The calving process

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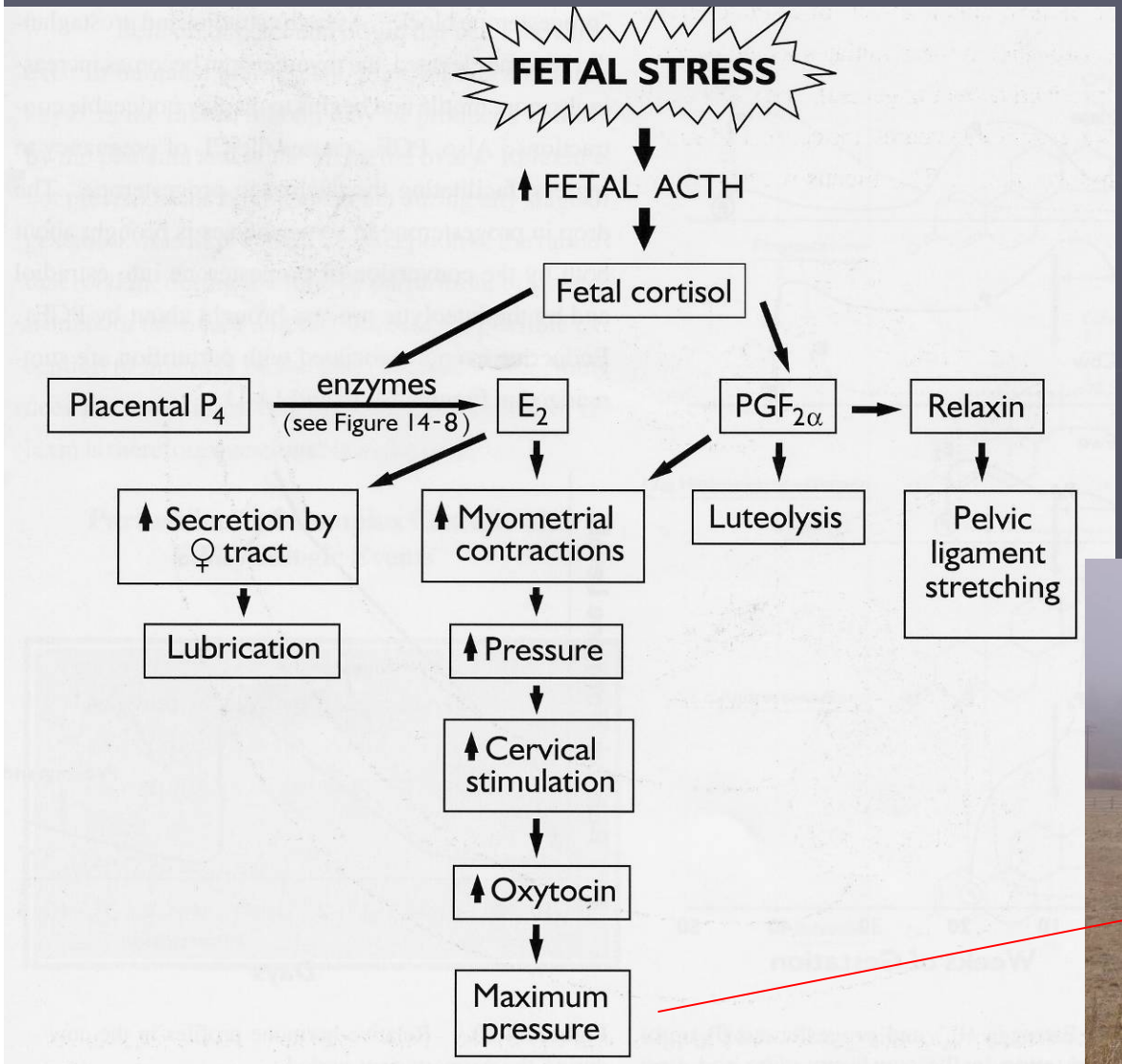
Calving is initiated by the calf



Signs of impending calving

- Udder development 2-3 wks before calving in cows- earlier in heifers
- Teats fill and lose wrinkles
- Sunken or hollow appearance to tailhead 2-3 days prior
- Mucous discharge from vulva and swelling of vulva
- Colostrum in udder
- Restlessness, reduced appetite, separation from group

Table 1. Stages of Labor.

Stages	Normal Duration	Normal Events
Stage 1	2-6 hours	a. Uterine contractions begin b. Cervical dilation occurs c. Restlessness; separate from herd d. Water bag expelled at end of Stage 1
Stage 2	< 2 hours	a. Uterine contractions increase b. Fetus enters birth canal c. Calf delivery is completed
Stage 3	2-8 hours	a. Afterbirth is expelled (cleaning)

Heifers – progress every 60 min ------- Cows – progress every 30 min

Stage I

- Intrauterine pressure increases and the calf rotates so front feet and head are positioned towards vulva of cow.
- Contracting uterus pushes calf towards cervix.
- Pressure-sensitive nerves in cervix result in uterine contractions when contacted by calf

Expulsion of fetus (Stage II) requires strong myometrial and abdominal muscle contractions.

Another important hormone involved in successful parturition is **relaxin.** Relaxin is a glycoprotein that is produced by either the corpus luteum or the placenta, depending upon the species. The synthesis of relaxin is stimulated by $PGF_{2\alpha}$. It causes a softening of the connective tissue in the cervix and promotes elasticity of the pelvic ligaments. Thus, this hormone prepares the birth canal by loosening the supportive tissues so that passage of the fetus can occur with relative ease.

One of the dramatic effects of estradiol elevation prior to parturition is that it initiates secretory activity of the reproductive tract in general, and particularly the cervix. As estradiol increases, the cervix and vagina begin to produce mucus. This mucus washes out the cervical seal of pregnancy and thoroughly lubricates the cervical canal and the vagina. Mucus reduces friction and enables the fetus to exit the reproductive tract with relative ease. As myometrial contractions continue to increase, the animal's feet and head begin to put pressure on the fetal membranes. When the pressure reaches a certain level, the membranes rupture, with subsequent loss of amniotic and allantoic fluid. This fluid also serves to lubricate the birth canal. As the fetus enters the birth canal, it becomes hypoxic (deprived of adequate levels

