and Policy Focus)
- Disease Control & Surveillance (Including Animal ID, Trace-Back Programs, Molecular Typing, Diagnostic Tests)
- Education of students and practitioners about issues associated with food animals and animal agriculture (for recruitment to careers and acknowledging they do a lot of public education; tours)
- Emerging Diseases (Including Infectious, Zoonotic, Exotic, and Vector borne Diseases)
- Environmental & Ecosystem Health Issues (Including Land, Air, Water, Nutrient, & Microbial Management)/Livestock and Poultry Carcass Disposal (Including Routine Mortality & Catastrophic Losses)
- Food & Feed Systems Security (Including Biodefense of the Food Systems, Quality of Foods, Modeling, Rapid/Accurate Diagnostics & Vaccinations, and Delivery Systems)
- Sustainable Production Systems (Including Endemic/Production Diseases, Profitability, Industry/Manure Management, & Nutrition/Nutrient Management)

Lower Priority Issues

- Identification, Detection, & Elimination of Residues (Including Hormones)
- Zoonoses

Technologies

- Ecosystem Health Technologies
- Genomics/Biotechnologies/Proteomics
- Modeling
- Rapid & Validated Diagnostics

Strategies

- Biosecurity for Disease Control (including on-farm and protecting the supply chain of feed and other products that enter or interface with the food chain)
- Certification/Quality Assurance
- Educational Outreach (Just-in-Time Education Delivery)
- Emergency Planning & Response (Including Business Continuity)
- Marketing (Including Science-Based Information to Inform Policy & Consumers)
- Production Systems Management
- Improving the Quality of Foods Through Diagnostics Prevention & Treatment (Consumer Education)

To Be Used by Commodity Reviewer Only

P.I.

PROJECT TITLE:

COMMODITY RELEVANCE (*Indicate how this fits with listed priorities*)

PROJECT PROGRESS (*If Applicable*)

COMMODITY RANKING (*Circle one*): High Medium Low

Reviewer's Signature

SCORING AND RANKING OF CFAH GRANTS

Scientific Merit

Scoring for scientific merit is solicited from the SAC. Two members of the SAC are assigned to each proposal as primary and secondary reviewers. They present their summaries and their recommended scores at the Review Committee Meeting. Points are assigned for quality of the introduction (15 points), research hypothesis (10 points), objectives (15 points), project description (50 points), and overall quality of grant preparation (10 points). A total of 100 points is possible using this criterion. Each member of the SAC who is present at the Review Committee Meeting votes by secret ballot. Ballots are collected and the accumulated total of all scores is divided by the number of ballots. The calculated average is the scientific score recorded on the official record.

Commodity Relevance

Scoring for commodity relevance is solicited from the FCAC and FASW. One member of the FCAC is assigned to review each proposal. This reviewer presents their summary and recommended ranking at the Review Committee Meeting. Proposals are ranked as having High, Medium or Low commodity relevance. Following discussion, each member of the FCAC and FASW who is present at the Review Committee Meeting votes by secret ballot. Ballots are collected and the rankings are assigned points, as follows: High = 100 points, Medium = 75 points and Low = 50 points. Additionally, bonus points may be assigned to proposals which demonstrate planning, implementation, outcomes and reporting that involves Veterinary Medicine Extension (10 points) and multi-institutional or multi-state involvement (5 points). The accumulated total of all scores is divided by the number of ballots. The calculated average is the commodity score recorded on the official record.

Overall Score and Ranking of Proposals

The official scientific score and the official commodity score (including bonus points) are added together and divided by two. The resulting figure is the final overall score. Separate ranking lists for each commodity (Dairy, Beef, Poultry and Other Species) are compiled based on classification designations provided by PIs on the original application forms. On each commodity list, the applicable proposals are ranked high to low by final overall score.

Funding Recommendations

The amount of total funding available is proportionately divided among the four commodity groups. Projects are recommended for funding based on the ranking list for each category, until the available funding for each category is exhausted. Although projects may be ranked on multiple lists, they are only eligible for funding up to the recommended maximum amount of \$20,000. The SVM Office of Research also recommends the appropriate funding sources which are applicable to each project with the understanding that federal funds (Temporary Hatch, Multi-state, Animal Health) must be allocated to projects which are federally approved.

The final ranking lists and recommendations for funding within each commodity group are distributed at a Review Committee Meeting where they are reviewed by the SAC, FCAC and FASW. Following discussion and consensus, the final recommendations are forwarded to the Director for approval and funds distribution.

