The Summer Dairy Institute: Advanced training for young dairy veterinarians

Charles W. Nydam, *DVM;* **Daryl V. Nydam,** *DVM, PhD;* **Charles L. Guard,** *DVM, PhD;*
Robert O. Gilbert, *BVSc, DACT;* **Steve Eicker,** *DVM, MS*
College of Veterinary Medicine, Cornell University, Ithaca, NY 14853

Abstract

Food supply veterinarians who intend to enter dairy cattle practice or other related career activities are in need of upgraded skills to better serve the dairy industry as it continues to evolve. As knowledge in all phases of veterinary medicine increases, the time available for students to increase their specific abilities within the conventional professional curriculum becomes more difficult, especially for those with food supply interests, as they are a minority of students competing for time and resources. The dairy industry has need of skilled veterinarians well-versed not only in their traditional capabilities, but also with an understanding of the complete picture of that industry as a "farm-to-fork" experience. Society at large also stands to benefit from a presence of skilled dairy veterinarians contributing to the production of safe, affordable dairy foodstuffs in a manner deemed sustainable and humane. Veterinarians in practice can and do acquire the necessary skills to make themselves relevant to their clients and consumers; however, better preparation of entry-level veterinarians can increase their value to their employers, their clients, themselves, and society in a more timely manner. Cornell University's College of Veterinary Medicine developed the Summer Dairy Institute (SDI) to provide an avenue for advancing skills of new veterinarians as a means to address the current and future needs of the dairy industry. The SDI has accumulated, from its nine years of existence with 183 participants from 38 veterinary colleges, valuable insights to aid in constant improvement of its offerings. This article describes the need, concept, and experience with the program.

Résumé

Les vétérinaires spécialisés en alimentation qui souhaitent entreprendre une pratique pour les bovins laitiers ou d'autres activités connexes à la profession, doivent acquérir des compétences pour mieux servir l'industrie laitière en constante évolution. À mesure que les connaissances dans toutes les sphères de la médecine vétérinaire s'étendent, les étudiants disposent de moins de temps pour perfectionner leurs compétences spécifiques dans le cadre du programme pédagogique conventionnel, particulièrement pour ceux qui s'intéressent à l'alimentation, car ils sont une minorité qui se disputent le temps et les ressources disponibles. L'industrie laitière a besoin de vétérinaires compétents qui maîtrisent non seulement leurs domaines de compétence traditionnels, mais qui ont aussi une compréhension globale de cette industrie et une expérience « pratico-pratique ». La société en général profitera aussi de la présence de vétérinaires spécialisés dans l'industrie laitière qui contribueront à la production de produits alimentaires laitiers d'une façon jugée durable et sans cruauté. Les vétérinaires praticiens peuvent acquérir les compétences nécessaires pour se rendre utiles à leurs clients et aux consommateurs, et ils le font; toutefois, une meilleure préparation des vétérinaires débutants pourrait accroître leur pertinence aux yeux de leurs employeurs, de leurs clients, à leurs propres yeux et aux yeux de la société en général, en temps opportun. Le College of Veterinary Medicine de Cornell University a créé le Summer Dairy Institute (SDI) qui offre la possibilité de développer les compétences des nouveaux vétérinaires pour les aider à répondre aux besoins actuels et futurs de l'industrie laitière. Le SDI a acquis une précieuse expérience après neuf années d'existence et avec 183 participants provenant de 38 collèges de médecine vétérinaire, pour contribuer à l'amélioration constante des services qu'il offre. Cet article décrit le besoin, le concept et l'expérience qui caractérisent ce programme.

Introduction

The Summer Dairy Institute (SDI) is an advanced training program for prospective dairy veterinarians at the College of Veterinary Medicine, Cornell University. It has been a unique program for the purpose and is also novel in its timing at the start of a career. This program draws together some 20-24 recent veterinary graduates and fourth-year professional students for a six-week intensive, residential course of practical experiences and lectures designed to fill the gap between traditional veterinary curricula and the perceived needs of the modern dairy industry.

The mission of the SDI is to accelerate and augment the ability of motivated veterinary students and new

veterinarians to contribute to the modern dairy industry while fostering development of professional networks.

