Department of Veterinary Medicine
University of Sassari

APPENDIX 10
SKILL LAB COMPENSATION: NON-ANIMAL MODELS

Appendix 10. **Skill Lab compensation: non-animal models currently used at DVMSS**

Hands on procedure	**Non-animal Model/ Compensation Method**	**Problems (P) and solutions (S)**	**Course, lecturers**
Fecal sampling from the rectal ampulla	Feces are correctly sampled from an artificial rectum in different species		Parasitology A Scala
BCS conduction on chest of a dog	BCS is correctly carried out on an artificial left hemithorax of a middle sized dog. The students can palpate the model at chest level with different nutritional states (1-5 points scale).	P: the BCS at the level of the chest, though highly informative, is only one part of the global conduction of the BCS S: a full dummy for the 5 nutritional states is under construction.	Animal Nutrition MG Cappai
Palpation of reproductive tract in non-pregnant female cattle	Students palpate reproductive tracts of regularly slaughtered heifers/cows. Tracts are not visible, each student palpates 4-5 tracts and fills in a questionnaire (i.e. dominant follicle, stage of cyclicity). After seeing the tracts, students discuss their answers in group and with staff.	P: the practical is scheduled after the in-vivo one. S: amend the practical calendar in the future academic years; P: numerous tracts can be difficult to collect S: a company that provides bovine frozen tracts has been identified (Pasini Carni)	Clinical veterinary obstetrics and gynecology 1 F Mossa, MT Zedda
Parturition assistance	Lambing is simulated using 2 specially built boxes and 1 or 2 dead lambs. One student places the lamb inside the box to simulate eutocia or dystocia. Another student diagnoses the dystocia by palpation and practices correct delivery assistance.	P: neonatal dead lambs can be difficult to collect and may be infectious S: a lamb model/mannequin may be purchased	
Artificial Insemination in sheep	Students practice semen deposition on reproductive tracts of regularly slaughtered ewes.	P: numerous tracts can be difficult to collect and store S: a single DVMSS procedure could be set to collect from slaughterhouse, transport and store organs from healthy animals required for practicals in different modules	

Ovum pick up (OPU) and embryo transfer	Procedures are simulated on reproductive tracts of regularly slaughtered cattle and sheep. Students prepare embryo transfer materials (catheters, guns, etc.), retrieve oocytes by aspiration of antral follicles and flush uterine horns.	P: numerous tracts can be difficult to collect and store S: a single DVMSS procedure could be set to collect from slaughterhouse, transport and store organs from healthy animals required for practicals in different modules	Clinical veterinary obstetrics and gynecology 2 S Ledda L Bogliolo L Falchi
Orchidectomy	A small plastic egg is tied with a string, to simulate the spermatic cord and the testicle. Students practice various types of ligatures on the string using a small klemmer	P: a more realistic model would improve the knowledge of the anatomical structures involved and of the surgical approach S: collection of testes and spermatic cords from the abattoir and creation of 3D printer models for small animals are ongoing	
Preparing for obstetrical and gynecological surgery in dogs/cats	Preparation for surgery is simulated in the operating theater. Students sterilize surgical equipment and apply the principles of aseptic surgery		
Suturing in obstetrical and gynecological surgery	Participants are trained on how to correctly use and place sutures on uteruses of regularly slaughtered ewes		
Suturing	Students practice on specially prepared silicon suture training pad. Continuous and interrupted sutures are performed using needles and threads of different characteristics such as shape, size, gauge, and using needle holders, tweezers and scissors.		Clinical veterinary surgery
Intravenous Inoculation	The student sticks a syringe needle into a rubber tourniquet filled with red liquid, covered with simulated skin.When the red liquid appears in the needle hub, he/she connects a syringe and slowly inoculates 2 ml of a colorless liquid.		
Venous catheter placement and intravenous inoculation	Trainees places a venous catheter on a rubber tourniquet; after replacing the needle cap of the catheter with a pierceable one, they connect it with a syringe and inoculate the liquid.		
Oro-tracheal intubation and 'cuffing' pressure measurement”	Participants insert various gauges endotracheal tubes fitted with cuffs into tubes of a higher gauge. Pressure is measured (aneroid analogue and Infinity Delta Dräger digital), during manual "cuffing" and compared with the perceived sensation on palpation of the "telltale balloon”.		
Osteosynthesis using plate and screws, of diaphyseal fracture of long bones	A PVC tube, similar in shape and size to a long bone shaft including the presence of a medullary cavity, is sawn to obtain an oblique fracture with two fragments. Two students at a time collaborate in reducing the simulated fracture with bone reduction forceps, applying a bone plate, drilling the holes and applying the screws according to the AO-ASIF method.		
Osteosynthesis using crossed Kirschner nails. of	To simulate a metaphyseal fracture in a long bone, a 1.5 cm-long piece is sawn off a cylindrical solid wood stick . Students work in pairs and hold		

metaphyseal fracture in long bones	together the fragments with bone reduction forceps, and perform osteosynthesis by drilling the fragments with two left in place pins in a criss-cross manner and almost on the same plane.		G Careddu N Columbano G Masala
Limbs bandaging	The student wraps the entire arm of a colleague or the lecturer with several types of bands (hemmed bandage, cotton bandage, elastic bandage) exerting different levels of tension.		
Artificial ventilation with AMBU bag	The student squeezes an AMBU bag with physiological rhythm and frequency checking the effect on the reservoir bag (which simulates the lung), and being aware of the real pressure applied by looking at a connected manometer.		
Artificial ventilation with pressure limitation	The student connects the components of the circuit (MATRX and HALLOWEL inhalation anesthesia equipment) to a reservoir bag that simulates the lung, then puts the equipment into operation applying an artificial ventilation and comparing pressure values palpated on the bag with those measured by the manometer.		
Echo-guided needle aspiration and cytology sampling	Procedures are performed on chicken breasts in which an olive is inserted. The olive simulates the lesion to be aspirated. The student can view the lesion by ultrasound examination and perform needle aspiration by echo-guided procedure.		Clinical veterinary medicine ML Pinna Parpaglia
Skin scraping	Students train using vegetables (i.e. potatoes), whose structure simulates the texture and the resistance of the skin surface to scraping.		
Skin needle aspiration	Needle aspiration is performed on vacuum-packed sausages whose casing simulates the resistance offered by the thickness of the skin		
Restraint techniques in cattle	Trainees practice how to correctly tie basic knots and set a rope halter on a plastic cattle model		Clinical veterinary medicine in food-producing animals F Fiore
Haltering in cattle	Participants correctly place a rope halter and ropes for casting a cow on a plastic bovine model (four methods), then they place a halter on a cow restrained in a chute		
Casting in cattle	Lanyards are placed on the bovine plastic model. Students place ropes on a teaching cow and mimic the lying technique. The bovine is standing, in a large box, with abundant bedding to avoid trauma.		
Inspection, palpation, percussion and auscultation of various organs and apparatuses in cattle	Students practice on a plastic educational mannequin with removable organs on the left side. Percussion is performed both manually and with a hammer and pleximeter.	P: lack of hammers and pleximeters for all students; absence of a model of suitable size	