CFAH FORMS

CENTER FOR FOOD ANIMAL HEALTH CHECKLIST FOR SUBMISSIONS

All CFAH Research Projects Require:

- _____ Application for Funds (CFAH Form 1)
- _____ Proposal Format (CFAH Form 2)
- _____ Budget Request (CFAH Form 3)
- _____ Assurance Statement (CFAH Form 4)
- _____ PI Publication List (recent publications relevant to proposal request)
- _____ Extramural Grant Draft (Required for USDA Animal Health/Formula Fund applications)
Draft outline may not exceed 15 single- or double-spaced pages written text and may not exceed a total of 20 pages including figures and tables. Outline must contain a project description and a budget. The project description must contain the following components:
 - Introduction
 - Progress Report
 - Rationale and Significance
 - Research

New Proposals Also Require: (Required for USDA Animal Health/Formula Funds, Temporary Hatch and Multi-State Projects)

- _____ CRIS Forms
 - AD 416 - Research Resume
 - AD 417 - Classification of Research
 - CSREES Form 2008 - Assurance Statement
- _____ Project Narrative

Continuing Proposals Also Require:

- _____ Progress Report (CFAH Form 5 or AD 421 Report)
- _____ Original Project Narrative (Required for USDA Animal Health/Formula Funds, Temporary Hatch and Multi-State Projects)

Submit the **ORIGINAL + 1 COPY** to the School of Veterinary Medicine, Office of Research and Graduate Education Programs.

**CENTER FOR FOOD ANIMAL HEALTH
APPLICATION FOR FUNDS
(CFAH FORM 1)**

Principal Investigator(s) & Co-Investigator(s):

Project Title *:

Project Status (check one): New: Continuing: 3 year proposal:

Type of Project: Temp. Hatch: Multi-State: Endemic Diseases:

 Bovine Abortion: USDA Animal Health/Formula Funds:

Commodity classification (check all that apply):

 Dairy: Beef: Poultry: Other species:

Amount Requested: \$

***For continuing projects, list amounts of funding received per year since the initial starting date.**

Amount Received: \$

For Continuing Projects, please provide the following information:

Project #

Continuation Project: Year 1 2 3 4

Funding Awarded (Previous fiscal year): \$

Attach Progress Report, including publications resulting from PI's research.

Has this research resulted in a submitted or funded extramural research grant? Yes No

NOTE: For a USDA Formula Fund Request(s), it is mandatory that a draft of an extramural grant be included.

CRIS FORMS:

CRIS forms are required for new USDA Animal Health projects, or USDA Animal Health or State continuation projects, which are approaching the termination date. CRIS forms may be obtained, electronically or paper copy, from the SVM: Research Office and consist of:

- AD 416
- AD 417
- Assurance Statement
- Project Narrative

Principal Investigator

Date

Department Chair

Date

* All continuation requests must use the prior approved titles.

CENTER FOR FOOD ANIMAL HEALTH (CFAH FORM 2)

(Format for CFAH Form 2: Maximum - 2 pages in 12 pt font)**

PROJECT TITLE:

1. INTRODUCTION (15 Points)*
 - a. Problem to be addressed (including brief literature review).
 - b. Justification for doing the project.
 - c. Experience of investigators and/or preliminary data to support the proposed project.
 - d. Documented importance to California. (Indicate how this fits in with listed priorities - see attachment)
 - e. Expected Impacts & Outcomes
2. RESEARCH HYPOTHESES OR PREMISE (10 Points)*
 - a. Clearly Stated
 - b. Testable
3. OBJECTIVES (to prove/disprove hypothesis) (15 Points)*‡
4. PROJECT DETAILS (50 Points)*
 - a. Design (to show how the experiments address the proposed objectives)
 - b. Anticipated results
 - c. Data analysis
 - d. Describe how Veterinary Medicine Extension is involved in the development and planning of the project. Simply communicating your research plan through a phone call or two does not constitute collaboration. A detailed plan for how outreach activities by an extension faculty will be delivered, must be provided. Alternatively describe and justify an alternative plan for designing research and communicating outcomes and impacts important to California stakeholders. *Up to ten (10) bonus points* for approved collaborations will be given.
 - e. Describe if this project includes multi-institutional and/or multi-state involvement and if so, indicate if any matching funds are being provided by the other party. *Up to five (5) bonus points* will be given for this type of collaborative efforts.
5. LITERATURE CITED** (It is mandatory that all publications relevant to this project be reflected in this request and included as an appendix.)
6. QUALITY OF GRANT PREPARATION (10 Points)
7. Grant application can be submitted electronically to the Office of Research in WORD

* Point weighting for evaluation will equal a total of 100 points. The quality of grant preparation will be given 5 points.

