Food Animal Students Clinical Rotation Planning for 2021-2022

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

School of Veterinary Medicine
Food Animal Production Medicine Section

Dairy Practice Update

- Wisconsin is the place to be!

Dairy Practice Update

- Wisconsin's strong dairy position continues
  - COVID-19 caused short-term pain and instability
  - dairy herds and dairy practices are resilient!
  - dairy practitioners are doing fine (small animal practice is booming….)
- Job prospects look good for the Class of 2021
  - could be even better for the Class of 2022

Dairy Practice Update

- Dairy-exclusive practices are growing and hiring
- Progressive dairy practices are implementing scheduled calf health programs

Two Kinds of Dairy Practices

- **Dairy-exclusive**
  - rural practices that have separated large and small animal
  - usually larger practices
  - may have sub-specialties within the dairy practice (mastitis, repro, heifers, nutrition, hoof care)
- **Mixed small and large animal**
  - dairy as the predominant large animal
  - individual DVMs may do both SA or LA, or DVMs may be SA and LA specific

Two Models of Dairy Practice

- **Physicians' model**
  - services targeted at individual animals
  - scheduled repro exams, DA's and dystocias
  - limited involvement with sick cows
- Includes most mixed practices and some DVM's within dairy-exclusive practices
- Limitations of the physicians' model:
  - our clients' worst day is our best day
  - on-farm personnel are doing more and more sick work

Two Models of Dairy Practice

- **Facilitator model**
  - DVM is aligned with herd management
  - DVM monitors herd data
  - DVM identifies herd opportunities
  - DVM helps oversee input from outside consultants
- DVM helps implement and monitor change
  - training employees
  - creating new monitoring systems
- DVM still does substantial cow-level work

Recent Example: Facilitator Model

- 2012 UW-graduate
- Dairy-exclusive practice in central Wisconsin
- Three days/week scheduled herd consulting
  - two large dairies
  - NOT the repro work
  - routine involvement in fresh pens, calf health
  - herd-level data monitoring
  - employee training