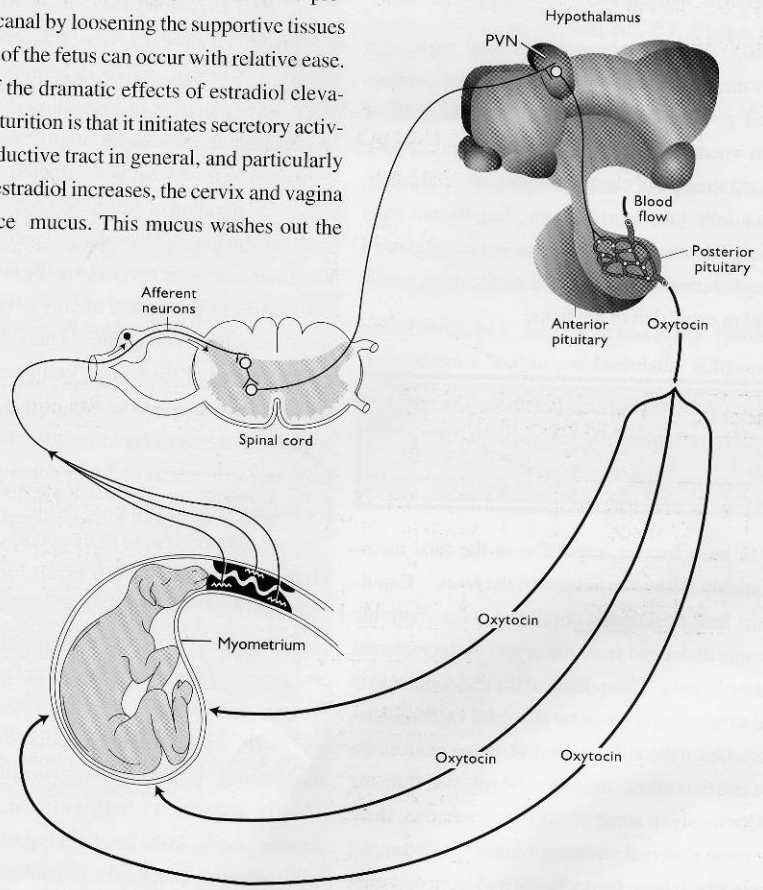


Figure 14-12. Pathway of sensory activation of oxytocin secretion by the posterior pituitary. As the fetus moves into the birth canal, elevated pressure on the cervix stimulates sensory neurons. A neural pathway terminates in the paraventricular nucleus (PVN) and causes oxytocin to be secreted from the posterior pituitary. Oxytocin causes contraction of the myometrium. (Graphic by Sonja Oei.)

Stage II – delivery of calf

- Uterine contractions push calf's feet and head against placenta until it ruptures
  - First water bag (chorioallantois) ruptures then second ruptures (amnion) about 1 h later
  - Continued straining forces calf into birth canal and calf's feet are usually visible within 2 h (cows) after water bag rupture
  - Calf is expelled within 1/2 to 2 hrs

Stage II

Second water bag

Stage II

Stage II

Stage III

- Afterbirth is usually passed within 1-8 h after calving.

Time course

Table 14-2. Duration of stages of parturition among various species.

Species	Stage I (Myometrial Contractions/ Cervical Dilation)	Stage II (Fetal Expulsion)	Stage III (Fetal Membrane Expulsion)
Cow	2 to 6h	30 to 60 min	6 to 12h

Bovine Obstetrics

- About 2% of calves are born dead
- About 2% of calves die within first week of life
- 3-7% loss birth to weaning
- Monitor cows in labor every 2 hours
- Cows- examine if no progress within 30-60 min after seeing fetal membranes
- Heifers- 60-90 min

When to intervene...

- If cow is restless for > 4-6 hours but does not go into labor (no straining)
- If cow is straining but no part of calf is showing after > 2 hours
- If feet or nose showing but calf not delivered after > 2 hours
- Anything abnormal!

Dystocia

- Abnormal or difficult delivery that may or may not require assistance
  - May result in injury or death to calf and/or cow/heifer

Dystocia & Obstetrics

- Cow-causes
  - Uterine (torsion), placental, vaginal
- Calf-causes
  - Disproportionate size, fetal monsters, twins
  - Malpresentation, malposition, malposture

General Rules

- Should not be hasty nor heroic
- Be **clean**, be **gentle** & use a lot of **lube**
  - Wash your hands and arms, clean pins, anus, and vulva of cow
  - Wear OB gloves
  - Exam should determine if calf is in normal birth position
- Determining the time to abandon one technique for another is gained through experience

Case Management

- Good chance for successful delivery by traction if:
  - Calf's fetlock joints delivered spontaneously through vulva and head is delivered spontaneously into pelvic inlet
  - Calf's hooves protrude through vulva during straining & then slide back
  - Can feel 'space' all around calf

Case Management

- Reduced chance for successful delivery by traction if:
  - neither of the previously listed signs are present
  - Calf's forelimbs cross within pelvis
    - indicates that shoulders are too wide
  - Calf's hooves are rotated with soles pointing inward
    - indication that elbows are forced together by narrow pelvic inlet

