

# AAVET Agricultural Animal Program Vision and Strategy

## ROUGH DRAFT 1.2

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**Note:** At this point, I'm solely responsible for writing this rough draft and as such it does not represent the official views of anyone else.

**Vision (Where we want to be?):** The WSU-U of I AAVET agricultural animal veterinary program will be nationally known for excellence in preparing students for life-long success in agricultural animal veterinary practice

**Mission (What is our purpose?):** Our program mission is to prepare students to be highly competent, future-oriented, innovative agricultural animal veterinary practitioners who are fully equipped to undertake lifelong, fulfilling careers providing value-added, progressive professional services to clients in the for-profit livestock industries as these industries adapt to rapidly changing technology and business environments.

### Synopsis:

- Emphasize training new graduates to supply excellent services to large scale livestock production agriculture; new graduates equipped to serve this segment with excellence can easily serve the traditional segments with excellence but not the reverse
- Seek program guidance through regular input from and evaluation by formal panels of highly regarded practitioners serving that type of clientele
- Streamline undergraduate students through strong applied Animal Science programs with emphasis in ruminant nutrition, reproductive physiology, enterprise management and agribusiness
- Strongly encourage undergraduate students to acquire significant "hands-on" experience on large scale livestock operations prior to matriculation
- Provide convertible scholarship/loans and early admission to top Animal Science undergraduates in these programs with the requirement that they complete the appropriate capstone coursework
- Begin selected skill training early in the DVM curriculum with the goal of students acquiring economic competency by graduation in those identified as most important by practitioners
- Establish mechanism for veterinary students to attend important multi-day off-campus training during the academic year in key topics not available at WSU
- Provide significant summer practice exposure across multiple large practices supported by convertible scholarships / loans
- Provide significant off-campus short duration intensive experiences, such as calving and rectal palpation, under veterinary supervision on large livestock operations to enable achievement of select economic competencies
- Provide certificate of successful completion to high quality candidates (program performance, overall class standing and peer, faculty and practitioner evaluation for non-cognitive factors such as attitude and work ethic) that employers trust and for which they will pay significantly higher starting salaries

### Increasingly Complex Global Agricultural Challenges:

Within their career span this generation of students and their clients will face significant, increasingly complex challenges due to major global trends:

- Increasing world population, growing from the current 6.6 billion to ~9 billion in ~30 years
- Increasing fossil fuel supply uncertainty, particularly petroleum-based
- Increasing resource scarcity relative to increasing demand, particularly of fresh water for food production

- Increasing climate variability compared to the relative climate stability of recent decades
- Increasing global market competition for natural resource commodities, most notably from the rising economies of India and China
- Increasing globalization of the human and animal food supply, international harmonization of standards and problems with off-shore supply chains
- Increasing global transportation of people, goods (both legitimate and illicit), and plant, animal and microbial pests and invasive species
- Increasing consumer and governmental requirement for socially responsible agricultural production, social responsibility having ethical, legal, environmental and community dimensions
- Increasingly rapid advance of science and technology due to the emergence of digital technology and instant information availability and exchange via the global internet

The likely potential effects and interactions of these trends:

- Due to population expansion, the human food need is projected to increase ~50% within 3 decades, significantly increasing competition for arable land, water, energy and other inputs
- Because the greatest population expansion is occurring in areas with already insufficient fresh water resources, these populations will indirectly compete for fresh water by importing food produced by a fresh water resources elsewhere
- As the current food system incorporates ~11 calories of fossil fuel energy per food calorie, significant shifts in production systems will occur in response to increasing energy costs and to consumer shifts in food demand mix in response to relative price changes
- The increasing population densities of humans and animals as a consequence of population expansion, particularly in the far and middle east, increase the opportunity for the maintenance and transmission of infectious agents, the evolution of new strains and the emergence of new agents, particularly in populations of LDC's (least developed countries) with poor infrastructures for transportation, sanitation, disease monitoring and control, with dense mixed agricultural systems and with low producer education levels
- As socio-economic status increases in population segments of developing economies, protein consumption shifts from plant-origin to animal-origin protein, increasing the demand for livestock-origin products
- Increasing climate variability increases weather extremes and decreases predictability with associated increased risks to agriculture production from violent weather, floods and droughts
- Climate change alters ranges of arthropod disease vectors, most notably enabling their expansion into previously free areas (e.g. emergence of European Blue-tongue vectors, West Nile Virus in US, resurgence of Texas Cattle Fever Tick)
- Demand for consumer goods from the expanding middle classes of China (20% of world population at 1.3 billion) and India (17% of the world population at 1.1 billion) will increase competition for resource inputs, particularly for intensive crop-based agriculture compared to extensive grazing agriculture
- Due to decreasing storage buffering in the supply system and increasing competition in the face of increasing scarcity increases, price volatility will increase for many of the inputs needed for livestock agriculture, increasing the importance of sound risk management and resilience against price shocks
- In response to decreasing margins and increasing scarcity of inputs such as land, freshwater and fossil fuels, technologies that increase production efficiency will advance rapidly. Because of instant global digital communication and the increasing scale of agricultural enterprises, the rate of technology adoption will be more rapid than historically.

#### **Increasing Professional Challenges:**

- To develop and provide solutions to these increasingly complex problems, veterinarians must understand both livestock agriculture's place within the more complex agricultural system and the food supply as an output of this complex of systems.