The Nuts and Bolts of Fourth Year

Emphasis Area Options

- Food Animal Emphasis
- Mixed Animal Emphasis
- Other Emphasis

4th YEAR CORE ROTATION OPTIONS

Food Animal ALL VM4 CORE		Equine ALL VM4 CORE		Mixed Animal ALL VM4 CORE		Small Animal ALL VM4 CORE		Other ALL VM4 CORE	
COURSE	WEEKS/CREDITS	COURSE	WEEKS/CREDITS	COURSE	WEEKS/CREDITS	COURSE	WEEKS/CREDITS	COURSE	WEEKS/CREDITS
LA Medicine	2 / 2	LA Medicine	2 / 2	LA Medicine	2 / 2	LA Medicine	2 / 2	LA Medicine	2 / 2
LA Surgery	2 / 2	LA Surgery	2 / 2	LA Surgery	2 / 2	LA Surgery	2 / 2	LA Surgery	2 / 2
Ambulatory	2 / 2	Ambulatory	2 / 2	Ambulatory	2 / 2	Ambulatory	2 / 2	Ambulatory	2 / 2
Radiology	2 / 2	Radiology	2 / 2	Radiology	2 / 2	Radiology	2 / 2	Radiology	2 / 2
Necropsy	2 / 1	Necropsy	2 / 1	Necropsy	2 / 1	Necropsy	2 / 1	Necropsy	2 / 1
(½ day x 2 wks)		(½ day x 2 wks)		(½ day x 2 wks)		(½ day x 2 wks)		(½ day x 2 wks)	
Anesthesiology	2 / 2	Anesthesiology	2 / 2	Anesthesiology	2 / 2	Anesthesiology	2 / 2	Anesthesiology	2 / 2
SA Gen Surgery	2 / 2	SA Gen Surgery	2 / 2	SA Gen Surgery	2 / 2	SA Gen Surgery	2 / 2	SA Gen Surgery	2 / 2
SA Medicine	2 / 2	SA Medicine	2 / 2	SA Medicine	2 / 2	SA Medicine	2 / 2	SA Medicine	2 / 2
Primary Care	2 / 2	Primary Care	2 / 2	Primary Care	2 / 2	Primary Care	2 / 2	Primary Care	2 / 2
Total Core	18 / 17	Total Core	18 / 17	Total Core	18 / 17	Total Core	18 / 17	Total Core	18 / 17
FOOD ANIMAL EMPHASIS CORE		EQUINE EMPHASIS CORE		MIXED ANIMAL EMPHASIS CORE		SMALL ANIMAL EMPHASIS CORE		OTHER EMPHASIS CORE	
LA Medicine	2 / 2	LA Medicine	4 / 4	SA Ortho Surgery	2 / 2	SA Medicine	2 / 2		
Food Animal Surg	2 / 2	LA Surgery	2 / 2	Ophthalmology	2 / 2	Ophthalmology	2 / 2	No required rotations for	
Dairy Skills 1	2 / 2	Equine Dentistry	1 / 1	Emergency Med	2 / 2	SA Ortho Surgery	2 / 2	"Other" emphasis	
Dairy Skills 2	2/2	Equine Elective	2 / 2			Emergency Med	2 / 2	Maximize flexibility	
Dairy Skills 3	2 / 2	Ophthalmology	2 / 2						
Total Emphasis	10 / 10			Choose 2 of 4 options		Choose 4 of 7			
		Total Emphasis	11 / 11	LA Medicine	2 / 2	SA Gen Surgery	2 / 2		
				LA Surgery	2 / 2	Cardiology	2 / 2		
				SA Medicine	2 / 2	Neurology	2 / 2		
				SA Gen Surgery	2 / 2	Oncology	2 / 2		
						Special Species	2 / 2		
				Choose 2 of 6 options		Dermatology	2 / 2		
				Cardiology	2 / 2	Dentistry	2 / 2		
				Neurology	2 / 2	Total Emphasis	16 / 16		
				Oncology	2 / 2				
				Special Species	2 / 2				
				Dermatology	2 / 2				
				Dentistry	2 / 2				
				Total Emphasis	14 / 14				
Electives (in SVM)	11 – 21 wks	Electives (in SVM)	10 – 20 wks	Electives (in SVM)	7 – 17 wks	Electives (in SVM)	5 – 15 wks	Mixture of electives and externships 31 wks	
Externships (outside of SVM)	0 – 10 wks	Externships (outside of SVM)	0 – 10 wks	Externships (outside of SVM)	0 – 10 wks	Externships (outside of SVM)	0 – 10 wks		
Vacation (max number of wks)	4 wks	Vacation (max number of wks)	4 wks	Vacation (max number of wks)	4 wks	Vacation (max number of wks)	4 wks	Vacation (max number of wks)	4 wks
Total	53 wks	Total	53 wks	Total	53 wks	Total	53 wks	Total	53 wks

Food Animal Emphasis

- 18 weeks "All VM4" core
- 10 weeks "FA Emphasis" core
  - Dairy Skills 1, 2 & 3 (6 weeks)
  - Food Animal Surgery (2 weeks)
  - One additional LAIM (2 weeks)
- 4 weeks vacation
- 21 weeks for electives
  - up to 10 of these weeks for externships outside the SVM

Food Animal ALL VM4 CORE	
COURSE	WEEKS/CREDITS
LA Medicine	2 / 2
LA Surgery	2 / 2
Ambulatory	2 / 2
Radiology	2 / 2
Necropsy	2 / 1
(½ day x 2 wks)	
Anesthesiology	2 / 2
SA Gen Surgery	2 / 2
SA Medicine	2 / 2
Primary Care	2 / 2
Total Core	18 / 17
FOOD ANIMAL EMPHASIS CORE	
LA Medicine	2 / 2
Food Animal Surg	2 / 2
Dairy Skills 1	2 / 2
Dairy Skills 2	2 / 2
Dairy Skills 3	2 / 2
Total Emphasis	10 / 10
Electives (in SVM)	11 – 21 wks
Externships (outside of SVM)	0 – 10 wks
Vacation (max number of wks)	4 wks
Total	53 wks

Mixed Animal Emphasis

- 18 weeks "All VM4" core
- 6 weeks "Mixed" core
  - SA Ortho Sx (2 weeks)
  - Ophtho (2 weeks)
  - Emergency Med (2 weeks)
- 8 weeks "Mixed" options
  - choose 2 of 4, then 2 of 6
- 17 weeks for electives
  - up to 10 of these outside the SVM