Necessary equipment

- **Tail tie rope**
- **Clean bucket**
- **Water (warm)**
- **Sleeves**

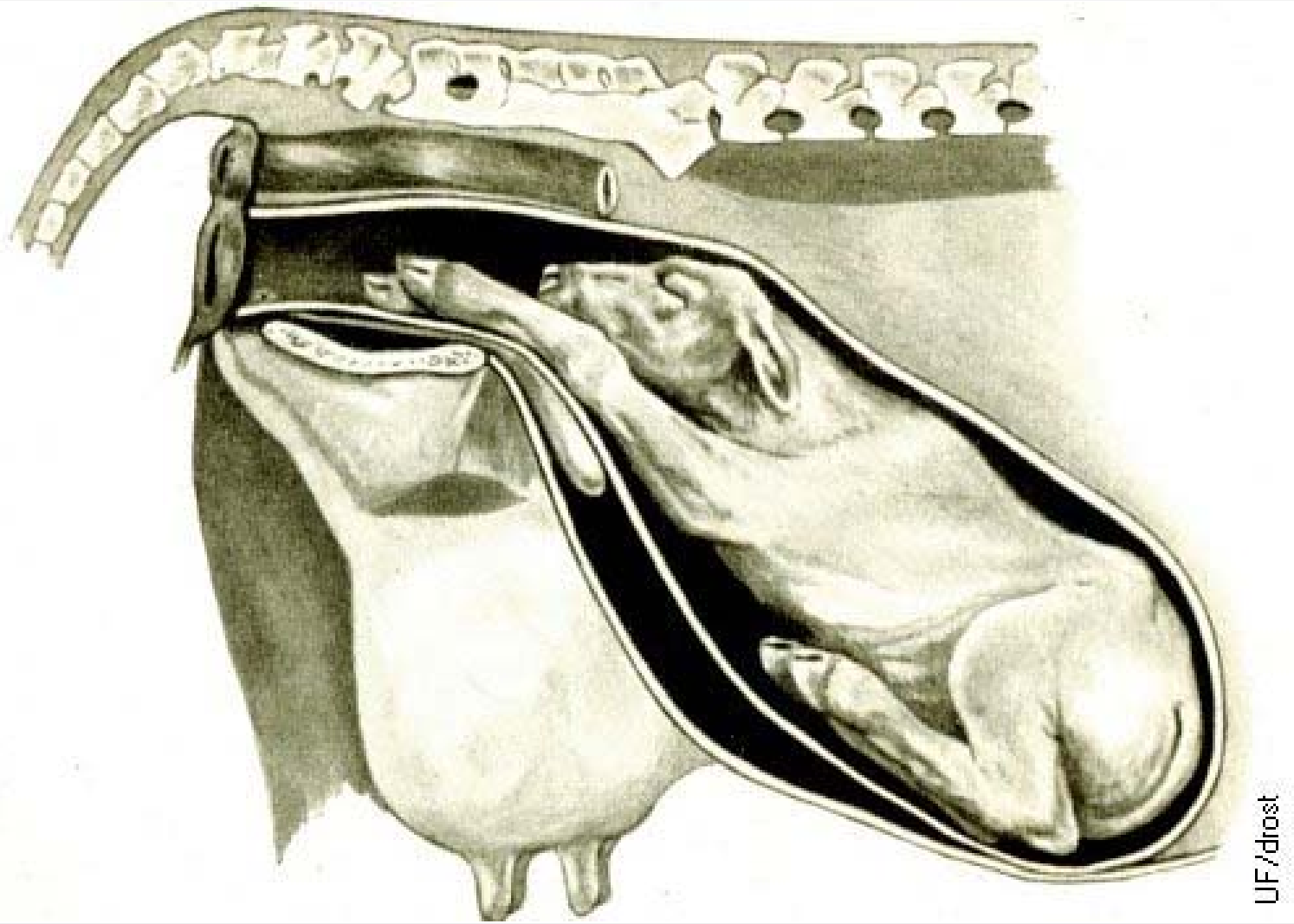
- **Lubrication**
- **Scrub (Prepodyne)**
- **OB chains & handles**
- **Calf jack**

OB equipment

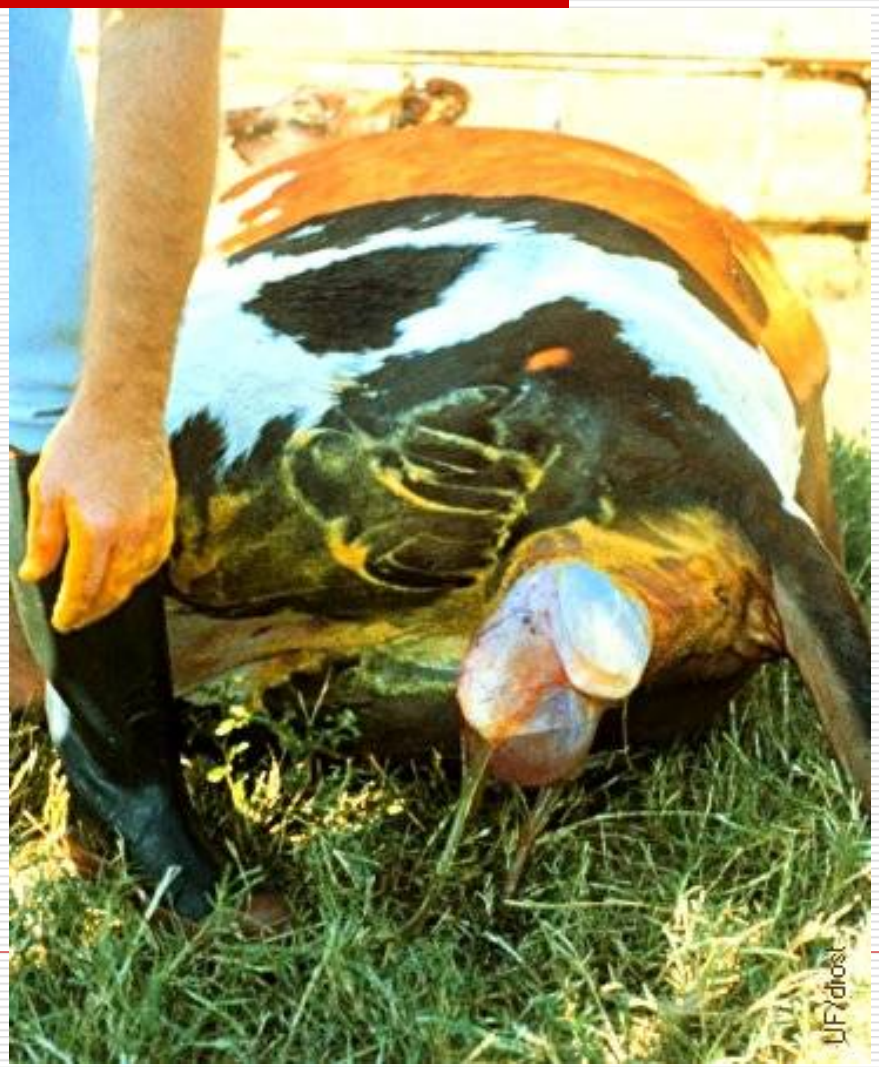
Dystocia Correction

- Methods
  - Mutation followed by forced extraction
    - mutation: returning the fetus to a normal presentation, position & posture

