The demographics of the veterinary profession have changed dramatically in recent years, with the most striking change being the gender shift within the profession. Women comprised just 10% of veterinary practitioners in 1970. In contrast, by 1985, more than 50% of the students attending veterinary schools in the United States were female, and by 1992, that proportion had risen to 64%. Today, just under 80% of students entering veterinary schools in the United States are female, with some veterinary school classes being 100% female. Female practitioners outnumber males, and it is estimated that women will comprise 67% of veterinary professionals by 2015.¹ A full discussion of the reasons for this demographic shift is beyond the scope of the present commentary, but similar, although less dramatic, changes have been occurring in the other health professions.²,³

The recent gender shift is likely to have an economic impact on the veterinary profession. Overall, female veterinarians command lower salaries than do male veterinarians,⁴ and studies⁵–⁹ show that, compared with male veterinarians, female veterinarians work fewer hours, are more likely to seek part-time veterinary employment, and are less likely to own veterinary practices. However, while the changing economic landscape of the veterinary profession has been extensively discussed, other aspects of the gender shift remain to be explored.

One of the more intriguing questions is what, if any, effect the gender shift in the veterinary profession will have on ideology. If women approach ethical problems differently than men, then gender-linked differences in moral philosophy combined with the increasing proportion of women in the profession could have enormous implications.

**Gender-linked Differences in Moral Philosophy**

Building on, among other things, the theory of a stepwise process for attainment of moral maturity, a theory pioneered by modern philosophers such as Jean-Jacques Rousseau, Harvard professor Lawrence Kohlberg espoused a cognitive theory of moral development that postulated that human beings, regardless of origin or culture, pass through six stages of moral development.¹⁰,¹¹ In this developmental paradigm, children are believed to begin formulating ideas of right and wrong first on the basis of decrees from authority figures, then on the basis of their own needs, and only later take into account various interpersonal relationships. According to this theory, the zenith of moral evolution is attained through “a commitment to universal ethical principles of justice, equality, respect and autonomy.”¹² Kohlberg asserted that the rate of moral development varies by individual and that many individuals fail to progress up the cognitive scale. Empirical assignment to one of the developmental levels is accomplished through the analysis of subject responses to various hypothetical ethical quandaries.

Carol Gilligan challenged Kohlberg’s theory in her book *In a Different Voice: Psychological Theory and Women’s Development.*¹³ Gilligan asserted that, because all of Kohlberg’s subjects were male, he failed to take into account the female perspective in outlining the stages of moral development. Gilligan further suggested that women tend to think and speak differently than men do when confronting ethical dilemmas. By making justice the moral ideal, Gilligan asserted, Kohlberg’s ethical test was fundamentally biased against females, who typically consider care of and benevolence towards other beings, rather than justice, to be the highest moral imperative. Thus, under Kohlberg’s framework, females would be less likely to achieve the zenith of moral development.

Gilligan at first proposed an alternative developmental stage model with care as the moral ideal. However, she and others did not find that women always scored higher than men on tests based on this model. Furthermore, women often scored higher than men on the defining issues test, an extensively validated tool for assessing moral development that was based on Kohlberg’s paradigm.¹⁴ Thus, while research on moral stages was still being carried out, Gilligan moved away from a stage theory and instead found empirical support for a theory of disparate moral orientations, the frameworks by which moral dilemmas are perceived and described.¹⁵,¹⁶ Gilligan has suggested that while men tend to operate under the ethics of a justice orientation, seeing the world “in terms of inequality or equal-
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The dichotomy between the ethics of care versus

Importantly, Gilligan was careful to title her book In A Different Voice, rather than In A Woman’s Voice, because she recognized that both men and women employ the ethics of justice and the ethics of care. Further research on this subject has underscored the importance of gender roles,19 with evidence suggesting that as gender roles change, moral orientation may also evolve. There may also be other, as yet undefined, orientations that contribute to responses to ethical dilemmas.

Gilligan and others have shown that one’s approach to moral problem solving (ie, use of the ethics of care versus the ethics of justice) has a sex basis at a young age. Girls place greater importance on relationships, which causes them to feel responsibility for preventing and alleviating pain in others, whereas boys pursue solitary achievements and feel it is their duty to uphold justice. This disparity between the sexes is still apparent as individuals age, as reflected in differences in voting behaviors on issues related to rehabilitation or execution of criminals and in regard to animal rights activism. In addition, even when gender roles change, there may be physiologic reasons for sex-based differences in moral problem solving. A recent study,21 for instance, found that there are at least 600 sex-biased genes in the mammalian brain, 10 times as many as previously thought. Thus, while recognizing the limitations of Gilligan’s theory, the concept of moral orientations (ie, the ethics of care vs the ethics of justice) provides a useful framework for examining the ethical perspectives of male versus female veterinarians.

