

Introducing the Topic of Organic Veterinary Practice Into the Veterinary School Curriculum

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Introduction

I graduated from the Tufts University Cummings School of Veterinary Medicine in 2005 with a doctorate in veterinary medicine, one year before the publication of Michael Pollan's *The Omnivore's Dilemma: A Natural History of Four Foods* and Barbara Kingsolver's *Animal, Vegetable, Miracle: A Year of Food Life*, two books that would change the way I looked at the food I ate, the landscape around me, and the way that my profession was involved in food production. Inspired, I devoured the available popular literature about food and agriculture and started changing my own eating habits based on the food system I wanted to support. I define "the food system" as the entire path our food takes from production to consumption and disposal as waste, in addition to the animals, people, and land impacted along that path. Meanwhile, professionally, I managed to stay as far away from food production as possible. Certain that I had no interest in being a farm veterinarian, I filled my vet school schedule with every companion animal elective I could, recycled my food animal course materials, and set off to practice companion animal emergency medicine after graduation.

After seven years of practicing emergency medicine, however, I developed a nagging sense of guilt for not engaging professionally in an issue that is so important to me personally. I increasingly saw our food system as the common denominator for many of our greatest societal, health, and environmental challenges. As I brainstormed ways that I, as a veterinarian, could help address my concerns with our food system, I realized that the discussion of the veterinarian's role in food production in my veterinary school experience was limited to the prevention, recognition, and treatment of farm animal diseases and improving livestock production in the prevailing farm system, namely confinement operations raising a single species. I began talking to farmers with operations that did not fit this model, including small-scale farms that combine crop and mixed livestock production, organic dairies, and grass-based livestock systems. I found that I had embarrassingly little to offer them when it came to topics such as antibiotic-free management

strategies and improving animal health and production starting with the health of the soil growing the forages fed to the livestock. In the winter of 2012, I entered the Agroecology Program at The University of Wisconsin – Madison with the intent to incorporate some of these topics into the general veterinary curriculum so farm models outside the prevailing agricultural system would be familiar to all graduating veterinarians, in addition to being a potential area of specialization for a subset of students.

As a starting point, I looked to the work of two previous graduate students, Jennifer Anne O’Neill, who completed a graduate program in Sustainable Agriculture at Iowa State University in 2010 and Dr. Martha Rideout, a veterinarian who completed the Agroecology graduate program at the University of Wisconsin – Madison in 2009. O’Neill performed a survey of food animal veterinarians and organic livestock farmers in Iowa to evaluate the available veterinary services for organic farmers and the perception each group had of their mutual working relationship.¹ Dr. Rideout performed a similar survey of organic dairy farmers and food animal veterinarians in Wisconsin.² Both studies found that veterinarians lacked an understanding of the National Organic Standards, which led to discomfort for both the vets and their organic clients when participating in herd health decisions. The surveyed veterinarians did not know where to look for reliable educational resources on organic practices, which contributed to their reluctance to make recommendations to organic farmers.

Veterinarians in the study supported inclusion of organic practices in the veterinary student training as well as continuing education (CE) opportunities that are approved by the Registry of Approved Continuing Education (RACE). RACE evaluates educational opportunities for practicing veterinarians and determines if they are suitable to provide the education credits required to maintain veterinary licensure. Paradoxically, what is eligible for continuing education after veterinary school is determined by what is taught in the vet school curriculum. The

guidelines read, “In order to be deemed eligible for approval by RACE, CE offerings shall refresh the participant in the standards for practice and the foundational, evidence-based material as presented in accredited schools of veterinary medicine. CE programs that advocate unsubstantiated modalities are not eligible for approval.”³ Given the importance of incorporating the topic of organic practice into the vet school curriculum in order to reach future vets or practicing vets seeking RACE approved credit, Dr. Rideout concluded her project with a list of specific recommendations for the Food Animal Curriculum Task Force at University of Wisconsin School of Veterinary Medicine. These recommendations included incorporating the discussion of organic farm systems into the continuum of farms examined in the food animal program, focusing on the similarities that exist between organic and all other farming models, as well as the subtle differences in farmer motivations and farming practices that make organic systems unique from an animal health perspective. Based on the responses from veterinarians in her survey, she recommended that all students pursuing food animal medicine receive a foundational education on the National Organic Program (NOP) and allowable practices for maintaining animal health. She felt, as I do, that it is important to reach all potential food animal veterinarians, not only the self-selected few who may enroll in an elective course, as a veterinarian may not be able to predict all the farm systems he or she will need to serve after graduation. Dr. Rideout also envisioned the veterinarian as an invaluable link in recognizing challenges to animal health and welfare in organic systems and the research needed to address those challenges.

At some point during their four years of veterinary school, students at most veterinary colleges make the decision to pursue either companion animal medicine (including equine) or food animal medicine, with a small percentage choosing other fields such as lab animal or wildlife medicine. Veterinarians who pursue food animal medicine (17%) may further specialize in a particular field through residencies or certification processes after veterinary school, such as

dairy or poultry medicine, or they may be a general practitioner serving a variety of farms.⁴

Depending on the region in which a vet is practicing, he or she may see a diversity of species and farm types, including organic farms, and must be prepared to serve a variety of clients. In

Wisconsin, 4.5% of dairy farms are organic.⁵⁶ While that may seem like a small corner of the market, this percentage represented 479 farms in 2012 (up from 256 organic dairies in 2009), a number that continues to grow despite a decrease in the total number of farms in the state.⁷

Organic food animal practice potentially represents an emerging field for food animal veterinarians. It is a service required by a growing sector of livestock farmers and requires a specialized set of knowledge and skills. For this reason, I elected to follow up on Dr. Rideout's suggestion to incorporate the organic guidelines as dictated by the NOP into the veterinary curriculum as well as foster an objective discussion about the unique animal health challenges facing organic producers. I created a curriculum that examines the similarities and differences between organic and other farming systems and specifically takes into consideration the implications the NOP guidelines have for veterinary practice, including the allowable practices and substances.⁸

While I found immediate support within the Agroecology Program and interest in organic veterinary practice among farmers and current veterinary students, I was surprised to find the UW veterinary school reluctant to allow me to incorporate the topic into their veterinary school curriculum. I learned that there are a number of reasons for this hesitation. First, the veterinary curriculum is very full with the core curriculum required for a veterinary college to retain accreditation. These core courses include the anatomy, physiology, pathology, microbiology, and pharmacology associated with each body system in a number of animal species. Elective slots are few and far between, and filled with courses specializing in well-established specialties like animal nutrition, emergency medicine, and dairy production medicine. Students carry more than

twenty credit hours each semester, often attending lecture and lab for more than eight hours each day, so it can be logistically difficult to add even a single lecture to an existing course.

While scheduling is admittedly tight, it is not the only barrier to introducing a discussion of organic practices to the curriculum. Most of the content presented in a veterinary classroom is founded in evidence-based medicine: clinical decision-making for an individual patient based on a consensus of existing research and published literature on a subject.⁹ This presents a challenge to organic veterinary methods for several reasons. First, there is a dearth of primary research and clinical trials examining organic alternatives to the treatment of disease processes traditionally treated with antibiotics or other synthetic substance prohibited by the NOP. A few of the veterinarians who specialize in organic livestock practice have published their methods and recommendations in textbooks, but their recommendations are based on empirical data rather than a controlled research experiment. Some organic practitioners use alternative medical practices, such as acupuncture and herbal medicine, which are only beginning to find acceptance and legitimacy within mainstream medicine in the U.S. The stigma associated with alternative medicine, because of the lack of research-based literature on the subject, may be narrowing the field of clinicians and educators within veterinary medicine who feel comfortable teaching organic methods.