Mixed Animal ALL VM4 CORE	
COURSE	WEEKS/CREDITS
LA Medicine	2 / 2
LA Surgery	2 / 2
Ambulatory	2 / 2
Radiology	2 / 2
Necropsy (½ day x 2 wks)	2 / 1
Anesthesiology	2 / 2
SA Gen Surgery	2 / 2
SA Medicine	2 / 2
Primary Care	2 / 2
Total Core	18 / 17
MIXED ANIMAL EMPHASIS CORE	
SA Ortho Surgery	2 / 2
Ophthalmology	2 / 2
Emergency Med	2 / 2
Choose 2 of 4 options	
LA Medicine	2 / 2
LA Surgery	2 / 2
SA Medicine	2 / 2
SA Gen Surgery	2 / 2

Mixed Animal	
Choose 2 of 6 options	
Cardiology	2 / 2
Neurology	2 / 2
Oncology	2 / 2
Special Species	2 / 2
Dermatology	2 / 2
Dentistry	2 / 2
Total Emphasis	14 / 14
Electives (in SVM)	7 – 17 wks
Externships (outside of SVM)	0 – 10 wks
Vacation (max number of wks)	4 wks
Total	53 wks

Choices, choices, choices

- Where do you see yourself?
- If **dairy-exclusive** plus interest in the **facilitator model** in addition to physicians' model
  - Choose "**Food Animal Emphasis**"
    - Food Animal Surgery plus one additional LAIM (required)
    - Dairy Skills 1, 2 & 3 (required)
    - Ambulatory – take the dairy option (required)
  - Consider the Applied Epidemiology (2 weeks), Artificial Intelligence (2 weeks), and Lung Ultrasound (1 week) electives
  - Choose outside externships (~10 weeks) with both herd-level and cow-level experiences

Choices, choices, choices

- If **dairy-exclusive** using **only physicians' model** or **mixed practice**:
  - choose "**Mixed Animal Emphasis"**
    - emphasize more cow-level experiences
    - you decide how to fill in the 14 weeks of "mixed emphasis options" (dermatology, dentistry play well in rural, mixed practices)
  - Dairy Skills 1, 2, and 3 are optional but helpful
    - must take in sequence; can stop at either Dairy Skills 1 or 2
    - get palpation experience somewhere
  - Consider the Applied Epidemiology (2 weeks), Artificial Intelligence (2 weeks), and Lung Ultrasound (1 week) electives
  - Choose outside externships (~10 weeks) that are more cow-level, but get some exposure to herd-level dairy practitioners

Details – Specific SVM Rotations

Dairy Skills 1, 2, and 3 Rotations

- Each has two rotations per year, two weeks per rotation
  - Dairy Skills 1: Weeks 10 & 11 (July 12 to July 23, 2021)
    Weeks 14 & 15 (August 9 to August 20, 2021)
  - Dairy Skills 2: Weeks 22 & 23 (October 4 to October 15, 2021)
    Weeks 26 & 27 (November 1 to November 12, 2021)
  - Dairy Skills 3: Weeks 44 & 45 (March 7 to March 18, 2022)
    Weeks 50 & 51 (April 18 to April 29, 2022)

Dairy Skills 1, 2, and 3 Rotations

- We are hoping you might have taken these selectives: (COVID caused the cancelation of the 2020 offerings)
  - hoof trimming
  - dairy calf ultrasound
  - dairy ration evaluation
- These are not pre-requisites, but they will help you

Dairy Skills 1, 2, and 3 Rotations

- Up to 15 students per rotation
  - scheduling preference to Food Animal Emphasis (unlikely to be a practical limitation)
  - some out-of-state students may also participate
- Each rotation is a pre-requisite for the next one
  - content builds
- General expectation is that you will take all three rotations
  - required for Food Animal Emphasis
  - technically could stop after 1 or 2 (if not Food Animal Emphasis)

Dairy Skills 1, 2, and 3 Rotations

- Herd-based approach to cow health and production
  - the herd is the patient
- NOT “more advanced” or “more on-farm” individual animal medicine
  - no DA surgeries or dystocias
- Substantial palpation experience

Dairy Skills 1, 2, and 3 Rotations

- Mixture of in-house didactics, palpation, and on-farm exercises
  - lots of short presentations and discussions
- Topics include herd records, applied statistics, partial budgets, transition cow management, udder health, drug use, vaccination protocols, lameness management, feeding management, ventilation assessment, fresh pen diagnosis and treatment protocols, etc.
- Principles can be applied to other species
- Outside reading and assignments

On farm exercises with dairy producers

Facilities evaluation (stalls, ventilation, etc.)