Our vision is to provide a concentrated six-week course of the highest quality to a select group of professionals whose career objective is to enhance the well-being of dairy cattle such that they contribute to efficient, profitable, and environmentally sound production of safe food.

The SDI, as of this writing, has now completed its ninth year and is planning for its tenth. This paper describes the program in its concept and further builds on the experiences of operating it.

Rationale

The evolving professional expectations of both society and the dairy industry require advanced skills from those who serve it now and in the foreseeable future.[2,5] These demands will be met, more or less successfully, by someone. If the veterinary profession is to be a successful part of that future, it will need to enhance the skills it already has and develop new ones, including an understanding of the dairy business environment.[11] By virtue of their unique education and training, veterinarians with the required competencies can work across several disciplines to offer the dairy industry valuable leadership and assistance in meeting sustainable goals, and do so more successfully than alternative resources.[9]

The dairy industry is an important source of meeting dietary needs of the United States and will remain so. Dairy cattle of today are highly efficient sources of high-quality human nutrients, while using foods for their diet that often do not compete with human use. The dairy industry in North America is likewise a highly efficient entity, using the cow to produce foodstuffs that are both affordable and safe. To compete and survive in an global economy the dairy industry has evolved, and continues to do so even more rapidly than forecast even relatively few years ago.[1] Much of that evolution has to do with the decline in the total number of dairy farms coupled with a rapid growth of large–sometimes very large–dairy operations, while increasing total milk and milk byproduct production to meet the needs of the populace for affordable dairy products. Between 1986 and 1996, the number of dairy farms decreased from 249,190 to 130,990, and from 1996 to 2012 decreased to 60,000, of which 1750 had more than 1000 cows (46% of the nation's cows) while the total number of dairy cows remained constant during those same years at around 9 million, with about 90% of that in replacements. In 2011, dairies with over 1000 cows (2.9% of total dairy farms) produced half of US milk; 34.6% came from farms with more than 2000 cows. Annual production per cow went from about 18,750lb (8,522 kg) in 2002 to nearly 21,400 lb (9,727 kg) in 2011, a 15% increase, which met the market demand for milk and milk products.[12] The large decline in number of dairy farm numbers during this period, in which remaining ones grew larger, is a continuation of a decades-old phenomenon. As part of the economics driving this change, the dairy farms remaining, especially the large ones, demand as part of their survival strategy maximum economic returns, including returns on health care issues. Meanwhile, the dairy industry is being challenged to be more sensitive to broad issues such as consumer desires, environmental impacts, and animal advocacy movements.[7]

As new levels of skills are acquired by dairy farm producers, so must skills needed by their supporting groups be raised. This includes the veterinary profession, which by repeated studies has been shown to be a respected presence on the farm for veterinary professional activities and a source of unique, unbiased, comprehensive, and science-based information pertaining to animal health, production, and biological security. To maintain this level of respect and usefulness, the veterinary profession is being asked by the industry to bring to them new knowledge and skills not being taught in the traditional veterinary curriculum. The typical North American curriculum, demanding as it is, does not allow enough time for those who would seek this higher level of competency in that setting. At the same time, there is no other group which can bring to the industry not only a cohesive view of its many aspects, but also the particular expertise that veterinarians possess as a result of specialized training in the biological sciences and medicine including, for example, such fields as microbiology, pathology, and population medicine.

Through field experience and continuing education programs, veterinarians can and do continue to acquire what is needed to stay abreast of veterinary and dairy science. However, these efforts require time and money, often not readily available at opportune times, particularly early in the post-graduate career. Meanwhile, new graduates may find themselves inadequately equipped to meet the demands of the progressive industry they work in. Many of the technical skills and easily made diagnoses that the newly minted veterinarian has learned are now, in the case of the large dairy farms which hold the biggest percentage of the nation's dairy cows, being handled by adept and competent lay staff employed by the farm. This change is being driven both by scale and economics. Large farms develop specialized workers who acquire technical skills for tasks historically performed by veterinarians in smaller herds. The veterinarian still needs to have these abilities, not only for farms traditionally manned, but also to be able to offer advice on situations relevant to large farms, including on farm training and retraining for the lay staff of larger operations. If unable to offer these new skills, the veterinarian can expect to have a decreased presence on progressive

farms, which will reduce potential professional income. Also, in the past, veterinarians earned significant income from sales of cattle pharmaceuticals and vaccines; however, economics again has altered the picture as large producers find lower cost sources or demand volume discounts from veterinarians. Furthermore, veterinarians better equipped to adequately be involved in health care management in progressive dairies will potentially find greater intellectual challenge and job satisfaction in using their veterinary education. These tangible and intangible rewards contribute, in turn, to ensuring an adequate supply of food service veterinarians. Any diminution of veterinary professional contributions to the dairy industry carries with it reduced vigilance for animal welfare, food safety, and introduction of exotic diseases.