Normal presentation, position, and posture



Clean, Clean, Clean



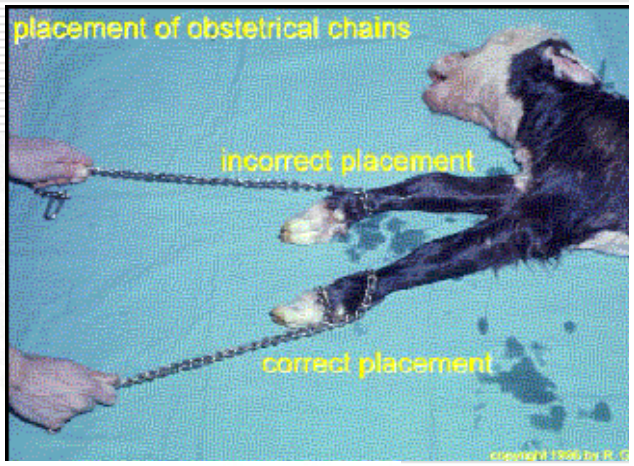
Vaginal exam

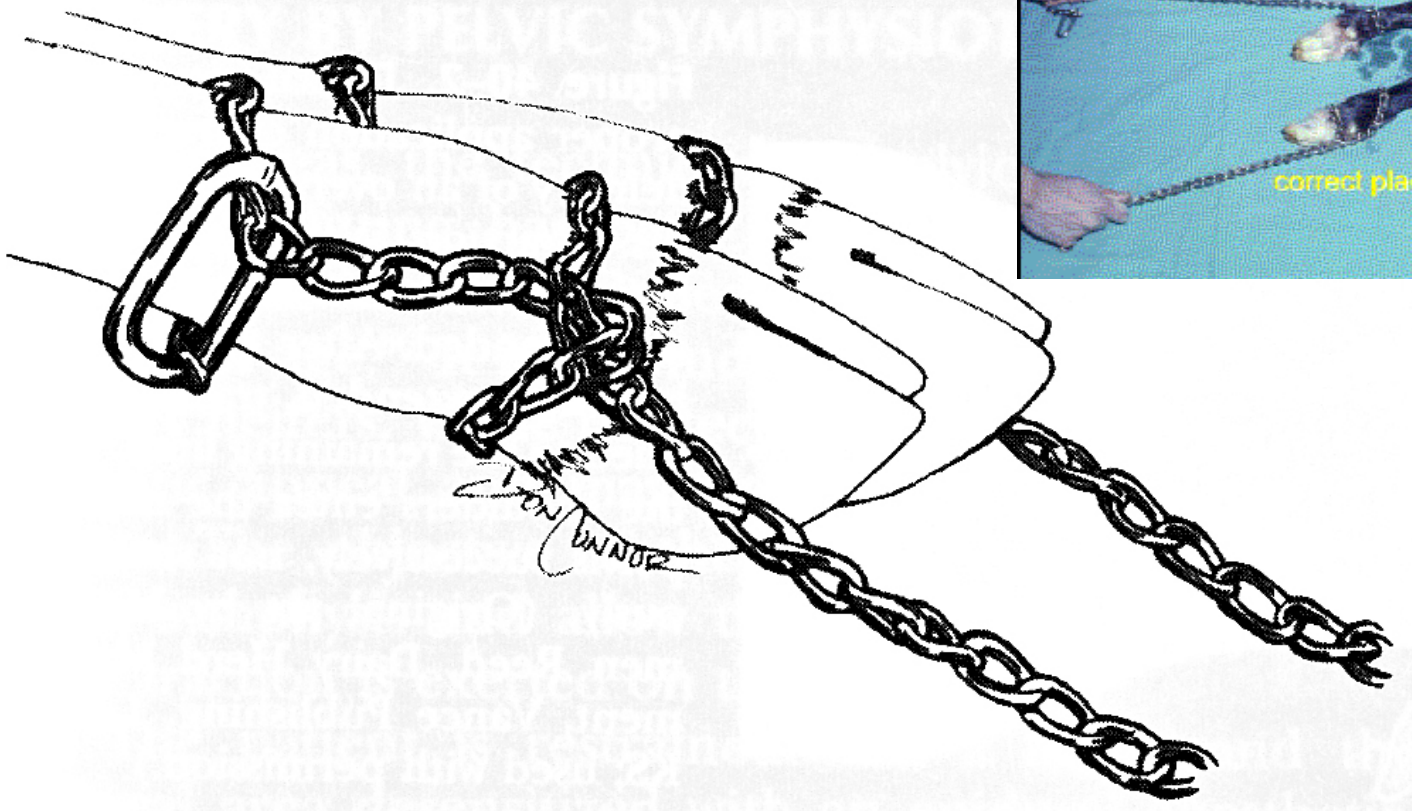
S-T-R-E-T-C-H Vulva-5 minutes

Cast cow to right side or allow to remain standing

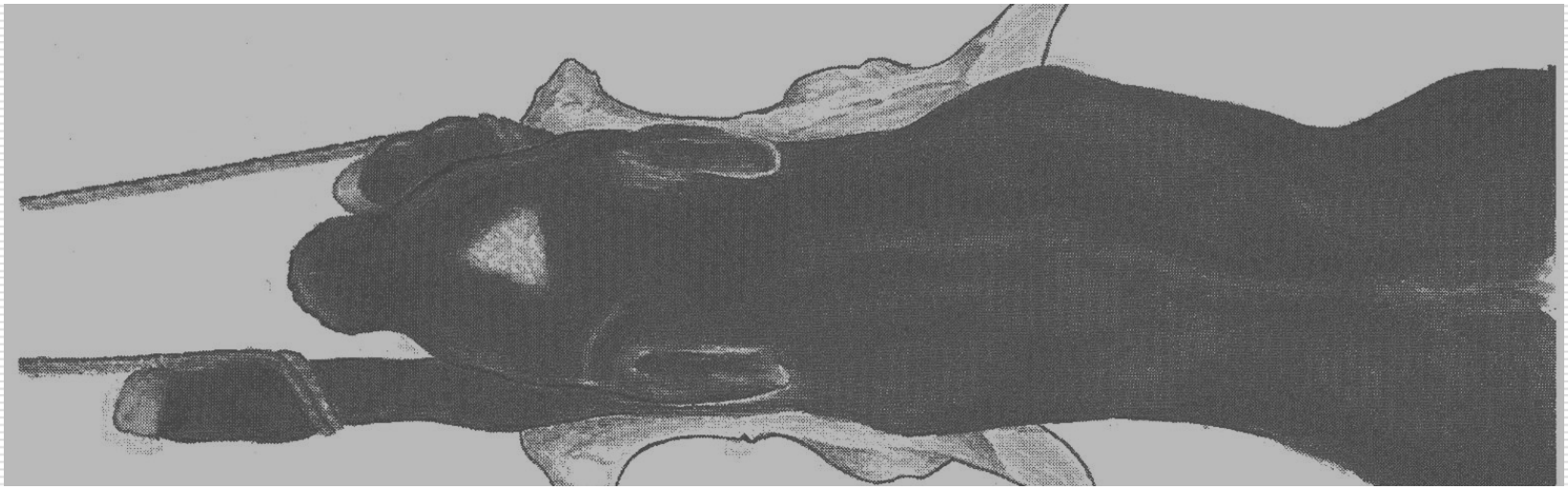