- Understand how agriculture and the human food production systems function within both natural systems and human systems and the consequences of these interactions
- This requires a basic understanding of soils, weather, hydrology, forages and other input commodities, production ecosystem, post-production industry, microeconomics, governmental, social and cultural factors
- Due to the effects of scale on competitiveness in industrial economics, livestock operation scale is increasing as producer numbers decline in response to decreasing margins and the declining long run cost curve for the particular industry
- Targeting the provision of traditional services to the more traditional smaller scale clients, particularly in the beef cow-calf sector, is not economically sustainable as evidenced by the relatively low starting salaries offered by practices currently providing such services and the decline in service providers
- Targeting the provision of new services to livestock producers supplying niche markets in which consumer choice is not primarily governed economics is risky and likely not sustainable against long term national and global trends (e.g. decline of [Whole Foods Market](#) from \$77 to \$17).
- Pareto's Rule suggests that because of economies of scale more than 80% of product is produced by fewer than 20% of producers and, given that the lower cost producers are survivors in commodity markets, these are the clients that have the highest likelihood of surviving long term
  - Leman, AD (1988). Diagnosis and treatment of food animal educational diseases. *JAVMA* 193:1066-1068
- Service mix and thus skills and knowledge needed changes significantly with increases in producer scale, generally shifting from delivery of technical individual animal skills to a more knowledge-based herd skills including selection, training and supervision of employees performing the technical skills previously performed by the veterinarian and shifting from a predominately treatment-focused paradigm to more focus on prevention
  - This shift from individual animal treatment focus to herd prevention focus markedly increases the need for an understanding of how these livestock enterprises operate in general and a need for the ability to rapidly acquire a detailed understanding of the specific operational details of client operations
- With the transition from the Industrial Age to the Information Age, professional knowledge is no longer a scarce or stable commodity with access essentially restricted to a limited set of providers but has become a commodity of varying quality often supplied in excess from a plethora of sources, making information literacy crucial
- Economic shocks to industry segments from global supply and demand competition will cause rapid changes in services consumed and will present new service opportunities that will be fulfilled by non-veterinary competition if not quickly provided by veterinarians
  - US production of farmed warm water fish currently ceasing, large CA feedlots not filling
- The economic pressure of narrowing margins will increase the speed at which technology that increases efficiency is adopted, impacting systems and the problems associated with them, often in unanticipated ways
- The consuming public and society increasingly expects that veterinarians act in their interest and as an agent for agricultural animals, serving as a trusted monitor of food safety and quality processes and as an auditor of animal well being.
- As a consequence of these trends, the most successful agricultural animal veterinary practitioners will likely be those who are the best prepared and are able to be the most entrepreneurial in adapting to change and in taking advantage of emerging opportunities

**Increasing Challenges to WSU-U of I Veterinary Agricultural Animal Program:**

We face increasingly serious challenges on several fronts.

- Increasing competition for students from WICHE states who are interested in agricultural animal practice, represented by our failure to enroll them, and for the best students from within Washington and Idaho.
  - The failure to consistently recruit WICHE students, who tend to be excellent students, has serious financial and reputation implications for us
  - The supply of high quality students interested in agricultural animal practice is not sufficient to supply all programs competing for these students from the states that were our traditional sources
  - Direct challenge from Kansas State University, approaching WICHE Boards with the statement that they provide the best education in agricultural animal veterinary medicine and providing tuition breaks to out-of-state students
  - Once the stream of students from a given state is broken, restarting it is very difficult; we have not successfully recruited students from Hawaii for several years. Thus, maintaining a consistent flow of students from each specific source is important.
- The differential between in-state and out-of-state tuition is no longer sufficient to ensure a captive supply of in-state students
  - With the VMCAS common application, students are applying to multiple schools to avoid “keeping all their eggs in one basket” and when admitted to several are often choosing to attend the one that they regard as having the strongest program in their area of interest.
    - For evidence, see the thread “[Successful Applicants 2012](#)” on sdn Student Doctor Network; many students applied to ~5 schools
  - Evidence includes the recent loss of a top Idaho student and a top Washington student to Wisconsin and Cornell.
- Insufficient supply of excellent applicants interested in agricultural animal practice
  - This implies that to ensure long term success, we have to embark on a process of “growing our own” high quality applicants in collaboration with those delivering the most important undergraduate program for success in agricultural animal practice, the Animal Science departments
- Because the agricultural animal practice demand for new graduates to serve large scale livestock is essentially limited to the western U.S., particularly at the higher starting salaries, but the new graduate supply is national, the bar for our current new graduates is higher than previously
  - In this competitive environment the opportunities and tolerance for establishing competency on some else’s nickel are not as readily available as previously
- Lack of perception of professional program excellence relative to other programs by potential students and stakeholders
  - Reflected by absence of the CVM from [US News and World Report public top ten rankings](#) (#14) while WSU’s most direct competition is present in the list (#2).
  - Reflected by recent WICHE student interested in agricultural animal practice requesting CVM bovine case load numbers to compare with CSU. Somebody somewhere suggested to this student that they make this comparison and this is likely to reoccur
  - Reflected by the recent choices of all Nevada WICHE applicants to attend another school that they regarded as having a stronger equine program
  - To overcome this deficit, we have to provide documented evidence of program excellence in a transparent fashion that is trusted by all stakeholders
- Program excellence must be accomplished within the time limits of 4 undergraduate curriculum years and 4 professional curriculum years

- Solutions such as adding a fifth year for students intending to enter agricultural animal practice do not appear to be feasible, as represented by the low enrollment in the Missouri Food Animal Master's program
- Within just the 4 year professional program many students are incurring increasingly large debts that they need to begin paying off with higher starting salaries; lower salaries common to some sectors of agricultural animal practice are a reason that new graduates leave that sector

### **Veterinary Student Recruitment & Pre-Veterinary Training Pathway:**

Recruitment of veterinary students interested in agricultural animal practice must begin prior to their undertaking undergraduate studies. Far too few veterinary students switch to agricultural animal practice if they don't enroll with that interest, most students with an agricultural interest at enrollment are from rural backgrounds, not necessarily from livestock operations, and majored in animal science. Once recruited toward veterinary medicine, the next goal is to stream them through animal science programs so that they graduate with a solid understanding of the agricultural system and how it functions, have strong training in applied animal science and know how livestock operations function due to having acquired significant hands-on large farm experience prior to enrolling in veterinary school. By acquiring this knowledge and experience prior to veterinary school, once enrolled students can begin learning a select set of technical veterinary skills early in the curriculum as they already have the application context for these and as the curriculum progresses concentrate on mastering these through specific opportunities provided in the curriculum, the result being that they graduate with select economic competencies.