Secondly, many organic farmers take a systems-based approach to raising livestock, which is not an approach unique to organic farming but is a foundational principle promulgated within the organic community. Farm animals are considered links in an integrated system that includes the soil, microbial community, vegetation, surrounding wildlife, climatic factors and the humans managing the system. Every farm is a complete system that must be understood as an individual case due to physical differences in the land, the size of the farm, the goals and realities of the farmer, the combination of species on the farm, seasonal changes, and the available markets for

the products. This presents a challenge when ensuring that a graduating veterinarian has an understanding of all the components of the system that could impact animal health, welfare, and production, such as soil science, hydrology, ecology and economics, in addition to the necessary veterinary medical techniques.

Finally, the University of Wisconsin – Madison has been a leader in agricultural research for over a century. Many of the farming practices used in today's highly mechanized, streamlined, and vertically integrated farming systems stem from the ideas and innovations of researchers on this campus and other land grant research institutions. Many of the students pursuing food animal medicine grew up on farms in Wisconsin that employ these farming techniques, which are now embedded in their identity as successful farmers. Organic agriculture imparts a different set of rules and the perception of a different set of values that challenge the paradigm many students and faculty consider the defining strength of this state and institution. I suspect that this contributed to the resistance to adding organic livestock practices into the curriculum.

The UW is not alone in its hesitancy to embrace organic farm practices into the information and skills provided to their students. In 2005, members of a breakout session at the Veterinary Medical Education for Modern Food Systems Symposium assessed the changing role of the food animal veterinarian in modern food systems, and how veterinary schools could best address those changing needs.¹⁰ A summary report was published one year later.¹¹ The authors, including Dr. Daryl Buss who at that time was the Dean of the UW School of Veterinary Medicine, recognized that there is decreasing demand for rural ambulatory private practitioners in a food system dominated by consolidation and vertical integration. As farms become larger and more technologically sophisticated, trained herdsmen and computer systems have replaced many roles of the traditional food animal vet. The authors saw this as one reason why there are currently fewer veterinarians engaged in food animal medicine than there have been at any point in the

past eighty years, and criticize veterinary schools for not being more proactive in identifying new roles for vets as the food system changes. The report states, “For veterinarians to respond, veterinary medical education must be immediately engaged in anticipating such changes so that we can suitably prepare graduates for the opportunities and challenges of the future.” Five areas that must be addressed in the education of a food systems veterinarian were identified: Population and production medicine, including the basic sciences and a knowledge of farming systems, business management, leadership and people management skills, public health, and career-development education for students, specifically introducing veterinary students with non-agricultural backgrounds to food production early in their veterinary preparation. They also recognized the need to expand the perception of the roles veterinarians can take in new food production niches, stating that, “Expanding our own internal vision is a prerequisite to expanding the vision of the food systems, and of the public, of the roles veterinarians should play in ensuring animal health and welfare, as leaders in food safety and security throughout the food chain, and as leaders in the management and leadership of modern food systems.” Interesting, the authors specifically state that “organic” is not a niche they felt warranted specific veterinary training as it is a term, “poorly defined and regulated” with “little mandated consistency as to what constitutes “organic” production or products.” If this represents the perception of a group of leaders in veterinary medical education, it is no wonder that organic veterinary methods have not been introduced into the curriculum.

I decided to reach out to colleagues at my alma mater, The Tufts University Cummings School of Veterinary Medicine, and met Dr. Brendan McMullen, a professor of food animal medicine and practicing food animal clinician. Brendan had firsthand experience working with organic livestock farmers in his previous position as a private practice veterinarian in rural Vermont. He also teaches an agriculture module in the Masters of Animals and Public Policy

(MAPP) program at Tufts, a program in which students “explore the historical, philosophical, scientific, cultural, legal, and political underpinnings of contemporary human-animal relationships.”¹² Through my connection with Brendan, I was invited to visit Tufts in March 2014 to teach three different groups of students. I gave a lunchtime presentation to the general veterinary student community, spent a day working with fourth-year dairy production elective students, and led a discussion section with the MAPP students as part of their agriculture module. Meanwhile, two veterinary student groups at the UW, the Integrative Medicine Club and the Bovine Club, collaborated to invite me to present my material to the general veterinary student population over lunch, which I did in February 2014. Once my student audiences and venues were solidified, I was able to begin the process of distilling the materials I had assembled to get to the crux of my argument for the inclusion of organic practices in the veterinary curriculum.

Agriculture affects every human on the planet directly, as food is a basic human need, and indirectly through its effects on global climate, air and water quality, and resource availability. Thirty-eight percent of the planet’s terrestrial surface is in agricultural production, making it the single largest use of land, and 75% of agricultural land is used to raise livestock.¹³ While the minority of veterinarians currently practices food animal medicine, we all rely on agriculture for the food we eat and have an obligation to be active participants in democratic decision-making. In addition, the public views veterinarians as an authority on animal health, welfare, and the human-animal relationship. For this reason, it is essential that all veterinarians have a basic working knowledge of the breadth and impact of livestock agriculture, and I believe that organic veterinary practice represents a growing niche deserving of basic literacy by all food animal veterinarians and expertise by a growing interested population of graduating veterinarians.

Curriculum

When designing my curriculum for the three different Tufts student groups and the UW students, I relied heavily on my own veterinary school experience as well as conversations with Dr. McMullen and colleagues currently enrolled in veterinary school at the UW for my knowledge of the structure and content of the veterinary curriculum. I focused on Dr. Rideout's suggestions derived from her survey as well as what I felt I personally would need to know to feel comfortable serving an organic livestock farm as a veterinarian. When planning my presentations, I used the "backward design" framework described by Wiggins and McTighe in *Understanding by Design*.¹⁴ I began by defining what I wanted students to be able to do or know following the presentation, and what enduring understanding I felt the students should have. I then determined what content I needed to convey in order to achieve that understanding. Finally, with these goals in mind, I put together a presentation best suited to the desired outcome, the group of students, and the venue in which I would meet them. Since I had only one meeting with each group of students and was not responsible for their academic assessment in a formal way, I relied on voluntary surveys to provide feedback on what they had learned from the presentation and how the presentation could be improved to enhance their learning outcomes. See Appendix 1 for the Student Feedback Surveys.

Lunchtime Talks

The lunchtime talks at both Tufts and the UW were open to all veterinary students, but not required, and were presented in a large lecture hall or conference room over the lunch hour. Students with a range of interests within veterinary medicine were present. I elected to present the information in the form of a Power Point slide show followed by a question and answer session to most efficiently present a large amount of content to large and diverse group in a short period of time. The slides contained much of the material in text form and were available to the students after the presentation as a reference. I determined that after the talk, students should be

able to understand the variety of motivations farmers have for choosing to farm organically, find the NOP website containing the organic guidelines applicable to veterinary practice, recognize the unique animal health challenges organic farmers and their veterinarians face, know where to find resources for organic veterinary medicine, and be able to imagine potential roles for veterinarians in the organic sector.

