

Developing a Comprehensive Animal Care Occupational Health and Safety Program at a Land-Grant Institution

Lyndon J Goodly,^{1,*} Vickie L Jarrell,² Monica A Miller,³ Maureen C Banks,⁴ Thomas J Anderson,⁴ Katherine A Branson,⁵ Robert T Woodward,⁶ Randall L Peper,⁷ and Sara J Myers¹

The Public Health Service Policy on the Humane Care and Use of Laboratory Animals and sound ethical practices require institutions to provide safe working environments for personnel working with animals; this mandate is achieved in part by establishing an effective animal care Occupational Health and Safety Program (OHSP). Land-grant institutions often face unique organizational challenges in fulfilling this requirement. For example, responsibilities for providing health and safety programs often have historically been dispersed among many different divisions scattered around the campus. Here we describe how our institutional management personnel overcame organizational structure and cultural obstacles during the formation of a comprehensive campus-wide animal care OHSP. Steps toward establishing the animal care OHSP included assigning overall responsibility, identifying all stakeholders, creating a leadership group, and hiring a fulltime Animal Care OHSP Specialist. A web-based portal was developed, implemented, and refined over the past 7 y and reflected the unique organizational structures of the university and the needs of our research community. Through this web-based portal, hazards are identified, risks are assessed, and training is provided. The animal care OHSP now provides easy mandatory enrollment, supports timely feedback regarding hazards, and affords enrollees the opportunity to participate in voluntary medical surveillance. The future direction and development of the animal care OHSP will be based on the research trends of campus, identification of emerging health and safety hazards, and ongoing evaluation and refinement of the program.

Abbreviations: OHSP, occupational health and safety program; PPE, personal protective equipment.

The protection of all employees from-work related hazards is both a legal and ethical responsibility of employers.^{10,12} Federally funded academic institutions using animals in research, teaching, and testing are required by the Office of Laboratory Animal Welfare to establish and maintain an occupational health and safety program (OHSP) as an essential part of the overall animal care and use program.⁹ Furthermore, to receive and maintain full accreditation status from AAALAC, institutions must adhere to the *Guide for the Care and Use of Laboratory Animals*,^{1,6} including aspects relating to occupational health and safety. In addition, an occupational health and safety program must be established for persons working with agricultural animals.⁴ Due to the decentralization of animal care and use programs, available safety resources, and lack of medical hospitals, some land-grant institutions, such as the University of Illinois, often face challenging obstacles in fulfilling these OHSP requirements.⁸

Our institution, the University of Illinois, is one of the original land-grant institutions, is registered with the USDA, has an Animal Welfare Assurance with the Office of Laboratory Animal Welfare, and maintains an AAALAC-accredited animal care and use program. The program includes a centralized laboratory animal division and a decentralized agricultural animal divi-

sion. The laboratory animal portion of the program is directed by the Division of Animal Resources. The agricultural animal portion of the program is coordinated through the Agricultural Animal Care and Use Program. Both of the segments of the program have reporting lines to the Office of the Vice Chancellor for Research, and both are overseen by a single IACUC. The Office of the IACUC is separate from the Division of Animal Resources and the Agricultural Animal Care and Use Program and reports to the Office of the Vice Chancellor for Research.

At our institution, the environmental health and safety programs are separated between 2 divisions. The Division of Research Safety, part of the Office of the Vice Chancellor for Research, provides services related to the identification and management of biologic, chemical, and radiologic hazards, with a primary focus on campus research laboratories. The Division of Research Safety is organized into 4 sections: Biologic, Chemical Waste, Laboratory, and Radiation Safety. The Division of Safety and Compliance, part of the Unit of Facilities and Services, includes an occupational safety and health department and an environmental compliance department. The primary focus areas of the Division of Safety and Compliance providing workplace safety programs and hazard management resources for campus and construction and maintenance personnel, including facility-related issues and providing environmental management programs. Medical surveillance is a key component for evaluating the health status of a participant in an animal care OHSP.^{11,14} Our institution does not have a medical-school-associated hospital. However, limited services, including tetanus and rabies vaccinations, are performed by the student health center. Occupational Medicine services are provided by local

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¹Division of Animal Resources, ²College of Agriculture, Consumer and Environmental Sciences, ³Division of Research Safety, ⁴Division of Safety and Compliance, ⁵Institutional Animal Care and Use Committee, and ⁶McKinley Health Center, University of Illinois, Urbana-Champaign, Illinois, and ⁷Lab Animal Resources, Indiana University, Bloomington, Indiana

*Corresponding author. Email:goodly@illinois.edu

hospitals through the campus medical-surveillance program for employees who use respirators, experience job-related injuries, require drug testing, or work with chemicals that require medical tracking. An additional issue was concern regarding the legality of mandatory enrollment in the existing animal care OHSP because of privacy issues and health-information protection laws.¹³

