Practitioner Competency Input

Setup Paragraphs:

As Ag Curriculum Coordinator, I need your input on the key clinical procedures that make a new graduate “practice ready” for your segment of agricultural animal practice. My idea is that if we identify a limited set of key procedures for each major practice segment (e.g., beef cow-calf, dairy, feedlot, small ruminant, mixed), students interested in that segment can be taught the key skill components of these early in the curriculum, leaving the balance of the 4 years for them to improve their competency. Meanwhile, these students will still be enrolled in a traditional veterinary education in which clinical skills are emphasized in the final year. The problem with this traditional approach is that the student has limited time to gain experience and confidence across the broad range of clinical skills they are expected to be familiar with. We want to improve this situation. As this is not a tracking program in which a selected set of clinical skills are taught, only a very limited set can be taught early. So the first step is to identify that set in which having increased competency would make the new graduate more “practice ready”. I need your help to identify these.

For your information, I’ve put the somewhat dated published clinical skill rankings by practitioners on my webpage “Ag Animal Veterinary Curriculum Resources” at http://www.vetmed.wsu.edu/courses-jmgay/AgCurriculumResources.htm:

U Illinois (Morin et al.) combined bovine skill list pdf xls (97K)
U Missouri FADACUM combined food animal competency lists pdf xls (250K)

Questions: Please answer the following, listing the 5 to 10 or so specific skills in priority order, 1 being the highest, for your segment of or perspective on agriculture animal practice.

I’ll combine responses by practice type for sharing with faculty and students but otherwise they will be anonymous. In the near future I hope that we have established a mechanism for practitioners to evaluate and provide input on our entire ag animal curriculum routinely.

Practitioner Responses:

Responders - thank you very much for your time and thoughts; they are much appreciated!

Practitioner responses are categorized by emphasis – beef cow-calf (CC), feedlot (F), dairy (D), small ruminant (SR) and mixed (M). Within each category, the responses of an individual practitioner have the same bolded identifier under each question. CC1 is the first cow-calf practitioner, CC2 the second and so on. These are numbered approximately by the date of response. For “reader friendliness” of future drafts as more responses come in, the responses are ordered from newest to oldest. I have edited these slightly to remove identifying information, corrected the few misspellings and reformatted to make the document easier to read. If I’ve changed your meaning, please let me know. Otherwise, except where noted the following remain essentially verbatim. (Note to responders: If in doing that I’ve inadvertently changed your meaning, please let me know! The line numbers are temporarily present to help in this process.)
Beef Cow Calf Emphasis: (8)

Response to specific e-mailed questions:

1) “Economic competency” (doing the right thing well enough and fast enough) in what 5 to 10 key individual and herd clinical procedures make a new graduate most “practice-ready” and “value-added” to both their client and their employer?

CC8:
- Communication – conveying thoughts, recommendations, ideas effectively with clients and colleagues
- Animal handling/restraint – knowing how to position yourself and handle the animal in an efficient and quiet manner with and without a chute
- Rectal palpation
- Breeding soundness examination on bulls
- Obstetrical procedures (prolapse, dystocia, etc.)
- Unassisted gross field necropsy
- Clinical examination and auscultation with appropriate treatment recommendation
- Familiar with biologics, treatment, and vaccine protocols

CC6:
- Palpation
- Castration
- Diagnosis and Treatment

I have a hard time coming up with 5 for this. I will add that all new graduates need to be able to do some things well that do not relate to their ability as a doctor. Such as back a chute. It is very easy to lose face to a 60 year old farmer when the new kid cannot get the truck backed up to the barn.

CC5:
- Empathy, understanding, appreciation, and a willingness to really find ways to improve the productivity of client's operations.
- This entails identifying bottlenecks in production which may or may not be strictly Veterinary related.
- Requires an open mind to seek outside help from nutritionists, behaviorists, lenders, etc. etc.
- The Veterinarian is still the one person that is the most competent to put the puzzle together.
- You never know what direction this will lead, but a passion and understanding of the producer’s plight will overcome any near term procedural problems. If you care, the client will appreciate it. That initial extra effort will pay dividends for a practice life-time.

CC4:
- pregnancy detection
- bull testing
- necropsy
- obstetrics
- ration evaluation

CC3:
- The most glaring deficiency of new graduates is lack of business sense.

They are so focused on medicine that they cost money the first year of practice, if you are lucky they break even the second year, and the third year will generate a profit. By that time a large number of them become aware that there are other parts of veterinary medicine and they move on. I have had many of them come back years later and wish they had stayed but for most the part the old saying they will move at least once applies. If they move before 5 years I often wondered if it was worth hiring them, the fun part was watching them blossom into good practitioners.
• Communication

I became a Veterinarian so I would not have to deal with people and boy was I wrong. Talking to clients and maintaining confidence is a skill that can only be developed by practice (some new graduates. The art of listening is also a skill that all new graduates must develop. I find that if you listen, a lot of the time a client will point you in the right direction toward a diagnosis. Gary McIntosh told me to always tell a client what I did know and not what I did not know, and when I started to get behind and lose confidence ask them about their kids, or something they wanted to talk about, pretty soon they were telling me the whole story about the patient and so on.

CC2:

• Communication - Knowing how to talk to clients in language they understand (i.e. not exuberant granulation tissue, but proud flesh; not medial aspect of the tibiotarsal joint, but inside of the back leg).
• Proficient in rectal palpation
• Clinical examination including auscultation
• OB's (reducing dystocias, pulling calves, prolapse repair and C-sections in a field situation)
• Know more than one way to restrain an animal including using drugs
• Treatment protocols and advantages of drug choices
• Breeding soundness examination of bulls
• Vaccine protocols

2) What are the minimum performance benchmarks for these?

CC8:

I feel that speed and proficiency come with time, and it is better to do it correctly than quickly. Appearing rushed or hurried gives the client the impression that you do not have the time to meet their needs – even with seasoned veterinarians. (Efficiency will come with time, and as the economics of the practice become clearer to starting practitioners.) Communication is the most important of these competencies, as you want to sell your cognitive skills in addition to technical procedures.

CC6:

• Palpation – 95% accurate within 21 days < 100 days gestation
• Castration – hard to put a number on but efficiently enough to not slow down the flow of cattle.

CC5:

No question that basic skills are an advantage when beginning.

In addition to repro skills, sick animal care, diagnostics, etc., etc. the most important quality is animal compassion and how one comports themselves around the animals. The opportunity to spend time (summers, preceptorships, etc.) with practices that resemble what you want to do is the correct time to pick up the basics. The WSU environment did not really provide the opportunity for me to develop all of the tools I used in practice. (Vaginally spaying heifers for example) It is necessary to develop special interests and do what is required to become proficient. (All education costs something; time, money, extra effort, etc.)

CC3:

I found if I set bench marks on time for a procedure the end result was mistakes and mediocrity. I told them all we are not looking at how fast a procedure could be done but how well it could be done. Competence and speed came with repetition.

CC2:

I feel they should concentrate on accuracy rather than speed. The speed will come with experience.

• Communication - Hard to measure, but if you get a lot of dumb looks you may need to use less technical terms.
• Rectal palpation for preg check and estimating gestation from 45 days bred to term
• Know how to diagnose or work up common problems: lameness, inappetance, pneumonia, rumen impaction
• Know different ways to fix different OB's and advantages and disadvantages
• Minimal know how to restrain a cow in a chute. Better yet know how to cast a cow and how to keep them tied down
• Know how to come up with treatment protocols for common problems: pneumonia, footrot, etc.
• Complete at least one full BSE on a bull
• Know how to discuss in laymen’s terms the different vaccines available.

3) “Economic competency” (rapid, efficient, minimum cost approach yielding practical results) in working up and making herd-specific recommendations for what 5 to 10 herd problems make the new graduate most “value-added”?

CC8:
I believe it is not about knowing all of the answers, but knowing where to accurately and efficiently find them. It is OK to say, “Let me look into that for you,” but then you need to deliver impressively with the answer. To establish confidence in your abilities in the initial conversation, a solid working understanding of, and differential list for, the following needs to be conveyed:
• neonatal calf scours,
• low pregnancy rates
• pneumonia
• abortion
• low weaning weight, etc..

As with technical skills, the efficiency and accuracy of answering these questions comes with time and experience.

CC5:
Herd specific diagnostics requires record keeping to see what the trends are. It is often a requirement that the Veterinarian assist the producer in this effort. It usually took me three opportunities (teachable moments) to point out the economic disadvantage of responding thus, instead of investing in a solution. Once you win the confidence of the producer and work up that ladder of identifying the production limiting problem, it never stops.

CC3:
In my practice it is pregnancy testing (cattle and horses), a good physical exam. Followed by the ability to determine which lab tests would be most beneficial and not running a battery of tests that became cost prohibitive, the art of taking a dirty wound debriding, cleaning it, suturing, and get first intention healing, delivering a new born and knowing when to perform a c-section, being a good surgeon.

