



## Ultrasonography and Embryo Transfer Workshops

Western College of Veterinary Medicine  
University of Saskatchewan  
Saskatoon SK S7N 5B4 Canada

*Ultrasonography and Embryo Transfer Workshops (May 4-9, 2020)*

*Ultrasonography Workshop (May 4-6, 2020)*

*Embryo Transfer Workshop (May 6-9, 2020)*

*OPU Practice (May 10, 2020)*

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Organized by the One Reproductive Health Program

**ULTRASONOGRAPHY & EMBRYO TRANSFER WORKSHOPS 2020**  
**PROGRAM AT A GLANCE**

<b>Date</b>	<b>Time</b>	<b>Subject</b>
<b>Monday May 4</b>	AM	<b>Lectures:</b> <i>Ultrasound basics, applications and techniques</i> <i>Reproductive physiology and examination of a non-pregnant cow</i>
	PM	<b>Lab:</b> <i>Wet lab demonstration and scanning practice</i>
<b>Tuesday May 5</b>	AM	<b>Lectures:</b> <i>Examination of the pregnant cow, bull, mare, small ruminants and camelids</i> <i>Ovum pick-up (OPU) and in vitro fertilization (IVF)</i>
	PM	<b>Lab:</b> <i>Live ultrasound demonstrations &amp; practice session</i>
<b>Wednesday May 6</b>	AM	<b>Lab:</b> <i>Live OPU demonstration and hands-on training</i> <i>Oocyte evaluation and IVM procedures</i>
	PM	<b>Lectures:</b> <i>Embryo transfer - history and application, reproductive physiology, superovulation and diagnostic spermatology</i>
<b>Thursday May 7</b>	AM	<b>Lectures:</b> <i>Synchronization in recipients, embryo collection and transfer</i> <i>Embryo development, evaluation and handling</i>
	PM	<b>Lab:</b> <i>Embryo collection and transfer</i>
<b>Friday May 8</b>	AM	<b>Lectures:</b> <i>Basic cryobiology, embryo freezing, labeling straws</i> <b>Lab:</b> <i>Embryo collection and transfer</i>
	PM	<b>Lab:</b> <i>Embryo collection and transfer</i> <i>Embryo freezing and labeling</i>
<b>Saturday May 9</b>	AM	<b>Lectures:</b> <i>CETA certification and biosecurity</i> <b>Lab:</b> <i>Embryo collection, freezing, and transfer</i>
	PM	<b>Lab:</b> <i>Embryo collection and transfer</i>
<b>Sunday May 10</b>	AM PM	<b>Lab:</b> <i>Additional OPU Practice for registered workshop registrants</i>

## DETAILED SCHEDULE

**Monday, May 4 (ULTRASONOGRAPHY WORKSHOP – DAY 1)**

8:00 <i>Corridor</i>	<b>Registration</b>	<b>Instructors</b>
8:30-8:40 <i>Rm 2115</i>	<b>Introduction</b> <ul style="list-style-type: none"> <li>• Welcome and Introduction - faculty &amp; assistants</li> <li>• Proceedings, references and textbooks</li> </ul>	Adams
8:40 - 9:40 <i>Rm 2115</i>	<b>Ultrasound basics</b> <ul style="list-style-type: none"> <li>• Characteristics of ultrasound waves &amp; echoes</li> <li>• The transducer: pulse emission and reception</li> <li>• Image interpretation &amp; artifacts, bioeffects</li> <li>• Signal processing</li> </ul>	Adams
9:40-10:00 <i>Corridor</i>	<b>Health Break</b> Opportunity to visit with Company Representatives	
10:00-11:00 <i>Rm 2115</i>	<b>Applications/Techniques</b> <ul style="list-style-type: none"> <li>• Scanners and probes</li> <li>• Modalities (B-mode, M-mode, Doppler)</li> <li>• Transrectal, transvaginal and transcutaneous approaches in different species</li> </ul>	Singh
11:00-12:00 <i>Rm 2115</i>	<b>Examination of the non-pregnant cow &amp; review of reproductive endocrinology and physiology</b> <ul style="list-style-type: none"> <li>• Follicular and luteal dynamics during the estrous cycle</li> <li>• U/S examination of cyclic changes in ovaries and uterus</li> </ul>	Adams
12:00-1:00 <i>Buffeteria</i>	<b>Lunch Break</b>	
1:00-2:00 <i>Rm 2115</i>	<b>Ultrasound examination of:</b> <ul style="list-style-type: none"> <li>• The bull</li> <li>• Mare</li> <li>• Small ruminants and camelids</li> </ul>	Dadarwal
2:00-3:00 <i>Anatomy Lab</i>	<b>Wet lab &amp; demonstration</b> <ul style="list-style-type: none"> <li>• Live cow demo</li> <li>• Machine set-up &amp; “buttonology”</li> <li>• Machine care &amp; maintenance</li> </ul>	Team
3:00–3:30 <i>Outside of lab</i>	<b>Health Break</b>	
3:30-5:00 <i>Anatomy Lab</i>	<b>Scanning practice</b> (4 – 15 min. rotations, and final 30 min.) <ul style="list-style-type: none"> <li>• Rotations with water bath specimens</li> <li>• Machine set-up and buttonology</li> <li>• Going from 2D to 3D (examination on mystery organs)</li> </ul>	Team