In 2004, the university's animal care and use program was granted continued "Full Accreditation with Condition" from the AAALAC Council on Accreditation. In particular, Council required that the University of Illinois "evaluate its overall occupational health and safety program and ensure that the program is directed and monitored by University of Illinois health and safety specialists." In conjunction with the reality that the existing animal care OHSP was paper-based and difficult to maintain, monitor, and modify, the AAALAC requirement provided the impetus for a complete reassessment of our animal care OHSP. Here we relate how the institutional management responded to the structural and cultural challenges it faced in the formation of a comprehensive and effective campus-wide, web-based animal care OHSP. We describe the current animal care OHSP at the University of Illinois in some depth, provide the underlying rationale, and specify the procedures that management personnel used during the transition. We hope that this report regarding our history and the structure of our animal care OHSP will be a resource to administrators, veterinarians, animal care staff members, researchers, environmental health and safety specialists, and occupational health and safety specialists as they develop and maintain a culture of safety within their animal care and use programs.

Case Report

Given the complexity of our campus' animal care organizational structure, our safety program divided between 2 separate departments, and the dispersed nature of responsibilities regarding occupational health and safety issues, we examined the Animal Care OHSP from the widest possible perspective. A number of steps were undertaken simultaneously in the review of our animal care OHSP, including soliciting a review team, forming an OHSP leadership team, and coordinating with the university's legal department.

Soliciting a qualified, external-review team of OHSP consultants. A team of OHSP consultants who were independent of the university was needed to provide a thorough and independent evaluation of our existing program. Three professionals with diverse backgrounds on OHSP experience and knowledge of animal care and use programs were selected to serve as our consultants. The scope of the work for the external OHSP consultants included reviewing all background material, meeting with university stakeholders to better assess the needs of the animal care OHSP, and recommending best practices for risk assessment and other OHSP activities. The external reviewers identified the lack of a senior university leadership official charged with eliciting the cooperation of the diffuse campus centers of expertise on safety matters as the key weakness of the existing Animal Care OHSP. The external evaluators made several recommendations, including the establishment of a university OHS Leadership Group composed of existing animal care OHSP stakeholders and the possible addition of an Animal Care OHSP Specialist to facilitate coordination among the various campus safety experts.

Forming the OHS Leadership Group. The OHS Leadership Group comprises representatives from various campus groups responsible for safety and provides a platform for discussion.

The members of the University of Illinois OHS Leadership Group include personnel from the Agricultural Animal Care and Use Program, Division of Animal Resources, Division of Research Safety, IACUC, McKinley Health Center, Office of the Vice Chancellor for Research, and the Division of Safety and Compliance. Included in this group are 3 campus-safety professionals, 2 compliance personnel, and 3 campus veterinarians. This group met weekly for 3 mo for approximately 1 h each meeting, and then met monthly while developing a comprehensive plan of action for revising the animal care OHSP. The group continues to meet monthly.

Involving the university's legal department. The OHS Leadership Group interacted with the university's legal department to address privacy concerns. The legal department ultimately approved mandatory enrollment in the animal care OHSP, including acquisition of demographic information and risk assessment, as long as the individual health-surveillance component of the enrollment process remained voluntary. That is, participants have the opportunity—but are not required—to complete a health-screening questionnaire. The questionnaire is then reviewed in confidence by a health professional. The leadership group decided to recruit and fund a parttime Medical Reviewer (that is, a health professional), initially a registered nurse but currently a physician at the university's student health center. The Medical Reviewer's role is to review all health-surveillance questionnaires, compare the responses on the questionnaires with those in risk assessments, and communicate directly and confidentially with participants to address any health-related concerns.

Changing the organizational structure. An overarching goal of the OHS Leadership Group was to improve the communication and coordination between campus safety groups and the animal care program. This process began by the pragmatic identification of an appropriate senior-level person who would have overall responsibility for and authority over the animal care OHSP. The leadership group identified the institutional veterinarian, who is also an Associate Vice Chancellor for Research, as the most logical choice, owing to his position in the university, knowledge base, qualifications, and existing responsibilities. The OHS Leadership Group then developed a job description for an Animal Care OHSP Specialist, specifying an education of at least a Bachelor of Science in environmental health or public health. The responsibilities for the Animal Care OHSP Specialist were to coordinate day-to-day activities, to evaluate OHSP at other institutions, and to identify best practices for the implementation and maintenance of the animal care OHSP. Some knowledge of animal care and use programs was preferred but not mandatory, given that we believed this flexibility would broaden our application pool. After a local search was conducted, an animal care OHSP Specialist was hired, and the position was funded by the Office of the Vice Chancellor for Research.

Web-based approach to OSHP. On the basis of our assessments of OHSP at other institutions and that of our own institution, the OHS Leadership Group determined that a web-based approach was the optimal long-term solution. Because several studies have shown that web-based learning is preferred over slide- or tape- and text-based materials,³ the paper-based system used by the university was deemed archaic. A web-based program allows for convenient and secure enrollment of employees, easy enrollment verification, and mandatory risk assessment. In addition, a web-based system is easily integrated with an online animal-use protocol system. The web-based approach facilitates efficient delivery of educational and training modules, fact sheets, videos, or links to pertinent information.