Ethics in Veterinary Medicine

The practice of veterinary medicine is rife with ethical quandaries owing to the often-competing obligations veterinarians have to their patients, their patients’ owners, and the medical and scientific communities in general.22 Approximately 70% of veterinarians in the United States practice small animal medicine, whereas the remaining 30% work in areas such as food animal medicine, equine medicine, academia, public health, pathology, and laboratory animal medicine, which includes comparative medicine and animal-based research. Clearly, the ethical dilemmas faced by small animal practitioners, who typically are treating privately owned pets, are different from those faced by veterinarians in these other areas of practice.

By definition, both laboratory animal medicine and food animal medicine are related to the consumptive use of animals. Veterinarians working in these specialties, therefore, are confronted on a daily basis with the realities of animal subordination and must find ways to reconcile their belief in the inherent value of animal life with the moral and legal status of the animals they treat.

Veterinarians approach ethical problems differently on the basis of their moral orientation, yet there has been little empirical research on the moral orientations of veterinarians. In some of the few studies23,24 that have been done, Self et al attempted to analyze the ethical ideologies of veterinary students and practitioners. In particular, they used the Gilligan real-life conflict and choice interview25 to characterize the extent of gender differences in moral orientation between male and female veterinary students at the end of their final year of veterinary school and found that a justice orientation was exhibited 67% of the time by the male students but only 33% of the time by the female students.25 Conversely, a care orientation was exhibited 65% of the time by the female students and 44% of the time by the male students. Although these differences were not statistically significant, the sample size was small (10 female and 10 male students) and participants were self-selected, which may have biased the results.

In contrast, a large study26 of medical students and practicing physicians demonstrated a definitive linkage between gender and moral orientation with regard to the allocation of critical care resources. In that study, women used the care orientation nearly twice as often as they used the justice orientation. Men used the care orientation significantly less often than women did and
were more likely than women to use the justice orientation to resolve moral dilemmas. Additional studies have shown gender-linked differences in moral orientation among nurses, young physicians, and medical ethicists, and have discussed the impact of these differences on the practice of medicine and on medical policy. Other studies have demonstrated this gender linkage among non–health care professionals.

Self et al suggested that future research should examine the implications the moral orientations of women have for the veterinary profession. Similarly, Tannenbaum has suggested that if female veterinary students and practitioners are indeed more concerned about the interests of their patients and more interested in animal welfare than their male counterparts, then the increase in the proportion of female veterinarians could have a substantial impact on the profession’s emphasis. The perceived shortages of veterinarians in food animal and laboratory medicine suggest that the profession would be well served by a closer analysis of these two specialties in light of gender-based differences in moral ideology.

**Food Animal Medicine: Animals as an Economic Commodity**

In recent years, a perceived shortage of food animal veterinarians has caused concern within the profession. In 2004, the Food Supply Veterinary Medicine Coalition was formed with the express purpose of assuring the public that food continues to be abundant, safe, and wholesome by ensuring that veterinarians are appropriately involved throughout the food supply system. Studies were commissioned by the Food Supply Veterinary Medicine Coalition to examine demand and supply patterns for food animal veterinarians and the issues that affect those patterns. Nevertheless, there remains a concern that the decrease in the number of veterinary students choosing careers in food animal medicine will adversely affect substantial segments of the livestock industry, particularly the dairy industry.

Within the livestock industry, there has been a trend toward consolidation of smaller, family-owned farms into larger production units. As a result, the populace has become more urbanized and increasingly distant from agriculture and food animals. In addition, larger production units tend to place more emphasis on the overall efficiency of production and less emphasis on the health of individual animals. Thus, food animal medicine may be less attractive to contemporary veterinary students in general, and production operations are increasingly removed from the ethics of care. Importantly, although improved equipment and drugs may make the female physique less of an impediment to food animal work, the increasing objectification of animals as production units is likely to inhibit involvement of those with an ardent ethics of care orientation.