Even while these changes are occurring, the dairy industry has need of the knowledge veterinarians have learned in their college experience or will acquire in practice as a necessary part of being able to offer competent service to their clients. Large herds have additional problems or opportunities which the properly trained veterinarian can respond to. More and more, these farms expect veterinarians to provide solutions for these problems beyond diagnosis and therapy, thus extending the role of the veterinarian into what is now often referred to as production medicine. A simple example is post-parturient hypocalcemia, which a trained herdsman can recognize and treat. Instead, the herd veterinarian can address the reason for the occurrence of the problem. This may start with nutrient balance, but continues with issues such as cow grouping, bunk space, footing conditions, stall design and bedding and, further back in the life cycle of the dairy cow, even reproductive programs that avoid prolonged dry periods. On all these issues, a veterinarian can contribute, either directly or as part of a team, to preventing a condition such as milk fever that has considerable potential for economic loss, stemming from the immediate problem and from a myriad of post-calving problems that may be influenced by this mineral imbalance. Many other such things occur in the interconnected web that influences animal wellbeing and, ultimately, the economic viability of the farming enterprise. Addressable problems will certainly be handled by someone, be they veterinarians or others, and again, the SDI program is initiated by and continues with the conviction that veterinarians are uniquely positioned to offer the best comprehensive insight and solutions.

The above example regarding hypocalcemia and opportunities for intervention to prevent both clinical and subclinical disease will serve any size farm, and brings up the chance for a comment on serving different size farms. Even with the growth in large farms and decline in number of smaller farms, there remain and will remain many smaller farms in one way or another. The education that leads to a veterinary degree permits the degree recipient much flexibility in being able to serve client and animal needs. This means that dairy veterinarians as a group, even while striving to meet developing needs of a more industrialized type of dairy agriculture, will be able to continue to serve all aspects of dairy medicine on any size farm as needed by the producer and society. That is, they will fill roles as both practitioner and consultant/coach. Understanding, compassion, and ability to communicate will in any case permit the veterinarian to use acquired scientific skills to assist farmers with differing needs to make progress, and in turn allow the veterinarian potential to achieve success. Being better able to offer needed services creates opportunity for the veterinarian to be financially rewarded, which will also help the profession to seek and maintain a viable presence in areas where that presence is needed. This is especially important considering the increased costs of a veterinary education and the subsequent debt load that usually accompanies it.

Furthermore, the skills a veterinarian learns in examining an individual animal are not lost in herd situations; they need only to be applied in a different venue. This process may be exemplified by the story oft-repeated of a successful dairyman, who, when asked how he could handle his large herd of 3000 cows, replied in effect that he took care of one cow as best he could and then did that 3000 times. This effort, paradoxically simple and complex, offers the same challenge to veterinarians.

An important aspect of preparing able veterinarians who will work with food animals is the need for the veterinary profession to participate in matters of social relevance and global concern.[10] The World Health Organization describes hunger as the world's No. 1 public health threat-killing more people than AIDS, malaria, and tuberculosis combined.[8] As population increases, along with a greater urban percentage and people seeking a wider and richer choice of foodstuffs as their economic status improves, world food supplies will have to increase, even with better distribution and improved use of current resources, while minimizing environmental impacts. Controlling animal diseases and increasing the productivity of animal agriculture are specific, substantive ways in which veterinary medicine can help reduce global hunger. Also, as pressure from population increases and more international trade develops, security of food supply will require more attention. The safety and availability of foods from animal origin is linked directly to animal health and herd management, which in turn depends on availability of adequate veterinary services offered by veterinarians well grounded in clinical skills and with training in the many phases of food production systems.[6] It is also important for veterinar-

ians to be on farms, as their presence coupled with their scientific training makes them vital for recognition of zoonotic diseases that may appear in livestock and so affect public health, and also for prevention and early recognition of bioterrorism. Programs such as the SDI contribute to these efforts by providing relevant training to young veterinarians, equipping them to respond to relevant industry problems, and thereby maintaining their presence on farms.