Furthermore, web-based enrollment provides documentation of participation in a readily accessible format, and confirmation of participation is available to both participants and their employers or advisors. The web-based system for the animal care OHSP was built inhouse by information technologists already employed by the Office of the Vice Chancellor for Research. The system was built by using Microsoft.net Technologies.⁷ The previously used OHSP enrollment forms were separated and revised so that the risk-assessment portion was separate from the health-screening questionnaire. Fact sheets, which had been sent by campus mail to OHSP participants, were uploaded to the website and are now distributed electronically. Fact sheets are designed to address species-specific and campus-specific zoonotic disease risks as well as general health and safety topics.⁵ An online OHSP training module was developed by the Animal Care OHSP Specialist with input from the OHS Leadership Group. The training addresses hazards commonly found in animal care facilities, including animal allergies, zoonotic diseases, animal biosafety level, respiratory protection, and sharps.^{2,5} Links are included in the training materials so that a user can find additional information regarding campus safety programs. Enrollment into the online system started less than 1 y after this web-based program began to be developed. Animal care staff, safety professionals, Facilities and Services employees, and anyone else on campus who needed to enroll in the program was identified by the Animal Care OHSP Specialist. All researchers were required to enroll when a new or amended IACUC protocol was submitted; protocol approval was withheld until all protocol personnel were enrolled in the OHSP.

Using this team- and web-based approach, the University of Illinois has revised and implemented a comprehensive animal care OHSP. The organizational structure is complex but inclusive of the university's safety professionals and stakeholders. The animal care OHSP is coordinated by the Animal Care OHSP Specialist. This person serves as a liaison for all health and safety professionals across campus who are involved in providing a safe work environment for the employees that use and care for research animals in the laboratory and agricultural facilities. The Animal Care OHSP Specialist reports to an Associate Vice Chancellor for Research (who is also the institutional veterinarian), who is ultimately responsible for the oversight of the animal care OHSP. The University of Illinois has taken a multi-faceted approach in the development of the animal care OHSP by forming the OHS Leadership Group to represent the various campus constituencies and to provide a platform for discussion. The Animal Care OHSP Specialist convenes OHS Leadership Group at least monthly to maintain regular evaluation of the animal care OHSP and to provide direction for future activities.

The web-based animal care OHSP is available for viewing at <http://research.illinois.edu/regulatory-compliance-safety/ohs>. All personnel with direct or indirect exposure to research and teaching animals must enroll in the program by completing the Animal Care OHSP Risk-Assessment Form and successfully completing the OHSP Training Module (Figure 1). Required participants include animal care staff, veterinarians, principal investigators, research staff, campus safety personnel, and Facilities and Services employees who work inside any animal facility. Other university employees with exposure to research or teaching animals are identified at the start of employment or when a job duty requires work to be performed in an animal facility. The risk assessment form (Figure 2) identifies the facilities in which the participant works, the animals the participant cares for or uses, and other workplace hazards,

including heavy lifting, repetitive motion, and loud noise. The completed risk-assessment forms are submitted into a database for review by the Animal Care OHSP Specialist and Medical Reviewer. Additional training and educational needs as well as safety controls are identified through this review. The voluntary health-screening questionnaire (Figure 3) includes information regarding allergies, chronic health conditions, and pregnancy. The health-screening form is reviewed confidentially by the Medical Reviewer, and any health concerns are communicated directly to the participant.

Animal-use protocol reviews provide the starting point for identifying the majority of personnel who need to be enrolled in the animal care OHSP. Protocols identify the species of animals, the locations of use, and procedures involving animal use. Within the protocol, the principal investigator must also identify the use of biohazardous materials, chemical hazards, radioisotopes, and recombinant DNA. Protocols identified to include a hazardous agent are sent to Division of Research Safety for hazard assessment (see next paragraph) during the IACUC protocol-review process.

Division of Research Safety—the principal campus administrative unit dealing with matters relating to biologic, chemical, or radiologic safety issues in research—works closely with campus faculty-led committees. Division of Research Safety responsibilities include developing campus safety guidelines and training regarding these hazards, assisting campus safety committees, consulting with researchers, and identifying campus compliance requirements. Independent of submitting animal care and use protocols for approval, investigators are required to gain approval before using various hazardous agents, including radioisotopes, chemicals, and biohazards. The appropriate section of the Division of Research Safety (Biologic Safety, Laboratory Safety, or Radiation Safety) conducts the review, in some cases as part of their responsibilities in support of and under the authority of campus committees or other safety-related requirements. Depending on the hazards, the Division of Research Safety may require additional enrollment in related safety programs. In addition, the Division of Research Safety may perform an audit, propose necessary modifications in facilities or practices provide appropriate signage, or assist in the development of hazard-specific standard operating procedures.