Forced Extraction - Equipment

Mean force required
to fracture a leg = 170 kg





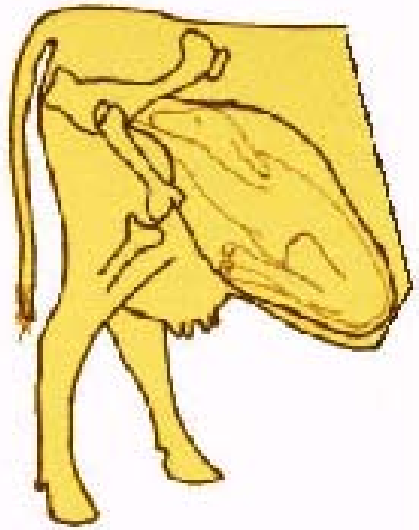
Forced Extraction



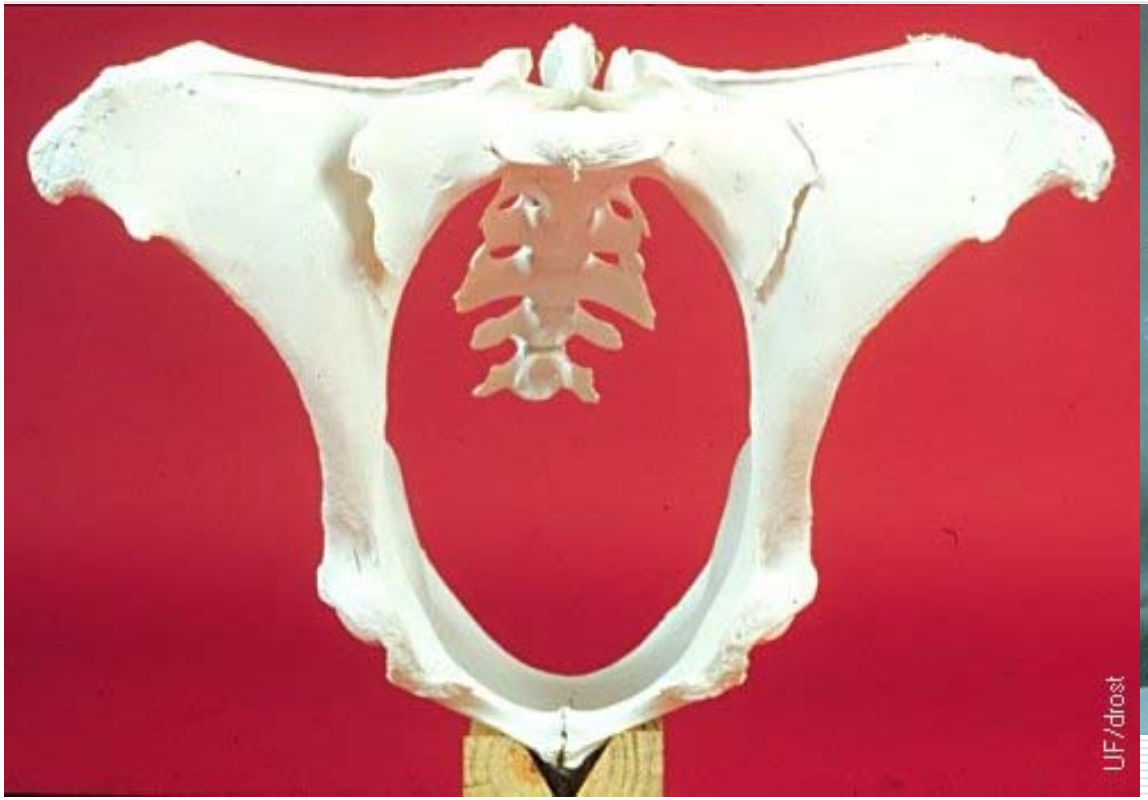
Forced Extraction

Pull through an arc.

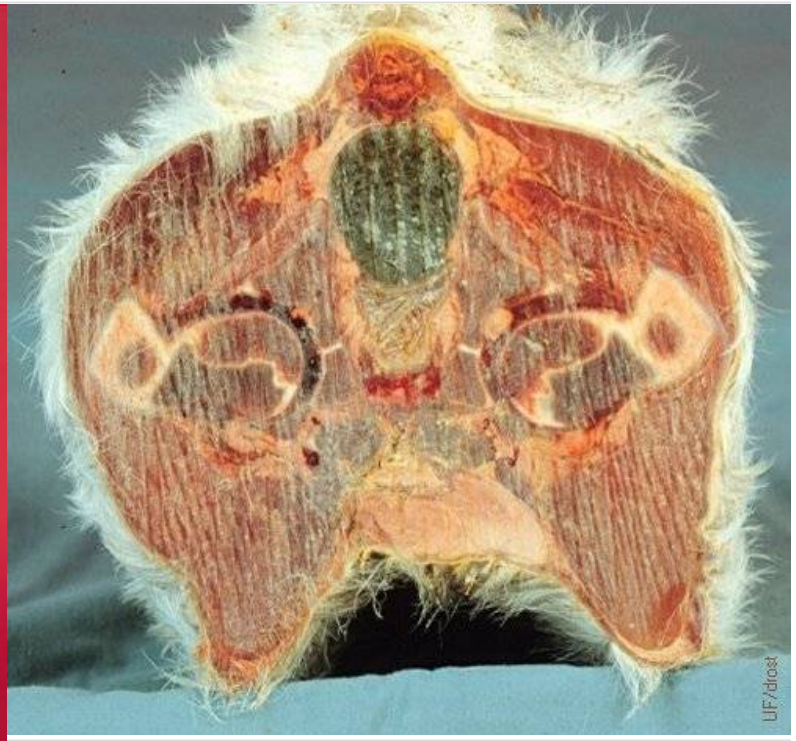
Avoid excessive force!