I began with a definition of the term 'organic', a discussion of the role organic agriculture plays in U.S. food production, and a look at the variety of motivations farmers have for choosing the organic model to place the subject in context and highlight its relevance to veterinarians. I then detailed the NOP's farm certification process and guidelines as they apply to livestock health, summarizing the prohibited and allowable substances and practices according to the USDA's National Organic Program. The organic guidelines in the United States vary significantly from those in the European Union, so the similarities and differences between these two organic programs were examined to better allow students to objectively evaluate the U.S. organic program. I next discussed the results of Rideout and O'Neill's surveys to emphasize the need for further veterinary education on organic farming practices. I presented the results of Project C.O.W., a multi-state study conducted by researchers at Cornell University, Oregon State University, and the University of Wisconsin – Madison, comparing dairy cow health, comfort and production on 200 organic and 100 conventional dairy farms in three states to demonstrate the similarities in animal health and welfare across farming systems.¹⁵ Dr. Rideout's survey had indicated that food animal veterinarians were concerned for the welfare of animals on organic farms because synthetic substances like antibiotics are prohibited in the treatment of sick animals, so I felt it was important to address this concern directly in my presentation.² I concluded the presentation with a list of ways I envision veterinarians becoming more knowledgeable about and involved in organic veterinary practice, including a list of helpful

published references and annual conferences students could attend. For the lunchtime talk Power Point slides, See Appendix 2.

Dairy Production Medicine Elective Presentation

At Tufts, I had the opportunity to spend an afternoon with a group of eight students that intended to pursue food animal or mixed large animal practice after graduation. These students were in the final months of their fourth and final year of veterinary school and therefore had a greater knowledge of and interest in farm systems, livestock diseases and treatment protocols than the general veterinary student population I had addressed during the lunchtime talk. All of these students attended my lunchtime talk prior to our meeting. Since I had two hours to work with a small group of students seated around a table, I elected to use a discussion format. As near-graduates, these students would potentially be walking onto organic dairy farms as veterinarians in three months. I felt it was most important that they were familiar with the allowable and prohibited substances and where to easily access these guidelines. I also wanted students to be able to critically explore the feelings they had toward organic veterinary practices and the roots of those beliefs in order to move toward objectively evaluating animal health and welfare on any type of farm with the goal of helping all farmers formulate improved animal health plans. Finally, if they still felt uneasy employing certain organic practices, I wanted the students to envision an active role they, as veterinarians, would be able to take to alleviate those knowledge and perception gaps.

In order to achieve these goals, the students evaluated hypothetical cases so they could describe the methods used to treat a disease process on a conventional farm, and then brainstorm how they would approach the same case on an organic farm. Fortuitously, I was invited to spend the morning in class with the students as they reviewed treatment protocols for the most common disease processes encountered on dairy farms, such as mastitis and milk fever, so we had

a common point of comparison when considering organic alternatives. For the organic protocols, I referred to Dr. Hubert Karreman's textbook, *A Handbook for Organic & Sustainable Farmers: Treating Dairy Cows Naturally*.¹⁶ My goal was to highlight the similarities in management strategies and preventative measures in all farm systems, and identify the point at which their treatment protocols would no longer be applicable in an organic system. We then discussed the treatment protocols allowable in organic systems in lieu of antibiotics or other synthetic medications, many of which draw from alternative medicine. Alternative medicine, including acupuncture, herbal medicine and homeopathy, is an area in which veterinary students have limited training or experience, and it draws on an epistemology different than that used in most of the veterinary school education. This seems to be the root of many of the students' and practicing veterinarians' (including my own) discomfort with organic practice, purely because it is based on an unfamiliar way of knowing and understanding the body. We discussed ways in which research could be conducted to improve veterinarians' comfort with these practices. Because organic farms are viewed as a system of interdependent parts, it can be difficult to mimic all the influential components of an individual farm in a laboratory setting. However, this challenge does not preclude on-farm clinical trials to compare, for example, different herbal fly control methods acceptable within the NOP. Research performed on the farm can be participatory in nature, engaging the farmer in finding solutions that will be fine-tuned to his or her farm type or region, making some translatable to other area farms. Research of this type, performed on a small scale and within specific farm systems, will necessitate the support of research professionals willing to be out in the field, roles that could be filled by practicing vets or vets working with State Cooperative Extension Systems. If these studies reveal no adequate solutions to an animal health challenge within the NOP guidelines, veterinarians could play a central role in influencing the

National Organic Standards Board, the organization responsible for generating the organic guidelines within the NOP to make changes in the allowable substances and practices.

Masters of Animals and Public Policy Presentation

None of the MAPP students are veterinarians or currently enrolled in vet school, so the focus of my final presentation more broadly explored the breadth of the human-animal relationship in sustainable livestock production. Their interests in animal health and welfare are more diverse and typically geared more toward policy and advocacy than medicine. The group of twelve MAPP students spent much of their spring semester on the topic of animal use in agriculture. I was able to spend a day with them, discussing the topic of sustainable livestock production with a focus on global and national policies that impact the decisions farmers and consumers make. Since we were a small group, I again elected to use a discussion format, although I supplemented our conversation with Power Point slides since I introduced several organizations and policies with a litany of acronyms. In preparation for the class, I asked the students to read or watch five items. To provide some background knowledge on the global impact of agriculture, I selected Foley et al.'s piece in *Nature*, "Solutions for a cultivated planet."¹⁷ To provide three convincing yet utterly contradictory perspectives on how to responsibly raise and consume meat, I chose an excerpt from Jonathan Safran Foer's popular memoir, *Eating Animals*, a plea for veganism, Allan Savory's TED talk on The Savory Method for reversing desertification and climate change through livestock grazing, and a rebuttal of the Savory Method by a team of academics in the journal *Rangelands*.¹⁸¹⁹ ²⁰ To familiarize them with an example of a governmental agricultural policy website, I asked them to peruse the USDA's NOP website. For the MAPP module syllabus and reading list, See Appendix 3.

The two most important concepts I wanted the MAPP students to take away from the discussion were firstly, the global impact of agriculture and how agricultural policies in the U.S.

affect not only the farmers directly impacted by each policy, but also indirectly affect every type of farmer here and around the world. In order to promote this understanding, the content included a summary of current U.S. policies affecting sustainable agricultural practices either directly or as the unintended side effect of a larger piece of legislation. Secondly, I wanted the students to explore why consumer food choices are uniquely difficult to dictate with government policies, and the implications this challenge has on the human health, animal welfare, environmental and social impacts of our agricultural practices. We tried to define what we mean by “sustainable agriculture”, which stakeholders are included in our definition, how animals fall into that definition, and what “sustainable agriculture” might look like on the landscape. We used the example of the consumer decision to eat meat from the readings as a framework to look at the interrelated and often oppositional components of our definition of sustainability. Finally, the students broke off into groups of two to three people to brainstorm a new piece of food or agriculture legislation they would like to propose to promote sustainability. I asked them to answer the following questions:

1. At what level would you like to propose policy change (local, state, or federal)?
2. What stakeholders are involved? How will you represent their interests and convince them that you represent them? Whose perspective may be missing?
3. Who will influence the outcome of your proposed legislation? Politicians? Consumers? Will consumer interests be an ally or a barrier?
4. Is more research needed? If so, who will do it and fund it?
5. How will you disseminate information and garner support for your cause?