The Division of Safety and Compliance is the campus unit responsible for evaluating ergonomics, noise, occupational safety, and respiratory hazards. A representative from this division performs routine surveillance periodically and can be called into animal facilities as needed to perform assessments in these areas. Monitoring and testing is performed to determine whether a hazard is present, whether controls can be engineered, whether additional or different personal protective equipment (PPE) is needed, and whether employees need to be enrolled in the Hearing Conservation Program, Respiratory Protection Program, or other medical surveillance program(s). The Division of Safety and Compliance works with the Animal Care OHSP Specialist to communicate expectations and to verify that the correct PPE is provided to employees.

Animal Care OHSP Specialist

The OHSP Specialist is responsible for providing guidance regarding and coordination of the animal care OHSP. An important duty of this person is to identify all personnel who are eligible to participate in the program. Staff members are identified for participation when they are hired, added to an IACUC protocol, or when job responsibility takes them into an animal facility. In addition, the Animal Care OHSP Specialist is

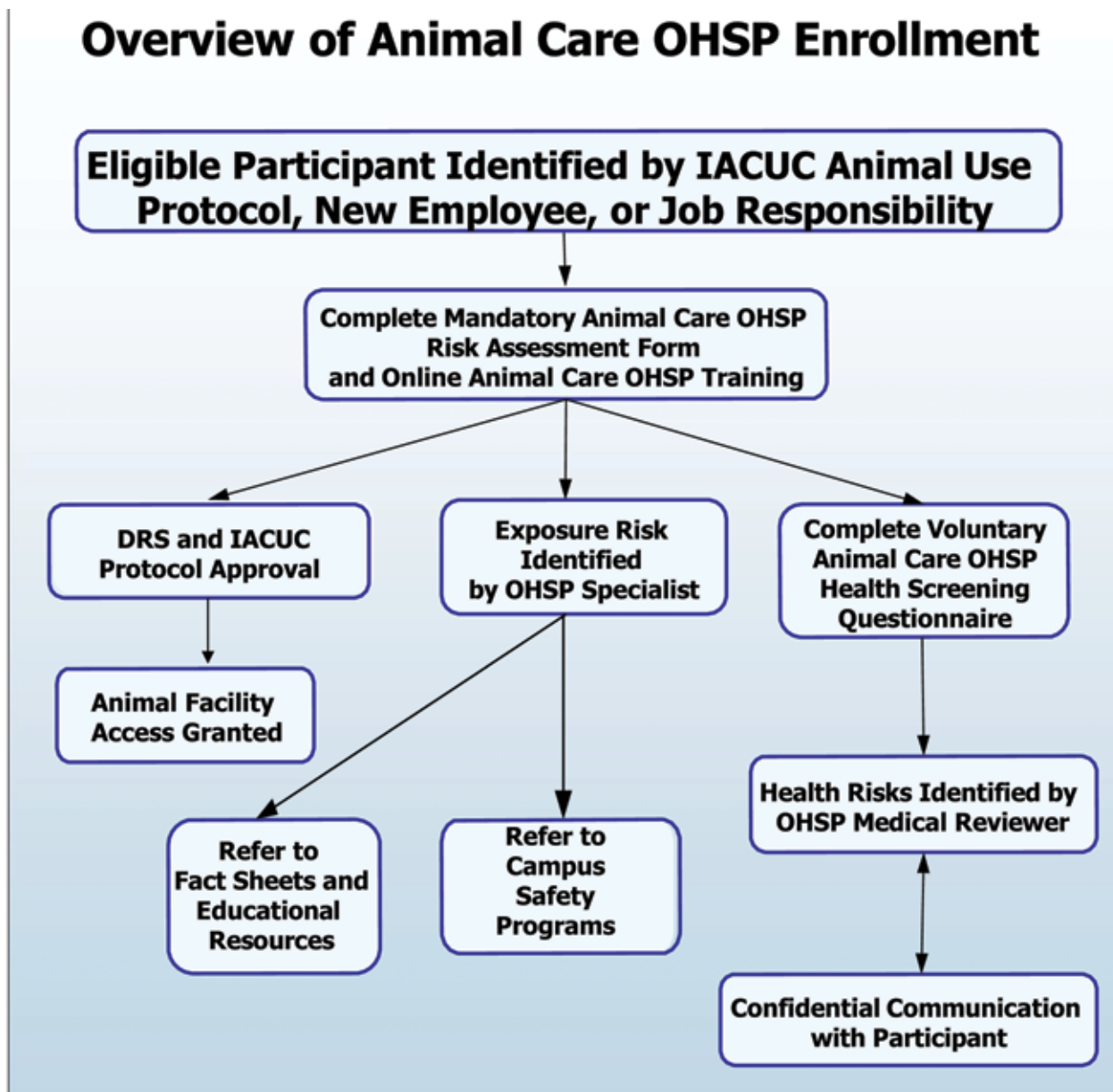


Figure 1. Flow chart of a participant’s enrollment into the animal care OHSP.