CC2:
• Neonatal Scours outbreaks
• Low pregnancy rates
• BVD outbreak
• Pneumonia outbreak
• Low weaning weight

4) What specific experiences outside the traditional on-campus curriculum and for how long would maximize the “practice readiness” of new graduates? Where and how can students best obtain these?

CC8:
Externships, internships, and preceptorships are all important in developing new graduates, but the time-frame is likely dependant on too many factors to set a specific time frame for competency. Getting experience in different situations is important in developing one’s own practice and communication style, thus taking part in many different experiences is critical. Finding a good first experience as a veterinarian with practitioners willing to mentor is where “practice readiness” is gained. Mixed practice requires several “seasons” to approach the variety of problems encountered with a true level of readiness.

CC6:
Here [Midwest – JMG] students wanting to practice food animal can take an elective that allows them to
visit an approved practice for 3 – 6 weeks. This allows them to see a realistic environment and much
higher case load. Students with any hope of being “practice ready” need to strive very hard to take
advantage of this and other opportunities. We enjoy having these students and it is good for our
practice. It is somewhat frustrating as a private practitioner and business owner to put out expense
(housing, time etc) to educate students who are paying the university for these credit hours. For this
program to be truly successful and beneficial the practitioner should be compensated. Without
compensation it is hard on a busy day to warrant taking time to slow down and teach if I want to
continue to pay my staff. In today’s world where many students do not have an ag background a class
in animal handling skills would be vital.

CC5:
Your examples are correct [2 weeks working on the calving crew of a 10,000 head dairy and spending a
month on the treatment crew of a 30K head feedlot - JMG]. Time spent learning the technical aspects
requires hands on experience. I still believe that the 4 years of Vet school gives you the license to learn.
If the desire is there, the practice skills will be mastered soon and what distinguishes practitioners from
that point on is self motivation. Most of FA medicine in general is of a technical (technician) mentality.
There is more to herd health than palpation. The ones that distinguish themselves are the ones that
seek professional collegiality and give back to the community.

CC3:
This is the right idea, experience in the field is invaluable. When Frank Braken asked me a similar
question 30 years ago I told him to establish a large animal clinic in Lewiston or Clarkston and rotate
third and fourth year students thru. This should be staffed with Veterinarians that have experience in the
real world and not from academia. The same should apply today only much more diverse.

5) What emerging technologies or opportunities should new graduates prepare for while in school?

CC8:
Being able to communicate individually, for groups, and in written word is important for adding value to
our services. We likely are not going to be able to rely on the technical procedure efficiencies from
question #1 as a basis for our services. Producers are looking for information that they can use in their
operations to make and keep them profitable. Therefore, being aware of and familiar with the emerging
technologies is the key – and these will be continually changing.

CC6:
As agriculture consolidates even further I believe the cow calf veterinarian will become more to
resemble the feedlot veterinarian. Consultation, record management etc. We as a profession have long
given lip service in an effort to move away from “fire engine practice” but the shortage, or perceived
shortage of food animal veterinarians may actually drive this to reality.

CC5:
Bovine immunology for example. I spend most of my time now contradicting the old paradigms that have
been proven wrong. As Robert Larson states in his evidence based medicine presentation "50% of
everything you learn in Vet school will be proven incorrect or obsolete in 5 years”. How do you prepare
for that?

CC3:
Two focuses:
• A food animal veterinarians should be able to show a client how their services will make money for
them
• All veterinarians should be able to run a business. One can be the best veterinarian possible and
still go broke. I my case a wife with an accounting major helped.

6) What particular weaknesses do new WSU graduates have relative to those of other schools?

CC8:
I have no reference for this question, but know that I felt adequately prepared from my education to
handle both small and large animal cases as a new graduate.

CC5:
I hired and had as preceptors, students from all over the U.S. I was generally quite pleased with our
WSU students. That is not to say that personal characteristics are not paramount, but I found the WSU
kids to be well prepared.

CC3:
I am not much help here as most students and veterinarians came from WSU. I can not put my finger on
why but the one or two students from A&M and Ohio State seemed to be more practice ready.

CC2:
WSU grad’s are somewhat weak in field veterinary medicine since there aren’t a lot of cattle around
Pullman

General Responses:

CC7:
In response to your input needs - I think some kind of preceptorship with veterinary clinics around the
country during summer breaks would be a great way to get hands on experience in many areas. I think
there are urban practices that aren't much benefit to them because liability concerns keep these practices
from letting the students do much more than glorified kennel work. But a roster of clinics that let them get
hands on should be organized with information regarding practice type and any other info that is pertinent.
Students at my practice (very rural and earthy) get hands on in both large and small animal (i.e. neuter,
venipuncture, lab form completion, clinical exam, patient monitoring, equine castration, etc.). We provide
them a place to live and minimum wage with no hour restrictions. Meals are offered at my residence next
doors for no charge. So far the students seem to like the arrangement.

As far as comparing WSU skills to other schools - I don't have any to compare with except one. I hired
a CSU student in 200X for XX months. XXXX’s clinical skills seem to be about the same as WSU students –
XXXX was not very proficient in people/life skills. I think it is hard for people who grow up in a city to switch
to small town living and what community obligations in a small town are. But, that was another story and the
person probably will do OK in a big city where they don't expect much community involvement.

CC6:
I actually sat in front of the computer for quite some time for the limited responses I gave and I can see
how this survey would be answered very differently by someone doing dairy practice. I think the most
important skills are not specific to veterinarians – people skills, problem solving skills. 75% of what I do
today is not related to what I learned in vet school. But the limiting factor I see with the students that go
through our practice is they do not want to commit to a job without set hours and emergency call that is not
able to compensate large salaries to do so.

CC4:
I hope that numerical skills will be important, but I certainly have not made them so yet. I don't think that
most veterinarians have the mind set to engage in analytic pursuits. I'm not sure I have the mind set to
pursue them in a market where every move has to be justified financially. I don't have the promoters' zeal,
and the promoters I've know don't have the data management and analytic horsepower to pull of what they
envision. So far, I haven't been able to must those either.

For all of these things, I think it is important for the students to know how they fit into the production
systems and what return they provide. That is more easily said than done. I've been reviewing some of the
literature related to bull testing. It is old and what I've seen is a little sketchy. I suspect that when we cull 5%
of mature bulls on semen quality, we generate a return for the ranchers, sometimes a handsome return if a
dominant bull is sub-fertile, but I wonder. I'm sure trich testing provides an excellent return for a newly
infected region where naive cows will suffer abysmal preg rates. I wonder about an area that is cleaned up,
or close to it, where cattlemen are vigilant and using young bulls.

Much of practice is relating to your clients. There is a fine line between brusquely efficient and so
yellow-dog friendly that you don't get much work done. I don't know that 4.0 students are well equipped to
find that balance.

CC1: Mixed practitioner, beef cow-calf emphasis:
I think that this is a very important project that is more noticeable since fewer students are farm
background. The ability to show what you can do for the first impression is very important, because a lot of
the time you don’t get a second chance. The basic issues that I notice are being confident, but not arrogant-
sometimes a real issue, willing to say they don’t know once in awhile, and learn to talk the clients language.
The everyday things like correctly Bang’s vaccinating (including the paperwork), tubing a cow, palpating a
cow, c-sections, identifying a herd problem and solving it, noticing signs of feed issues (even if you don’t
know that much about nutrition) and refer to someone that does, ability to work with foot issues and
treatment, diagnosis and treating mastitis, vaccinating correctly with speed, drawing blood and giving IV’s
with large bore needles/catheters, and knowing where to stand/push cattle. Necropsy of normal and
abnormal animals quickly and alone. Replacement of uterine and vaginal prolapses with a majority of
animals living in the case of uterine prolapse.

These are all issues that should be basic to getting your foot in the door, but all this is secondary to
being able to talk to the client in language they understand and making them comfortable in accepting your
work/expertise. Communication … communication … communication. New grads have a wealth of book
knowledge, but putting that to use is a different beast altogether. Growing up on a ranch and riding with vets
for many years prior to vet school gave me a leg up on this aspect and I think it would be very stressful to
have to be a new grad and try to learn these issues at the same time. Hands on doing the dirty work is the
best way to learn and retain the information. Calving or lambing a large number of animals where you have
to assist in dystocias and some c-sections is a very good way to learn. Early identification of a sick animal in
a feed lot is very important but isn’t very easy to do. Following a good pen rider around for awhile will really
help. Minimum benchmarks are difficult to say, as everyone learns at a different speed—“see one, do one,
teach one” always helped me retain information. Speed comes with repetition and familiarity. I think
practitioners realize that students aren’t the fastest when they get out and the starting salary usually mirrors
that, but learning shortcuts from the experienced people will help this area. Emerging technology is going to
be an important aspect of the profession and cost efficiency/operational efficiency is going to dictate more
and more in the future. One thing that small animal and equine people have a hard time getting through their
head is a cow is only worth so much. A c-section on a cow is larger, dirtier and harder work than on a dog,
but you won’t be doing any if you charge $1500 to do it.
**Feedlot Emphasis:** (1)

**Response to specific e-mailed questions:**

1) “Economic competency” (doing the right thing well enough and fast enough) in what 5 to 10 key individual and herd clinical procedures make a new graduate most “practice-ready” and “value-added” to both their client and their employer?