To conclude our discussion, the small groups came back together and we looked for contradictions or synergies that existed between their proposals. Unfortunately, the class period

ended during this portion of the activity, cutting our discussion short. For the MAPP Sustainable Livestock Production slides, see Appendix 4.

Reflection

My experiences working with the veterinary students were overwhelmingly positive, although quite different between the two schools. I found all of the students' enthusiasm for learning and their ability to question what they were learning in a professional manner inspiring and contagious. The experience I had arranging my talks with Tufts was quite different than my experience working with the UW from the beginning. At the UW, I spoke to several veterinary faculty members early in my graduate school career when I was looking for an advisor and graduate committee, and found that the faculty either did not consider the topic of organic practice a high priority in the food animal curriculum, or were already too overloaded with students to accept another advisee. When I did finally speak at the UW veterinary school, it was coordinated by two student-organized clubs led by current veterinary students with an interest in organic agriculture that I had met through my Agroecology colleagues. Since Tufts was my alma mater, I was able to contact faculty I knew at the veterinary school directly with my interest in speaking to the students, and was connected through these colleagues to Dr. McMullen. Dr. McMullen not only showed immediate support for discussing organic food animal practices in the veterinary curriculum, but he also seemed grateful that I wanted to take on the task and was happy to collaborate on my curriculum planning. We bounced ideas back and forth via email for nine months prior to my weeklong trip to Massachusetts in March 2014.

I detail the differences in my experiences because I feel that these processes directly impacted my experiences with the students. At the UW, I was brought in by a current student and introduced as a fellow graduate student from another department on campus who was coming to present my graduate work. At Tufts, I was introduced as a visiting veterinarian and guest

lecturer, brought in by faculty in the food animal medicine and MAPP programs. During the question and answer session after the lunchtime talk at the UW, I was questioned as a fellow student, and one who some students perceived to be less knowledgeable about agriculture than they were, rightfully so as many of these students have undergraduate degrees in agricultural sciences. The students that chose to ask questions challenged the material I presented and the validity of organic farming as a model. At Tufts, the students addressed me like they would a faculty member, with respect and interest for the subject and my knowledge of the material. They asked for advice in pursuing their interests in organic food animal medicine, and shared their concerns and experiences in this area. While the latter was obviously a more pleasant experience as the presenter, both were invaluable in opening my eyes to range of acceptance for organic practice that exists within the veterinary student body.

I asked the two groups with whom I was able to lead a discussion section at Tufts, the MAPP students and Dairy Elective students, to fill out brief surveys (See Appendix 1). Unfortunately, I was not able to get written feedback from the lunchtime talk attendees as the students were rushing in and out in a tight window between classes. My goal with the surveys was to gauge each student's interest and familiarity with the topic prior to our meeting. I also wanted to determine what students were taking away from the talk, as my previous teaching experience has taught me that the points the presenter thinks are most clearly stated are often not the points the listeners notice or remember. Finally, I wanted to know if anything jumped out to the students as a missing link that would have made my presentation more meaningful or understandable to them at this point in their education. This question was especially helpful as it was hard for me to recognize the jumps I made in my explanation of the problem and potential solutions after spending several years focused on the discussion of organic livestock veterinary practice and having not been in veterinary school for ten years.

The students' feedback largely mirrored my own impression of the discussions, and provided some insightful points I had not considered. For example, both groups echoed my regret in not having more time for discussion after I presented information to them. The students seemed most engaged during the small group discussion periods, but I struggled to determine how much background information I needed to provide in our single meeting prior to presenting them with a problem to discuss. Despite having my presentations planned in advance, it took a large part of each afternoon session to calibrate my presentation and questions to their familiarity with the topic, leaving less time than I expected for discussion. Many of the students also noted this shortcoming and suggested that the interactive questions be interspersed throughout the presentation to allow meaningful discussion of whatever portion of the material we have time to cover. Some students also felt that the discussion would have been more productive had they been able to look at my slides in advance or have them in front of them for reference. I regret not thinking of this as it would have been easy to email the class my slides prior to our meeting, cutting down on the time needed covering the background material and giving them greater comfort and confidence in our conversations. I think these two simple pieces of practical advice from the students would greatly improve the presentations in the future.

Another way to alleviate some of my uncertainty of the students' background on the topics would be to ask them to fill out a short electronic survey prior to the class. For example, with the MAPP students, I overestimated the number of students with an agricultural background or focus to their graduate work. When I met them in class, I learned that most had a companion animal focus to their work, and while very interested in the topic of sustainable livestock production, their interests came from the perspective of conscientious consumers and animal advocates rather than agricultural policymakers. Knowing this in advance, I could have started with a more general introduction to the different types of farms, including pictures and videos, as the

discussion of agricultural systems was new to many of these students. Students suggested a more comprehensive discussion of global agriculture and farming systems to improve their understanding of the problem and the solutions they could implement as citizens wanting to improve livestock farming systems. In the Dairy Production elective class, it would have been helpful to know the types of farms with which the students had personal or professional experience, as some had spent time on farms or traveling to different farms with veterinarians outside of their vet school farm rotation. A few students reflected on our discussion comparing animal health on a variety of farm sizes, and wrote that they were unfamiliar with the acronym, 'CAFO'. Again, simple clarification of discipline-specific jargon could have made the conversation more meaningful to these students.

Many of the students recognized that their suggestions fell outside the scope of what is possible in a single class period, but were still very helpful in providing ideas for future elective courses. For example, one student wished that we could have walked through an organic case study for each of the most common food animal disease processes that we had discussed in their morning protocol class. Another wished that a practicing organic vet could visit and discuss their experiences and challenges in the field. Others expressed a deeper interest in agricultural policy and history in the U.S., and the economic drivers of the organic food movement. Reading their thoughtful comments and suggestions, I was thrilled to see their interest in the topic of organic veterinary practice extend beyond the boundaries of our discussion.

While the transfer of information, such as the organic guidelines, through lectures, discussion and elective courses is important in preparing veterinarians to work with organic farmers, I believe that the most important step in promoting a productive organic farmer-vet relationship is changing the prevailing attitude the veterinary profession has toward organic farming. In his paper, "The Challenge of Integrating Ecosystem Health throughout a Veterinary

Curriculum,” Dr. Craig Stephen highlights the barriers to including the study of ecosystem health in the education of all veterinarians.²¹ Many of these barriers are similar to those I faced in promoting the discussion of organic veterinary practices, including the challenge of teaching an integrative, systems-based approach to health and disease within the current framework of the busy veterinary curriculum and the challenge of integrating a discussion of ethics and values into a scientific program in an educationally sound manner. He suggests, rather than offering an elective course to only those students interested in the subject, that the concept is woven throughout the four-year veterinary program in the hope that it percolates throughout the curriculum and affects how students approach challenges they face in practice. I foresee this happening through the inclusion of organic farms in the continuum of farm systems taught to all food animal veterinarians and incorporating a systems-based approach for assessing all farming systems. Obviously this is far simpler on paper than in practice, as it would require acceptance and implementation by the entire veterinary faculty rather than the enthusiasm of one individual. Participation of the entire faculty will require a paradigm shift within the veterinary medical education system, a process that is bound to be gradual and dependent on the continued persistence of those interested individuals within the veterinary faculty and student body.