** Literature cited not included in 2 page limit

‡ Multistate Research Projects must use the initial approved objectives as outlined in the 5-year- Project plan

NOTE: Any proposal using less than a 12 pt. font will not be considered for funding.

BUDGET REQUEST (CFAH FORM 3)

Project Title:

Investigators:

Effort %

A. Personnel:

\$ _____
\$ _____

Subtotal \$ _____

B. Supplies (animals, etc.):

\$ _____
\$ _____
\$ _____

C. Equipment (items greater than \$1,500):

\$ _____
\$ _____
\$ _____

D. Other

\$ _____
\$ _____

**TOTAL \$

** \$20,000 maximum may be requested

CFAH ASSURANCE STATEMENT (CFAH FORM 4)

Check appropriate statements, supplying additional information when necessary. The PI agrees to assume primary responsibility for obtaining the required approvals and for complying with all policies and procedures of the University of California governing the procurement, care and handling of animals used for research and the safe use of infectious biological agents, recombinant DNA/RNA, and the release of recombinant organisms as part of research at UC Davis. All required approvals and certifications must be in place before project will receive funding.

PI:

TITLE:

Animal Use and Care

- Project does not involve use of vertebrate animals.
- Project involves use of vertebrate animals.

Protocol number: Approval Date:

Safety

- Yes No Carcinogens? If Yes, CUA #
- Yes No Ionizing Radiation? If Yes, RUA #
- Yes No Pathogenic Agents? If Yes, BUA #
- Yes No Recombinant DNA? If Yes, GUA #
- Yes No Federally Regulated Drugs or Controlled Substances?

Principal Investigator

Date

CFAH PROGRESS REPORT
(CFAH FORM 5)
(CRIS Form AD 421 may be substituted for this report)

Principal Investigator:

Project Title:

Project Number:

Amount Funded: \$

Reporting Period:

PROGRESS:

Describe progress made toward each objective in lay terms (no page limitation)

PUBLICATIONS:

(Published & Submitted)

Abstracts, presentations, and submitted manuscripts:

CRIS FORMS

USDA/CFAH PROJECT NARRATIVE

Must be typed in **exact** order as indicated and accompany USDA Forms AD 416 and 417 and CSREES 2008. There is no page limit.

PRINCIPAL INVESTIGATOR:

A. TITLE

A brief, clear, specific designation of the subject of the research. The title, used by itself, should reflect the objectives and scope of the project (include assigned number if a revision).

B. JUSTIFICATION

Present (1) the importance of the problem to agriculture and rural life of the State or region; (2) reasons for doing the work (such as the needs the project will fill) and doing it at this time; and (3) ways in which public welfare or scientific knowledge will be advanced.

C. PREVIOUS WORK AND PRESENT OUTLOOK

A brief summary of previous research (citing important publications); status of current research; and the additional knowledge needed which the project is expected to provide. (Literature citations may be listed at the end of the project outline.)

D. OBJECTIVES

A clear, complete, and logically arranged statement of the specific objectives of the project.

E. PROCEDURE

A statement of the essential working plans and methods to be used in attaining each of the stated objectives. Procedures should correspond to the objectives and follow the same order. Phases of the work to be undertaken currently should be designated. Location of the work and the facilities and equipment needed and available should be indicated. Wherever appropriate, the procedure should produce data suitable for statistical analysis. The procedure should reflect careful planning and should provide flexibility for changes if changes became necessary.

F. PROBABLE DURATION

An estimate of the maximum time likely to be required to complete the project and publish results. Whenever a material change in the objectives of a project is advisable, a new or revised project outline should be prepared and submitted. A major change in procedure might also necessitate a revision of the project outline. Projects may be applied for up to five years.

G. FINANCIAL SUPPORT

Estimated annual allotments (by funds) to (1) salaries, and (2) maintenance, based on analysis of requirements for labor, equipment, supplies, travel, and other operating expenses.

H. PERSONNEL

The leader or leaders and other technical workers assigned and % of effort.

I. INSTITUTIONAL UNITS INVOLVED

Each subject-matter unit in the agricultural experiment station and any other units of the institution contributing essential services or facilities. The responsibilities of each should be indicated. If there is an advisory, coordinating, or directing committee for the project, the official title of the committee should be listed.

J. COOPERATION

A statement listing the U.S. Department of Agriculture or other stations, institutions, or agencies expected to cooperate formally or informally on the project. If project is part of a Region project, list Regional Research Project Number.

K. LITERATURE CITED

A reference list of pertinent literature cited.