2) What are the minimum performance benchmarks for these?

3) “Economic competency” (rapid, efficient, minimum cost approach yielding practical results) in working up and making herd-specific recommendations for what 5 to 10 herd problems make the new graduate most “value-added”?

4) What specific experiences outside the traditional on-campus curriculum and for how long would maximize the “practice readiness” of new graduates? Where and how can students best obtain these?

5) What emerging technologies or opportunities should new graduates prepare for while in school?

6) What particular weaknesses do new WSU graduates have relative to those of other schools?

**General Responses:**

**F1:**

- To become economically sound first and Medically sound second. A MBA approach to Agri-business. We had one business class in school at was not even close to what we needed.” Do not tear down know areas of profit so that you can improve morbidity.” “It is less expensive for me to loose the digestive deads then to change away from potatoes.”
- Take on “Prevention” pattern of thought rather then a “Cure” approach. Vaccines make us more money that do antibiotics, with the possible exception of Metaphalaxis.
- Learn statistics
- Learn how to read the literature critically.
- Follow Dale Hancock’s’ approach to data.
- Learn to listen.
- Develop an intellectual network.
- Give away all your “Tasks” to the crew.
- Become a teacher.
- Always have goals and expectations, short and long term.
- Study motivation and how you get people to perform.
- Read “How to win friends and influence People” by Dale Carnegie
- Become an empathetic Coach.
- Learn both how to prioritize and risk assess.
- Learn to utilize the pharmaceutical Companies without getting too close. Image and perception is everything.
- Learn how to evaluate data critically and efficiently. Learn where the “Red Flags” are.
- Build relationships that put you on the decision making team.
- Be a cheer leader when things are tough.
- Learn about successful systems and how to build them and tear them apart when needed. This takes experience.
- Become above average in public speaking and all forms of communication.
- Develop follow through skills with return phone calls and more.
• Learn how to market yourself with magazine articles and public speaking engagements. Most of our growth is still word of mouth. Good work gets 7 good comments and bad work gets 14.

• Position yourself to stay on the leading edge of all technologies even when they do not directly have to do with what you are providing.

• Learn negotiation skills. There are classes for this.
**Dairy Emphasis:** (17)

**Response to specific e-mailed questions:**

1) “Economic competency” (doing the right thing well enough and fast enough) in what 5 to 10 key individual and herd clinical procedures make a new graduate most “practice-ready” and “value-added” to both their client and their employer?

D17:
- perform rectal palpations
- perform lda,rda,c-section
- demonstrate competencies in OB procedures including fetomies
- balance rations for dry, lactating and calf pens
- be able to diagnose repro and milk quality problems from dairy comp305
- be able to necropsy a mature dairy cow unassisted
- write treatment protocols for 10 major dairy cow diseases (metabolic and non-metabolic)

D16:
- Physical examination
- Pregnancy Diagnosis / Rectal Palpation
- Surgery Experience
  - DA
  - C-section
  - Hernia
  - Cancer eyes
- IV injections and blood draws (including calves)
- Fetotomies / Obstetrical procedures
- Necropsies - including calves
- Perform Blood Agar and mycoplasma cultures, incl. interpretation

D15: (#1 and #2 combined)
- Three things - A student who can do the following 3 things will be profitable to the dairy vet, and will give their employer a relief from long hours and emergency duty, something worth more than the time they bill:
  - Bangs vaccination and TB testing: very simple, basic skills that are billable that get a new grad some quality time with clients by themselves.
  - Sick cow work/DA's: to recognize disease and write out a treatment plan. To know when to operate and when to beef. To be able to do a DA surgery by yourself in 45 minutes (prep to close) would be a good goal.
  - Calvings/Fetotomies/C-sections: The bench mark is, whatever you decide to do, get it done within 90 min. Make the correct decision in the first 5 minutes: avoid, "let's try to pull it for a while...that didn't work....let's try a fetotomy....couldn't get all the pieces....let's try a c-section. If you really know the procedures, then you should know immediately which will be the most effective way to go for that particular animal. Unfortunately for new grads, experience is the greatest teacher.
- Palpation skills: 90% accuracy on days preg. Being accurate on day 1 is most important. Speed develops over time. I have lots of patience waiting for the right answer, very little for "making it up" answers. Palpation is the source of a Dairy vet's credibility (right or wrong), until you can do this, very few doors will open for you (unless your services are "free").
- Semen testing: with feed prices rising, the old "just put in more bulls than you need to cover the bad ones" doesn't pencil anymore (if it ever did). It doesn't take a sub-fertile bull many days on feed to cover the cost of semen testing. Should be able to do 5-10/hour.
Motivation to improve your practice: all the other stuff falls into this category. Until you are proficient at the traditional skills, there will be limited opportunity for you in consulting. You will get some credibility from the company you keep, but this window will close quickly if you are incompetent in the traditional areas. If you can get through vet school, it means you have the ability to be taught. Once out of school, you will have to listen and communicate with clients, and begin to teach yourself. However, motivation to improve your practice is not an excuse to be consumed by it.

D14: (these first three questions are interrelated so I will answer as one)

- A rectal palpation at over 50 per hour on open cows with 100% positive preg diagnosis over 40 dslh
- Ability to perform LDA/RDA surgery in under 1 hour with 90% success
- Understanding reproductive programs enough to converse and adapt
- Ability to discern calving problems and make correct judgments
- Ability to perform c section or fetotomy under 2 hrs
- Ability to exam individual cows or necropsy and put together or rule out possible herdwide issues and pass that onto management
- Treat individual animals for problems in a manner that can be shown and explained to owners and herdsmen
- Know industry standards for all areas of the business such as milk price, feed price, animal costs, herd statistics such as for DC305 culling death rates
- Understanding the operation of management programs such as dc 305 or DHIA Plus
- Be aware of industry issues such as animal welfare, BSE, Johnes, CWT program, marketing( BST vs Organic)

D13:

- Able to diagnose pregnancy at 35 post insemination with palpation and ultrasound, ability to palpate for 4-5 hours.
  - It may be impossible to get the endurance factor in school as it requires daily repro exams.
- Obstetrics.
  - We do a lot of fetotomies, due to the economics of a C-section and the historically poor post surgical results. Most large dairies would prefer fetotomies but we do some C-sections.
- Employee training.
  - Be competent in all areas of the dairy so you can help train employees, i.e., milker schools, hospital milk barn training, sick cow training, calving schools. etc. To train employees in these areas you need to have a good "practical understanding" of these positions.
- Vaccination protocols. A lot of different companies have similar products. What is needed is a good understanding of what products are available, their efficacy, their economic viability and when they are needed.
- Surgery. Be able to cut a DA, repair an umbilical hernia or cut a C-section in a reasonable amount of time.
- Records analysis. This should be higher up on the list.

D12: (extracted from text)

- Palpation/Pregnancy Detection - pregnancy status and fetal age down to 35 days
- Surgery with economic assessment:
  - DA – LDA multiple techniques, RDA/RTA
  - C-section
  - Umbilical hernia surgery, enucleation, teat surgery, and laceration repair are also common
- Obstetrics: (crews are very adept at fixing problems on their own and large herd veterinarians are usually only called for worst-case situations)
  - Identify presentation and determine the appropriate method of correction and extraction, while maintaining the integrity and viability of the dam and fetus if alive
  - Fetotomy
• Computer Records Programs
  o Working knowledge of DC305, DHI Plus, Dairy Quest, and Westfalia Dairy Plan
• Cattle Handling and Restraint and cow psychology:
  o Comfortable around cattle to effectively, calmly, and quietly work them (know techniques of
    people such as Bud Williams and Temple Grandin)
  o Effective restraint techniques using ropes and halters
  o Basic chemical restraint protocols
• Spanish language skills – enough said

D11:
• Surgery-DA’s and C-Sections—Able to understand the economic implications of the intervention—
  organized, sanitary with moderate speed.
• Rectal palpation—99% accuracy at 35 DCC
• Quality Milk Program-basic understanding of milking procedures, treatment protocols and records
  monitoring compliance—able to communicate and motivate.
• Reproduction management of synch programs and understanding of input costs and benefits. Able
to view records for results and compliance.
• Interpersonal skills for assuring application of the science and compliance. Able to facilitate group
  action planning sessions.
• Records analysis for programs like DC305 & DHI-Plus. More important to know the right questions,
  they can learn how to discover the answers later.
• Young stock Management-Nutrition, housing and vaccination protocols.
• Forage production and management—basics of harvesting, storage and feed out.