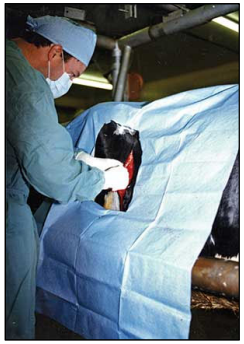
Learn herd management software (DairyCOMP 305, others)

Dairy Skills 1, 2, and 3 Rotations

- Includes training in responsible and accountable antibiotic use
  - one day of Food Armor® training
  - rest of training for certification is online

Food Animal Surgery

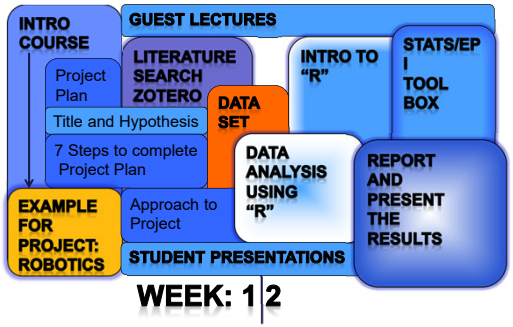
- Required for Food Animal Emphasis
  - max enrollment is 18 students
  - not all Mixed Emphasis students will be able to enroll
- Weeks 40 & 41
  (February 7 to 18, 2022)



Applied Epidemiology Rotation

- For students interested in applying quantitative and statistical skills to population data
- May include non-DVM students
  - maximum enrollment = 14
- Weeks 18 & 19 (September 7 to 17, 2021)
- See Dr. Döpfer for details
  - she will contact all enrollees this spring about what type of data set they wish to analyze

TIME LINE



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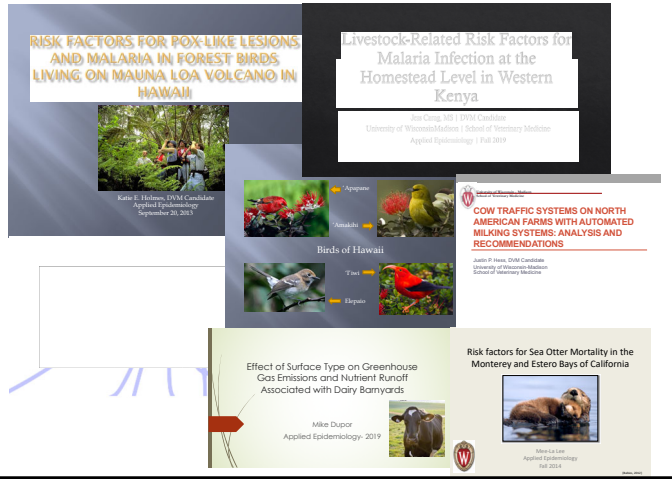

In the End…

- **Exposure to writing a project plan**
- **Experience in using bibliography software**
- **Report about the outcome :**
  - **5 page written report**
    - **(including project plan and approach)**
  - **Oral presentation of 30 min duration, discussion**
- **Exposure to quantitative methods using a statistical tool box in R**
- **Exposure to different data sets and research questions**

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Artificial Intelligence (A.I.) Rotation

- May include non-DVM students
  - maximum enrollment = 14
- Weeks 8 & 9 (June 28 to July 8, 2021)
- See Dr. Döpfer for details
  - she will contact all enrollees this spring about what type of data set they wish to analyze

