Regions of the pelvic limb (proximal to distal)	Common Name	Species
Gluteal	Horse – croup Ruminants & Pig – rump	All
Thigh		All
Crus	Gaskin	All
Pes	Limb distal to crus. i.e. includes tarsus, metatarsus and digit(s)	All
Tarsus	Hock	All
Metatarsus	Ungulates – cannon/shank	All
Digit	Toes. In ungulates, includes pastern and “foot”	All
Pastern		Ungulates
“Foot”	Hoof	Ungulates

Joints of the pelvic limb (proximal to distal)	Common Name
Coxofemoral or coxal	Hip
Stifle	
Tarsus	Hock
Metatarsophalangeal	Ungulates – fetlock or ankle
Proximal interphalangeal	Ungulates – pastern jnt
Distal interphalangeal	Ungulates – coffin jnt

Osteology of Pelvis/Os coxae		
Osteology	**Features**	**Species Differences/comments**
Ilium	Auricular surface – articulation with sacrum=sacroiliac joint.	
	Tuber sacrale	
	Tuber coxae	Ruminant = “hook bones”
	Greater ischiatic notch	
Ischium	Ischiatic tuberosity	Ruminant = “pin bones”
	Ischiatic arch	
	Ischiatic spine	
	Lesser ischiatic notch	
Pubis		
Acetabulum	Partly formed by acetabular bone, plus ilium, ischium, pubis	
	Acetabular notch	
	Acetabular fossa	
Obturator foramen	Bordered by pubis and ischium	
Pelvic symphysis	Midline fusion of left and right os coxa	

Osteology of Thigh & Crus		
Osteology	**Features**	**Species Differences/comments**
Femur	Head	
	Fovea capitis	
	Neck	
	Body (shaft)	
	Greater trochanter	Horse – cranial & caudal parts
	Lesser trochanter	Attachment for iliopsoas m.
	Trochanteric fossa	
	Intertrochanteric crest	
	Third trochanter	Horse – superficial gluteal m. attachment
	Medial/lateral supracondylar tuberosities	Attachment for gastrocnemius mm.
	Supracondylar fossa	Ungulate – attachment for SDF m.
	Trochlear groove	
	Medial/lateral trochlear ridges of femur	
	Resting and gliding surfaces of femoral trochlea	Ungulate
	Medial/lateral condyles of femur	

	Medial/lateral epicondyles of femur	
	Extensor fossa of femur	Attachment of long digital extensor m., (and fibularis tertius m. in ungulates)
Patella	Ungulate – apex (distal end), base (proximal end)	Horse – resting and gliding surfaces
Sesamoids of gastrocnemius mm. = Fabellae	[L] faba = bean; the fabellae are bean-shaped sesamoids	Carnivore
Sesamoid of popliteus m.		Carnivore
Tibia	Body (shaft)	
	Tibial tuberosity	
	Medial malleolus	All
	Lateral malleolus	Horse, because fibula fused to tibia.
	Distal intermediate ridge	Horse – this is a specific clinical/radiographic imaging term for the cochlea of the tibia where OCD occurs.
Fibula	Lateral malleolus	Carnivore, ruminant, pig

Osteology of Tarsus		
Osteology	**Features**	**Species Differences**
Calcaneus	Tuber calcanei (calcaneal tuberosity)	
	Sustentaculum tali	
Talus	Trochlea – with medial and lateral ridges of trochlea	Artiodactyls have a proximal and distal part to the trochlea
Tarsal bones – Central, I, II, III, IV		Variation in number present and fusion between tarsal bones, be able to identify in carnivore, horse, ruminant.

Osteology of Metatarsus and Digit		
Osteology	**Features**	**Species Differences**
Metatarsal bone I		Carnivore only (variable)
Metatarsal bone II	Horse – button of splint bone at distal end	Horse – MT2 is the medial splint bone
Metatarsal bone III	Horse – sagittal ridge of MC3	Ruminant – MT3 + MT4 fused
Metatarsal bone IV	Horse – button of splint bone at distal end	Horse – MT4 is the lateral splint bone; Ruminant – MT3+MT4 fused
Metatarsal bone V		Carnivore only
Metatarsal sesamoid bone		Ruminant
Proximal sesamoid bones	Base, apex, axial and abaxial surfaces	Ungulate only
Distal sesamoid bone = Navicular bone	distal border, proximal border, flexor and articular surfaces, sagittal ridge of navicular bone	Horse only
Digits (I)II-V – species variation	Consist of proximal, middle and distal phalanges; axial and abaxial side to each digit (or medial and lateral sides in horse since only one digit)	Carnivores – 4 digits typical, ie digits 2-5 Ruminant and Pig – 4 digits (3 and 4 are weight bearing; 2 and 5 = dewclaws) Horse – 1 digit (3rd digit, bears all weight of limb!)
Proximal phalanx		Ungulate – Pp, P1, long pastern bone
Middle phalanx		Ungulate – Pm, P2, short pastern bone