responsible for the hazards identification process and for assessing the enrollment needs for Facilities and Services personnel or others who need temporary access to animal facilities. The Facilities and Services workers perform maintenance duties in the animal care facilities, including temperature-control maintenance, plumbing repair, and preventative maintenance on equipment. Because Facilities and Services workers are unionized and assigned to specific trades, multiple and different workers might be assigned to a particular building or farm each day. The unions themselves are supportive of our new animal care OHSP, because most employees want to be informed about potential hazards and how they can protect themselves. To ensure that the approximately 900 Facilities and Services personnel who need to perform duties within an animal facility are educated about the hazards and are enrolled in the animal care OHSP, all Facilities and Services staff are targeted for enrollment. Because many Facilities and Services employees do not readily have access to computers, enrollment into the program is accomplished differently than for other staff. The Animal Care

OHSP Specialist is assisted by employees from the Division of Safety and Compliance to provide onsite training and facilitate completion of the Animal Care OHSP Risk-Assessment Form. The Animal Care OHSP Specialist reviews the form and sends the employee an Animal Care OHSP Health-Screening Questionnaire when one is requested. Completed Health-Screening Questionnaires are sent directly to the Medical Reviewer through campus mail or electronically for a confidential review.

The Animal Care OHSP Specialist plays a critical role in ongoing evaluation of the animal care OHSP, including validating participation and assuring that all potentially affected employees are informed appropriately of the possible risks and exposures within the animal facilities. The Animal Care OHSP Specialist reviews all animal care and use protocols—including the animal use description and the hazards, personnel, and training sections—specifically to identify safety concerns, attends IACUC meetings, and is a member of the Institutional Biosafety Committee. In addition, the Animal Care OHSP Specialist monitors the animal facilities to ensure that required

Animal Care OHSP Risk Assessment Form

Name (Last, First): _____ NetID: _____

Department: _____ Email Address: _____

1. Indicate the facilities where your work is performed: _____

2. Please identify the **HIGHEST** level of exposure for any animals that apply to your status:
 Level 1 – Enter the building where animals are housed but not the rooms where the animals are used or housed.
 Level 2 – Enter the rooms where animals are used and housed but do not have any direct animal contact.
 Level 3 – Handle “unfixed” animal tissues and fluids, but do not handle live animals.
 Level 4 - Provide husbandry and care, handle, restrain, collect specimens, provide veterinary care or administer substances to live animals.

Level	1	2	3	4	Level	1	2	3	4
Amphibians					Llamas or Alpacas				
Bats					Mice				
Birds (non poultry)					Possums				
Cats					Pigs				
Cattle					Poultry				
Dogs					Rabbits				
Fish					Rats				
Gerbils					Reptiles				
Goats					Sheep				
Guinea Pigs or Hamsters					Wild caught animals				
Horses									

3. Additional Occupational Health and Safety Information:
 Does your work involve any of the following?

- Extreme temperatures
 Heavy lifting (more than 50lbs)
 High concentrations of particulates (dust, feed)
 Loud noises
 Repetitive motion
 Sharps
 Other health and safety concerns: _____

4. Animal exposures may be considered a health risk and all users and care staff are strongly encouraged to complete the Health Screening Questionnaire. The questionnaire will be CONFIDENTIALLY reviewed by the Animal Care and Use Program Medical Reviewer.

- Yes, I will complete and confidentially submit the Health Screening Questionnaire.
 At this time, I decline participation in the Animal Users Health Screening Program for persons having direct or indirect contact with animals. I understand that if in the future I continue to have exposures to animals and would like to participate in the University’s Animal Users Health Screening Program, I may do so.

5. Acknowledgement

- I have answered the questions on this form truthfully and to the best of my knowledge.
 I decline completion of this form. (I understand that I am required to complete this form as well as other forms and training to have access into the animal facilities and/or use animals at this university.)

 Signature

 Date

Figure 2. The mandatory animal care OHSP Risk-Assessment Form is required for enrollment. This form identifies a participant’s animal and occupational exposures while performing work in university-owned facilities. Education and training is provided according to the reported exposures.

PPE is worn correctly, appropriate safety awareness signage is posted, and safe work practices are followed. The Animal Care OHSP Specialist might also assist in researching newly identified hazards in future research protocols or may make recommen-

dations regarding the appropriate PPE for a particular project. The Animal Care OHSP Specialist participates in semiannual IACUC inspections and onsite audits performed by Division of Research Safety within the animal facilities.

Animal Care OHSP Health Screening Questionnaire

This Health Screening Questionnaire is **CONFIDENTIAL**. Information provided will only be viewed by the Animal Care and Use Program Medical Reviewer.