The pre-veterinary steps are the following:

1) The CVM and the U of I and WSU Colleges of Agriculture collaborate to recruit agriculture-interested students to all WSU and U of I agricultural disciplines

- A high proportion of animal science majors are intent on pursuing admission to veterinary school but most of these students intend to pursue domestic pet practice rather than production livestock practice, are likely more competitive because of better high school preparation but are not likely candidates for later conversion to the production livestock pathway.
- Due to the net outflow of youth from rural communities, an increasing deficit of college graduates is occurring across the entire spectrum of production agriculture from the farm input supply chain, on farm and the product chain away from the farm. This deficit will increasingly impede agricultural progress and the supply of food.
- Because the traditional flow of potential students with farm experience is too small to meet the need, the recruiting target has to be broadened.
  - The passive model of either "siphoning off" the farm kid going off to college intending to then go back to take over the family farm or pursuing an alternative career because the farm is too small to support all the siblings no longer works
  - Sell the bright high school student from suburban and rural communities who has done well in science on the opportunity of an important rewarding professional career in applied biology producing food
  - The most likely prospect is a student attending a high school in a rural community who grew up in town but who is familiar with farms and who has spent a significant amount of time out of doors either working, recreating or playing sports.
  - Expecting to convert many youth not experienced with the outdoor environments of typical farms to production agriculture and agricultural animal practice is likely unreasonable, particularly if most of their exposure to the vicissitudes of weather was during the short dashes between the controlled environments of houses, cars, schools and elsewhere.
- As their scale increases, agricultural enterprises are shifting from a model of the family members attending college to obtain specialized skills in production areas to the more traditional business model of family members going to college to obtain conventional business skills with the strategy of hiring employees with the specialized production skills
  - The scale of many livestock enterprises, worth tens of millions of dollars, is such that the owning family members concentrate on running it as a business, hiring the production expertise

represented by those majoring in disciplines such as animal science rather than acquiring the expertise themselves

- WSU and the U of I are potentially overlooking the emerging “market” of large scale production agriculture as employers of a broader range of its graduates, particularly from longer educational pathways and combined programs involving professional degrees such as MBAs and DVMs
- Other agricultural colleges, now in national competition with WSU and the U of I due to the reduced differential between in-state and out-of-state tuition, appear to be recognizing this need and are promoting leadership development initiatives for students from the various industry segments
- Recruiting of potential rural students, which essentially means recruiting their families, has to be based on the values on which such rural and small town families make career choices
  - Reward proportional to work, conservative values, importance of family roots, strong work ethic
  - Compared to urban and suburban systems, rural K-12 school systems tend to be deficient in career counseling and lack access to many role models for careers.
- Sell the sizzle of being a leader in producing food to feed the world and of being well rewarded working in the multi-million dollar farm businesses that increasingly comprise modern production agriculture.
  - The food production game is no longer Grant Wood's [American Gothic](#), 1930
  - Because of economies of scale and the Pareto Principle of 20% of firms producing 80% of the supply, large scale production agribusiness is the future of sustainable food production
  - Sizzle – fresh air, great people, strong communities, small town values, rewarding work, contributing, helping, being a professional, outdoor recreation opportunities, working with nature

2) For the first year students enter a common stream that is based on a systems approach to agriculture in which they learn the fundamental concepts of agriculture production systems, the human food systems, the natural and human systems in which agriculture is embedded and the primary input-output relationships between these.

- Provide a broad exposure to the basics of all the components of the agricultural system from soils to plants to animals and the basic concepts, basic paradigms and vocabulary of the associated disciplines.
  - Because many of the farm-level problems of intensive agriculture are systems problems involving multiple disciplines and these are of increasing importance, producers must have a broad understanding across these disciplines and discipline experts must have sufficient understanding of the other involved disciplines so that collaborative problem solving is facilitated
  - Knowing their limits is also important for graduates as is having an idea of what is involved if they wish to develop expertise in a collateral area
- As decisions in production agriculture are driven by bottom-line economics, require strong foundation course work in applied microeconomics
- Orient the student to the food supply system including the processing industry, distribution flows and consumption pathways, the various regulatory structures, import and export practices, and consumer demand so that in the end the student understands the farm to fork pathways and the ultimate clientele
  - To make good predictions and decisions, an understanding of the food system structure and economics is essential for anyone in production agriculture because society, the taxpayer and ultimately the consumer drive the entire system through their perceptions and choices.
  - Understand the general history of agriculture and current food geography
  - Understand the general challenges and opportunities of US and global food production and supply systems
- Apply the 5-year criteria – what will the student need to understand about this to function with excellence in livestock production agriculture 5 years post-graduation (Fink, Wiggins and McTighe)?

- Due to common enrollment, students developing a specific discipline interest will interact with students pursuing the other agricultural disciplines
- Assist students in the transition from small rural high schools, providing guidance on learning strategies, metacognition and communication skills to compensate for disadvantages due to the lack of resources and challenges typical of such schools.
- Because Spanish is a significant native language among agricultural employees of large operations and, due to immigration and social circumstances, likely will remain so for a significant portion of a student's career, learning conversational agricultural Spanish is important.
- Capitalize on strong links to producers, alumni and professional associations:
  - Bring in engaging speakers from across the agribusiness spectrum to a required seminar series with the goal of broadening student understanding of agriculture and providing exposure to potential career opportunities
  - Establish an annual "career day" with high caliber keynote speakers from private enterprise
  - Provide a wide range of summer intern positions across the food production system that the student selects based on their interest
  - Seek their guidance on curricular content and processes

3) Starting the second year, stream students into the traditional major pathways of agribusiness, crops and livestock.