Current numbers support the suggestion that female participation in food animal medicine is limited. For instance, although 76.7% of respondents in an employment survey of 2006 veterinary graduates were female, only 0.9% of women reported to have taken jobs in large animal–exclusive practices, whereas 7.0% of men had accepted such jobs. In a study of factors influencing the career choices of veterinary students, male veterinary students were 13 times as likely to express a preference for a career in food animal medicine as were female students, suggesting that prejudices against women in food animal medicine persist or that women are avoiding food animal medicine for other reasons.

**Laboratory Animal Medicine: Animals as an Intellectual Commodity**

As is the case for food animal medicine, laboratory animal medicine may not reconcile well with an ethics of care moral orientation. Although laboratory animal veterinarians care for individual animals, colony health is generally given priority over the health of individual animals. Perhaps more importantly, animal-based research is generally at odds with the ethics of care philosophy, which values avoiding causing harm to others and caring for discrete individuals. As stated by Elizabeth Paul, “strong belief in both the value of science and the potential for appreciable suffering in animals certainly represents a challenging and uncomfortable position.”

Just as there is a shortage of veterinarians in food animal medicine, there also is a shortage of veterinarians in laboratory animal medicine. A National Research Council study cited the explosion in genetic engineering, a growing emphasis on translational research, burgeoning regulatory requirements, and the increased risk of infectious disease transmission associated with increased global exchange of animals and animal products as important factors in the increased need for veterinary involvement in scientific research. Combined with this, there has been a substantial increase in the number of animals used in research, even as the number of larger species, such as dogs and nonhuman primates, has decreased. Between 1995 and 2002, for instance, there was a 31.7% increase in the number of competitive grants funded by the National Institutes of Health for research involving animals.

Despite this overall increase in the need for veterinarians in laboratory animal medicine, the number of individuals completing residency training in laboratory animal medicine was 25% lower in 2002 than in 1996. In 2002, only 666 actively employed individuals held board certification from the American College of Laboratory Animal Medicine, whereas an estimated 1,608 animal research programs in the United States were registered with the USDA or held National Institute of Health assurances.

The current gender distribution of laboratory animal veterinarians is unclear. Because of the diversity of the field, in terms of training and career pathways, and the small number of veterinarians working in the field, relative to other veterinary specialties, detailed demographic information is not widely available. Approximately 36% of board-certified laboratory animal veterinarians in 2004 were women; however, this may not accurately reflect the true gender distribution because many laboratory animal veterinarians are not board certified. Clearly, there are many female laboratory animal veterinarians. However, the job descriptions of laboratory animal veterinarians vary widely.
For example, the National Research Council study categorized laboratory animal veterinarians as clinical veterinarians, administrative staff, scientific faculty, and private consultants. Although the clinical and advocacy roles of laboratory animal medicine may be attractive to veterinarians with an ethics of care orientation, the proportions of time spent on these activities is variable. Although women may be attracted by the flexible hours, generous benefit packages, and high salaries of laboratory animal medicine, relative to other areas of veterinary medicine, a previous study found that veterinarians who pursue a career in animal-based research were more likely to be men.

**Women and Animal Activism**

While there are shortages of veterinarians in food animal and laboratory animal medicine, there is no paucity of animal activists who oppose the use of animals in these fields, and women are overrepresented among their ranks. In 1992, the demographic picture of animal rights activists was described as ‘female, white, well educated, middle to upper middle class, politically liberal, and childless.’ Although this characterization has been challenged, the preponderance of women in animal rights activism has been corroborated. A 1996 study found that “women were more likely than men to support the tenets of the animal protection movement... were more likely than men to favor increased restrictions on animal use and were more concerned about the suffering of research animals.” A study of veterinary students indicated that gender was the most significant predictor of attitudes towards animals and their use.

It is beyond the scope of the present paper to discuss the complex reasons why women are more active in animal advocacy than men, and more study of the subject is needed. However, women's alignment with the ethics of care has been implicated as an important inciting factor for empathy towards animals. In a study of whether structural experiences with oppression and domination incited women to animal rights activism, a gender ideology arising from subordination was found to be useful in differentiating women who did and did not support animal rights, but did not account for the greater support for the animal rights movement among women than among men.

Although the demographics of animal rights activists and contemporary veterinary students are generally similar, these do not represent the same population. Indeed, most college and graduate school students in the United States fit a similar profile. Furthermore, the most ardent supporters of animal rights malign any human interference, a stance that would make veterinarians obsolete. Even so, evidence indicates that the ethics of care moral orientation figures prominently in the motivations for individuals in both groups, and this similarity should not go unnoticed. Although the analysis of gender differences in policy preferences is complex, women are statistically more supportive than men of compassion issues, such as aid for the poor, the sick, and the unemployed, whereas gender differences for issues less obviously aligned with the ethics of care, such as traditional values issues (e.g., pornography, marijuana, and sex education), are negligible. The ethics of care has been shown to be an important motivational factor for women in their political, as well as their professional, lives.