Conclusion

Over the past three years, while I was not able to weave the topic of organic veterinary practice into the permanent veterinary school curriculum as I had originally hoped, I did ultimately succeed in my goal of creating curriculum and presenting it to the general veterinary student population at two veterinary schools. As with most things in life, my greatest learning occurred along the way, through the process of trying to make connections, failing, and then succeeding through new avenues I forged and fortuitously fell upon. When it seemed that every path was a dead end, I found encouragement and direction from an advisor who agreed to work

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with me despite the fact that my project was not related to his research. I found a colleague at Tufts with the food animal medicine knowledge and experience I lack, a professor whose open-minded and enthusiastic teaching made me proud to be a Tufts alumna. Finally, I found students who were excited to talk to me and to each other about our changing food system, and who are now talking to their respective administrations about future elective courses on organic veterinary practice. With continued pressure from the students, the curriculum will change to reflect their interests and veterinary schools will succeed in their mission of continuing to meet the needs of our changing food system.

Appendix 1

Feedback on Organic Livestock lunchtime talk and Dairy Elective Discussion

Presenter: Dr. Meredith Coulson

Email: mlcoulson@wisc.edu

1. How interested are you in the topic of organic veterinary practice?

(Not interested) 1 2 3 4 5 (Very Interested)

2. Please list two things you learned in today's talk/discussion.

3. What could be presented more clearly?

4. What would have improved your learning on this subject?

Feedback on the MAPP Sustainable and Organic Agriculture Presentation

Presenter: Dr. Meredith Coulson

Email: mlcoulson@wisc.edu

1. How interested are you in the topic of organic veterinary practice?

(Not interested) 1 2 3 4 5 (Very Interested)

2. Please list two things you learned in today's talk/discussion.

3. What could be presented more clearly?

4. What would have improved your learning on this subject?




Appendix 2

**Organic Livestock
Production: The Role of
Veterinarians**

Meredith Coulson, DVM
University of Wisconsin – Madison
Agroecology Program

Tufts Cummings School of Veterinary Medicine

March 26, 2014

My story:

- Graduated from TCSVM in 2005.
- Completed a rotating small animal internship at OSVS in 2006.
- Practiced small animal emergency medicine for six years in RI and WI.
- Currently completing a master's degree in Agroecology at the University of Wisconsin – Madison.

Objectives

- Share what I have discovered in the hope of answering for you some of the questions I had about organic livestock.
- Build awareness within the veterinary student community of the potential roles for veterinarians in this growing agricultural sector.
- Follow up on the recommendations made by two previous graduate students who surveyed organic farmers and the veterinarians serving them. (Rideout, 2009 and O'Neill, 2010)

Overview

- The National Organic Program
- Allowable practices
- Implications for veterinary practice
- Resources for vets
- Q&A

What is 'organic'?

- "A labeling term that indicates that the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used." -USDA National Organic Program

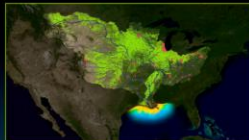
Organic Stats



- Fastest growing sector of U.S. agriculture.
 - 4.8 million organic acres in the U.S. (900 million total agricultural acres)
 - 3.5% of U.S. food production.
 - 9% of U.S. vegetable acres.
 - Number of organic farms in WI grew 157% from 2002-2007 while the total number of farms decreased.

Choosing Organic

- Why do farmers choose organic?
- Motivators
 - Environmental
 - Animal welfare
 - Human health
 - Lifestyle
 - Financial



Environmental Impacts of Agriculture

- Largest use of land – 38% of the terrestrial surface.
- 35% total greenhouse gas emissions.
- Gulf Dead Zone – hypoxic zone the size of CT with too little oxygen to support most marine life. 1.7 million tons of N and P from agricultural runoff and treated sewage enter the Gulf each year from the Mississippi River Basin.
- Loss of pollinators linked to pesticide use. 75% of the world's food crops rely on insect pollination.

Animal Welfare

- Consumer assumption that organic implies improved welfare.
- Organic label does include some welfare stipulations. Not necessarily true but often the only food label available distinguishing production methods.
- Farmers looking for an alternative to the prevailing confinement methods can earn a premium by adhering to organic standards.
- Current rise in humane food labels, third party certifiers separate from the NOP focusing on welfare.



Public Health

- Antibiotic resistance. 70% of abx used in the U.S. given to livestock.
- Water contamination from chemical and manure runoff.
- Air quality concerns for communities around large operations.
- Worker safety: chemical exposure in fields, toxic gases and dust exposure in confinement systems, route for zoonotic disease transmission to the public.
- Many alternatives to CAFO-raised meat, but organic, again, is often the only distinguishing label.

Lifestyle

- Find land stewardship rewarding.
- Wanted a change of pace. Enjoy the challenge of learning a little about many interrelated parts rather than a lot about a very streamlined system.
- Wanted more hands-on work. No longer excited by the technology race, commodity markets, debt burden.
- Only alternative to getting big or getting out.
- Ideological

Financial

- Niche markets are often the only economically viable option for small and medium farms.
- Lower overhead with fewer inputs, margins not quite as tight.
- Rodale Institute 2011: 30-year study showed that organic farms use 45% less energy and are on average more profitable.
- Organic milk premium on average 60-100% over conventional.

Who Farms Organically?

- Demographics similar to farming in the U.S. overall.
 - Similar age, level of education and number of years of farming experience. Slightly larger percentage of women.
- 51% transitioned from conventional farming. 49% started organic.
- 60% of organic farms gain 100% value of sales from organic.
- 50% of U.S. organic farms are in five states: CA (20%), WI (10%), WA, NY and OR.

Who farms organically?



- There is no typical organic farm or farmer.
- Organic and conventional farmers share many production strategies and goals.
- Many conventional farms use conservation practices and preventative medicine, and strive to minimize input use. Organic farms must be profitable to persist.
- However, from a veterinary perspective, the NOP makes some explicit distinctions between organic and conventional systems.

National Organic Program (NOP)

- Established by the Organic Food Production Act in 1990 but labeling was not implemented until 2002.
- USDA organization responsible for governing organic food production and handling in the U.S..
- Regulatory framework that generates the organic regulations with input from the public and the National Organic Standards Board (NOSB).

What does USDA Organic mean?

- The operation has been certified by a USDA accredited state or private certifying agent to uphold the NOP standards.
- About 100 certifying agencies in the U.S.
- Certifiers can be private (Oregon Tilth) or state agencies, usually through the department of agriculture.



Certification by state

- All agencies must certify to NOP standards.
- Some private agencies have additional standards to certify to international standards or additional labels (ex: Salmon Safe).
- States may propose a State Organic Program with standards above and beyond the NOP to which all agencies in that state must certify.
- Demonstrated environmental need for additional standards.
- California is currently the only state with its own State Organic Program recognized by the USDA with additional standards.

Certification Process

- Transition requires three years without any use of prohibited substances or proof that none have been used in > 3 years.
- Written application with a three-year farm history
- Initial and then annual on-site inspections
- Organic System Plan
- Average \$500-1000 annual certification costs
- Only required if >\$5000 in organic sales/year

What does USDA Organic Mean?