4) Livestock production path:

- The goal is for students to build a common, sound foundation for a successful career in livestock production agriculture, whether they terminate with an undergraduate degree well prepared to, for example, work as managers, as herdsmen, or work in allied industry or they continue on to veterinary school, MBA programs or graduate work.
- Provide a core of substantial strong coursework in applied animal nutrition, reproductive physiology, production management and agribusiness
  - Due to the increasing scale of these enterprises, the agribusiness training should include exposure to the traditional business topics of human resources, finance, marketing, operations, and administration as well as applied agricultural economics such as partial budgeting, cost-benefit analysis and enterprise analysis.
- Provide required summer-long intern positions on large scale livestock facilities in which the student acquires a "hands-on" understanding of how all the major segments of that type of operation function by working as if they were an employee with the employees in that segment.
  - The rare student who already has such experience would be strongly encouraged to work as an employee on an operation other than the one on which they acquired their experience and would be encouraged to work in a different segment or region.

5) Provide pathways to other professional degrees, such as MBA, that capitalize on the market opportunity that large agribusiness represents for other WSU and U of I programs besides traditional graduate training and veterinary school.

6) Students intending to apply to veterinary school and intending to serve agricultural animals as a significant portion of their practice would be strongly encouraged to pursue this pathway and would be strongly recruited from it.

- Students would be strongly advised to complete the capstone courses in their undergraduate animal science programs
- Students would be strongly encouraged to develop their leadership skills and experience by participating in club leadership, CUDS and Cougar Feeders or their equivalents, scholastic competitions such as North American Intercollegiate Dairy Challenge and other similar extracurricular activities
- A well thought-through scholarship/loan program would provide the incentive for target students to take such capstone courses and provide an incentive for stakeholders to fund such a program

- For example, if a recipient remains in agricultural practice for a defined period of time, the stipend is all scholarship. If they leave before, the scholarship converts to a loan on a prorated basis.

7) High achieving students in this pathway are the best candidates for early veterinary school admission with delayed enrollment to complete their capstone animal science courses

- Students exceeding curricular and extracurricular performance benchmarks would be offered early admission to veterinary school
- Such students could receive stipends for summer internships on large farms subject to the condition that if they do not enter and remain in agricultural animal practice for a defined period of time, a portion of the stipend becomes a loan.

(See “Recruiting Ag Animal Veterinarians” in *Veterinary Medicine Extension Newsletter*, [2\(1\):2-3](#), 2008)

### **Admission of Agricultural Animal Veterinary Student Candidates:**

Because the best investment of student time while in veterinary school is in developing and strengthening veterinary skills in their area of interest rather than in correcting fundamental weaknesses that with the appropriate undergraduate curriculum would not be present, the goal is to enroll students who already have established a strong animal-science knowledge base, have a systems perspective of food production and have acquired significant “hands-on” large farm experience. Otherwise, insufficient time is available for students to acquire the depth of experience with large farm operation that practitioners strongly recommend and to acquire economic competency in select veterinary skills.

1) Target students with significant prior knowledge and experience

- Because they are more likely to both be better agricultural animal practitioners and to remain in that career path, CVM selection procedures should be modified to increase the priority of applicants having significant animal-science and food systems knowledge and strong evidence of “hands-on” involvement in livestock care on large farms supported by the appropriate recommendations.
  - Students without strong animal science undergraduate training and significant on-farm experience would be unlikely to gain enough during the 4 year veterinary curriculum compared to be competitive with those who have both
- A majority of agricultural animal practitioners queried about their expectations of new graduates responded that significant hands-on livestock experience of sufficient duration across all segments is necessary

2) Modify Veterinary School admission requirements and selection procedures to enroll strong applicants

- Require strong evidence of livestock interest and involvement, of positive attitude and of work ethic
- Exchange the traditional veterinary experience requirement for requirement of specific, verifiable hands-on livestock experience
  - Experience in the more readily accessible traditional veterinary practice focused on the treatment of individual animals is likely counter productive for students intending to enter farm-based production agriculture practice
- Follow Cornell’s lead in moving beyond primarily using grades and test scores as the basis for admission requirements to include the use of non-cognitive factors such as requiring strong, verified evidence of career interest, attitude and work ethic.

3) Successful applicants with a strong, appropriate animal science background but without significant hands-on large farm experience could be provided the opportunity to remove this weakness by undertaking an on-farm experience during the summer between their admission notification and their fall enrollment in veterinary school.

- Students without such experience and not doing so would have a lower priority when any subsequent selection is required for limited opportunities and would not be eligible for a certificate program.

4) From the time of admission onward, provide strong mentoring to students indicating an interest in agricultural animal practice

- Develop a guidebook similar to the Cornell Opportunities Map described in Mitchell HM, DV Nydam, KK Reyher, RO Gilbert (2004). The Opportunities Map at Cornell University: Finding Direction in Dairy Production Medicine *JVME* 31(4):384-386. (current copy provided by RO Gilbert)

### **Establishing Competencies Required of Agricultural Animal Veterinary Students:**

Establishing the competencies required of new agricultural animal veterinary graduates in the major practice types (e.g., beef cow-calf, dairy, feedlot, small ruminant, mixed) is a key component of this process. Because the majority of new graduates entering private practice usually do so as employees, the veterinary school is conceptually the same as a business supplying a product to meet the needs of its customers where new graduates are our product and their employers are our customers. Hence, beyond passing the NAVLE (national board licensing exam) the primary question is what set of competencies that make the new graduate most value added to their employers and their clients?