Net ID: _____ Name (Last, First): _____
 Department: _____ Campus Address: _____
 Email Address: _____ Phone: _____

1. Allergy History
 Do you have any of the following?
 Asthma Chronic allergies Chronic cough
 Hay Fever Itchy, irritated eyes Skin Rash
 None

2. Are you allergic to any of the following?

Animals
 Birds Cats Cattle Dogs Goats
 Guinea Pigs Horses Misc Non-Human Primates Poultry
 Rabbits Rats Sheep Swine

Other Please list: _____
 None

Grasses
 Alfalfa Grasses Grains Trees Woods
 Other Please list: _____
 None

Other
 Chemicals Dust Dust mites Latex Wood
 Other Please list: _____
 None

3. Immunizations
 Please indicate if you have received any of the following immunizations or if you have acquired the natural disease. If your response is yes, please provide the date, if known.

Disease	Immunization	Date	Don't know
Hepatitis A	<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/>
Hepatitis B	<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/>
Pertussis	<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/>
Rabies Series	<input type="checkbox"/> No <input type="checkbox"/> Yes		N/A
Rabies Titer	<input type="checkbox"/> No <input type="checkbox"/> Yes		N/A
Tetanus	<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/>
BCG (Bacille Calmette-Guérin)	<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/>

4. Tuberculin skin test
 Have you had a PPD (tuberculin) skin test? No Yes Date _____
 What were the results of the PPD (tuberculin) skin test? Negative Positive
 If the skin test was positive, did you have a chest X-ray? No Yes Date _____
 If the skin test was positive in the past, check if you are having any of the following symptoms:
 Bloody sputum Fever Unexplained weight loss
 Chronic cough Shortness of breath

5. Medical History
 Have you had (check all that apply)
 Arthritis Cancer Chronic back or joint pain Cystic fibrosis Diabetes
 Emphysema or chronic lung condition Heart disease Heart murmur & valve disease
 Hernia Kidney disease Liver disease Pneumonia Recurrent bronchitis
 Rheumatic fever Seizures Tuberculosis
 Other Please list: _____
 None

6. Do you have any ongoing medical conditions? No Yes
 If yes, explain: _____

7. Have you ever contracted a disease from animal or experienced an injury (bites, kicks, scratches, needle sticks, etc)? No Yes
 If yes, explain: _____

8. Have you ever been told by your physician that you have an immune compromising medical condition or are you taking medication that might impact your immune system? No Yes
 If yes, please explain: _____

9. Are you currently taking medications (prescription or over the counter)? No Yes
 If yes, please list: _____

10. Are you currently under a physician's care for allergies? No Yes
 If yes, please explain: _____

11. Is there a chance you are or may become pregnant while working in this environment? No Yes

12. Additional comments concerning your health status:

There may be increased occupational health risks associated with your job while you are pregnant (or trying to become pregnant), sick, or exposed to different species of animals. Therefore, if at any time after completing this questionnaire:
 1. you are pregnant or planning to become pregnant;
 2. you become aware of a change in your health status
 3. the species of animal you are exposed to at work changes;

you are strongly encouraged to update this form and to contact the Animal Care and Use Medical Reviewer to receive additional health recommendations or to answer any questions.

Figure 3. The voluntary animal care OHSP Health-Screening Questionnaire is completed by participants and reviewed by the Medical Reviewer to better assess a participant's health risk due to animal and occupational exposures.

All injury reports from the laboratory and agricultural facilities are submitted to and investigated by the Animal Care OHSP Specialist to determine why the incident occurred, how it could have been prevented, and what (if any) additional safety controls need to be implemented or training provided. The Animal Care OHSP Specialist reports any instances of unsafe work practices to the Associate Vice Chancellor for Research and the OHS Leadership Group. Previously, injuries were reported to supervisors, but no specific staff member was responsible for compiling the information and investigating the injuries. Within the animal care OHSP, risks associated with hazardous agents are assessed. Specific tests and monitoring for potential exposure to radioisotopes, hazardous materials, or zoonotic diseases are implemented as indicated through the risk assessment. Prior to the introduction of a new hazardous agent into an animal facility, the Animal Care OHSP Specialist, in conjunction with the principal investigator responsible for the research and other campus safety professionals, conducts staff training regarding the agent.

Discussion

The components of a comprehensive OHSP are well-established and include risk assessment, hazard identification and management, adequate facilities and equipment, PPE for hazards that cannot be contained by engineering controls, standard operating procedures, medical surveillance, education and training, and program evaluation.^{6,10,14} Using a team and web-based approach, the University of Illinois revised and implemented a comprehensive animal care OHSP. The organizational structure is complex but inclusive of the university's safety professionals and stakeholders (Figure 4). The animal care OHSP is coordinated by an Animal Care OHSP Specialist. The person in this position serves as a liaison for all health and safety professional across campus involved in providing a safe work environment for employees who use and care for research animals in the laboratory or agricultural facilities. The Animal Care OHSP Specialist reports to an Associate Vice Chancellor for Research (who is also the institutional veterinarian), who is ultimately responsible for the oversight of the Animal Care OHSP. In this case report, we have documented for the first time the management activities associated with the development and enhancement of a comprehensive animal care OHSP at a land-grant university.