D10:
• Rectal palpation
• Pregnancy diagnosis via ultrasound
• DA surgery
• Neonatal disease workup
• Obstetrics, this would include c-sections
• Routine processing, (i.e., brucellosis vaccinating, dehorning, etc.)
• Herd problem workup (mastitis, respiratory, abortion, etc.)
• Necropsy

D9:
• Computer records – Dairy Comp 305
• Personal skills, including ability to speak Spanish
• Analysis of reproductive issues
• Ability to advise on general production issues: vaccines, milking procedures, milking equipment
  evaluation, fresh cow problems, bulk tank analysis
• Feeds and feeding including ration formulation
• Individual animal medicine includes surgical skill and trans-rectal palpation

D8: (combined 1 & 2)
• Pregnancy detection via rectal palpation.
  As a dairy practitioner, this is the most commonly performed task. Clients expect proficiency
  (100% expected, 95% reality). Without ultrasound, detection should be at 35 days post-service
  (minimum) and with ultrasound 28-30 days post-service. Speed is difficult to quantify because
  there are so many factors that determine speed: coral conditions, body condition of cattle,
  weather, stage of pregnancy, administering injections, tail marking, etc. Most dairymen are
  pretty understanding of speed, especially if you are doing a good job. A 100 cow herd check (no
heats, early preg, big calf confirmations, etc with the vet tail marking and giving injections) should be completed in 2 to 2 ½ hours.

- Pregnancy detection with ultrasonography.
  I believe it is important that dairy veterinarians be able to perform all palpation tasks competently without an ultrasound. There will always be situations when the ultrasound will not be available (malfunction, battery running out during herd check, etc). However, having the ability to competently use ultrasound is important. For me, as a new veterinarian I palpated everything, then on open cows double checked with the ultrasound. I did this for the first few months to improve my accuracy. I still use the ultrasound to double-check pyos, dry cow confirms that don't feel right and difficult/straining cows.

- Dystocias.
  New graduates are expected to be able to deliver or “solve” any dystocia presented to them. This includes being competent with manual manipulations, fetotomies, uterine torsions, caesarean sections (and anything else I forgot). For benchmarks, I think the ability to remove the calf without injuring the cow is the goal. Time is not that important at first as long as the outcome is positive and the dairyman is charged by procedure and not hourly rate.

- Sick cow diagnosis and treatments.
  Upon physical examination, graduates should be able to diagnosis and prescribe legal, practical and successful treatments.

- DA diagnosis and treatment.
  Accurately diagnosing and being able to correct DA’s is important. Some dairymen prefer surgery (vets choice to technique) and some like roll and toggles. I think it is important to be able to do both and offer both techniques and be able to explain the pros and cons of each to the dairymen. Surgery should be completed within an hour, roll and toggle 15-30 minutes.

- Brucella vaccinate, tag and tattoo
  It is important to be able to administer brucella vaccine, apply a readable tattoo and a tag that will stay in the ear (without any warts). A reasonable rate of 50-75 calves per hour when in lock-ups.

- General: administer vaccinations, injections and treatments SQ, IM, IV and general cow handling skills.
  Benchmarks: know how to give all injections types without causing pain/ damage (abscesses, etc) to animal. Be able to work cattle without upsetting them, or causing injury to animal or human.

**D7:**

- Physical Exam - able to detect abnormal uterus, mammary gland, GI, Lungs …
- Palpation – able to detect and age pregnancy
- Ultrasound – detection of pregnancy past 28 days, detection of abnormal uterus- metritis
- Communication – able to provide options and discuss solutions to issues without sounding arrogant or undereducated –
- Pharmacy knowledge – understand the biology of pharmaceuticals and how they impact cow health, the farm economics and the public health
- Basic nutrition – with an emphasis on how cows or other large animals are fed and what is normal feeding practice – they don’t need to know how to balance a ration
- Obstetrics – experience and thought as to how to provide a safe, healthy and economic outcome to problem birth.
- Surgery – Experience with different LDA procedures, the process of a C section, Claw amputation,

**D6:**

- Palpation of pregnancy and ovarian structures
- Reproductive ultrasonography
- Thorough physical exam
- LDA surgery
Management of dystocia
• Fetotomy
• C-section
• Placement of IV catheter

D2: combined with previous (phone call)

Critical skills - Initially ability will be judged by producer and new employer by:
• Palpation skills – be able to accurately palpate a 42 day pregnancy accurately at a rate of at least 30 per hour.
• Ultrasound skills – I do not care for any ultrasound skills UNTIL new graduate is proficient in palpation skills FIRST. Have seen new grad unable to palpate because they were only taught ultrasound which is not economically and practical in commercial large scale dairy operations.
• Obstetric skills –
  o Have been taught a systemic approach to dystocia and a complete knowledge of normal parturition.
  o Know how to properly administer an Epidural within 30 sec.
  o Knowledge of all OB instruments with uses and limitations. (Many new grads don’t know OB equipment and how to use it).
  o Knowledge of fetotomy procedures with indications, methods, and limitations.
  o Knowledge of C-Sections with indications, methods, and limitations.
• Basic Surgical Skills
  o Knowledge of all surgical instruments, names and indications for use. (Basic surgical equipment handling)
  o Ability to correctly attach suture needle to suture material
  o Proficient in all surgical knots and suture size selection
  o (Basic suture patterns and manipulation – sponge board practice)
    ▪ Everting, inverting, interlocking, Connel, Cushing, Utrecht
  o Approaches and some experience in specific procedures: LDA & RDA; eye enucleation; bleeder control; basic teat procedures; c-sections.
• Physical exam proficiency
• (Basic sick cow work)
  o LDA, RDA diagnosis and treatment
  o Hardware
  o GI diagnoses and management

D1:

When I joined the mixed animal practice after my internship immediately I was expected to know and perform well:
• Palpations (fresh cows, early preg (>40 days), and confirms(>150 days) as well as bull bred (guessing the days))
• DA surgeries and toggles
• C-sections
• Uterine prolapses
• OB cases (including uterine torsions)
• Treating cows with diarrhea, pneumonia, mastitis, metritis, lameness, milk fever, ketosis, retained placenta, etc.

2) What are the minimum performance benchmarks for these?

D17:
• rectal palpations: 40 hd/hr with 99% specificity on open cows and 96% accuracy on conception dates (i.e. the cow calves on the cycle or date given)
• Ida’s, rda’s, c-sections: 75% 12 month survival
• ob’s: full fetotomy in less than 2.5 hrs
• Necropsies: <1 hr

D16
• Physical exams - Diagnose with reasonable accuracy which systems are experiencing problems (RUMMBA) in less than 15 minutes. Primarily without clin path support.
• Pregnancy Diagnosis - Greater than 90% accuracy at diagnosing greater than 40 day pregnancies at a rate of more than thirty cows per hour. (Speed not that critical)
• Surgery:
  o DA - Perform solo in less than 1.25 hours. Truck to truck
  o C- Section - Be comfortable performing, speed not initially critical.
  o Hemia - Be comfortable with procedure should be less than 1.25 hrs.
  o Cancer eye – enucleation - Experienced, less than 1 hour
• IV injections - Less than 5 minutes to hit jugular vein.
• Blood draws - 10 calves in less than 30 minutes.
• Fetotomy - Full 5 cuts in less than 2 hours, know the procedure well
• Necropsy:
  o Less than 45 minutes on cows.
  o Less than 30 minutes on calves.
• Read Blood Agar and Mycoplasma cultures
  o Greater than 80% accuracy at Genus diagnosis from colony morphology.
  o Greater than 60 BA cultures per hour.
  o Greater than 150 myco cultures per hour

D15: (see above)
D14: (these first three questions are interrelated so I will answer as one – see above)
D13:
To be honest most of these benchmarks would be hard to reach in school. We have been trying for two years to hire someone as are all the practices within 200 miles. I think the new grads need as much experience and exposure as possible. But when it comes right down to it the clients we deal with are very large (2,500-10,000 milking cow dairies) and are multi million dollar operations. What we need is someone who has a good knowledge, is a very hard worker, is capable of working around the cows safely and is able to communicate with the client. We had a 4th year student riding with us that had all experience in the world and yet still put himself in very life threatening situations behind the cows, was not very warm with the clients and his communication skills were minimal. None of our clients are going to trust a new grad right out of school regardless of experience so they need time to get the training wheels on. Our clients trust us to find and train them. What we need is individuals that have the book knowledge, are hard working, have a strong desire and interest and we will get them the rest of the way. Any extra experience is a plus. I don’t think you need to kill yourself getting better ag grads. What is needed is getting more ag animal vets to enroll in vet school. But we can’t even find individuals with the minimal qualifications right now. I think there are 15 jobs for every new grad out there.
D12: (extracted from text)
• Palpation/Pregnancy Detection - arrive at a diagnosis within one minute
• Surgery - uncomplicated LDA surgery from “truck to truck” within one hour
D11: (see response above)
D10:
• Palpate competently 50 cows/hr in lockups and 30/hr in barn
- Know the procedure for ultrasound and be comfortable with the view of structures on the screen. Developing the ability to sex embryos would come with practice experience.
- DA surgery skin to skin in about 45 minutes with min 90% success rate
- Know the common neonatal diseases and be able to do necessary testing that would provide the most value to the client.
- Be able to diagnose fetal malpresentations quickly and make the decision for c-section earlier rather than later as this greatly influences surgery success. C-section in 60-90 minutes. Breed back in Holsteins post c-section I’ve decided is a crap shoot, so I wouldn’t put any benchmark percentages there.
- Routine processing vaccinating alone--20-40 calves/hr (highly dependent on facilities)
- Vaccinating in combo w/ dehorning-- 10-15 calves/hr (includes pulling arteries, but may not include blocking)
- Able to initiate a herd workup plan and implement in an economic manner
- Perform necropsy on animal, collecting required samples in under an hour