Response and Conception

Recognizing the need for advanced skills in veterinarians serving a progressive dairy industry, Cornell University College of Veterinary Medicine created an opportunity to provide a higher level of competency to those soon to leave their formal academic studies to begin a career in the dairy industry and its allied fields. This proactive approach is intended to be beneficial to the participants, dairy cattle, and their owners. It is also an effort to disseminate accurate knowledge of the dairy and affiliated industries in response to increasing attempts by some to influence animal agriculture without real knowledge of it and lacking in rigorous scientific assessment.

Contributing to the impetus for this program were the College of Agriculture and Life Sciences at Cornell, dairy producers, private and academic veterinarians, nutritionists, and other allied agribusiness members. Cornell University has a long tradition of deep involvement in the field of cattle medicine. It is not only located in the fourth largest state in terms of milk production and third in dairy cow numbers, but is situated near a strong dairy area with many progressive farms that could contribute to the effectiveness of the program. Subsequent experience with the program has borne out this favorable geographic feature.

The SDI is presented as an opportunity for a concentrated, advanced learning experience for prospective dairy veterinarians either newly graduated or approaching the clinical years of their college curriculum. There has been nothing similarly available to accelerate this acquisition of abilities, particularly at the onset of the veterinary career. No other program has offered such a breadth and depth of compacted current information. Even considering the knowledge attainable by this program can be accumulated during practice, this benefit would require many months or even years and would necessitate time from practice and loss of income to attend continuing education opportunities. The stated aim is to make participants more confident in modern practice roles, and in this way to provide value to themselves, their employers, the entire dairy industry, and society as a whole. This is accomplished by convening a selected group of up to 20-24 applicants (which has varied from 14 the first year up to 25 applicants for the 2012 course) for an intensive six-week course, combining classroom courses taught by experts in their specialty with a variety of field experiences to provide a "cow to cup" experience for the participants. Offered as an eight-week course for the first six years of the program, the course was then compacted to six weeks. The duration of six weeks was deemed long enough to cover the subjects desired and seemed to best fit the time available, given the time that could be used to attend it by a majority of participants still in school and needs of those newly graduated who had jobs awaiting them. In addition, immediately following the SDI course, the Quality Milk Production Services at Cornell's College of Veterinary Medicine offers for those who are able to take advantage of it an in-depth two-week course covering all aspects of udder health. At the conclusion of the SDI course, it is hoped that by sharing and integrating knowledge from several sources these student participants will have been able to build on the core skills and medical and diagnostic training they had already received in their veterinary training to substantially have advanced their educational process. They will be better prepared to continue on their vocation-long learning experience and take a viable position in servicing the dairy industry.

The participants are exposed to leaders in the field of bovine medicine and related agribusiness and those who influence the industry. Additionally, they have the opportunity to interact with each other. This is enhanced by providing a communal living place and most meals. Evening barbeque/picnic meals at the homes of various faculty members are planned for four or five times during the course to provide additional socialization and interaction opportunities. It is anticipated that assembling these top young veterinarians in this way will establish friendships and networks of colleagues to the benefit of the profession and industry.

Modules covered by renowned experts in their field instruct by means of lectures, discussions, wet laboratories, and field exercises that include reproduction, nutrition, udder health/quality milk, farm finances and financial decision making, animal welfare and behavior, farm facilities, hoof care, labor management, young stock care, biosecurity, data management and performance monitoring (including Dairy Comp 305), transition cow management, and practice management. In addition, as the number of Hispanic workers working with dairy cattle has dramatically increased, a course in use of Spanish language in a dairy setting is taught. Speakers addressing the assembly come from academia of several colleges, government, dairy related industries, progressive dairy farms, and private practice. In the most recently completed session of 2012, 72 guest faculty were listed, 52 addressing the group in a

classroom setting and the others on-site at farms or in dairy-related industry.