*Note: ultrasound equipment will be provided, but participants are welcome to practice with their own equipment*

**Tuesday, May 5 (ULTRASONOGRAPHY WORKSHOP – DAY 2)**

8:00 <i>Corridor</i>	<b>Registration</b>	<b>Instructors</b>
8:30-9:15 <i>Rm 2115</i>	<b>Examination of the pregnant cow and abnormalities</b> <ul style="list-style-type: none"> <li>• Bovine: Diagnosis, development, twinning</li> <li>• Fetal sex diagnosis</li> <li>• Ovarian &amp; uterine abnormalities</li> </ul>	
9:15-10:00 <i>Rm 2115</i>	<b><i>In vitro</i> embryo production</b> <ul style="list-style-type: none"> <li>• World market expansion – why?</li> <li>• Role of the practitioner</li> <li>• Single vs superstimulated, sexed semen</li> <li>• Cows and prepubertal heifers</li> </ul>	Mapletoft Singh
10:00-10:15 <i>Corridor</i>	<b>Health Break</b> Opportunity to visit with company representatives	
10:15-11:00 <i>Rm 2115</i>	<b>Ultrasound-guided ovum pick-up (OPU) &amp; IVF</b> <ul style="list-style-type: none"> <li>• Equipment (handles, needles, vacuum, flow rate, temp.)</li> <li>• COC collection technique</li> <li>• COC searching, grading, shipping</li> <li>• Overview of IVF process &amp; techniques</li> </ul>	
11:15-12:15 <i>BTU</i>	<b>Ultrasound-guided ovum pick-up lab demonstration</b> <ul style="list-style-type: none"> <li>• Demonstration of OPU</li> </ul>	Adams
12:15-1:00 <i>Buffeteria</i>	<b>Lunch Break</b>	
1:15-2:45 <i>Dairy Barn</i>	<b>Live demonstration session</b> <ul style="list-style-type: none"> <li>• Early pregnancy diagnosis</li> <li>• Fetal sex diagnosis</li> </ul>	Adams & Team
3:00-4:00 <i>BTU &amp; Repro barn</i>	<b>Practice session</b> Rotations with: <ul style="list-style-type: none"> <li>• cows (pregnant &amp; non-pregnant), mares, llamas, sheep and bulls</li> <li>• water baths (pregnant and non-pregnant)</li> </ul>	Team
4:00-4:15 <i>BTU</i>	<b>Health Break</b>	
4:15-5:30 <i>BTU &amp; Repro barn</i>	<b>Practice session</b> Rotations with: <ul style="list-style-type: none"> <li>• cows (pregnant &amp; non-pregnant), mares, llamas, sheep and bulls</li> <li>• water baths (pregnant and non-pregnant)</li> </ul>	Team
5:30 <i>BTU</i>	<b>Clean-up &amp; concluding remarks</b>	

*Note: ultrasound equipment will be provided, but participants are welcome to practice with their own equipment*

**Wednesday, May 6 (ULTRASONOGRAPHY & EMBRYO TRANSFER WORKSHOP WORKSHOPS – DAY 3)**

8:00 <i>Corridor</i>	<b>Registration</b>	<b>Instructors</b>
Rotation 1: 8:30-9:30 Rotation 2: 9:30-10:30 <i>BTU &amp; Repro barn</i>	<b>Ovum pick-up and searching lab</b> (See table) <ul style="list-style-type: none"> <li>• Rotations (60 min. – 1 operator + 1 assistant collect 1 ovary from the 8 superstimulated heifers)</li> <li>• 2/3 of class doing OPU</li> <li>• 1/3 in lab for searching, grading, &amp; IVM</li> </ul>	Team
10:30 – 11:00 <i>BTU</i>	<b>Health Break &amp; change of animals</b>	
Rotation 3: 11:00-12:00 <i>BTU &amp; Repro barn</i>	<b>Ovum pick-up and searching lab</b> (See table) <ul style="list-style-type: none"> <li>• Continued as above</li> </ul>	Team
12:00-1:00 <i>Buffeteria</i>	<b>Lunch Break</b>	
1:00-2:00 <i>Rm 2115</i>	<b>Embryo transfer: history and applications</b>	Mapletoft
2:00-2:30 <i>Rm 2115</i>	<b>Embryo transfer: endocrinology and physiology</b>	Mapletoft
2:30-3:00 <i>Corridor</i>	<b>Health Break</b>	
3:30-4:30 <i>Rm 2115</i>	<b>Superovulation – physiology, gonadotropins and ovarian manipulation</b>	Mapletoft
4:30-5:30 <i>RM 2115</i>	<b>Diagnostic spermatology</b>	Dadarwal