Bovine pelvis

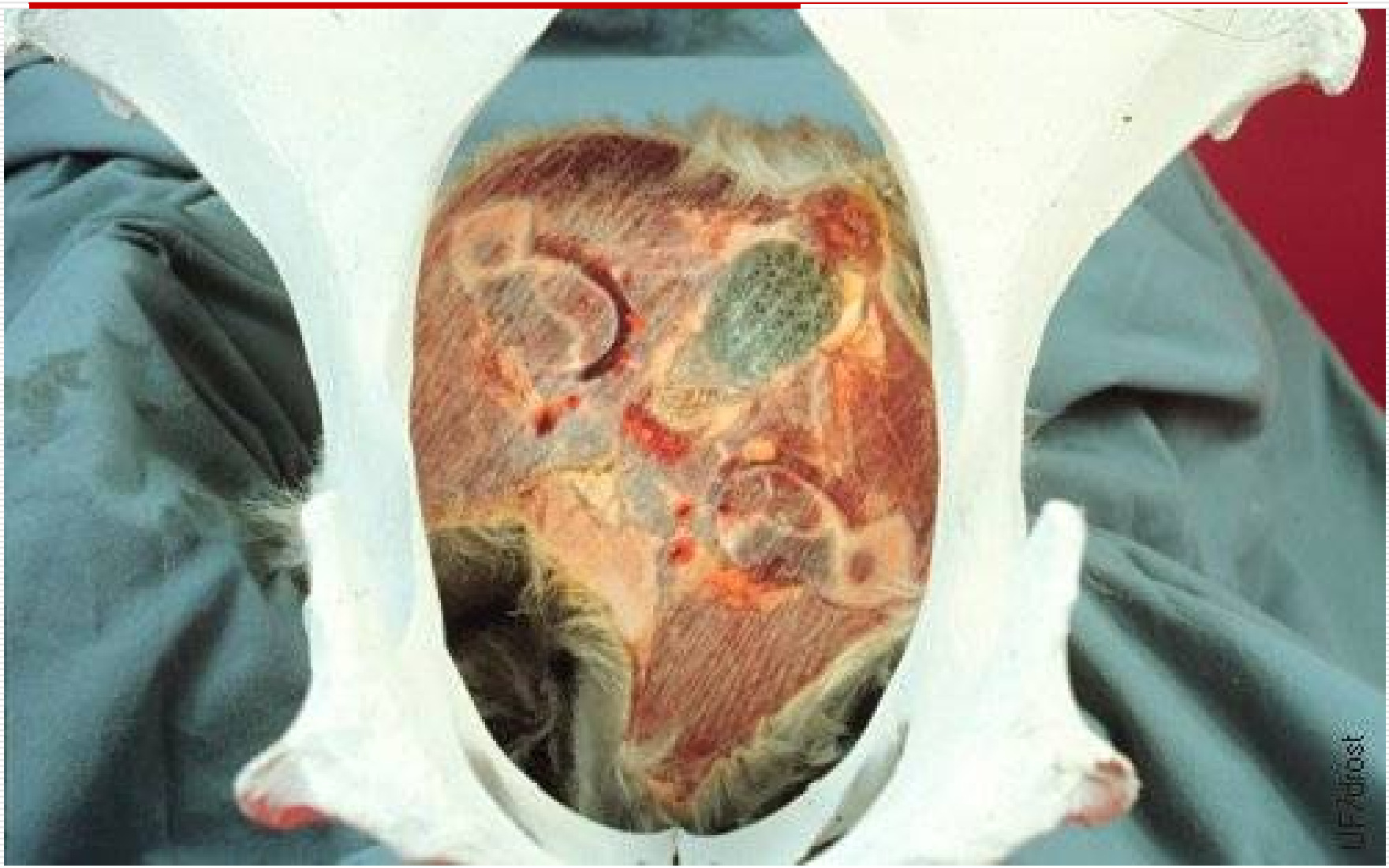


Calf pelvis



UF/drost

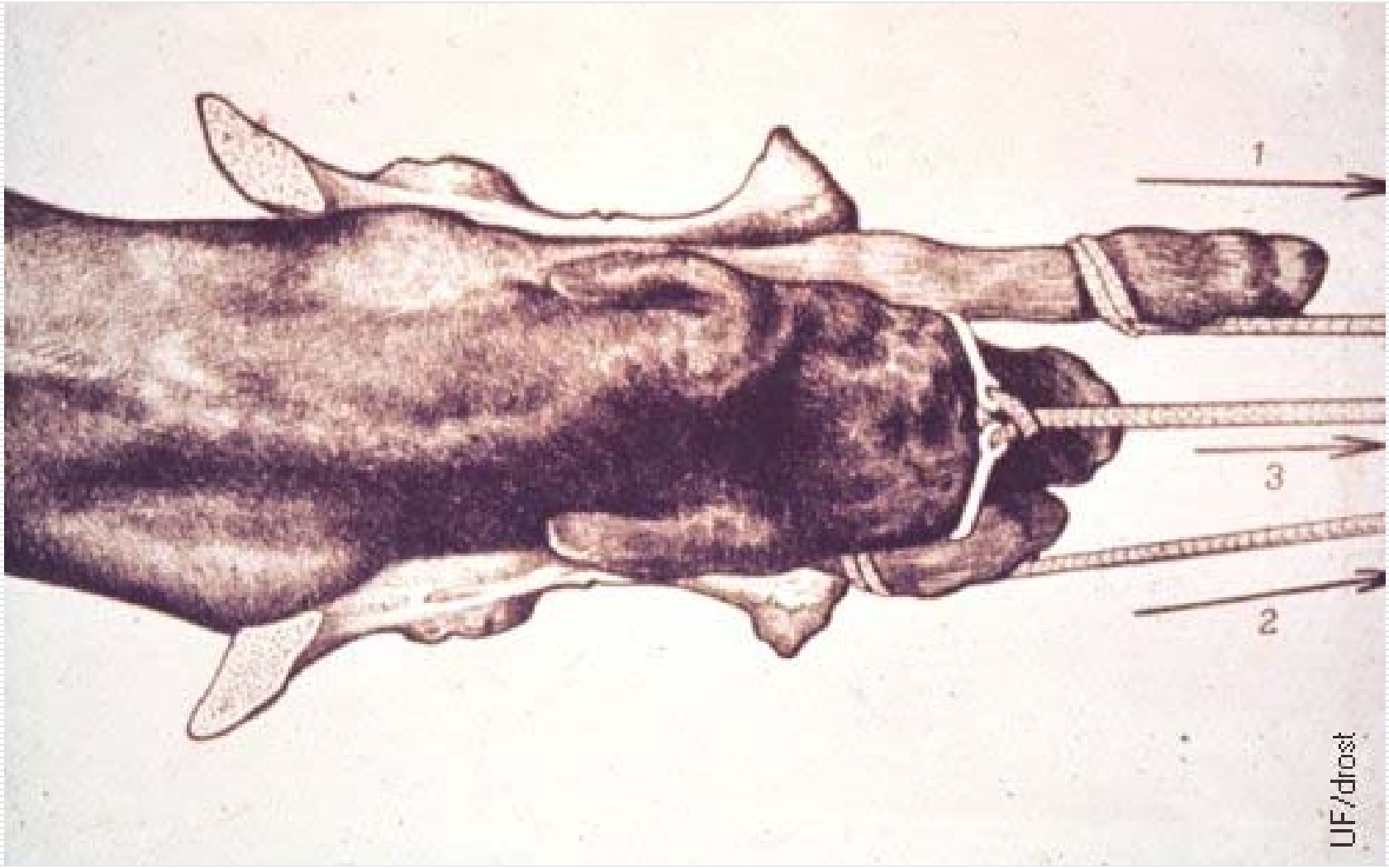
Prevent hip-lock



As soon as head is out- rotate calf

When hips clear pelvic inlet – rotate back

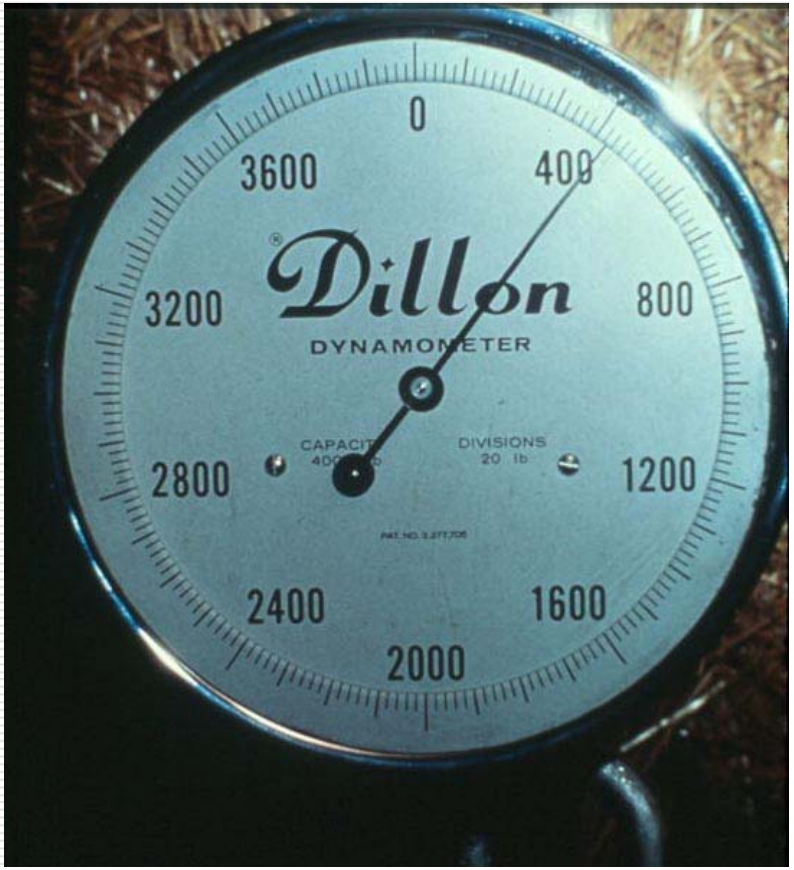