**Arguments and Other Factors**

Statements about gender roles and their effects, however well supported, incite passionate responses from those suspicious of gender stereotyping. The then-president of the Canadian Veterinary Medical Association wrote a brief article in 2003 in which she said,

The feminization of veterinary medicine has...changed the profession...in [many] ways. Many of these changes are desirable, others may be less so. The caring and nurturing aspects of the veterinary profession may have been enhanced, but income may have been compromised, there may be less interest in practice ownership, and fewer graduates may be entering large animal practice.

A response letter from an angry reader called Dr. Lofstedt's assertion “an outright sexist comment” and noted that “the personality attributes of caring and nurturing are human characteristics and are not limited to, or exaggerated in, one sex or the other... Instead of blaming the profession, the Association should focus on developing and changing society's views on veterinarians, the value (monetary and otherwise) of their services, and on gender roles in general.”

Gilligan's theory provides only one of many valid ways of studying the issue of gender-linked differences in moral philosophy. Although her work has been criticized, the moral orientation theory has also been used successfully in many disciplines to study and explain gender issues. There is extensive evidence that caring and nurturing frame the personalities of more contemporary women than men. Whether this comes about through disparate ethical socialization or is the result of some basic and possibly biological feature of womankind, this empathic leaning figures prominently in the interaction of women and animals. It remains to be seen whether these differences are the result of women's subordinate status and will change as gender roles change. Neither men nor women are culpable for the challenges facing veterinary medicine, but recognizing the changing gender identity of the profession and understanding its impact are important when addressing these challenges.

Importantly, although the increase in the proportion of female veterinarians has coincided with the shortages of veterinarians in food animal and laboratory animal medicine, the degree to which the one has caused the other is unclear. Certainly there are numerous factors contributing to decreased veterinary involvement in these areas. For example, urbanization of the populace is an important factor contributing to the shortage of veterinarians in food animal medicine. Future veterinarians who are not exposed to farm animals and agriculture as children are generally less likely to want to live in rural areas and practice food animal medicine as adults. Economic factors are also important in that rural areas may not provide as many job opportunities for
the spouses and partners of veterinarians, an important factor for two-income households. Similarly, the rise in the vegetarian and vegan movements, especially among young people, may dissuade students from pursuing careers in food animal medicine.

As is the case with food animal medicine, laboratory animal medicine faces multiple challenges. The funding structure for residency programs in laboratory animal medicine has been dynamic, leading in some cases to inconsistent training programs. The image of animal-based research is tainted by animal rights campaigns, and public relations debates such as the *Popular Science* article\(^\text{58}\) naming laboratory animal veterinarian as the third worst job in science, after anal-wart researcher and worm parasitologist, have only hurt the cause. Even given these factors, however, the preponderance of the evidence suggests that a change in moral orientation of veterinarians stemming from the gender shift of the profession is at least partially responsible for decreasing veterinary involvement in these important areas.

**Veterinary Medicine: The Future**

The fact that the veterinary profession, as articulated by the publications and actions of the AVMA, is undergoing considerable shifts in ideology may be interpreted as a positive manifestation of the increasing involvement of women. There are signs of progressive changes and a new ethical awareness in the profession. For example, the AVMA’s *Principles of Veterinary Medical Ethics* has evolved in the past 20 years from a code largely concerned with pragmatic matters, such as advertising, collegiality, and competition among practitioners, to one that pays greater attention to the interests of clients and, especially, animal patients. In 1987, the AVMA held a colloquium on recognition and alleviation of animal pain and distress, and in 1990, the AVMA held the first of a series of animal welfare forums designed to present the latest research on the scientific and ethical aspects of animal welfare. In 1996, the AVMA elected its first woman president in its 135-year history, and throughout the years, the AVMA has adopted approximately 120 position statements on ethical issues relevant to the veterinary profession.

Despite these encouraging developments, shortages of veterinarians in food animal and laboratory animal medicine are problems that must be addressed, as such deficiencies undermine the safety of our food supply; the quantity and quality of our research data; and, most importantly, the well-being of the animals that the profession is entrusted to serve. Thus, the changing demographics and concomitant changes in the underlying ideologies of the profession must be analyzed and addressed to ensure that veterinarians remain autonomous protectors of animal health and welfare.