Having the appropriate structure alone will not necessarily translate into an effective animal care OHSP. Institutions must be willing to address the fundamental issue of whether their programs are actually protecting their employees. University administrators, compliance personnel, safety professionals, and veterinarians tackled this issue head-on when challenged by AAALAC to thoroughly evaluate our animal care OHSP. The desire of our campus to demonstrate its commitment to a safe working environment was one of the compelling arguments in our discussions with the university's legal department in establishing mandatory enrollment. Also instrumental in the creation of this greatly revised animal care OHSP was the willingness of the key stakeholders to accept the external reviewers' findings, the assignment of a senior institutional leadership authority to centralize the campus safety effort for animal care, and the OHS Leadership Group's readiness to challenge the status quo. The animal care OHSP was completely overhauled to meet the needs of personnel yet fit within our complex campus safety structures. This balance was made possible through the creation of the OHS Leadership Group, use of external consultants, hiring of an Animal Care OHSP Specialist, and financial commitment

Organizational Structure of the Animal Care OHSP

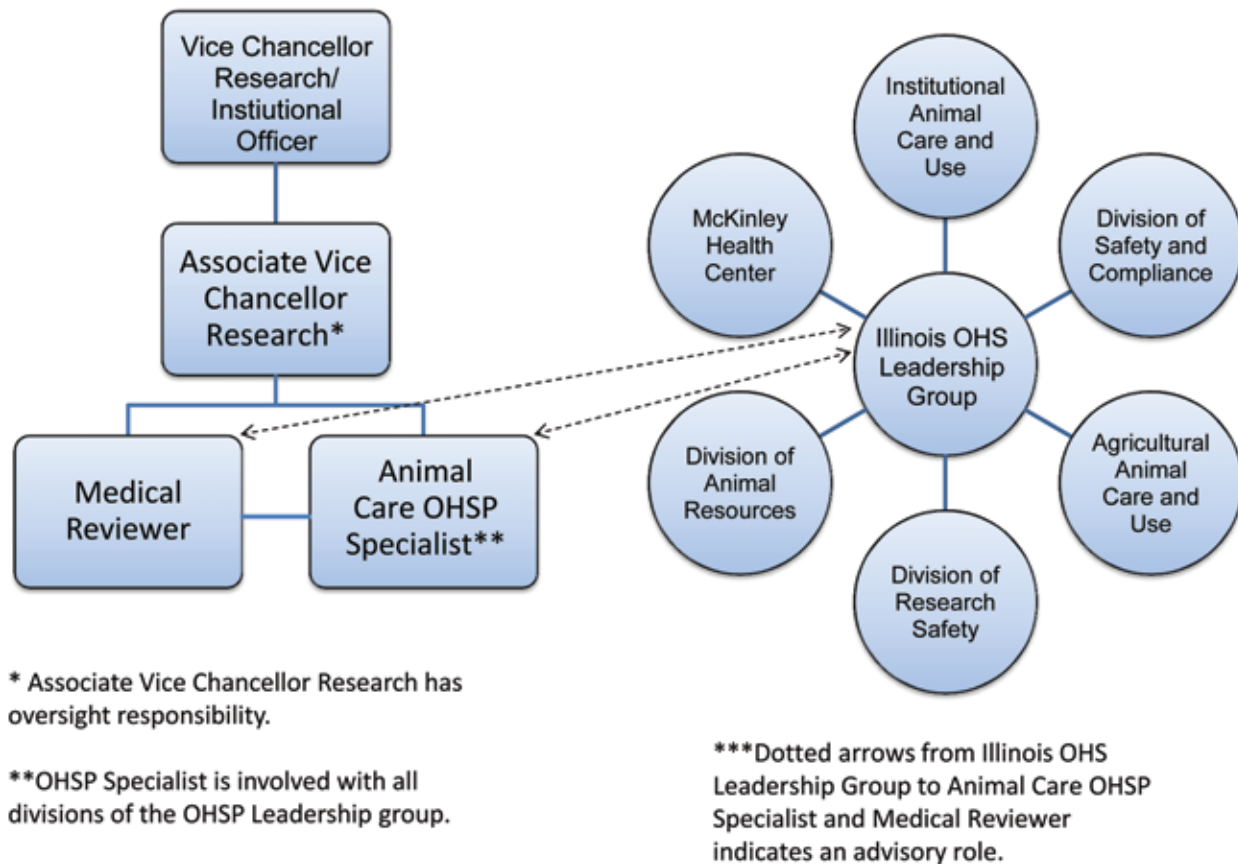


Figure 4. Organizational structure of the animal care OHSP at the University of Illinois Urbana–Champaign.

from the Office of the Vice Chancellor for Research. The cost to our institution for developing this new animal care OHSP was minimal and was primarily associated with the hiring of an OHSP Specialist and a parttime Medical Reviewer.