Three point traction



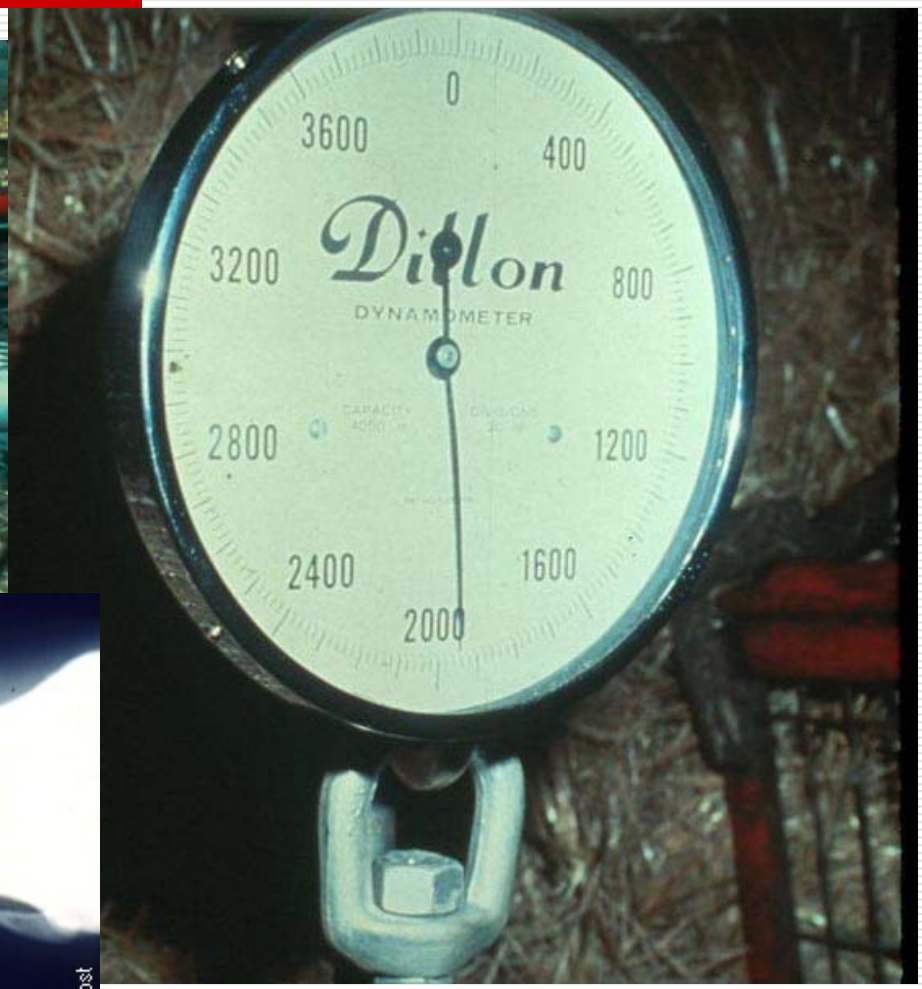
Forced extraction

Pull in synchrony with contractions

Forced extraction



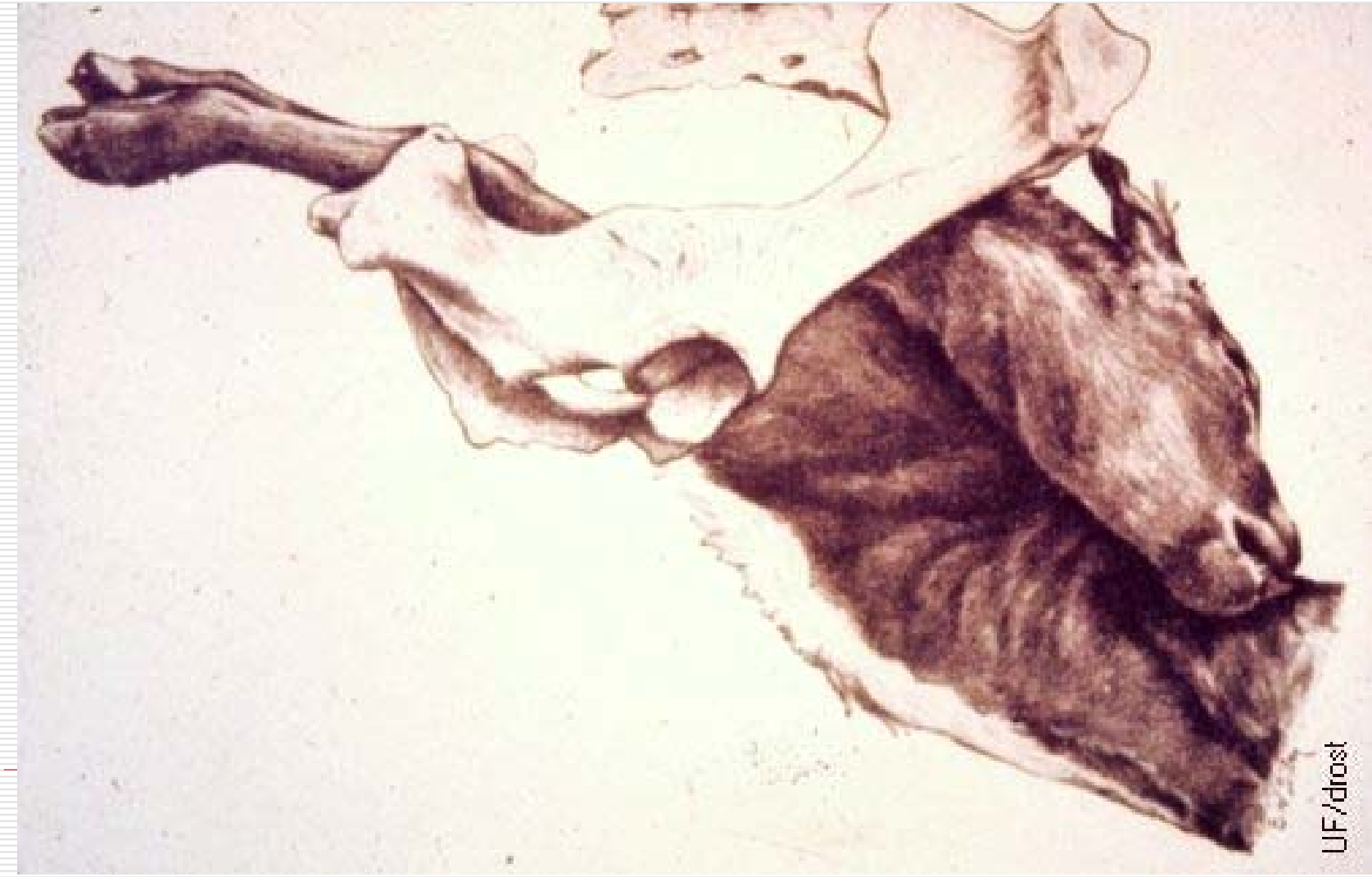
Forced extraction



Use when…