1) Establish the key competencies and the performance standards for these that the key stakeholders, their future employers, expect new graduates to have at graduation and then design and execute the curriculum so that students achieve practice readiness in these

- The Goal is self-sufficiency in a selected set of clinical skills that the new graduate applies in a fluent, flexible and effective fashion. (Wiggins & McTighe, p 112)
- Students graduating with a track record of economic competency in such a set of skills will have greater confidence, will gain broader competence faster than will students without this skill level, will be worth paying considerably higher starting salaries, and will be more likely to remain in this career path
- To accomplish this, we need to work with a broad, representative range of practitioners in the agricultural animal practice segments across the west in a formal, structured manner to continually prioritize those learning outcomes that represent “economic competency” (doing the right thing well enough and fast enough) in those sets of individual and herd clinical procedures and herd problem solving scenarios that make the new graduate most “practice-ready” and “value added” for both their client and their employer in that practice type
  - [Practitioner Input on Competencies](http://www.vetmed.wsu.edu/courses-imgay/documents/PractitionerCompetencyInput.pdf) - <http://www.vetmed.wsu.edu/courses-imgay/documents/PractitionerCompetencyInput.pdf>
  - To date, thoughtful practitioners have provided considerable advice
  - See section below titled “Formal Practitioner Advisory Boards”

2) At regular intervals (e.g., 6 months, 1 year, 2 years, 5 years), survey CVM graduates entering agricultural animal practice for feedback on CVM training and their practice readiness.

- Graduate feedback would also provide a basis for recognizing faculty achievement of teaching excellence

3) Early in the program provide students the competencies, the performance benchmarks and what effort will likely be required on their parts to meet them as part of the mentoring program above.

- This empowers a student to make informed choices and establishes accountability between faculty and students, the faculty being accountable to the student to provide learning opportunities and the student being accountable for taking full advantage of these.
  - This information would become a component of the student handbook mentioned above
- Students would be strongly encouraged to begin assembling an electronic portfolio documenting their unique learning experiences, such as attendance at national meetings or participation in special seminars, outcomes of their clinical cases, and herd problem investigations
  - The student handbook would provide guidance in portfolio development, such as examples, and this would evolve as students invest their creative energies in these over time.

### **Agricultural Animal Veterinary Student Group Size & Training Pathway:**

If students are to achieve the goal of economic competence in even a limited set of technical skills by graduation, that they begin training in these early in the curriculum to have sufficient opportunities for the repeated, reflective, deliberate practice that establishes competency is critical. To obtain this competency level

will very likely require that they invest additional time beyond the current curriculum that is currently free, namely the two summers between the first and second and the second and third years.

1) Based on the level of current student interest and the expected increased interest a strong program would generate, we expect that a maximum of approximately 15 students per year would avail themselves to an intensive program.

- Maintaining a critical mass of students in the program in each class year is important for maintaining program continuity year-to-year and to attracting excellent students. The minimum size for critical mass is likely seven students, the minimum optimal group size.

2) Under the current WSU academic calendar, students have approximately 16 weeks between the end of spring finals and the beginning of the fall semester. If 4 weeks are taken out for vacation, 12 weeks per summer are available in the three summers between admission to veterinary school and the beginning of the clinical fourth year.

- If a stipend of \$4,500 per student per summer is provided, a maximum of \$67,500 per year per student cohort is needed or \$135,000 per year for two cohorts in two summers.

### **Summer Experience:**

0) Summer after admission – students not having hands-on experience with how large livestock farms function acquire it

- For those students without “hands-on” large livestock farm experience during their undergraduate programs, 12 week intern positions on large scale livestock facilities in which the student acquires a “hands-on” understanding of how all the major segments of that type of operation function by rotating through them and working as if they were an employee with the employees in that segment.
- A model for this program is Dr. Chris Schneider’s current U of I program, which is based on the California program described in Smith B (2004). The UC Davis early dairy experience program *JVME* 31(4):366-367.

1) Summer of First Year – learn the basic veterinary technical skills and apply these in intensive experience on large livestock operations

- Because of the time required to develop clinical skill competency, beginning early is very important – see: Ericsson, KA (2004). Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Academic Medicine* 79(10):S70-S81. ([pdf](#) - article begins on page 4 of prepublication proof on USC website)
- Foundations of Agricultural Animal Practice Summer Scholarship Program (technical skill contents are essentially those of the current in-clinic ag animal block) – 3 weeks, 7-8 students max, flip with Theriogenology?
  - Proposed by Dr’s. Barrington and Parish
- Obstetrics and Reproduction Skills Introduction – 3 weeks, 7-8 students max, flip with Foundations of Agricultural Anima Practice?
  - Being developed by Dr. Tibary and theriogenology colleagues
- Rotate through defined intensive “hands-on” experiences on large livestock operations for balance of the summer and during blocks of free time during the academic year:
  - Spend at least three weeks working in the maternity area of a large dairy under the guidance of a veterinarian, no more than 2 students in that area on that operation at a time - need ~4 such dairies that flip students
  - Spend at least three weeks on the treatment crew of a large feedlot under the guidance of a veterinarian, no more than 2 students in that area on that operation at a time – need ~four such feedlots that flip students (Alberta, WA, ID, TX panhandle, KS)
  - The operations having sufficient size and other characteristics, such as local housing opportunities for students, that are willing participate in such a program are critical resources with limited capacity that other schools will likely be competing for as well.

- As a consequence, establishing and maintaining solid relationships with a sufficient number of such operations throughout the west is critical

## 2) Summer of Second Year:

- Rotate through four different large agricultural animal practices, spending approximately 3 weeks in each, no more than two students in a given practice at a time
  - Need ~seven cooperating practices that have the capacity to house 2 students at a time to provide this experience
  - The desirability of students doing this has been noted by several practitioners responding to the competency query
  - These practitioners would also be involved in performing guided assessments of student's attitude, work ethic and communication skills as part of evaluation and feedback for the student

3) Because of his livestock industry contacts and his experience establishing the Idaho program to attract students to agricultural animal practice, Dr. Chris Schneider is the logical faculty member to lead the off-campus components of the agricultural animal curriculum.