Off-site activities are a vital part of the expanded learning experience. At least one day each week is allotted for this. Experiences include specific activities by one or two participants at a time who might accompany for that day a progressive dairy practitioner on calls, a foot trimmer, an artificial insemination technician, milk quality technicians on herd surveys, a nutritionist, or farm personnel. A nearby large dairy farm provides experience in their milking parlor, feed management, or maternity pen management. In larger groups, participants visit a significant cattle slaughter facility/processing plant, a cheese plant, a milk pasteurizing plant, livestock auction, a feed mill, and an artificial insemination/bull stud facility. Group visits arranged with the cooperation of nearby farms allow coordination of classroom material with practical situations. These farms include large established farms, recent start-up farms, organic farms, and a specialized young stock operation.

In the completed years of the program, there have been 183 participants from 30 North American veterinary colleges, plus eight universities from Europe and New Zealand (Table 1). The program has been directed to students entering their fourth year or recent graduates of the veterinary curriculum to ensure that participants had sufficient formal training to get maximum benefit from the material presented, and so that they could sooner apply the lessons learned from it. In a few instances, exceptional participants have enrolled after completion of their second year. The program is advertised to potential attendees in several ways, including letters to the schools of veterinary medicine, American Association of Bovine Practitioners student organization faculty advisors, and officers of the AABP/food animal student clubs at the schools; the AABP Listserve; AABP Conference; and, importantly, word-of-mouth from past participants and speakers.

Efforts to make the program known to students earlier in their veterinary curriculum have been increased to allow them more opportunity to arrange their academic calendar to accommodate attendance at SDI. Competing for time of potential participants are clinic or other academic requirements conflicting with the time of the program and, for those just graduated, the need to start a paying job to meet financial obligations or the need of their employer for urgent assistance. There have, however, been instances where the employer has encouraged the participant to delay working for the experience of the course and offered some financial support, as they see the benefits of a new employee starting their job with this additional foundation.

As noted, the program advertises for up to 24 participants per year. Applications to SDI well exceed the number accepted, with each year garnering more applicants. When considering the number of possible applicants, the pool is to a somewhat self-selected for several reasons. First, there are a small number of students across the North American veterinary colleges in the target years that wish to engage in food animal practice. Second, many of these choose some other sector of food animal production than dairy. Then, conflicts arise with the academic calendar of some schools. Additionally,

Table 1. Universities with colleges/schools of veterinary medicine represented by participants of the Summer Dairy Institute.

Auburn University	University of Montreal
University of Calgary	North Carolina State University
Cardenal Herrera University, Spain	The Ohio State University
Colorado State University	University of Guelph
Cornell University	Oklahoma State University
University of Edinborough	Oregon State University
University of Florida	University of Prince Edward Island
University of Georgia	Purdue University
University of Illinois	University of Saskatchewan
Iowa State University	Texas A & M University
University of Lisbon	Tufts University
University of Liverpool	Tuskegee University
Kansas State University	State University of Utrecht
Louisiana State University	University of Vienna, Austria
Massey University	Virginia Tech and University of Maryland
Michigan State University	Washington State University
University of Minnesota	University of Wisconsin
Mississippi State University	Ross University
University of Missouri	

there are the time limitations imposed by externships and other educational opportunities, or by the needs of an impending employer, thus diminishing the available pool. Resources and logistical support available for the program also make the targeted number of participants a good working one. A class much exceeding the number selected is in danger of losing the intimacy of the instructional setting desired and allowing the development of subgroups, rather than a cohesive group that can support one another during the program as well as in the future.

Participants are asked to do course evaluations during the six-week period plus a final evaluation. Information thus gathered, plus informal comments offer constructive ideas that have been used to improve the course. Participants have uniformly praised it overall, calling it a rewarding and valuable experience. Such positive comments continue to be forthcoming in the years following participation in the course. Expressions commonly used in support of their assessment include such comments as "fantastic opportunity", "invaluable investment", and "a must-do for new dairy practitioners". Relative to the expenses students incur to attend, they again uniformly agree the experience was "a bargain" and "well worth the expense." When asked at the completion of the course if they would recommend it to future potential attendees, the response has been a unanimous affirmative. By this means, past participants are a valuable resource in promoting the program to applicants still in college, especially as they return to their institutions or maintain contact with students and faculty there.