D9:
- Computer records:
  Be able to effectively navigate the “bredsum” and “econ” commands. Other programs aren’t even worth mentioning, a monkey can figure them out in minutes. Analysis of the dairy’s situation by the others including DHI are inadequate. Every student should participate in Minnesota’s DC-305 course
- Personal skills:
  Clients don’t care what you know until they know you care. Levels one and two of Rosetta Stone CD-ROM
- Reproductive issue analysis:
  Until the practitioner has looked at the Dairy Comp, and asked all of the farm’s workers, he probably won’t be able to figure what is causing the problems with infertility. This area has been controlled by the veterinarian for a long time, this is expected to be our specialty, lets keep it that way.
- Advice on general procedures:
  Students need to spend at least a month, as an employee on a progressive dairy, in order to start to be able to form opinions that will matter to a client. Dr. Wayne Ayers has started an IBVEP that is just the type of thing that these students need. Milking procedures, obstetrical procedures, feeding procedures are taught very well by Wisconsin and Minnesota CVM on clinical rotations, WSU needs to imitate or send the students.
- Feeds and feeding:
  Once practitioners graduate it is very difficult to gain sufficient knowledge in this area. Students should be able to create a ration that is found on a dairy, and not in a lab. I’m not sure what is needed to accomplish this, I’m still trying to gain this knowledge.
- Individual animal skills:
  Least important of all of them, I’m not sure that this knowledge will be necessary five years from now. Surgical skills are addressed in small animal and they do a really good job of teaching them. Key to trans-rectal palpation is stamina, students cannot develop this in school. This skill should be de-emphasized and students should be discouraged from wasting time trying to accomplish this in school. We can give them all they need to know in the first 14 days of practice. This is the biggest problem that I see as a practitioner, students are so focused on this skill that they are handicapping themselves and cannot see it. Lets spend time on the other skills, these are all taught in a small amount of time once employment begins.

D8: (see response above)
D7:
- My thoughts on minimums:
  - Physical exam – 6 cows per hour
• Palpation – 40 cows per hour >95% accuracy
• Ultrasound – 30 cows per hour > 95% accuracy
• Communication - ?
• Pharmacy knowledge – dosage and withdrawal on penicillin, ceftiofur, flunixinmexine, aspirin, hyperonic saline, Ca P IV preparations, dextrose, tetracycline, sulfa dexamethasone
• Nutrition – can perform a Penn State Shaker Box test in 15 minutes, Can identify common feedstuffs
• Obstetrics – person knows the normal process of parturition and when to intervene, knowledge of fetal positions,
• Surgery – can perform a LDA with one procedure in 90 minutes, can perform a C section in 120 minutes

D6:
• 95% accuracy on pregnancy diagnosis by palpation at 35 days, aging of fetus to within 5 days between 35 and 90 days and to within 1 month between 3-9 months while palpating at least 50 cows per hour. Identification of follicular cysts, follicles and CL’s.
• 95% accuracy on pregnancy diagnosis by ultrasound at 28 days and able to confirm presence of fetal heartbeat on fetus between 30 and 75 days while scanning at least 50 cows per hour. Accurate identification of ovarian structures.
• Able to perform a thorough physical exam and explain disease process and rational treatment plan to owner/herdsman. Must be able to identify LDA, RDA, hypocalemia, dehydration, metritis, pneumonia, ketosis, traumatic reticulo-peritonitis, Johnes disease
• Able to perform LDA surgery with proper sterile technique with 1.5 hrs by at least 1 approach. Knowledge of all surgical approaches to LDA correction.
• Able to identify and correct abnormal presentations, identify when fetal extraction will injury dam and C-section or fetotomy is indicated
• Knowledge of cuts needed and able to perform fetotomy
• Able to perform uncomplicated C-section within 2 hours with survival of dam
• Able to prep and place IV catheter on dehydrated neonatal calf and begin fluid administration within 1 hour

D2:
Be able to perform with Accuracy and reasonable speed.
• Palpation 30 per hour minimum with sizing of pregnancy to at least 42 days
• Dystocia – 2 hours max
• C-section – 2.5 hours max with utilization of a peritoneal lavage. SUCCESS DETERMINED BY ABILITY OF COW TO ENTER HERD AND MILK NOT BREED (WILL BREED IF WILL MILK 1ST)
• Eye enucleation – 1 hour max

3) “Economic competency” (rapid, efficient, minimum cost approach yielding practical results) in working up and making herd-specific recommendations for what 5 to 10 herd problems make the new graduate most “value-added”?

D17:
• low production (i.e. low peak milk or poor persistency)
• poor reproductive performance
• acidosis and/or high incidence of lda’s
• lameness
• mastitis
• high calfhood mortality <14 days,14-60, or >60 days

D16:
• Mastitis rate / high Somatic Cell Count
• Calf Scours - Including colostrum management
• Bovine Respiratory Disease - Including immunology and vaccinology
• Low Pregnancy Rate - Heat detection rate and/or conception rate
• Low Milk Production
• Fresh cow disorders/removal
  o DAs
  o Milk Fever
  o Retained placenta / metritis
• Rumen Acidosis
• High Dead On Arrival (DOA) rate

D15:
• Calf barn mortality/morbidity
• Transition cow problems
• Ration troubleshooting
• Lameness
• Mastitis
• Dairy Employee Training
• Poor Reproduction
• Poor Production
• Posilac Rehab Therapist

D14: (these first three questions are interrelated so I will answer as one – see above)
In dairy practice reproductive issues are the backbone and groundbreaking issues. They allow a newbie to interact and gain the trust to be asked the other questions that lead to consulting roles. Even if they are more versed in knowledge that us seasoned practitioners have, they have not built up the bond of trust yet to have herd issues placed in their hands. Having the knowledge when that window of opportunity arises is important as is the ability to understand how the industry works. Training herdsmen with every call (and learning from their experience) will lead them to trust you, which will translate to them providing that feedback to the owners/managers.

D13:
• Reproduction programs and Records analysis
  o This is a constant changing thing with timed AI programs constantly being tweaked and every herd's management being different.
• Evaluating cull rates and finding ways to keep more cows longer
• Vaccination programs, how to manage and to prevent disease and save the client money
• Calf ranch management (see all three above)
• Fresh cow programs because this is where cull rates are the highest, probably more appropriately called Transition cow programs.

D12: (extracted from text)
• Whole herd problem diagnosis of:
  o DA incidence
  o increased milk fever incidence
  o increased retained placenta/metritis incidence
  o milk fat depression
  o milk yield drops
  o clinical/subclinical acidosis or ketosis
  o abortion storms
  o pneumonia outbreaks
- lameness problems
- dry matter intake depression
- decreased fertility/pregnancy rates
- mastitis problems (environmental and contagious)

- Common areas needing improvement on farms (or opportunities to make a living without palpating all day)
  - Reproduction: students should have impeccable knowledge of:
    - the reproductive cycle
    - common programs (e.g. OvSynch) used to manipulate it and problems not limited to the cow’s physiology that can affect reproduction.
  - Cow Comfort - knowledge of facilities design and upkeep and cow psychology to improve cow comfort.
  - Heat abatement strategies.
  - Employee training and monitoring of protocols - Spanish language skills are invaluable for teaching and gaining rapport with the employees.
  - Milk Quality – can include everything from microbiology labs to milker training to protocol development to facilities evaluation—endless opportunities

- Vaccination Protocols:
  - Dr. Evermann has a good philosophy that will serve new grads well in getting started.
  - Know what we want to vaccinate for (what are the typical problems we want to avoid and/or what are the problems specific to the farm?) and what type of immunity is required for the problem/bug in question

D11:
- DA Surgery
- Adding cows
- Improving conception rate and pregnancy rate
- Cost of high SCC
- Heifer rearing costs and age at first calving
  - Dr. Dave Galligan and Dr. John Fetrow have been developing partial budgets for years. Students need to be exposed to the best, learn from this core information and begin to develop their own partial budgets to answer specific questions. Dr. Galligan is using a program called Dashboard to communicate the results of some very sophisticated spreadsheets.