### **Didactic Curriculum Experience:**

To avoid issues such as limited licensure and concerns about future career options for students pursuing agricultural animal practice, the goal is to accomplish excellence without "tracking". CVM students currently have a very high national board pass rate and maintaining this rate is important. Unless the exam is altered to reflect species interests, small animal questions currently comprise the majority of species-related questions (NAVLE Test Specifications - canine, feline, pet birds, other small animals – 53%, bovine – 17%, equine – 17%).

1) Ensure that appropriate learning objectives and their performance benchmarks are incorporated into core and elective courses to meet the selected competencies identified by practitioners as being the most important

- Recent sources published in refereed journals:
  - Miller RB, LE Hardin, RP Cowart, MR Ellersieck (2004). Practitioner-Defined Competencies Required of New Veterinary Graduates in Food Animal Practice *JVME* 31(4):347-365
  - Morin DE, PD Constable, HF Troutt, AL Johnson (2002). Individual animal medicine and animal production skills expected of entry-level veterinarians in bovine practice. *JAVMA* (221(7):959-68.
  - Morin DE, PD Constable, HF Troutt, AL Johnson (2002). Surgery, anesthesia, and restraint skills expected of entry-level veterinarians in bovine practice. *JAVMA* 221(7):969-974.
  - Root Kistriz MV, PJ Chenoweth, A Tibary (2006). Efficacy of training in theriogenology as determined by a survey of veterinarians *JAVMA* 229(4):514-521
- Internal source:
  - Practitioner Input on Competencies  
<http://www.vetmed.wsu.edu/courses-jmgay/documents/PractitionerCompetencyInput.pdf>
- As significant practice on animals is not possible for some of these competencies involving individual animals, achieving performance standards may require incorporating high fidelity models into courses that students use for deliberate practice of the specific technical skills required for some of the higher ranked competencies
  - Smeak DD (2007). Teaching Surgery to the Veterinary Novice: The Ohio State University Experience *JVME* 34(5):620-627.
- Achieving performance benchmarks may require restructuring timing, content and delivery of hands-on training
  - Dr's. Barrington and Parish initiative to provide clinical training to students completing their first year.

- Supplying the appropriate teaching cases in sufficient numbers to provide the needed learning experiences may require modifying the current clinical instruction paradigm and the associated faculty evaluation and reward system
  - To achieve success, didactic courses will need to be designed for maximizing understanding and for promoting long term knowledge retention
- 2) Move those learning objectives not regarded as core across all species and practice types into elective classes with the goal of providing sufficient curricular time for students taking electives to master their content.
- Otherwise, cognitive overload will likely ensue, resulting in burnout among many students with the consequence being a decline in program enrollment as students shift to a sheer “binge and purge” survival mode and concentrate on the lower levels of the learning taxonomies
- 3) Change the required attendance policy to enable first through third year students to participate in off-campus educational experiences during term that are not available at WSU
- Enable students to participate in valuable short-duration learning experiences off campus, such as the Bull Breeding Soundness Examinations for WSU-sponsored Prosser Bull Test
  - As noted by practitioners, students attending selected professional meeting programs, particularly for those educational experiences not available on the WSU and U of I campuses, is important
    - For example, the AABP Preconference Seminars are annual one to three day seminars coordinated and presented by national experts, often university faculty members (e.g., Nordlund, Oetzel, McGuirk, Cook, Nydam, Morely, Hutjens, Moore, Klingborg, Risco, Drost, Donovan, Rapnicki, Eicker, Fetrow, Stewart, Schukken, Dalton, Shearer, Reneau, Buergelt) and elite practitioners (e.g., Wustenberg, Andy Johnson, Karreman, Corbett) on applied subjects to a depth that isn’t available in the CVM curriculum
    - The absence of CVM students interested in equine practice from the annual AAEP meeting has been noted by equine practitioners, likely to our detriment.
  - To reduce conflict, this policy should be implemented in a way that students are treated as responsible, accountable adults and that the consequences of their participation are borne more by the participating students than by faculty whose responsibility is to provide reasonable accommodation for justifiable learning experiences.
    - National meetings with significant educational opportunities are usually scheduled well in advance so that particular teaching activities could be scheduled around them
- 4) Provide a strategically placed break in the academic calendar of each semester simultaneously across all three years for students to pursue intense electives and off-campus experiences prior to their fourth year (originally proposed by Dr. Parish)
- By scheduling the break simultaneously across all three years and being synchronous with clinical blocks, special electives, such as nutrition of exotic animals, can be presented on a four year cycle so that all interested students would have the opportunity to take it and the enrollment would be more likely to be large enough to sustain the class and more likely to justify bringing in outside experts
  - By strategically placing these breaks to correspond with annual events such as the WSVMA meeting in the fall and the WSU CVM Spring Conference in the spring, special courses could be developed that could both provide practitioners continuing education and provide unique learning opportunities for students.
    - Because of the dual purpose, expending more funds to bring in national and international experts would be justified and would benefit both students and practitioners.
    - Because of the time freed up for students wet labs and field experiences could be a component of the program
    - By using a class per day format rather than class per hour format for scheduling, off-campus venues providing more appropriate teaching resources and being more attracting to practitioners could be used