Shurtleff et al\(^\text{19}\) showed that veterinary students who expressed a preference for food animal medicine were mostly male and more likely than any other employment group to go along with the wishes of clients in regard to debarking, ear cropping, and euthanizing healthy animals. Martin et al\(^\text{19}\) and Martin and Taunton\(^\text{50}\) found that students aspiring to careers in food animal medicine attached less value to some aspects of the human-animal bond. In addition, women were more likely than men to indicate that the human-animal bond plays an important part in their lives. Serpell\(^\text{19}\) found that the experience of owning or keeping food animals was associated with significantly less negative attitudes towards elective and cosmetic procedures, as well as with a perception that animals experience pain differently than humans. Further analysis of the moral orientations of veterinarians in food animal medicine and of graduating veterinary students through tools such as Gilligan’s real-life and choice interview would be informative. An in-depth look at the preferences of female veterinarians involved in food animal medicine would also be instructive to determine whether female veterinarians entering food animal medicine, for instance, gravitate towards heritage farm work or whether emphasizing the animal welfare advocacy roles of food animal veterinarians would attract more women to the field.

An informed analysis of these issues may reveal that no amount of public relations, aggressive recruitment, or mentoring will reconcile contemporary food animal medicine with contemporary veterinarians. If this is the case, then other methods for dealing with the veterinarian shortage must be developed. By necessity, individuals without a veterinary degree are increasingly performing health-related procedures on food animals. In many cases, there is little oversight of the training and skills of these individuals. Human medicine has increased the numbers of paraprofessionals, especially physicians’ assistants, and it is possible that in a similar manner, veterinary technician training programs could be expanded to develop the veterinary equivalent of physicians’ assistants.\(^\text{51}\) As an example, some developing nations have institutionalized training of agricultural technicians to sustain large livestock enterprises in areas with few veterinarians. Also, it is worth noting that paraprofessionals are well used by the laboratory animal community. The American Association of Laboratory Animal Science has a well-respected certification program to recognize technicians, technologists, and resource managers who have mastered the husbandry and care of laboratory animals.

Comparative demographic and sociologic studies of veterinarians involved in laboratory animal medicine would be helpful in determining whether women in this field are more attracted to clinical or advocacy positions than to positions directly involving animal-based research. It would also be helpful to know whether individuals involved in animal-based research, men and women, veterinarians and nonveterinarians, are more likely to have an ethics of justice moral orientation. Serpell\(^\text{50}\) showed a link between an affiliation with food animals and less negative views of research involving animals and teaching programs involving live-animal surgery. This may support the idea of an ideologic kinship between veterinarians working in food animal medicine and those working in laboratory animal medicine. Further research exploring this link would be interesting.

Increasingly, researchers have come to understand that unmitigated animal pain and distress adds an uncontrolled variable to research data and
is bad science. Animal welfare compliance in research is predicated on self-regulating through institutional animal care and use committees. Arguably, the animal welfare acumen of scientists would be strengthened by requiring ethics training, as studies have shown that moral reasoning is improved with formal ethics training. Although most veterinarians receive at least some didactic instruction in ethics during their training, ethics instruction in doctoral programs in the sciences is generally left to the mentoring scientist and may or may not occur. An influx of female veterinarians in laboratory animal medicine may create a research environment that is more hospitable to animal welfare regulation and that scrutinizes animal use more closely.

There may be room in both food animal and laboratory animal medicine for experts in animal welfare who have not had veterinary training. As an example, Temple Grandin is an animal scientist who has revolutionized techniques and equipment for the handling of food animals. Even so, given the scope of the veterinary curriculum, veterinarians are among the most qualified individuals to make animal welfare assessments. Animal welfare regulations need to be based in scientific fact rather than anthropomorphic assumptions about what is good for animals. Veterinarians are also instrumental to the study and validation of alternatives to animal use.

The veterinary medical profession is clearly at a crossroads. The increase in the proportion of women in the profession has contributed to changes in the underlying ideology. Shortages of veterinarians in food animal and laboratory animal medicine are serious problems with diverse and complex causes that can be solved only through innovative and open-minded analysis. If veterinarians continue to work under the paradigm of the past, they will fail to meet and balance all of their competing professional obligations; humans and animals will ultimately pay the price.

### References

36. Sterner KE. An invited perspective on the shortage of veterinarian-