D10:
- High DA rate
- High bulk tank somatic cell count
- High neonatal morbidity/mortality
- Low conception rate
- High lameness rate

D9:
- Reproductive Issues, “why can’t we get these cows pregnant”
- Transition Cow Disease Prevention, this includes cow comfort
- Mastitis Problem Investigation, this includes milk machine maintenance
- Ration formulation and feeds acquisition
- Lameness scoring and evaluation

D8:
- Vaccine protocols for the entire herd: newborns, calves, heifers and adult cattle for reproductive disease, respiratory, mastitis and possibly salmonella and newborn diarrhea.
- Reproduction protocols:
pre-synch, DIM for 1st service, ovsynch, cidrsynch, etc.

- Records analyses:
  - Reproductive parameters: PR, CR, etc
  - Milk production: by string, by lactation, etc
  - Sick cow rates, culling rates, abortion rate, etc

- Mastitis management and treatment protocols

**D7:**

- Reproduction – monitoring and instruction on the management of the following
  - Palpation and U/S skills to a level which enable further recommendations to be made – beyond pregnant or open
  - Bull Breeding -
  - Heat Sync. Programs
  - AI timing and Heat detection

- Mastitis
  - Fresh cow culture evaluation and treatment/prevention program
  - Bulk Tank culture evaluation
  - Instruction and evaluation on milking time procedures

- Fresh cow treatment and Evaluation
  - Examination and implementation of programs to keep fresh cows healthy

- Nutrition
  - Feed bunk evaluation – to be able to detect the difference between good feed provision and poor feed provision to animals
  - Urine pH knowledge – to be able to make diet recommendation based on urine pH of close up cows
  - Rumen pH – to be able to decide if SARA or clinical acidosis is an issue

**D6:**

- Calf scours outbreak or chronically high calf scours incidence
- High herd LDA incidence
- High incidence of metritis in fresh cows
- Chronically high calf pneumonia incidence or calf pneumonia outbreak
- Variable manure consistency and poor performance in milk cows

**D2:**

Overtaught in schools. New Grad MUST be able to perform routine procedures confidently and with competency in a reasonable timeframe or will NEVER be allowed to progress to the next level by producer.

**D1:**

- Because of my training [MS in ruminant nutrition – JMG] I helped a little with nutrition as well, but I don’t think that would make my top ten list of skills to be good at. A little understanding I feel is sufficient for a new grad.
- An area that I needed to be good at and it was something that I felt very inadequate about was calves
- I put prevention at the top of the list. That includes vaccination programs (type of vaccine and timing) for cows, calves and feedlot heifers, colostrum management, transition cow management, cow comfort and movement.

4) What specific experiences outside the traditional on-campus curriculum and for how long would maximize the “practice readiness” of new graduates? Where and how can students best obtain these?

**D17:**
Ride with a dairy vet and:
- palpate 200-400 cows per day for 20 days (4,000 to 8,000 cows)
- do 5 supervised (and hopefully un-assisted) Ida's and 2 c-sections

D16:
- Milk Quality Workshop - 2 weeks min., 4 weeks better with private practices specializing or university such as Cornell’s Summer Dairy Institute.
- Nutrition workshops
  - 2 weeks min, either with private practices or university
  - Examples; Van Saun – Penn State, Grummer- U Wisc.
- Calving Block - 2 weeks, U Minnesota Transition Management Facility or large dairy
- Fresh cow treatment crew on large 3000 + cow dairy - 2 weeks
- Palpation “time” - With private practices 6-8 weeks (including preceptor)

D15:
Working on large (5000+ cows) farms, WITH the hired labor would be the best. Spend two weeks in the maternity pen, the milk barn, the calf barn, with the breeders, with the hospital crew, etc. Do the same rotation on a couple of different operations and see how one size does not fit all. Vet school does a good job of demonstrating disease, but a poor job of “normal” repetition. I have heard good things about the Cornell summer Dairy Institute (would recommend going into Junior year) and we sent one employee to Dr. Shearer’s course for a month. Lastly, preg check every chance you get, and appreciate each different vet’s communication style.

D14:
- Farm experience is essential - learning how to operate around cows and employees. I would recommend for all non-farm raised vets.
- Attending AABP, the workshops more so than the general meeting - much more intense and meaningful

D13:
Students entering dairy practice need to spend at least 2 months on a private dairy working for two weeks in each area - Calving, Calf ranch, Milker, Hospital barn, Hospital worker, Breeder, etc. As palpation goes away from the Dairy vet because we can not supply the vets, a consultant role will replace it and then it will be essential to have an excellent understanding of the inner workings of a dairy.

Talk to XX, 3rd year at WSU, on what she has done from the summer before vet school as this is what all future dairy vets should do. We would hire her in a minute because she has been on multiple dairies and rode with >10 different vets in multiple states.

D12: (extracted from text)
For the student to gain exposure/experience/competency in these skills, spend time away from the hallowed halls:
  - Spend at least one month with a large herd practice engaging in palpation every day and learn to palpate with both arms at an early stage to prolong their careers
  - Spend a few weeks with the calving crew of a large herd
  - Think about spending time with a beef practice as they typically see more C-sections than we do

D11:
- Spend two weeks on large dairy emerged with the herdsman and hospital crew.
- Spend two weeks with a consulting nutritionist and herd’s nutrition foreman.
- Spend two weeks on a well managed calf ranch
- AABP Pre-Convention Seminars, i.e., Heifer rearing, Record Monitoring, Dry Cow Nutrition

D10:
For me, my preceptorship in Sunnyside w/ Dr. Wedam gave me the most benefit. This was 4 weeks long, but would have been even better twice that long. Four weeks on a large dairy would be very valuable for any student interested in dairy practice.

D9:
- Mastitis Problem Investigation, Transition Cow, and General Dairy Production Blocks at U-W Madison
- Spending a month in Mexico to learn the language that is so vital to dairies
- Dr. Ayres’ IBVEP these guys are on the right track

D8:
I think this will vary for each student depending on their skill levels and goals for practice. In general, the first few skills listed above should be addressed. The current month long preceptorship in 4th year address some of this skills, however, if they could be addressed earlier in school, the preceptorship could be used to ‘fine-tune’ the skills for practice.
Palpation- I believe it just takes time to become competent. Any time students can get practice, they should.
Dystocias- I believe training was lacking here for me. I knew the basics, but hadn’t had the opportunity to practice them much. If students could even spend 1-2 weeks with the calving crew at a 3000 cow or greater dairy it would help.
Records Analysis- Spending a week or two with consultants, industry veterinarians or vets that do a lot of computer analysis would give students the training they need.

D7:
Work on at least one if not multiple Farms- 2 weeks – to understand the day to day normal operation

D6:
For students interested in dairy practice, spending 2 weeks working on the calving crew of a 10,000 head dairy, attending Dr. Jan Shearer’s lameness workshop and the Cornell Summer Dairy Institute, [to this the practitioner added – JMG] spending at least 2 weeks per summer in externship with busy dairy practices (several different ones) during first through 3rd year summers and another 2-4 weeks during senior year.

D2:
It would be great to have lots of palpation and dystocia experience BUT I feel someone should teach them the correct procedures before dumping them in a calving barn with lay dairy employees.

5) What emerging technologies or opportunities should new graduates prepare for while in school?

D17:
- emerging technologies: amino acid balancing in lactating dairy ration.
- Complete a MS IN DAIRY NUTRITION at WSU Animal Science even if it requires an extra year (or two) at WSU

D16:
- Dairy records
  - RFID
  - Dairy comp/DHI Plus
  - EZ Feed/Feed Watch
- Non-Traditional (Non-Palpation) pregnancy diagnosis methods
  - BioPRYN
- Feeds Costs; Analysis and management
- Parlor Technology
  - Robotic Milkers
- Employee Training
  - How to teach others diagnosis and treatment skills
  - Basic Spanish
• Financial understanding of dairy management
• Estrus synchronization programs
• New vaccine technology; needless, intradermal, intranasal

D15:

Technologies:
  o Computers: spreadsheets (Excel inside and out), DairyComp, DHI-Plus, finding resources on the internet.
  o Sexed semen conception keeps improving.
  o To make ultrasound “work” on big dairies (>4000 cows), it will have to be run by the employees, so understanding this technology is important, but I can’t see myself using one on a routine basis. I have one client whose employees run the ultrasound, it hasn’t improved reproduction (not a timed-AI herd), but I do check fewer cows, which is always a good thing.

• Opportunities: Efficiency of production (with base/quota programs being instituted in many co-ops, the old “just add more cows” solution is no longer viable). Also, rising feed costs demand more efficient animals and labor. bST-free milk marketing also fits into this opportunity. Our practice has grown the most when milk prices are the lowest.

• Another opportunity is the “extra-label” ban on ceftiofur, any chance to revisit old hospital paradigms is an opportunity to improve.