The role of the Animal Care OHSP Specialist in communicating and coordinating among the members of the OHS Leadership Group, researchers, animal care staff, facilities and service personnel, and all participants cannot be overstated. Timely and persistent communication with all of our stakeholders has been fundamental throughout the long process of developing our animal care OHSP. Acceptance and support from participants is crucial, given that personal responsibility is an important factor of any safety program.¹⁰ Noncompliance with the program can result in denied access to our animal facilities and loss of the privilege to use research and teaching animals on campus. In addition, our animal care supervisors and the Animal Care OHSP Specialist monitor compliance with recommendations regarding PPE and adherence to standard operating procedures. Animal care staff is trained on the PPE required for entry into the animal facility and for each animal room, including those with projects at Animal Biosafety Level 2.² Any noncompliance is addressed with the principal investigator or research staff. The Animal Care OHSP Specialist works with all participants, encouraging prompt reporting of personal injuries. Participation by the Animal Care OHSP Specialist in IACUC meetings, the continuous input by the OHS Leadership Group, Division of Research Safety audits, and training sessions have been critical to the success of the program.

The new web-based system simplifies enrollment into the program for all participants with access to a computer, given

that the system is accessible at all times, and provides immediate feedback regarding participants' health risks related to their occupational exposures. In addition, the system immediately notifies the IACUC office and Animal Care OHSP Specialist when participants have completed their required forms and training. This alert leads to more timely approvals of IACUC protocols. Furthermore, the web-based system enables our campus to easily track our enrollment, something we were unable to do through the previous paper-based system. Statistics regarding how many people are enrolled and how many people have completed the health-surveillance form are obtained easily. The portal also enables members of administration to view real-time enrollment numbers, because participants' records are archived once they have been removed from a protocol or have left the university. Previously, there was no way to determine how many people were enrolled in the animal care OHSP program at any given time. In contrast, we now know there are currently 3584 participants in the animal care OHSP, 2011 of whom are participants in animal use protocols, and the remaining 1573 are ancillary personnel. Integration of the animal care OHSP enrollment with the animal use protocol system greatly enhanced accessibility for users and aided in tracking completion of enrollment.

Through this web-based animal care OHSP portal, training is conducted, previously unknown hazards are identified, risks are assessed for each staff member, and participants are offered (and provided) voluntary medical surveillance. The web-based animal care OHSP has enhanced the medical surveillance of its participants. Since the health-screening questionnaire was separated from the risk-assessment form, the number of people

participating in the health-screening portion of the program has increased: previously about 14% of participants opted to complete the health-screening information; currently this number exceeds 60%. Annual reminders are sent to employees, stressing the importance of the medical surveillance and asking them to consider taking part.

The revised animal care OHSP has opened communication between the Division of Research Safety, the Division of Safety and Compliance and the animal care facility's staff. The Animal Care OHSP Specialist is the liaison for communication between the groups. Since the implementation of the program, an audit system has been developed with Division of Research Safety for protocols using Animal Biosafety Level 2 agents and hazardous chemicals. A standard operating procedure is in place for radiation use within an animal facility. In addition, the Animal Care OHSP Specialist is the contact between Safety and Compliance and the animal care staff to ensure that any concerns employees have regarding noise, respiratory and ergonomic hazards are addressed. Members of the Division of Safety and Compliance are available to evaluate and monitor any perceived hazard and to provide training when necessary.

The refinement of the University of Illinois Animal Care OHSP continues, and challenges remain despite the significant upgrades already implemented. A particularly difficult challenge is the logistics of enrolling the Facilities and Services workers. Improvements still need to be made regarding identifying new Facilities and Services employees at their hiring so that their inclusion in the animal care OHSP can be accomplished in a timely manner. The Animal Care OHSP Specialist continues to work with the Division of Safety and Compliance to identify new Facilities and Services employees so that enrollment can be completed. The Division of Safety and Compliance is currently investigating the implementation of a basic safety-training program for all new Facilities and Services hires. Enrollment into the animal care OHSP would be included in this training session.

In conclusion, numerous resources and publications are available regarding the importance and necessary components of an occupational health and safety program for people caring for and using animals in research and teaching. We here have described the process that a land-grant institution followed to develop their new, comprehensive, animal care OHSP. The animal care OHSP at the University of Illinois was greatly improved by soliciting input from external consultants and internal stakeholders, hiring an Animal Care OHSP Specialist, and coordinating safety efforts across campus. The cost to implement the program was minimal but required extensive time and effort from all parties involved. The future direction and development of the animal care OHSP will depend on the

changing landscape for research and teaching on the university campus. The OHS Leadership Group and Animal Care OHSP Specialist need to continue to identify emerging health risks and safety hazards to our personnel and to be fully engaged in evaluating and refining the animal care OHSP to mitigate these challenges.

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