ARTIFICIAL INTELLIGENCE FOR VETERINARY MEDICINE

DÖRTE DÖPFER

NATHAN BOLLIG

Food Animal Production Medicine
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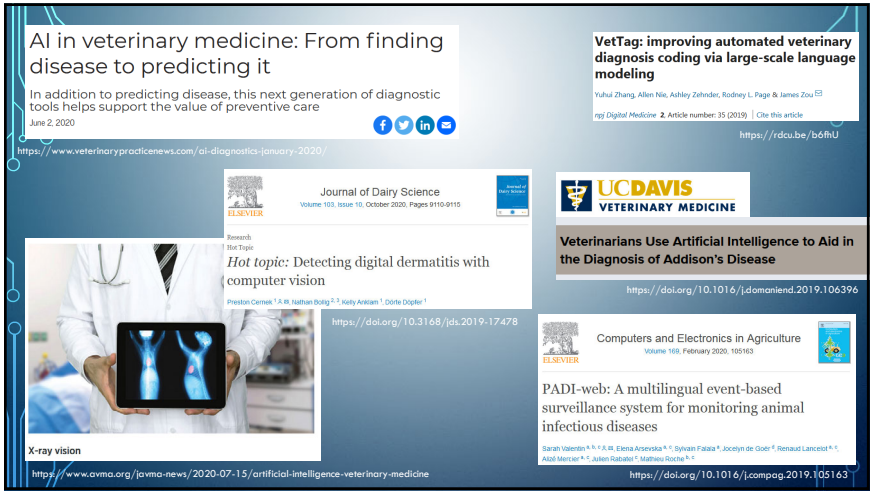

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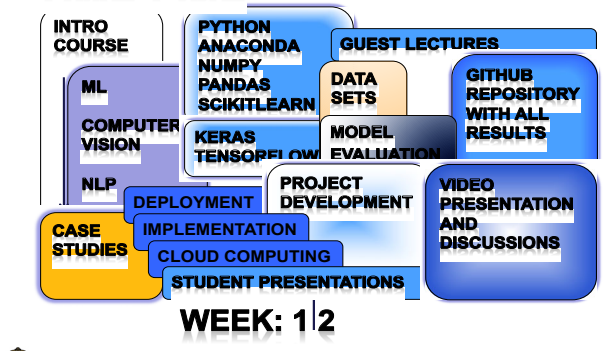

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YOU WILL DO ALL OF THIS!

- **Write code** in Python programming language
- Explain **machine learning concepts**.
- Describe how machine learning is **relevant to veterinary practice today**.
- **Build a machine learning application** to automate a classification or regression task using data relevant to veterinary medicine.
- **Automate** your model: apply existing machine learning and model deployment frameworks within an application.
- Recognize that the pathway to a working machine learning application often includes **iterative problem-solving**.
- Develop **scientific communication skills**.
- **Evaluate** the strengths and limitations of a machine learning application

Lung Ultrasound Rotation

- For students interested in incorporating lung ultrasound into food animal practice
- One-week elective rotation with Dr. Ollivett
- Two possible blocks:
  - Week 46 (March 21 to 25, 2022)
  - Week 47 (March 28 to April 1, 2022)

Course: MED SC-V 675 — SPECIAL TOPICS: Diagnostic ultrasonography for respiratory disease in dairy calves

- **Credit(s):** 1 (45 hrs per credit)
- **Graded** A-F
- **Dates:** Two 1 week rotations will be offered: Week 45 (8 students max) and Week 46 (8 students max)
- **Course designation and attributes:** 4th year Food Animal track students going into dairy cattle practice
- **Instructional mode:** Face to face learning with both didactic and lab portions
- **Contact information:**
- Name: Terri Ollivett, Assistant Professor, Food Animal Production Medicine
- Office: Rm 2004
- Email: ollivett@wisc.edu
- Cell: 608.358.1640
- Classroom: TBD

Rotation details - 30% didactic and 70% hands-on training

- Review pathophysiology and anatomical considerations specific to BRD
- Learn and practice lung ultrasound technique using portable equipment
- 1 written quiz and must demonstrate basic ultrasound exam

Day 1: Use cadaver model to differentiate normal lung, abnormal lung, and rib imaging
Day 2 – 4: Use portable US units to practice scoring lungs on pre-weaned dairy calves
Day 5: Summarize data collected from on-farm scanning sessions