• Another opportunity is the rising public interest in animal welfare.

D14:

Good question but hard to answer as they are emerging means they may not turn out to be relevant

D11:

Focus more on nutrition, reproduction and heifer raising. These are the opportunity areas that have the largest potential returns on most dairy operations. The science and technology are important but secondary to communication and leadership. Nutrient management and environment compliance will also be opportunity areas.

D10:

I see ultrasound as the wave of the future for preg testing cows. Also, some dairies are using the available blood testing for preg diagnosis. Veterinarians are going to have to prove their value as more than a palpator or they may be phased out by the economic crunch.

D9:

Be able to interpret ultrasonographic images including fetal sexing. Brad Stroud has a video on fetal sexing that helps with this situation

D7:

Ultrasound – cost effective use
Vaccine technology –
“Green” Technology

D2:

I think it would be interesting to have a class in “Current Affairs of Industry of Interest”. The world changes constantly. I had a class in high school on Current Affairs which consisted of reading newspapers and magazines and then discussed the future problems, implications, and possible broad solutions. This type of course for a specific industry would be the best approach to something like this since these problems and technologies are in constant change.

6) What particular weaknesses do new WSU graduates have relative to those of other schools?

D16:

Interesting that these mirror many of the important areas listed in #2, 3, and 4.

• Ruminant Nutrition
• Mastitis/Milk Quality
• Lameness training
• Records analysis (May have improved with Wenz)
• Facility Design
• Calving experience
• Sick cow diagnosis and treatment (is probably similar to other schools)

D15:
I haven’t seen enough WSU students to comment on this question. However, I am rapidly developing a “west of the Rockies, or south of the Mason-Dixon” bias, which is less a reflection of new grad skill and more of a personality preference. I still think you hire people you enjoy working with who are, above all, motivated to learn; the rest can taught (I can’t teach personality and I am not a motivational speaker).

D14:
General cow experience

D13:
Minimal records analysis, OB work, time on private dairies. I don't think WSU graduates have many weaknesses and from what I have heard Dr. Chris Schneider has really tried to change the ones they have had in the past.

D12: (extracted from text)
• WSU students are severely lacking in training in Palpation/Pregnancy Detection
• WSU students surgical skills/tissue handling skills are generally poor to fair

D10:
I can only compare myself as a WSU graduate to two associates I have had that were hired as new grads. One graduated from Colorado State and the other from Wisconsin. Overall, I feel I was trained every bit as well as the CSU grad and feel like I was better prepared for practice than the Wisconsin grad. The place where I feel WSU could improve is to somehow get the ag animal students more hands on experience, either through increased preceptorships or externships, since the ag animal clinic caseload is relatively small.

D9:
Our practice has the opportunity to spend time with at least ten students a year that come through the Caine Veterinary Teaching Center. WSU students are lacking skills in computer records, personal skills, analysis of reproductive issues, ability to advise on general production issues and in feeds and feeding. They are fairly competent with most of the skills in individual animal medicine and surgery except palpation, which they are very focused at mastering.

D8:
While practicing in California, I’ve heard nothing but complements about students that had graduated from WSU.
Cow sense and cattle handling skills are one area where I believe all veterinary schools are lacking, especially because many food animal veterinarians were not raised on farms. I know this skill is difficult to teach, but I believe we need to continue to work on this area.
The one area I have always felt was lacking was records analysis. I worked with vets that graduated from UC Davis and U Penn. Both were more knowledgeable with records analysis. The one from U Penn was extremely knowledgeable.

D7:
Lack of a herd production medicine experience – not instruction – experience

D6:
Palpation experience/ accuracy and exposure to adequate caseload to be able to become competent at surgeries and calvings have been the weak area of WSU students’ training.

D3:
A school’s greatest asset for information of this sort is its recent graduates - have them report back at 6 months / 1 year / 2 years / 5 years on WSU training and practice readiness.

D2:
My experience that WSU students has been better to some degree with the experience problem BUT all new grads from all schools that I have been exposed to have not been taught the BASICS of practice and the consultant mentality has been overtaught.

General Responses:

D16: (extracted from accompanying note)

There are some intellectual areas I think are more important than "skills" that are not really covered here such as immunology, nutrition, epidemiology, etc, though some are. I tried to tie these into your points as well, but I think some of these are more important to me than how many cows can you palpate per hour. Speed on many of these skills is not nearly as important as having done them (C-section, DA) or being accurate (preg diagnosis).

Also, every time I read these skill lists I struggle with the idea that we should have a list for cow/calf and feedlot as separate areas. These are very intertwined and WSU students have a long way to go in quality of cattle education before we need to separate these two areas. That is; I’d be happy to see Beef medicine and skills taught of any sort vs. small animal and anesthesiology. WSU really has the cart before the horse if you’re going to separate feedlot out. Those students would be lucky to see a calving block even if they are into feedlot and it doesn’t really apply. Maybe I’m off base here, and Texas A&M or some plains school may be able to specialize students by industry, but I think WSU would be good to have a list of ‘beef skills’ to set as a goal right now. My 2 cents.

D12: (extracted from text)

Advice to students not necessarily related to specific skills

- Have a good general knowledge and interest of the industry and operation so you can understand and address your clients’ needs and concerns. Read trade magazines.
- Check your ego at the door. This can be a humbling profession at times. Don’t think you know everything or can accomplish everything in one day. Often times the dairyman knows a heck of a lot more than you about his cows and operation. Listen and ask questions. If you don’t know something, admit it up front, and try to find the answer (i.e. Don’t B.S.). Many times there is not a quick solution to a problem and progress can take time and be limited by money, facilities, personnel, etc., or all the above. Depending on the client, it can take two or more years before enough confidence is gained by the dairyman in you to listen to your recommendations.
- Remember that the dairy community is very small, and your actions/words are often relayed to other dairymen. These guys do talk to each other. If you want to have a long career in this business, don’t gossip about other dairymen, keep your mouth shut, and don’t burn bridges with clients, nutritionists, dairy employees, equipment dealers, salesmen, etc. You are one part of a large team, with the goal of improving your clients’ operations.
- Show up for work and be on time. Work hard when you are on the farm. Most times you are charging by the hour, so don’t waste your client’s money when you are there. This is also important to your veterinary employers.
- Try to maintain a clean and neat appearance. Don’t show up with dirty coveralls and boots. Try to wash your truck once in a while.
- Maintain a good relationship with the state/federal entities. Complete your regulatory paperwork fully and in a timely fashion. You never know when you may need a favor from these people and they will tend to help you out if you keep your ducks in a row.

D5: practitioner & dairyman:

I’ll take a stab at this but as you probably well know I am not in the mainstream on this issue. I think it is unlikely that many new grads will be "value added" herd problem solvers until after a period of total immersion in their chosen industry as traditional "bugs and drugs" veterinarians. I think exposure in the curriculum to population medicine, epidemiology, farm economics, etc is good, but given the limited time available I still believe that a primarily medical education with comparative aspects (large and small animals, ruminant and monogastric, etc) is still the most valuable part of the degree. Here students must learn to collect and analyze information, formulate a treatment plan, and monitor progress or outcomes. When they get good at this they use this same system on herd and business problem solving. Thus the most important things as I see it are to select energetic individuals who have intellectual vigor, who are emotionally
engaged, committed, and who have learned how to learn. We can take it from there in the field. Of course selecting these individuals is easier said than done.

That being the case, I expect a new DVM or intern to have enough basic science and medical education to diagnose and treat most common diseases (infectious and metabolic) of cattle. It would be nice if they had command of some of the techniques that would include some palpation, surgery, sample collection. It would be real nice if they had spent enough time close to the industry they hope to serve to understand what the basic premise is and what is likely to lead to or preclude profit in that industry. Some schools have enabled this better than others. The Davis program early in the curriculum supplements students who work in or observe the dairy industry. SDI at Cornell is another great program. Good mentors at their first practice is probably most practical.

As far as emerging issues, I think nutrition and business skills will determine who holds dairy assets so maybe after the DVM they should get an MBA and PhD in nutrition or prepare to learn in the school of hard knocks.

The shortcomings I have seen in WSU interns or grads are mostly related to attitude and appetite for what we do. Perhaps this is a generation thing but I think that if you pick the right applicants, you will get the right end product.

**D4: Mixed practitioner, dairy emphasis**

This is kind of a tough survey to fill out because I have a mixed large animal practice....in addition, the food animal industry has become so specialized, yet highly variable in the skills that they want depending on practice area. For instance, the skills needed in Wisconsin where I practiced are very different than out here in the West, even though they are both dairy practices. I believe the more important pre requisite for students is to have industry knowledge, practical animal farming knowledge, and knowledge of the “local” animal ag culture where they will practice. This will vary depending on the practice area. For instance, if you are in California, you might not need to know how to trim a hoof or treat mastitis. But you better know the concept behind it. I used to think that doing a DA surgery was an important skill....but I only do one a week now.