Distal phalanx		Ungulate – Pd, P3, coffin or pedal bone
	Extensor process	All (attachment of CDE)
	Flexor tubercle of Pd	Carnivore, Ruminant
	Solar border (margin)	Horse
	Crena marginis solearis	Horse
	Medial and lateral plantar processes (‘wings’) of Pd	Horse
	Solar surface with smooth area and flexor surface	Horse (DDFT attaches to flexor surface of solar surface)

Joints and Ligaments of the Pelvic Limb	
Features	**Species Differences**
Sacroiliac joint	
Sacrotuberous ligament	Dog
Sacrosciatic ligament	Ungulate
Coxal joint	
Ligament of the femoral head	Cut end can be identified (in horse combined with accessory ligament)
Accessory ligament of the femoral head	Horse only (no need to identify separately to regular ligament)
Acetabular lip	Carnivore – cartilaginous extension of rim of acetabulum
Transverse acetabular ligament	Carnivore – bridges acetabular notch
Stifle (genual) joint	
Patellar ligament(s)	Horse & Ox – medial, intermediate/middle, lateral
	Carnivore, small ruminant, pig – single
Femoropatellar ligament	Medial and lateral
Collateral ligament of stifle (may also refer to as femorotibial ligament)	Medial and lateral
Cruciate ligament	Cranial and caudal
Meniscus	Medial and lateral

Meniscofemoral ligament	
Femoropatellar joint	
Medial femorotibial joint	
Lateral femorotibial joint	
Parapatellar fibrocartilage	Horse only, see cross section specimens
Tarsus – Tarsus and distal not studied in pig	
Flexor canal of tarsus	
Collateral ligament of tarsus	Medial and lateral
Long plantar ligament	Horse only
Tarsocrural joint	Articular surface
Tarsocrural joint pouches	Horse – dorsolateral, dorsomedial, plantarolateral, plantaromedial
Proximal intertarsal joint	
Distal intertarsal joint	
Tarsometatarsal joint	
Metatarsophalangeal and interphalangeal joints	The detailed arthrology and ligaments is similar to the thoracic limb and will not be revisited here. It suffices to be able to name the bones and the joints of this region.

Muscle Action Groups	
Flexors of the stifle and extensors of the hip	• Biceps Femoris m. • Semitendinosus m. • Semimembranosus m.
Flexors of the hip	• Sartorius m. • Iliopsoas m. (covered in lab 4)
Adductors of the pelvic limb	• Gracilis m. • Pectineus m. • Adductor m.

Muscle/structure	**Attachments/comments**	**Action/comments**
Biceps femoris m. Gluteobiceps m. (in artiodactyls)	1. Sacrotuberous (sacrosciatic in ungulates) ligament and ischiatic tuberosity 2. Lateral stifle, tibia, and tuber calcanei In artiodactyls, biceps femoris and superficial gluteal are fused to form gluteobiceps m. (see next lab)	Flex the stifle; extend the hip (Secondary: extend stifle and tarsus, abduct hip)
Semitendinosus m.	1. Ischiatic tuberosity (all species) plus vertebrae and sacrosciatic lig. (horse and pig) 2. Tibia and tuber calcanei	Flex the stifle; extend the hip. (Secondary: extend the tarsus) The vertebral and ligament attachments in the horse and pig provide for the rounded contour of their croup/rump.
Semimembranosus m.	1. Ischiatic tuberosity (all species) plus vertebrae and sacrosciatic lig. (horse and pig)	Flex the stifle; extend the hip. (Secondary: extend the stifle) The vertebral and ligament attachments in the horse and pig

	2. Distal femur and medial condyle of the femur (plus medial tibia in ungulate)	provide for the rounded contour of their croup/rump.
Sartorius m.	1. Ilium 2. Cranial part: patella; Caudal part: tibia	Flex the hip (Secondary: cranial part extends the stifle; caudal part flexes the stifle)
Gracilis m.	1. Pelvic symphysis 2. Tibia and tuber calcanei	Adduct the pelvic limb (Secondary: flex the stifle, extend hip and tarsus)
Pectineus m.	1. Ilium and pubis 2. Distomedial femur	Adduct the pelvic limb
Adductor m.	1. Pelvic symphysis, ischium and pubis 2. Distocaudal femur	Adduct the pelvic limb (Secondary: extend the hip)
Popliteal lymph node	Identify in carnivore	Site for lymph node biopsy (eg fine needle aspiration).
Fascia lata	Identify very thick fascia on cranial and lateral thigh	Related to biceps femoris and tensor fasciae latae mm.
Femoral Triangle	Identify and recall muscular boundaries of this region	Recall clinical application for femoral pulse palpation in carnivores.
Croup/Rump	Horse = croup Artiodactyls = rump	Croup of horse and rump of pig have a rounded contour due to additional vertebral origins of hamstring muscles. In the carnivore and ruminants the ST and SM muscles arise from the ischiatic tuberosity but not the sacral or caudal vertebrae.