Of note is the comment by several participants of how much they enjoy being with a group of people with the same passion and interest that they have. Often, they feel as they are a minority in these respects in classes at their veterinary colleges. Here, they have noted they can feed off each other and the speakers sharing common ground in a close environment. Likewise, many speakers, some of whom have contributed to the program several times, have not only commended the program but have also commented without solicitation on how they have enjoyed participating with an audience that is attentive, focused, and enthusiastic and how they are inspired by such a motivated audience. They, too, are a conduit for making others aware of the program.

Cornell University College of Veterinary Medicine has supplied the location of the activities, such as classroom space and computer access, plus logistical support not accounted for as separate items. Included here is administrative assistance. Beyond this, the cost of the program has, over the nine years of its existence, ranged from $80,000 to $100,000 per year; thus between $4000 and $5000 per participant. This variability in fixed and flexible costs over time has been influenced by changing program costs and enrollment numbers.

A coordinator was hired in a part-time position to assist in carrying out the preparation of the program and to attend to day-to-day details of it during the time of the course. Invited speakers are offered honoraria, plus travel expenses. Speakers used from within the college do not receive honoraria, however. Vehicle use expenses are incurred when transporting participants to off-site activities. Rent for housing has thus far been paid to vacant sorority or fraternity houses available for use during the summer. Meal expenses include provision for five weekly dinners plus food at the house for breakfast and simple bag lunches. Miscellaneous expenses include such things as notebooks and a few publications or compact discs purchased for use by the participants.

Income sources include a contribution from the participants, which has ranged from $1200 to $2000 over the duration of the program, mostly and currently near the upper end of the range. The participant fee was $2250 for the 2012 SDI session. Many of the participants have defrayed their contribution to the program cost by receiving scholarships, mostly from the American Association of Bovine Practitioners (currently a $750 award from the AABP Education Grant is available to qualifying applicants) and some colleges have supported their students financially. The charge to participants is less than half the cost to SDI for running the program. It was decided early in the conception of the program that some cost should be borne by participants, but that the cost of the program should not be a barrier to engaging the opportunity. Much of the program income to make up this deficit comes from grants, thus far primarily from government sources. Industry has also been a provider of some gift money, and this is a source which is being more actively recruited. Other industries have contributed generously of their time by providing speakers or hosting visits. As participants find success in the growth of their work, it is hoped that they may be a source of financial support through gifts and this has already happened. There has been occasional support of the program by a future employer and as the program illustrates its usefulness to these people, perhaps this could be developed as an income source.

As the number of past participants grows, there are now sufficient numbers of them to consider offering a continuing education reunion for them. This is in consideration at this writing. Maintaining contact with those who have completed the program is considered to be vital to assist in the program's development and continued evolution to better serve both participants and those whom they would serve. From several sources, including our active correspondence with past participants, we know that most of them are currently and pro-actively involved in the dairy industry in one form or another.

This includes private practice of various sorts, government positions, academic posts, international organizations, agricultural investment, and managing dairies.

Conclusion

The dairy industry is engaged in the activities of the world far beyond the confines of withdrawing milk from a cow. Although not a prime focus of the Summer Dairy Institute, this is touched upon in many of the offerings of the course. Some examples of global influence include the increase in the price of grains fed dairy cattle because of diversion of corn to ethanol production, which is in turn influenced by the world oil price and associated political decisions, and the increase in prices for nitrogen fertilizer needed for crop growth and which commercially comes mostly from natural gas. Also, wealth increase in some developing nations is leading to greater demand for protein products for human diets. Political decisions in some milk-producing countries (such as quotas in parts of Europe and China's decision to make more milk available to its people) and weather influences affect the world market supply, and consequently affect the economic well-being of milk producers, which in turn affects their decisions in running their farm operation, including veterinary involvement. Whether in these examples or others, such as computer support from overseas or specialized milking equipment from other countries, the North American dairy industry is part of a worldwide economic community.

In his book, The World is Flat, in which he discusses economic competition in a world made flat by global competition, author Thomas Friedman uses and describes the term "versatilist," saying, "Versatilists apply a depth of skill to a progressively widening scope of situations and experiences, gaining new competencies, building relationships and assuming new roles."[3] This seems to be asked of food supply veterinarians.