- Examples that could be expanded to include on-farm components are, Dr. Jan Shearer's workshop on bovine lameness and the applied veterinary nutrition symposium, both of which Dr. Chris Schneider has coordinated in previous years
  - Sufficiently long breaks (e.g. 2+ weeks) strategically placed in the current 15 week long fall and spring semesters would even student flow to these operations somewhat and keep their participation more even rather than occurring in summer pulses only.
    - ?Which do such operations prefer? Students spaced year around or only summertime?
  - For large cow-calf operations, the current semester breaks likely miss the most intense calving periods and are somewhat too short for students to maximize their experience
  - These breaks also benefit students in other practice streams because they are periods in which students can obtain intense experience in off-campus venues such as spay-neuter programs that cannot be accomplished on the WSU and U of I campuses and provide times in which special electives could be taught to all years of students
  - These breaks also provide opportunities for scheduling special intense joint courses between the Animal Science departments and the WSU CVM that are targeted at animal science graduate students and agricultural animal veterinary students (an idea proposed by Dr. Carl Hunt)
    - Because many departmental graduate student classes are small, they can be scheduled to accommodate such a break
    - The joint collaboration ensures a larger enrollment, making the class more sustainable
- 5) Provide more structured opportunities for students to develop high information literacy, numeracy and creativity, expand critical thinking skills and develop strong habits of mind, adaptive expertise and alternative ways of seeing
- The ability to develop original ideas that have value (entrepreneurship) is required for long term success
  - Practice applying problem solving to herd problems
    - Develop a recurring course that continually engages students in working with practitioners and producers on problems coming through WADDL and includes literature reviews and farm visits
  - Able to function as an adaptive expert in addition to routine expert (KA Ericsson. An expert-performance perspective of research on medical expertise: the study of clinical performance *Med Educ* 41:1124-1130, 2007)
- 6) Continue to adapt components of innovative programs from other veterinary schools
- Iowa State's 3 year beef records analysis program described in "Teaching Veterinary Students Beef Production Medicine with Student/Producer Teams" *JVME* 34(4):524-528.
- 7) Monitor the development and provision of distance education programs from other universities and from professional societies that may be useful augmentation to the CVM curriculum.
- Distance programs often have the advantage of being available in an on-demand fashion so that they fit around the interested student's schedule
  - Examples of potential courses:
    - U of Illinois [Advanced Dairy Nutrition](#) (not asynchronous)
- 8) Strongly encourage students to join as a student member those professional organizations relevant to the student's practice interest upon matriculation.
- Examples:
    - Dairy – AABP, NMC, Society of Theriogenology
    - Beef – AABP, AVC, Society of Theriogenology
- 9) To increase leadership skills and experience, strongly encourage students to actively participate in relevant on-campus activities:

- VBMA, Ag Animal Club, Theriogenology Club
- Cougar Communicators – WSU student Toastmasters Club for practicing and improving communication skills
- CUDS, Cougar Cattle Feeders, Dairy Challenge (eligible if undergraduate degree hasn't been granted)

### **Clinical Year Experience:**

1) Establish and maintain a balance the required core blocks in the senior year clinical rotations across the practice types and disciplines with the objective of maximizing student learning outcomes across core and interest-specific areas.

- The first step is establishing block-by-block specific learning objectives with performance benchmarks that are evaluated in an competency assessment program
  - Establishing the CVM agricultural animal competencies was initiated by Dr's Steve Parish and John Wenz
- Accomplishing this balance requires regularly surveying CVM graduates entering agricultural animal practice for feedback on CVM training and their practice readiness at regular intervals (e.g., 6 months, 1 year, 2 years, 5 years).
  - An initial attempt at such a survey is the "2007-08 Senior Ag-Interested Student Survey", the results of which are on the AAVET SharePoint site
- Dr. Hancock's proposal of 9/12/08 that all students intending to ever go on a for-profit livestock operation in a professional capacity will be required to take the following:
  - Ag animal clinical nutrition spring of 3<sup>rd</sup> year.
  - The following 4th year blocks (minimum):
    - 4 weeks of beef or dairy specialty block at Caine Center
    - 2 weeks of standard block at Caine Center
    - 2 weeks of FDIU block
    - 4 weeks of Diagnostics.

### 2) Individual animal clinical medicine (WSU VTH)

- Ensure appropriate case mix and quantity for completing the development of economic competency in those individual animal skills identified as being most important in practitioner surveys and by practitioner panels and meeting the requirements for the balance of the competencies
- Rather than caseload and mix for individual animal clinical blocks being determined only by the service requirements of the local haul-in clientele and the local WSU and U of I research herds, ensuring the appropriate case mix and quantity likely requires development of innovative strategies, such as acquiring appropriate donated case material and special visits to large herds in the region during those individual animal clinical blocks with agricultural animal students
  - The bovine case load numbers are important for competing with Kansas and other cases where potential students are making comparisons between schools
  - With the declining value of camelids, that component of the agricultural animal case load is likely to decline
  - The responsible faculty are taking steps to improve the WSU VTH agricultural animal block in response to the impression of its low value class by many of the students interested in agricultural animals in the class of 2008

### 3) Herd medicine (U of I Caine Center, AAHP FDIU)

- Ensure appropriate herd mix and herd exposure for completing the development of economic competency in selected herd problems and herd clinical procedures identified as being most important in practitioner surveys and by practitioner panels and meeting the requirements for the balance of the competencies.

4) Identify opportunities for clinical blocks at other schools having strong blocks and expertise in key areas not present in depth at WSU or the U of I

- Wisconsin dairy blocks, part of the program described in Cook NB, CO Eisele, RF Klos, et al. (2004). A coordinated teaching program for future dairy practitioners at the University of Wisconsin-Madison, School of Veterinary Medicine *JVME* 31(4):372-379.
- Kansas, Iowa, Nebraska GPVEC beef blocks
- Need to synchronize block sequencing as much as reasonable with those schools to enable CVM students to participate and to ensure that they are well prepared by the time of their participation

#### **Agricultural Animal Practice Certificate Program:**

A well constructed, rigorous certificate program is the key to establishing CVM “brand identity” and to positioning us well in the marketplace for acquiring excellent students and for placing new graduates. The certificate cannot be simply evidence of program completion. To have value, being awarded the certificate must make the student stand out from graduates of the programs provided by the competition and, in turn, such students must be rewarded with higher starting salaries. To achieve such value, formal input from practitioners is critical to establishing and maintaining the performance standards.