After reviewing your previous surveys [the Illinois and Missouri surveys – JMG]...I find no major differences in my rankings....so I am going to cop out a bit on this survey....other than to say this:

A graduate food animal veterinarian needs to be able to DO everything that a good herdsman can do (IV, pump cows, trim feet, give injections, etc.). The only way this can happen is for them to spend time at farms working. If a client realizes that they know more than the vet, then they will not use him or her. Basic animal HUSBANDRY is what is needed for mixed practices or food animal practices that service small to medium farms. If you are working for [a 10k+ dairy herd – JMG], palpating three hundred cows in a day is important.

Things to think about in the future? Not sure about this one, other than it is always changing. If a food animal grad can think logically through problems then they can work with small low input farms, centralized industrial farms, pasture based farms, CAFOs etc. I am not sure which type of animal agriculture will emerge from the changing economy, but I know that I can adapt. If you have industry knowledge, general knowledge of agronomy/economics/social/environmental issues etc. you can better anticipate changes and stay ahead of the curve.

The only thing that WSU is handicapped by is that it is in the middle of wheat fields. The individual clinical cases for students are not available….unless you consider alpacas a food animal (which I don’t….and I do a lot of camelid work as well) like they would be at other vet schools closer to farms. In the end, it doesn’t matter if students have good opportunities outside of the college, working with food animal veterinarians who are forward thinking and have good critical thinking skills.

Sorry about the rambling. I think your idea about gaining early competence in specific skills is excellent....in fact that is what I am trying to do with some prevet students before they get to you....but again, the best way is repetition, and the best repetition can occur on some of the large operations....then when they feel they can pull a calf, hit an IV, diagnose a pregnancy they will feel more confident. Then they can apply this knowledge to smaller farms and different situations after you teach them the REALLY important stuff like epidemiology, statistics, nutrition, disease investigation, etc....

Also one more note: I have my food animal prevet students read the trade journals religiously (Dairy Herd, Progressive Dairyman, Beef, etc......). If I had a group of food animal students at WSU, I would sit with them once a week over coffee and discuss what we have read. Even the advertisements are helpful in preparing students. Just a thought
D3: (summary of a phone conversation on the questions)

For large herd dairy practice, new graduates can cash flow by doing lab work, calfhood vaccinations, filling out health papers and assisting with herd checks while getting on-the-job training with experience vets. The income from large herd clients is so important to the practice that they don’t send new graduates on calls to such herds by themselves for the first 6 months so initially new graduates do not have a lot of independence.

An area that students could easily develop an expertise in early in school that would help them go a long way toward paying for themselves is milk microbiology. Being less than 1% of veterinary microbiology, milk microbiology as a result is generally not taught well enough by veterinary schools. Different areas of the country, such as Minnesota, Wisconsin and Cornell, have developed procedures appropriate for the herds in their region. A good resource for students that covers the basics is the paper on on-farm milk microbiology in the Proceedings of the NMC Visalia Summer Meeting (2007).

Students would benefit from spending 2-4 weeks on large dairy farms (those calving 30-50 cows per day) working with the calving crew. They need some instruction to orient them first but they would get valuable hands-on calving experience and very valuable experience working with farm labor, most of whom are not fluent in English. In his experience, dairy cow calving is different and more difficult than beef cows and dairy cows need close supervision even when well managed.

Large dairies are rapidly adopting Electronic ID and protocol-based timed AI programs with sexed semen because these are the most efficient breeding programs. To gain skills students should spend 1 month working with the breeding crew on a large dairy using such a protocol-driven program. Because dairy help is under the gun to get a lot of work done, they don’t have time to analyze the data they generate so students would have the opportunity to gain a lot of valuable skills working with the data and the employees. Training and working with specialized labor takes experience, particularly those not fluent in English. Ultrasound will be involved much more in these programs. Students don’t graduate with sufficient ultrasound skills but they can become proficient much faster than they can with traditional rectal palpation. Students need arm stamina and experience scanning pregnancies.

The endgame isn’t just becoming an experienced palpator. The large herd side of the dairy industry just keeps innovating, presenting new opportunities for veterinarians. Large dairies need veterinarians who can oversee and train specialized dairy employees. The end result is a veterinarian who knows how to develop protocols and understands teaching techniques and procedures for employee monitoring and reporting to management. Veterinarians are a resource to management to help manage segments of the dairy. These segments are:

- Milking management
- Breeding management
- Maternity management
- Calf management
- Colostrum management

Excellent computer and software skills are valuable assets for new graduates involved in this. Lots of technology could be implemented by computer literate new graduates who know how to do data entry and analysis. One way to gain these skills might be to do an internship with Valley Ag Software (DC305).

An emerging opportunity is aggressive lameness control programs because large dairies can generate high returns from these. Jan Shearer’s lameness program is excellent; others promote unfounded techniques. Their practice encourages each large herd to buy an Appleton Steel Hoof Trimming Chute. These chutes are ergonomically good for both the operator and the cow and enables hoof trimming in a fail-safe, accident-free manner. Trimmers using traditional chutes end up with back problems.

The Cornell Summer Institute is excellent but attendees suggest to obtain maximum benefit new graduates should spend a year in practice first and then go.

The dollars on large dairies are so big that management relies on specialized informed people for many things, such as accounting and commodity buying. To gain a sense of this business, students might attend a seminar by one of the specialized accounting firms [e.g, Genske, Mulder & Co. - JMG]. In these large herds, this is beyond the veterinarian’s role but they may be involved in smaller herds.

D2: Thoughts on Veterinary Education:
1) Most schools do not understand the requirements of a good practitioner because they themselves are not ones. This is no fault of theirs. The system selects researchers driven to publish even at their clinical levels. Most have never had to feed themselves in the real world nor satisfy the public.

2) I do not agree with the approach of intense species tracking &/or limited licensure for the following reasons:
   - Most graduates will end up doing something in their careers that they do not expect to do while receiving their education.
   - Awarding the DVM degree to individuals that do not have exposure to all facets of Veterinary Medicine is a disservice to the public and the industries that we are to serve.

3) We have selected students based on their didactic skills – memorization and regurgitation of facts (the ability to learn and repeat). This concept is further continued in Professional education.

   The next level that I believe VM education misses on is teaching the students how to think and approach problems like a veterinarian. If you ever watched the movie “The Paper Chase” with John Houseman, he states the entire goal of legal education is to mold the student’s mind to think like an attorney not to learn everything there is know.

   There is not time in 4 years nor all the information available to teach students everything, but if the didactic material is mastered and the basic clinical skills presented with the ability to think and apply that education, the graduate should be successful.

4) The biggest shock to me after being exposed to students and new grads from several institutions is the complete lack of basic clinical instruction. For example, all have not recognized, nor know how to use the common OB instruments used in a dystocia. Know how to properly attach a suture needle to suture; how to administer a successful epidural injection within 30 sec; know how to tie the required suture knots. With this thought in mind, how will you turn them loose in a maternity barn or expect them to be able to perform a C-section.

5) This idea to teach consultants is fine only after the new grad can function with basic skills like palpation, obstetrics, and minor surgery.

D1:

I've been thinking about our conversation about what skills graduating veterinarians should possess when they leave WSU. Coming up with that list is the easy part. The more difficult task is to make it happen, both by providing the opportunity for the students to learn and assessing their skills.

Just a couple of thoughts. I don't think it is realistic to be able to teach all of these things at WSU. If I were you I would spend as little time in the classroom and spend most of my energy and resources lining up one on one experiences for the students. For example, I remember a test question on the national board exam about how much tuberculin you inject into the caudal tail fold of a cow when you TB test her. I remembered Dr. Stone saying something about it, but I wasn't sure of the answer at the time. I don't know if I even got it right. When I went to Michigan and after TB testing thousands (yes thousands) of cattle, you better believe I knew how much tuberculin to use. It was by doing that is the real teacher, not in the classroom. I understand your hands are tied a little (or maybe a lot) at WSU to have much hands on experience. That's OK. There are plenty of cattle and veterinarians within a days drive. I loved your idea of starting the hands on process sooner in the curriculum. I know that very few students in every class are interested in Ag animal, but for those that are, why not use the WSU facilities (LA clinics, dairy, etc) for the 1st and 2nd year students and send the 3rd and especially 4th year students away as much as possible. I think their are veterinarians, myself included, that WSU could identify as sort of adjunct clinical instructors, or whatever that would provide the experiences the CVM identifies as important, and just as interns and residents have a log of so many Sx's or cases they have to work up in order to qualify to take the exam, put similar requirements on the students and have the mentoring veterinarian sign them off. Whether those experiences happen at WSU, the Caine Center, or off site at an approved location. You are probably reading this thinking that I don't have a clue how the system works, and you are right, but I have never been one to let the system dictate the outcome of what I was trying to accomplish.

Small Ruminant Emphasis:

Mixed Emphasis: (no large animal species is > 40% or a majority of practice income)
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