**Thursday, May 7 (EMBRYO TRANSFER WORKSHOP – DAY 4)**

8:00 <i>Corridor</i>	<b>Registration</b>	<b>Instructors</b>
8:00-9:00 <i>Rm 2115</i>	<b>Estrus synchronization and recipient management</b>	Mapletoft
9:00-10:00 <i>Rm 2115</i>	<b>Techniques of embryo collection and transfer</b>	Mapletoft
10:00-10:15 <i>Corridor</i>	<b>Health Break</b>	
10:15-11:00 <i>Rm 2115</i>	<b>Embryo development, classification and evaluation</b>	Mapletoft
11:00 – 12:30 <i>WestGen lab</i>	<b>IVF lab</b> - fertilization of OPU oocytes, set-up and process	Singh & Team
12:30-1:30 <i>Buffeteria</i>	<b>Lunch</b>	
1:30 – 3:30 <i>BTU</i>	<b>Wet lab: embryo collection and transfer</b>	Mapletoft & Team
3:30-4:00 <i>BTU</i>	<b>Health Break</b>	
4:00-5:30 <i>BTU</i>	<b>Wet lab: embryo collection and transfer</b>	Mapletoft & Team

**Friday, May 8 (EMBRYO TRANSFER WORKSHOP – DAY 5)**

8:00 <i>Corridor</i>	<b>Registration</b>	<b>Instructors</b>
8:00-9:00 <i>Rm 2115</i>	<b>Basic cryobiology, vitrification and equipment</b>	Anzar
9:00-10:00 <i>Rm 2115</i>	<b>Embryo freezing in practice, direct transfer and labeling straws</b>	Mapletoft
10:00-10:30 <i>Corridor</i>	<b>Health Break</b>	
10:30-12:30 <i>BTU</i>	<b>Wet lab: embryo collection and transfer</b>	Mapletoft & Team
12:30-1:30 <i>Buffeteria</i>	<b>Lunch</b>	
1:30 – 3:30 <i>BTU</i>	<b>Wet lab: embryo collection and transfer Embryo freezing including labelling and records</b>	Mapletoft & Team
3:30-4:00 <i>BTU</i>	<b>Health Break</b>	
4:00-5:30 <i>BTU</i>	<b>Wet lab: embryo collection and transfer Embryo freezing including labelling and records</b>	Mapletoft & Team

**Saturday, May 9 (EMBRYO TRANSFER WORKSHOP – DAY 6)**

8:00 <i>Corridor</i>	<b>Registration</b>	<b>Instructors</b>
8:00-9:00 <i>Rm 2115</i>	<b>CETA certification/CFIA accreditation</b>	Mapletoft
9:00-10:00 <i>Rm 2115</i>	<b>Biosecurity and the embryo lab</b>	Mapletoft
10:00-10:30 <i>Corridor</i>	<b>Health Break</b>	
10:30-12:30 <i>BTU</i>	<b>Wet lab: embryo collection, freezing and transfer</b>	Mapletoft & Team
12:30-1:30 <i>Buffeteria</i>	<b>Lunch</b>	
1:30 – 3:30 <i>BTU</i>	<b>Wet lab: embryo collection, freezing and transfer Continuing lab exercises of specific interest</b>	Mapletoft & Team
3:30-4:00 <i>BTU</i>	<b>Health Break</b>	
4:00-5:30 <i>BTU</i>	<b>Final Lab:</b> <ul style="list-style-type: none"> <li>• Exercises of specific interest</li> <li>• IVF lab –rotations to assess in vitro embryo development</li> </ul>	Singh Mapletoft & Team

**Sunday, May 10 (OPU Practice)**  
Additional OPU practice for registered workshop registrants  
8:30 – 4:30

8:15 <i>Corridor - Rm 2115</i>	<b>Registration</b>	
8:30-12:30 <i>BTU &amp; Repro barn</i>	<b>Lab</b>	
12:30-1:30 <i>Buffeteria</i>	<b>Lunch</b>	
1:30 -4:30 <i>BTU &amp; Repro barn</i>	<b>Lab</b>	