- Key to attracting and maintaining a critical mass of outstanding students
- The key measure of success is new graduates granted the certificate being worth higher starting salaries or more quickly gaining economic self-sufficiency
- To accomplish this positioning, the awarding of this certificate must be based on solid, evidence of high performance that includes an excellent attitude and a solid work ethic as well as evidence of excellent knowledge and skills in important areas as recognized by practitioners
  - Overall academic performance in CVM curriculum must be above some threshold, such as above the bottom quartile
- For the program to be successful, all the stakeholders (prospective students, current students, faculty, practitioners, producers and administrators) must be aware of the process for establishing and maintaining appropriate criteria, must trust the process and must be aware of their role
- Proposed by Dr. Steve Parish and based on the University of Florida Certificate in Food Animal Veterinary Medicine ([FAVM](#)), which has similar goals
  - From the FAVM website: “Students who successfully complete this program will receive a certificate that documents their advanced and directed training in FAVM. **This certificate will identify the new graduate veterinarian as an employment prospect for an entry level position in food animal practice or a food systems profession.** The certificate will provide students an edge in employment readiness due to their dedication, work ethic and commitment to the certification process. They will be better prepared to provide leadership in the area of food systems veterinary medicine.” (bolding theirs)

Not every student completing all the activities can expect to receive the certificate, just as every Boy Scout does not make Eagle, but they must have every opportunity to do so. This means that the program must provide strong mentoring and frequent assessment opportunities with sound feedback so that the student can fail, overcome the failure and still achieve excellence. Assessment of attitude and work ethic requires 360° evaluation from peers, mentors and practitioners as well as from faculty.

#### **Formal Practitioner Advisory Boards:**

Formal practitioner advisory boards representing each major agricultural animal practice type are critical to establishing and maintaining the excellence of the certificate program. These boards will provide the necessary link between practitioners and the program, both for establishing the components of the program and for representing the value of the program and the certificate to their peers. With the primary mission being teaching and a limited clientele not entirely representative of private practice, the WSU CVM and the U of I clinical environments cannot be expected to be completely representative of the private practice environment or can we be fully aware of its needs.

- Practice types: beef cow-calf, dairy, feedlot, mixed, small ruminant

- Identifying participating practitioners:
  - The critical need is to obtain sufficient breadth of input from representative groups of practitioners such that faculty, students and fellow practitioners trust the process and their input and, if students achieve those goals, that the practitioners would pay those new graduates significantly higher starting salaries
  - Optimal advisory group size is likely 7 to 12 active members
  - Potential means of achieving broad representation:
    - Request nominations from state organizations(WA, ID, MT (?)) for each of the major practice types in those states that are both major sources of students and subsequent employers of new graduates
    - Request nominations from the leadership of the appropriate professional organizations (AABP, AVC, AASRP, . . . )
    - CVM nominations from among alumni and professional contacts across the western U.S.
  - Rotate membership with staggered terms to provide continuity of “institutional memory”
- Functions:
  - Serving as mentors
  - Auditing of curriculum learning objectives relative to livestock production agriculture
  - Establishing economic competencies and performance benchmarks for these
  - Validating the certificate program
  - Publicizing the program and recruiting candidates in concert with CVM staff
- Ultimately, the CVM Faculty remain responsible for designing and delivering the curriculum

### **Important General Skills and Knowledge for Agricultural Animal Veterinary Students:**

Relative to other veterinary curriculum focus areas, agricultural animal veterinary students need strong knowledge and skills in:

- Applied farm economics and management
  - As decisions are fundamentally driven by economics, only by understanding these economics can veterinarians play a major role in the decision making process at the table with the other primary consultants (e.g., bankers, accountants, nutritionists); otherwise they will be limited to passive participation.
  - Only by understanding the drivers forcing clients to change can veterinarians anticipate and adapt services to match client’s changing needs and make maximum advantage of emerging opportunities
- Applied veterinary nutrition and feed management
  - Because feeds typically represent half of the input costs of production, reducing feed costs while maintaining animal health and performance is critical. Nutrition and feeding related risk factors are involved in many prevalent production diseases.
  - Producers adaptations to feed price shocks and increasing uncertainty will increase the frequency of nutrition-related “wrecks” and challenges
  - Knowing their limits is also important
- Reproductive physiology and endocrinology
  - reproduction is at the core of most production systems and relatively small changes in reproductive performance have major economic impact
- High information literacy

- Specific:
  - Perform efficient searches of bibliographic databases
  - Evaluate the strength of publications and studies from the scientific literature, trade and industry publications
  - Efficiently collect, analyze and summarize data from client's operation
- Practitioners working with the larger operations generate and evaluate enterprise-specific information and for all operations identify and evaluate the strength of external information for application to the specific operation
- Self-directing, self-motivating, reflective learner
 

(From ACGME) - Identify one's strengths, deficiencies and limits; set learning and improvement goals, identify and perform appropriate learning activities; systematically analyze practice performance

  - Otherwise, practitioners risk losing a significant amount of value over time because the industry evolves very rapidly in response to economic pressure, including the rapid adoption of emerging technology, and research is constantly expanding the relevant knowledge base
- Interpersonal skills, including communication, training and supervision
  - As the size (scale) of livestock operations increase, the role of practitioners serving these industries includes implementing farm-specific preventive practices, establishing standard operating procedures, and training and monitoring employees responsible for more of the "hands-on" animal work traditional performed exclusively by the veterinarian