Diagnostic ultrasonography for respiratory disease in dairy calves
Dr. Terri Ollivett (8 DVM students)

Date	AM		PM
Mon	8:00 AM start **Room TBD** Didactic: - Anatomy of the Bovine Lung - Basics of Ultrasound and the #WeanClean™ Philosophy - Quiz	Lunch at the SVM	1:00 to 5:00 PM: - iPad Scoring System - Buttonology: Using the machines - Calf Handling & Restraint
Tues	8:00 AM **Wet lab** - scanning cadaver model 9:30 AM Van leaves for **On-farm scanning**	Bring lunch to farm	5:00 PM finish Continue scanning: 1 - 3 week old dairy calves
Wed	8:00 AM **Van leaves for farm** On-farm scanning: 4 - 8-week-old dairy calves	Bring lunch to farm	5:00 PM finish Continue scanning: 4 - 8 week old dairy calves
Thurs	8:00 AM **Van leaves for farm** On-farm scanning: Assessment of group housed calves	Bring lunch to farm	5:00 PM finish Continue scanning group housed dairy calves
Fri	8:00 AM to 12:00 Noon Didactic: Analyze #WeanClean™ data from each herd	Lunch at the SVM	1:00 - 5:00 PM Continue analysis, present herd data, evaluations

Supplies: Clean coveralls, clean boots, stethoscope, thermometer, writing utensils, clipboard, FAPM iPad
Bring lunch/beverage each day. On-farm days may end earlier than the schedule suggests.

Externships Outside the SVM

- Usually 8 -10 weeks
- Dairy-exclusive, facilitator model
  - add some herd-level experience in dairy-exclusive practices
- Mixed or dairy / physicians' model
  - emphasize more cow-level experiences

Leverage Other Students' Experiences

- Talk to this year's seniors!
- All senior students fill out an externship evaluation
  - single page "green sheet" (Class of 2020 and earlier)
    - binders of these are available in OAA (open 9 AM to 3 PM now)
  - Electronic evaluations (Class of 2021)
    - OAA is populating a database of these
    - student access available by May 2021?

Externships for Palpation Experience

- Some students use this as an opportunity to travel
- Western US dairy practices
  - California's Central Valley
    - Lander Vet Clinic, Turlock, CA
    - Westside Vet Services, Los Banos, CA
  - Idaho's Magic Valley
    - North Valley Veterinary Clinic, Gooding, ID
- You <u>can</u> get enough palpation in Upper Midwest practices
  - it depends on the specific practice

Ultrasound Unit for Externships

- Arrange your own ultrasound unit
  - student loan program through IMV Imaging
  - apply online

https://www.imv-imaging.com/university-program/university-program/student-ultrasound-request/

On-Farm Dairy Preceptorship

- Intense exposure to large dairies
- 1 or 2 weeks on a large dairy
  - work the fresh pens, maternity pens, repro exams
  - milk culturing
  - really high volume exposure (but all on one farm)

Preceptorship Sites

- Milk Source – Rosendale Dairy
  - no on-site DVM's (preceptorship)

- Calf Source (preceptorship)
- Holsum Dairies (have on-site DVM's, could be an externship)
- Calf raiser, goat dairy, other….

Other Species

- **Beef** – cow-calf and/or feedlot

School of Veterinary Medicine and Biomedical Sciences
GREAT PLAINS VETERINARY EDUCATIONAL CENTER

  - Iowa State beef rotations
  - western US beef practices

Other Species

- **Swine**
  - Iowa State

SMEC SWINE MEDICINE EDUCATION CENTER

  - great even if not strong swine interest
  - diagnostic lab (Galesburg, IL or others)

Other Species

- **Small ruminants and camelids**
  - practitioners working in this area (Dr. Chris Duemler, Brodhead)
  - Drumlin Dairy (9,000 does)

Absences from FAPM Rotations

- Plan to be present every day
  - we are lenient on sickness, personal conflicts
  - we are somewhat lenient on job interviews (limited number if possible, check with us first to determine the best day to be absent from the rotation)
  - we are not lenient on other outside experiences (conferences, other outside training)
- Contact us well ahead of time for optimal NAVLE dates
  - we can help you determine the best day to be absent

Questions?