Lab 4

Muscle Action Groups	
Flexors of the hip	• Tensor fasciae latae m. • Iliopsoas m. • Sartorius m.
Extensors of the hip	• Gluteofemoralis m. • Superficial Gluteal m. • Middle Gluteal m. • Deep Gluteal m.
Lateral rotators of the femur	• Internal Obturator m. • Gemelli m. • Quadratus femoris m. • External obturator m.
Extensors of the stifle	• Quadriceps femoris mm.

Muscle/structure	**Attachments/comments**	**Action/comments**
Tensor fascia latae m.	1. Ilium, gluteal fascia 2. Fascia lata	Flex the hip, extend the stifle
Gluteofemoralis m. (cat only)	1. Caudal vertebrae 2. Fascia lata	Abduct hip or move tail laterally
Superficial gluteal m.	1. Pelvis 2. Third trochanter (horse and carnivore); fuses with biceps	Extend the hip and abduct the pelvic limb

	femoris in artiodactyls to form gluteobiceps m.	
Sacrotuberous ligament – canine feature	Fibrous band connecting sacrum to ischiatic tuberosity	Attachment site for muscles in canine.
Middle gluteal m. (and piriformis, FYI)	1. Ilium 2. Greater trochanter (**caudal part** of greater trochanter in horse)	Extend the hip, abduct the pelvic limb, and rotate femur medially at hip
Accessory gluteal m. – in ungulates only.	1. Pelvis 2. Greater trochanter of femur, (**cranial part** in horse)	Extend the hip, abduct the pelvic limb – ungulate only.
Trochanteric bursa – horse feature	lies deep to tendon of accessory gluteal as it inserts on greater trochanter.	Identify in horse specifically.
Deep gluteal m.	1. Ilium and ischiatic spine 2. Greater trochanter (**caudal part** in horse)	Extend the hip, abduct the pelvic limb, and rotate femur medially at hip
Internal obturator m.	1. Dorsal ischium and pubis 2. Trochanteric fossa	Lateral rotation of femur at the hip.
Gemelli mm.	1. Ischium 2. Trochanteric fossa	Lateral rotation of femur at the hip.
Quadratus femoris m.	1. Ischium 2. Intertrochanteric crest	Lateral rotation of femur at the hip. (Secondary: extend the hip)
External obturator m.	1. Ventral ischium and pubis 2. Trochanteric fossa	Lateral rotation of femur at the hip.
Quadriceps femoris m.	1. Rectus femoris=ilium; Vastus mm.=proximal femur	Extend the stifle. (Secondary: rectus femoris also flexes hip)

	2. Tibial tuberosity	
Iliopsoas m.	1. Ilium and lumbar vertebrae 2. Lesser trochanter	Flex the hip
Sartorius m.	1. Ilium 2. Cranial part=patella; Caudal part=tibia	Flex the hip (Secondary: cranial part extends the stifle; caudal part flexes the stifle)

Lab 5

Muscle Action Groups	
Flexors of the tarsus	• Cranial tibial m. • Fibularis longus m. • Fibularis tertius m.
Flexors of the tarsus, extensors of the digit(s)	• Long digital extensor m. • Lateral digital extensor m.
Extensors of the tarsus	• Gastrocnemius m. • Soleus m.
Extensors of the tarsus, flexors of the digit(s)	• Superficial digital flexor m. • Deep digital flexor m.

Muscle/structure	Attachments/comments	Action/comments
Cranial tibial m.	1. Proximal tibia 2. Proximal metatarsals (species variation)	Flex tarsus
Cunean tendon – horse	Medial tendon of insertion of Cranial tibial m. attaches to fused T1/T2 bones	Horse only
Cunean bursa – horse	Subtendinous bursa of cunean tendon	Horse only
Long digital extensor m.	1. Extensor fossa of the femur 2. Extensor process(es) of distal phalanx(ges) – species variation	Flex tarsus, extend digit(s).
Extensor retinaculum	Fibrous band binding down tendons – species variation	
Lateral digital extensor m. – horse and ruminant	1. Fibular head and lateral collateral ligament (of stifle) 2. Unites with long digital extensor tendon in proximal metatarsus (horse); Digit 4 (Ruminants)	Flex tarsus, extend digit(s)
Fibularis longus m. (not present in horse)	1. Proximal tibia and fibula 2. Proximal metatarsals and T4	Flex tarsus
Fibularis tertius m. – horse and ruminant	1. Extensor fossa of the femur 2. Proximal metatarsus (and T4, horse)	Flex tarsus
Gastrocnemius m. – medial and lateral heads	1. Supracondylar tuberosities of the femur 2. Tuber calcanei	Extend tarsus (Secondary: flex the stifle)