- **Organic crops:**
 - Prohibited substances, procedures and GMOs are not used in production or processing.
 - Land is actively managed to control pests, weeds and disease, maintain soil fertility and prevent soil erosion and runoff.
 - Land has been managed organically for at least three years prior to selling crops with the organic label.

What does USDA Organic Mean?

- **Organic livestock:**
 - Producers do not use antibiotics, growth hormones or other prohibited substances, use 100% organic feed and bedding, meet animal health and welfare standards, and provide animals with access to the outdoors.
 - Manure is managed appropriately.
 - Pastures used for grazing are managed organically.

Prohibited Substances	Allowable Substances
Oral and Parenteral: -Strychnine -Antibiotics -Hormones -Biologics prohibited by the FDA -Any drug other than vaccines in the absence of illness -Any synthetic drug other than the allowable substances Feed Additives: -Ionophores -plastic pellets -urea/manure -slaughter byproducts	Oral and Parenteral: -Aspirin, Atropine, Butorphanol, Electrolytes, Flunixin, Furosemide, Glucose, Mg hydroxide, Mg sulfate, Oxytocin, Fenbendazole, Ivermectin, Moxidectin, Tolazoline and Xylazine. Topical: -copper sulfate, glycerine, lidocaine Disinfectants: -chlorhexidine, hydrogen peroxide, iodine, alcohols Vaccines Vitamins & Trace Minerals

Outdoor Access

- Defined as access to sunshine, shade, fresh water, protection from predators, and adequate space for exercise and natural behaviors.
 - Ruminants must spend a minimum 120 days grazing or receive 30% DMI from pasture.
 - No outdoor feed value requirements for organic poultry at this time.



Health and Welfare Standards

- Preventative care, including vaccines and parasite control.
- Provide appropriate nutrition, shelter, bedding, pasture and sanitation for the species and climate.



Health and Welfare Standards

- Provide treatment for sick animals.
 - Cannot withhold medications to maintain organic status.
 - Veterinary biologics first, then allowable synthetics, and finally, if needed, prohibited substances.
 - **If prohibited substances are used, animal must be permanently removed from organic production.**
 - This differs from EU and Canada where some antibiotics are allowed if administered for a documented disease process, up to 3 treatments/year with extended withholding times.
- When?

US vs. EU

- U.S. has stricter regulations in almost all areas except livestock husbandry.
- Highly prescriptive requirements by species in the E.U. while there are only general guidelines in the U.S.
- Welfare was a core value of the organic movement in Europe while consumer & environmental health concerns drove the movement in the U.S.

US vs. Canada

- Quebec has its own organic program and standards.
- 2009 Organic Equivalency agreement between U.S. and Canada - traded organic goods may bear the USDA or CFIA organic labels despite minor differences in guidelines.
- Exceptions: Crops produced using hydroponics or sodium nitrate, or in violation of Canadian stocking rates may not be sold as organic in Canada. Dairy derived from livestock treated with abx cannot be sold as organic in U.S. (Abx not allowed in meat animals in Canada).

The Welfare Question

- Is farm animal welfare diminished on organic farms due to the prohibition of antibiotic use in sick animals?

Veterinarians & Organic Dairies

- Martha Rideout, DVM, MS Agroecology 2009, surveyed organic dairy farmers and large animal veterinarians in WI.
 - Vets perceived herd health to be lower than farmers did.
 - Vets cited inability to use antibiotics and lack of science behind standards as reasons for this perception – not an observed difference in animal health.
 - Organic farmers were wary of veterinary involvement. Felt vets did not understand or respect their method of farming.

Veterinarians & Iowa Organics

- Jennifer Anne O'Neill, MS Sustainable Agriculture, 2010, did a similar survey of veterinarians and organic livestock farmers in IA.
 - Disconnect between vets and farmers on the perceived health of the herd.
 - Few vets felt that organic farming provided environmental benefits while every farmer cited this as a core motivator.

Similar Conclusions

- Vets cited lack of educational resources founded in scientific research as one source of their discomfort.
- Vets supported inclusion of organic practices in vet school curricula and RACE-approved CE opportunities to increase their knowledge.
- Vets demonstrated a poor understanding of the definition of organic, national organic standards and where to find reliable information.
- Vets and farmers differed in their perceptions of herd health.

The Welfare Question

- Dr. Pamela Ruegg in the UW – Madison Dairy Science Department along with researchers at Cornell and Oregon State in Project C.O.W. in 2012.

The Welfare Question

- Looked at 300 organic and conventional dairy herds.
- Evaluated farmer questionnaires, bulk tank samples, 120 days of animal health records, and did an onsite evaluation of cows for BCS, hock health, lameness, udder hygiene and calf health.
- Ultimately evaluated conventional grazing systems separately from conventional confinement systems.

Results

- Milk production was lowest on organic followed by grazing and then confinement.
- Number of mastitis cases lowest on organic farms, followed by grazing, and then confinement.
*Prevalence correlated with intensity rather than system.
- No difference in culling rate or adult mortality.

Results

- Similar number of lameness, milk fever, calf pneumonia, calf diarrhea and metritis cases in all systems.
- Very low occurrence of DAs, ketosis, adult cow diarrhea and adult cow pneumonia on organic/grazing farms.

Results

- Methods of disease detection and rate of treatment similar across categories.
- Organic producers reported the greatest struggle treating calf and adult cow pneumonia.
- *Use of a veterinarian in treatment of sick animals was lower on organic and grazing dairies for all diseases.

What Does This Mean For

- Demand for organic ~~vets?~~ growing and farmers are trying to meet that demand.
- Increasing number of organic livestock farms.
- Organic farms must meet animal health standards to get and remain certified.
- Individual animals still get sick.
- Many of our familiar tools (antibiotics and synthetic drugs) are off limits.

What does this mean for vets?

- Traditionally, vets and farmers have had close working relationships.
- Right now organic farmers rely more on advice from other farmers than on vets.
 - 38% of organic livestock farmers rely on regular veterinary services compared to 69% of conventional farmers.

What does this mean for vets?

- Advice from an organic farmer: “We don’t need more studies looking at how organic measures up to conventional. We believe in organic farming so what we need is research to help us to do it better.”
- An opportunity to be creative and innovative in order to serve more clients and improve the health and welfare of animals on organic farms.

Get Involved

- Potential roles for vets:
 - Research!
 - Practice. Very few people currently specializing in organics.
 - Consultants for transitioning farmers. Systems approach.
 - Advocates for animal welfare and good medicine in growing network of organic food and agriculture organizations.
 - Become a representative on the NOSB and influence guidelines.
- If this interests you, get involved while in vet school.
 - Talk to farmers about the challenges they’re facing.
 - Talk to faculty. You have access to great resources while in school.
 - Student interests can drive curriculum changes.

