ASAS GRADUATE STUDENT SYMPOSIUM: RESEARCH ETHICS: WHAT ARE THEY AND WHY ARE THEY NEEDED?

0109 What are research ethics? M. S. Calvo-Lorenzo*, *Oklahoma State University, Stillwater.*

Due to the diversified nature of research, there is no universal manner in which scientific investigations are conducted. Thus, the responsible conduct of research will vary from discipline to discipline, and from laboratory to laboratory. Society's expectations for research responsibility are complex and guidelines for conducting responsible research are not always clearly defined. Some responsible practices are defined and mandated at the professional, institutional, and/or governmental level, whereas other non-binding guidelines and best practices are informally defined and executed through the mentor/trainee relationship. The culmination of these various practices, including responsible behaviors and attention to conducting the best research by scientists, has established that research ethics must be built on a commitment to the essential values of honesty, accuracy, precision, efficiency, and objectivity. These values represent research integrity and are the basis for ethical decisions and actions, regarding data management, mentor and trainee responsibilities, collaborative research, use of humans and animals in experimentation, authorship and publication, public accountability, and the peer review process. "Ethics" is often defined as the study of moral values and ethical decision-making aids us in the critical consideration of such values to make decisions we consider to be "right." However, "ethics" is often used interchangeably with the term "morals" and our ability to ethically analyze our actions should not be confused with the ability of our conscience to differentiate right from wrong. Moreover, ethical behavior implies adherence to principles that underlie a specific context or profession, whereas the use of morals in the work place or research setting implies conformity with a behavioral code generally accepted in some defined setting or culture. This distinction is important in understanding what research ethics are, especially as research enters the realm of moral reasoning. One must determine what is ethically (vs. legally) right and wrong. Ultimately, making well-reasoned ethical and moral responses to dilemmas in the conduct of science should consider: 1) all issues and points of conflict, 2) the interests and expectations of all parties, 3) recognition of possible consequences that may arise from proposed actions, and 4) identification of the professional and moral obligations of scientists. Researchers and trainees can gain more insight and knowledge by using case studies to discuss the elements of critical thinking, ethical decision making, and moral reasoning as it pertains to situations that scientists encounter during the course of a research career.

Key Words: research ethics

0110 Why are research ethics important and how do they affect academia? M. L. Galyean*, *Texas Tech University, Lubbock.*

Animal welfare and associated animal care and use issues have been at the forefront of ethical concerns for animal science researchers for many years. More recently, animal science researchers, particularly those working with industry-sponsored research, have come under increasing scrutiny with respect to bias and conflict of interest in their research programs. Universities and most corporate research units have well-defined procedures that must be followed when vertebrate animals are used in research. Similarly, most universities have established policies for assessing, reporting, and remediating conflicts of interest of a personal, financial, or professional nature. In terms of financial conflicts, a collective interest of > $5,000 is typically the threshold for disclosure of potential conflicts to colleagues and research team members. More subtle conflicts of interest and bias that do not require reporting might affect faculty members who receive discretionary funding and products to support research, consulting activities, honoraria for work on advisory boards or for giving technical presentations to industry clients groups, and trips to company-sponsored activities of various types. In terms of animal research, responsible conduct that will instill public confidence requires more than following minimum guidelines. Faculty researchers, graduate students, and research staff should work together to provide the highest possible standards of animal care; however, ultimately the principal investigator must be responsible and devote appropriate time to oversight of research projects and animal care. Delegating oversight of research activities and animal care to graduate students or staff members without proper training and instruction is unwise and inappropriate. All members of research teams should be dedicated to optimal experimental design and methods of collection, analysis, and interpretation of data. To do otherwise is an unethical defiance of public trust. Busyness is never an appropriate excuse for principal investigators to shirk their responsibilities to research team members in terms of providing proper oversight of research activities. Research teams should conduct regular, transparent self-evaluations of whether they are providing the highest standards of animal care and also assess potential conflicts of interest and bias for all team members. Including peers outside the research team to help evaluate real or perceived bias and conflict of interest issues might be useful. Graduate students and research staff can play a key role in ensuring ethical conduct of research by asking for training and instruction, and questioning potential bias and conflict of interest issues.

Key Words: animal care, bias, conflict of interest, research integrity

0111 Importance and impact of research ethics on industry. M. Brown[*1] and D. Smith[2], [1]*Global Animal Products, Inc., Amarillo, TX,* [2]*Performance Plus Liquids, Inc., Sterling, CO.*

Ethics is commonly defined as the rules of behavior or norms of conduct that differentiate between acceptable and unacceptable practices. Guidance of scientists by an appropriate ethical compass is paramount in research because scientists occupy a unique position of trust with the readers/users of their data. One end of the research ethics spectrum is typified by descriptors, such as error-free, accurate, precise, repeatable, well-documented, transparent, objective, and unbiased, whereas the opposite end of the spectrum involves misconduct in some form. A wealth of resources is available that illuminate the principles of ethics in the context of responsible conduct in research. Full awareness and evolution of one's own understanding of ethics arises from daily use of these principles and periodic reflection. In the scope of this presentation, the impact of research ethics of a given applied research program on industry is a function of the quality of the data generated and conveyed, and on the cultivation of skills and attributes of graduate students from that program that will be carried into future careers. Herein, industry refers to beef cattle production and the professionals that provide service to this sector of agriculture. Discussion will encompass quality assurance considerations in the execution of applied studies and generalized examples that illustrate the potential impact of low-quality data on certain aspects of industry. A comprehensive survey of employers of master's and doctoral graduates in the cattle feeding sector from 20 states in the United States and 1 Canadian province indicates that the area of greatest discrepancy between employer desires and employee preparation involved elements of character, followed by interpersonal and communication skills. Efforts to conduct and report high-quality data garner the highest value and appreciation by industry. Greater emphasis on fostering good character and communication skills of developing scientists will be beneficial to industry, academia, and society.

Key Words: applied science, ethics, quality assurance