The Summer Dairy Institute is seeking to be a resource to address the need to provide new veterinarians who wish to serve the dairy industry with upgraded skills to allow them to do so successfully. By providing students who are curious and passionate an opportunity to build on prior information with new specific knowledge as well as to expose them to a better understanding of how things tie together, it is hoped that they can gain more value for themselves, their profession, and society. To quote Friedman again as he concludes his book, it is further hoped that these veterinarians will take their place in "the generation of optimists, the generation that wakes up each morning and not only imagines that things can be better but also acts on that imagination every day".[4]

Acknowledgements

The life of the program is the enthusiastic participants and guest faculty. Any success of SDI belongs to them.

Funding sources to bridge the gap between participant contributions and our costs have been numerous and include The Murphy Foundation, USDA Smith-Lever, Schering Plough Animal Health, Elanco Animal Health, Merck Animal Health, USDA-NRI, Cornell University, and the New York State Veterinary Medical Society, with in-kind support from Pfizer Animal Health, NYS Department of Agriculture and Markets, Valley Ag Software, USDA-FSIS, Cargill/Taylor, Genex, Diamond-V, and Boehringer Ingelheim.

Jill Short has provided invaluable support to the program and SDI could not function without her. Linda Nydam has further contributed logistical support to this endeavor.

References

1. Buss DD, Osborn BI, Willis NG, Wash DA. Veterinary medical education for modern food systems: setting a vision and creating a strategic plan for veterinary medical education to meet its responsibilities. *J Vet Med Educ* 2006;33:479-488.
2. Fetrow J, Cady R, Jones G. Dairy production medicine in the United States. *Bov Pract* 2004;38:113-120.
3. Friedman T. *The world is flat*. New York: Picador/Farrar, Straus and Giroux, 2007;294.
4. Friedman T. *The world is flat*. New York: Picador/Farrar, Straus and Giroux, 2007;635.
5. Guterbock WM. The role of veterinarians on dairy farms in the future. *Compend Contin Educ Pract Vet Food Anim Med Management* 2001;S26-29, 39.
6. Herrick JB. The world's food supply and the role of food animal veterinarians. *J Am Vet Med Assoc* 1997;210:751-752.
7. Hewson CJ. Hidden costs of food production: the veterinarian's role. *J Vet Med Educ* 2006;33:561-566.
8. Kelly AM, Marshak RR. Veterinary medicine: global health. *J Am Vet Med Assoc* 2007;231:1780-1883.
9. Larson RL. Food animal veterinary medicine: leading a changing profession *J Vet Med Educ* 2004;31:341-346.
10. Leighton FA. Veterinary medicine and the lifeboat test: a perspective on the social relevance of the veterinary profession in the twenty-first century. *J Vet Med Educ* 2004;31:329-333.
11. Nordlund K. Grumpy old vets: the 1960's practice hits the 21st century. *Bov Pract* 1998;32:58-62.
12. USDA, APHIS website, *2006 US Animal Health Report*. Available at www.aphis.usda.gov/publications/animal_health/content/printable_version /06_AHReport_508pdf

Author Information

Charles W. Nydam, DVM, was a predominately dairy practitioner for 40 years and private practice owner before becoming Coordinator of the Summer Dairy Institute.

Daryl V. Nydam, DVM, PhD, is an associate professor of dairy health and production in the Department of Population Medicine and Diagnostic Sciences and co-director of the Summer Dairy Institute.

Charles L. Guard, DVM, PhD, is associate professor of ambulatory and production medicine in the Department of Population Medicine and Diagnostic Sciences and co-director of the Summer Dairy Institute.

Robert O. Gilbert, BVSc, MMedVet, DACT, is professor of reproductive medicine in the Department of Clinical Sciences and co-director of the Summer Dairy Institute.

Steve Eicker, DVM, MS, is founder and Director of Research and Development of Valley Ag Software and at-large-member of Summer Dairy Institute Committee.

Address correspondence to: Daryl Nydam, Section of Ambulatory and Production Medicine, Dept. of Population Medicine and Diagnostic Sciences, College of Veterinary Medicine, Cornell University, Ithaca, NY 14853. E-mail: dvn2@cornell.edu.