Resources for Vets

- Paul Detloff, D.V.M. *Alternative Treatments for Ruminant Animals*. 2009.
- Hubert J. Karreman, V.M.D. *The Barn Guide to Treating Dairy Cows Naturally*. 2011
- Hubert J. Karreman, V.M.D. *A Handbook for Organic and Sustainable Farmers: Treating Dairy Cows Naturally*. 2007.
- Midwest Organic and Sustainable Education Service Conference. <http://www.mosesorganic.org/conference.html>. Feb. 27 - Mar. 1, 2014.
- Organic Valley Veterinary Workshop – offered every other year.
- Sarah D. Slaby, D.V.M. Dr. Sarah’s Essentials. <http://www.drSarahsEssentials.com/index.html>. Follow link to presentations.
- USDA NOP website. www.ams.usda.gov/nop.
- Helpful listservs: NSAC, NRCS, Michael Fields Agricultural Institute

Appendix 3

Vet 502 Animals and Society: Sustainable Agriculture Module

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Program
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Overview

Food is a basic human need, and agriculture is the ultimate source of our food. All types of agriculture impact land and resource use, but livestock production is unique for a number of reasons. First, livestock and the production of livestock feed have the greatest impact on global land use and greenhouse gas production. Secondly, there are animal welfare implications with different livestock production systems. Finally, the demand for meat is growing rapidly as populous countries like India and China eat increasingly more meat. In this class, we will discuss the global role of sustainable agriculture, pressures that direct agricultural policy and the challenges facing food policy makers and practitioners in the field of sustainable livestock production in the U.S.

Goals

After this class, you will have deliberated:

- The environmental impact of different livestock production systems.
- The many faces of sustainable agriculture globally.
- What “sustainable agriculture” means in the U.S. today.
- Current federal policies affecting sustainable agriculture in the U.S. including:
 1. The Farm Bill
 2. The National Organic Program
 3. The Food Safety and Modernization Act
- Why food is a uniquely challenging subject for policy makers.

Materials

Before we meet as a class on March 24th, please read/watch the following materials:

1. Foley, Jonathan A., et al. "Solutions for a cultivated planet." *Nature* 478.7369 (2011): 337-342.
2. Safran Foer, Jonathan. "Eating animals." *Hamish Hamilton* (2010). Chapter 3, Words/Meaning, pg. 43-78.
3. Allan Savory's TED talk on reversing desertification using livestock grazing. <http://www.youtube.com/watch?v=vpTHi7O66pI>
4. The Savory Method Can Not Green Deserts or Reverse Climate Change. Author(s): David D. Briske, Brandon T. Bestelmeyer, Joel R. Brown, Samuel D. Fuhlendorf, and H.Wayne Polley. Source: *Rangelands*, 35(5):72-74. 2013.
5. Please peruse the National Organic Program website, and take a peak at the Organic Regulations link under the Organic Standards heading. <http://www.ams.usda.gov/AMSV1.0/nop>.



Suggested Reading for more information on global food security and sustainable agriculture: De Schutter, Olivier. "Agroecology and the right to food." *United Nations. December* (2010).

Appendix 4

**Sustainable Livestock
Production**

Meredith Coulson, DVM
University of Wisconsin – Madison
Agroecology Program

Tufts University MAPP Program
March 26, 2014


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- Completed a rotating small animal internship at OSVS in 2006.
- Practiced small animal emergency medicine for six years in RI and WI.
- Currently completing a master's degree in Agroecology at the University of Wisconsin – Madison.


Overview

- Global role of sustainable agriculture
- Environmental impact of livestock systems
- Legislation affecting sustainable agriculture in the U.S.
 - The Farm Bill
 - The National Organic Program
 - The Food Safety and Modernization Act
 - Preservation of Antibiotics for Medical Treatment Act/GFI 209 and 213
- Challenges facing food and agriculture policy makers

Global Agriculture

- Largest use of land – 38% of the terrestrial surface is cultivated.
- Major source of greenhouse gas emissions (35% of total).
- Most new agricultural land clearing is in the tropics – implications for climate change and biodiversity loss.
- Most of the freshwater consumed globally is used for irrigation (estimates range from 60-90%).

Global Agriculture

- Demand for food expected to double by 2050.
 - Population growth
 - Increased consumption per capita
 - trend toward more meat consumption globally
 - meeting needs of the ~1 billion people who are currently undernourished
- What are we going to do!?! 

What does 'sustainable' mean?

- Environmental resilience
- Economic viability
- Social equity
- What do these “three pillars” look like in practice?
- How are different approaches reconciled?

Livestock Production

- 75% of agricultural land used for raising animals.
- 18% total global GHG emissions related to livestock production (60% of Brazil's emissions).
- 62% of total global crop production is directly allocated to human consumption.
 - 35% goes to animal feed. As high as 75% in parts of the U.S..
- Relatively inefficient protein and energy conversion rate.
 - It takes 13 kg of grain to produce 1 kg of beef protein.
 - It takes 40 calories of fossil fuel energy to produce 1 calorie from beef (compared to 2.2:1 ratio for grain).

Livestock Production

- 70% of abx used in the U.S. given to livestock.
- Air quality concerns for communities around large confinement operations. Almost no siting restrictions.
- Worker safety in confinement production and processing facilities. Reliance on cheap, compliant (often undocumented) labor.
- Impact of cheap meat becoming a cultural norm. Prices of houses and cars have increased 1400% in the past 50 years. Prices of meat and eggs haven't even doubled.

Livestock Production

- 1.3 billion people depend on the livestock industry for livelihood.
- >800 million food insecure people currently rely on animal products for protein and calories.
- In 2007, 92 lb of meat were produced per person on the planet.
- Overconsumption of meat associated with many health problems for the affluent.

Livestock Production

- Are the "three pillars" of sustainability enough when considering livestock?
- Is animal welfare part of sustainability?
- Whose perspective matters? Is any one story more "correct"?

Can Livestock Production Be Sustainable?





The Farm Bill

- Omnibus bill passed by Congress roughly every five years
- Covers everything having to do with agriculture, food and the actions of the USDA
- Twelve Titles: I. Commodities (now includes livestock), II. Conservation, III. Trade, IV. Nutrition, V. Credit, VI. Rural Development, VII. Research and Extension, VIII. Forestry, IX. Energy, X. Horticulture (includes organic), XI. Crop Insurance, XII. Misc.
- The Agricultural Act of 2014 was signed into law on 2/7/14, replacing the Food, Conservation and Energy Act of 2008.

Effects on Sustainability

- Conservation and Energy
- Subsidies and Insurance
- Local and Regional Food Systems
- Beginning and Disadvantaged Farmers
- Organic
- Research, Education and Extension
- Rural Development

Conservation Initiatives

- Natural Resource Conservation Service (NRCS) – grew out of the Soil Conservation Service, founded in 1935 in response to the Dust Bowl.
- Incentive programs for sustainability initiatives through the Conservation Stewardship Program (paid for conservation performance on a whole-farm basis) and Environmental Quality Incentives Program (technical and financial assistance for on-farm projects).

Subsidies and Insurance

- Historically provided price or revenue support for commodity farmers. Shifting from direct payments to crop insurance.
- Criticized for distorting international commodity markets and masking the true cost of food production, especially meat.
- New in 2014: Insurance premium subsidies tied to conservation compliance to discourage use of marginal lands for row crops.
- Limited insurance if native sod is converted to cropland in prairie states.
- New in 2014: Whole Farm Diversified Risk Management Insurance. Revenue insurance for diversified farm systems including integrated crop-livestock systems.