Superficial digital flexor m.	1. Lateral supracondylar tuberosity – carnivore; Supracondylar fossa – ungulate 2. Tuber calcanei and middle phalanx(ges) (plus proximal phalanx in horse)	Extend tarsus, flex digit(s)
Soleus m. – identify in cat	1. Proximal fibula 2. Common calcanean tendon	Extend tarsus
Common calcaneal tendon	Powerful combined tendon on caudal crus	Recall the contributing muscles.
Deep digital flexor m. 3 heads: Lateral digital flexor Medial digital flexor Caudal tibial (ungulates)	1. Proximal caudal tibia and fibula – species variation 2. Plantar distal phalanx(ges)	Extend tarsus, flex digit(s)
Popliteus m.	1. Lateral epicondyle of the femur 2. Proximal caudal tibia	Medial rotation of leg at the stifle
Reciprocal apparatus – horse	Fibularis tertius and SDF mm. working together, part of PL passive stay apparatus in horse.	Stifle and tarsus extend and flex in unison in horse.

Lab 6

Many of these terms have been covered in previous labs.

Primary structure	Feature	Horse and Ruminant (Ox), unless noted
Stifle	Medial and lateral trochlear ridges, femur	
	Medial and lateral condyles, femur	
	Trochlear groove, femur	
	Patella	
	Resting and gliding surfaces of patella	horse
	Resting and gliding surfaces of trochlea, femur	horse
	Parapatellar fibrocartilage	horse
	Medial and lateral collateral ligaments, stifle	
	Medial and lateral femoropatellar ligaments	
	Medial, intermediate, lateral patellar ligaments	
	Cranial and caudal cruciate ligaments	
	Meniscofemoral ligament	
	Medial and lateral meniscus	

	Femoropatellar joint	
	Medial femorotibial joint	
	Lateral femorotibial joint	
	Patella locking mechanism – 4 structures involved	horse
Tarsus	Tarsocrural joint	
	Dorsomedial, dorsolateral, plantaromedial, plantarolateral pouches of tarsocrural joint	horse
	Proximal intertarsal joint	
	Distal intertarsal joint	
	Tarsometatarsal joint	
	Talus – medial and lateral trochlear ridges	
	Calcaneus – tuber calcanei, sustentaculum tali	
	Tarsal bones – central, 2nd, 3rd, 4th	species specific fusion
	Flexor canal of tarsus and its boundaries	
	Flexor retinaculum	
	Subtendinous calcaneal bursa	

	Medial and lateral collateral ligaments	
	Long plantar ligament	
	Tendons of caudal crus muscles at tarsus	
	Tendons of cranial crus muscles at tarsus	
	Extensor retinaculum	
	Cunean tendon	horse
	Cunean bursa	horse
Metatarsus	Tendons of digital flexors and extensors	
	Suspensory ligament	
	Accessory ligament of DDFT – as present	horse
Pelvic Limb Passive Stay Apparatus – horse	Patellar locking mechanism	horse
	Reciprocal apparatus – fibularis tertius and SDFT	horse
	Suspensory apparatus	horse
	SDFT, DDFT (+/- accessory lig.)	horse

Foot anatomy – horse unless otherwise noted	
Epidermal features	
Coronet/"coronary band"	junction of haired skin and hoof wall
Hoof capsule	the epidermal structure of the foot, consists of wall, sole, frog.
Toe, quarters, heels	Hoof wall subdivisions as viewed externally
Bars (of foot)	feature of hoof wall on ground surface
Sole (of foot)	
Frog: crura, apex, central groove, spine of frog	
Paracuneal/collateral grooves of frog	between bars and frog
Heel bulbs	
Perioplic groove	on inner surface of hoof wall, very narrow
Coronary groove	on inner surface of hoof wall, relatively wide
3 layers of hoof wall =	
stratum externum	= periople
stratum medium	
stratum internum	= insensitive lamina or epidermal lamina
Tubular and intertubular horn	understand where it is found
'White line'	unpigmented deepest part of stratum medium

White zone	white line plus stratum internum and pigmented horn in between, extending from P3 solar border to ground surface.
Dermal features	
Perioplic corium	
Coronary corium	
Laminar corium and terminal papillae	
Sole corium	
Frog corium	
Additional features	
Digital cushion	modified hypodermis (subcutaneous tissue)
Collateral cartilages of foot	Horse
Vascular anatomy of foot	Horse
Coronary plexus	*Concept only, not identified*
Dorsal plexus	*Concept only, not identified*
Palmar plexus	*Concept only, not identified*
Foot anatomy – artiodactyls	
hoof wall	
sole	
heel bulb	
digital pad	combination of heel bulb and underlying digital cushion