Organics

- Provides funding for organic research and extension (OAREI), and market data (OPMDI).
- 2014 bill increased funding to the National Organic Program (NOP) for research and administration.
- Broadened crop insurance for organic crops.
- Former 5% surcharge for organic insurance removed and coverage is now based on previous records and market prices like conventional crops (rather than inspection).

Additional Areas Potentially Influencing Sustainability

- Funding for beginning and disadvantaged farmers and ranchers who tend to be small to medium in scale.
- Support for rural development through small business microloans and value-added producer grants.
- Funding for new farmer's markets, community food security programs and farm-to-school programs.

Livestock Production

- 2014 bill rejected a provision that would have restricted USDA's ability to ensure market competition and fair contracts for livestock and poultry producers despite pressure from multinational meatpacking companies.

National Organic Program (NOP)

- USDA organization responsible for governing organic food production and handling in the U.S..
- Established by the Organic Food Production Act in 1990 but labeling was not implemented until 2002.
- Regulatory framework that generates the organic regulations with input from the public and the National Organic Standards Board (NOSB).
- Unique legislation because continuous review and revision are built into it. (Ex: Five-year sunset for all allowable materials).

What is 'organic'?

- "A labeling term that indicates that the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used." -USDA National Organic Program

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Food Safety and Modernization Act (FSMA)

- FDA oversees all food safety other than meat, poultry and egg product safety (USDA).
- First major reform to food safety laws by the FDA since 1938. Focus on prevention rather than detection. Signed into law in 2011. Still in the process of "rule-making" and implementing.
- Included provisions to be scale appropriate (including direct-market ag and value-added production), take into consideration the public goods of conservation measures, allow farm identity preservation and work in concert with, not against, the NOP (such as guidelines on manure and compost use).

PAMTA and FDA GFI

- Preservation of Antibiotics for Medical Treatment Act – Amendment to the Food, Drug and Cosmetic Act. Introduced and sent to committee in March 2013. Prognosis: 1% chance of enactment.
- FDA Guidance for Industry #209 and #213. Documents released in December 2013 suggesting voluntary industry compliance.
 - Phase out labeling for production uses of antibiotics.
 - Require veterinary-client-patient relationship for administration of antibiotics in feed or water.
 - Concern that new guidelines will have minimal effect on CAFOs and unintended consequences for small, diversified livestock farms in remote places where appropriate veterinary service is sparse and cost prohibitive.

What would you change?

- Policy?
 - At what level?
 - Process versus outcome. Who influences the outcome (law)?
- Which players are represented? Whose perspective is missing?
- Consumer attitudes?
 - How?
- Research and development
 - Who? Who funds it?
- Dissemination of information
 - Who do people listen to when making decisions?

Resources

- The 2014 Farm Bill: <http://agriculture.house.gov/sites/republicans.agriculture.house.gov/files/pdf/legislation/AgriculturalAct2014.pdf>
- American Humane Certified: <http://www.americanhumane.org/animals/programs/farm-animal-welfare.html>
- Animal Welfare Approved (AWA): <http://animalwelfareapproved.org/about/>
- Certified Humane Raised and Handled: <http://certifiedhumane.org/>
- Henning, Brian G. "Standing in Livestock's' Long Shadow": The Ethics of Eating Meat on a Small Planet." *Ethics & the Environment* 16.2 (2011): 63-93.
- National Organic Program (NOP): <http://www.ams.usda.gov/AMSv1.0/nop>
- Natural Resource Conservation Service (NRSC): <http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>
- National Sustainable Agriculture Coalition (NSAC): <http://sustainableagriculture.net/>
- Farmers' Guide to the CSP (published by NSAC): <http://sustainableagriculture.net/wp-content/uploads/2011/09/NSAC-Farmers-Guide-to-CSP-2011.pdf>
- Concise and mildly entertaining explanation of the major government agencies governing food: the FDA and the USDA. <http://chicagohealthyfood.blogspot.com/2009/08/fda-and-usda-explained-to-best-of-my-ability.html>
- USDA Census of Agriculture: <http://www.nrcs.usda.gov/fdlib/ctms/2012/>

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- ¹ O'Neill, J.A. (2010). *Status of veterinary care for organic livestock producers in Iowa and suggestions for improvement*. Iowa State University Graduate Program in Sustainable Agriculture, Ames, IA. Graduate Theses and Dissertations. Paper 11775.
- ² Rideout, M. (2009). *Veterinarians and Organic Dairies: Meeting Informational Needs*. MS Thesis. University of Wisconsin – Madison Agroecology Program, Madison, WI.
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- ⁵ Silva, E., Paine, L., Barnidge, M., Carusi, C., & McNair, R. (2012). Organic agriculture in Wisconsin: 2012 status report. *Center for Integrated Agriculture Systems: Madison, WI, USA*.
- ⁶ Battaglia, R., Bussler, G., Adamson, C., Hubbell, A., Hunka, C., Joyner, A., & Schulz, E. 2013 Wisconsin Agricultural Statistics. (2013). *United States Department of Agriculture National Agricultural Statistics Service in cooperation with the Wisconsin Department of Agriculture, Trade and Consumer Protection: Madison, WI, USA*.
- ⁷ Blazek, K., Silva, E., Paine, L., & Atwell, T. (2010). Organic agriculture in Wisconsin: 2009 status report. *Center for Integrated Agricultural Systems*. Retrieved from: <http://www.cias.wisc.edu/wp-content/uploads/2010/02/org09final022310.pdf>.
- ⁸ United States Department of Agriculture Agricultural Marketing Service. (2014). Nation Organic Program. Retrieved from: <http://www.ams.usda.gov/AMSv1.0/nop>.
- ⁹ Greenhalgh, T. (2014). *How to read a paper: The basics of evidence-based medicine*. John Wiley & Sons.
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- ¹¹ Buss, D. D., Osburn, B. I., Willis, N. G., & Walsh, D. A. (2006). Veterinary medical education for modern food systems: setting a vision and creating a strategic plan for veterinary medical education to meet its responsibilities. *Journal of veterinary medical education*, 33(4), 479-488.
- ¹² Tufts University Cummings School of Veterinary Medicine. (2014). MS in Animals in Public Policy. Retrieved from: <http://vet.tufts.edu/mapp/>.
- ¹³ Foley, J. A., Ramankutty, N., Brauman, K. A., Cassidy, E. S., Gerber, J. S., Johnston, M., ... & Zaks, D. P. (2011). Solutions for a cultivated planet. *Nature*, 478(7369), 337-342.
- ¹⁴ Wiggins, G. P., & McTighe, J. (2005). *Understanding by design*. AscD.
- ¹⁵ Stiglbauer, K. E., Cicconi-Hogan, K. M., Richert, R., Schukken, Y. H., Ruegg, P. L., & Gamroth, M. (2013). Assessment of herd management on organic and conventional dairy farms in the United States. *Journal of dairy science*, 96(2), 1290-1300.
- ¹⁶ Hubert J. Karreman, V.M.D. *A Handbook for Organic and Sustainable Farmers: Treating Dairy Cows Naturally*. 2007.

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- ¹⁸ Safran Foer, J. (2010). Eating animals. *The Peterson Field Guide Series (EUA)*, (29).
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- ²¹ Stephen, C. (2009). The challenge of integrating ecosystem health throughout a veterinary curriculum. *Journal of veterinary medical education*, *36*(1), 145-151.