- there is sufficient room in the birth canal
- the calf is lined up correctly
- there is ample lubrication.

Lateral deviation of head



Carpal flexion

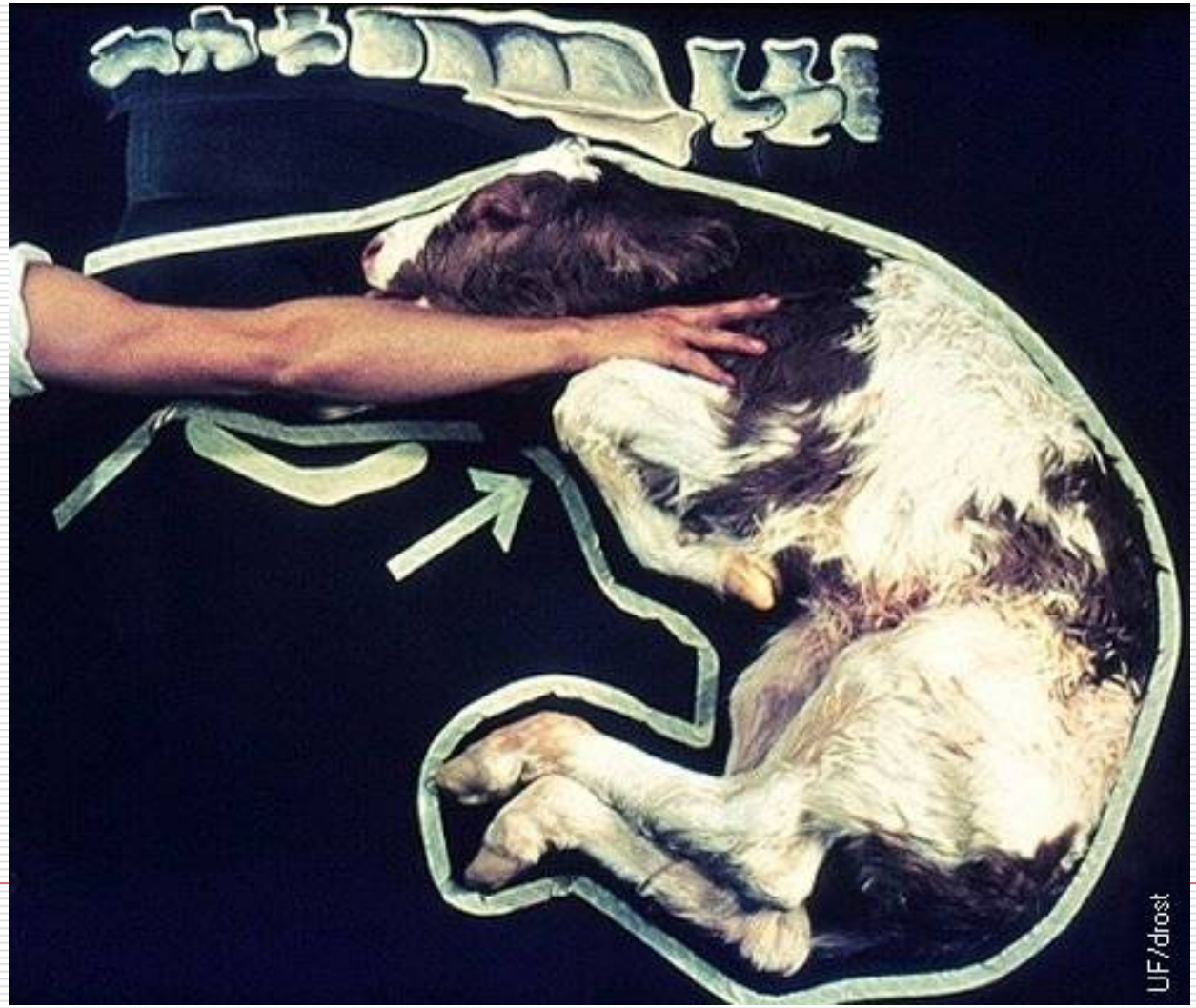
Correction of carpal flexion

Carpal flexion- foot out of reach

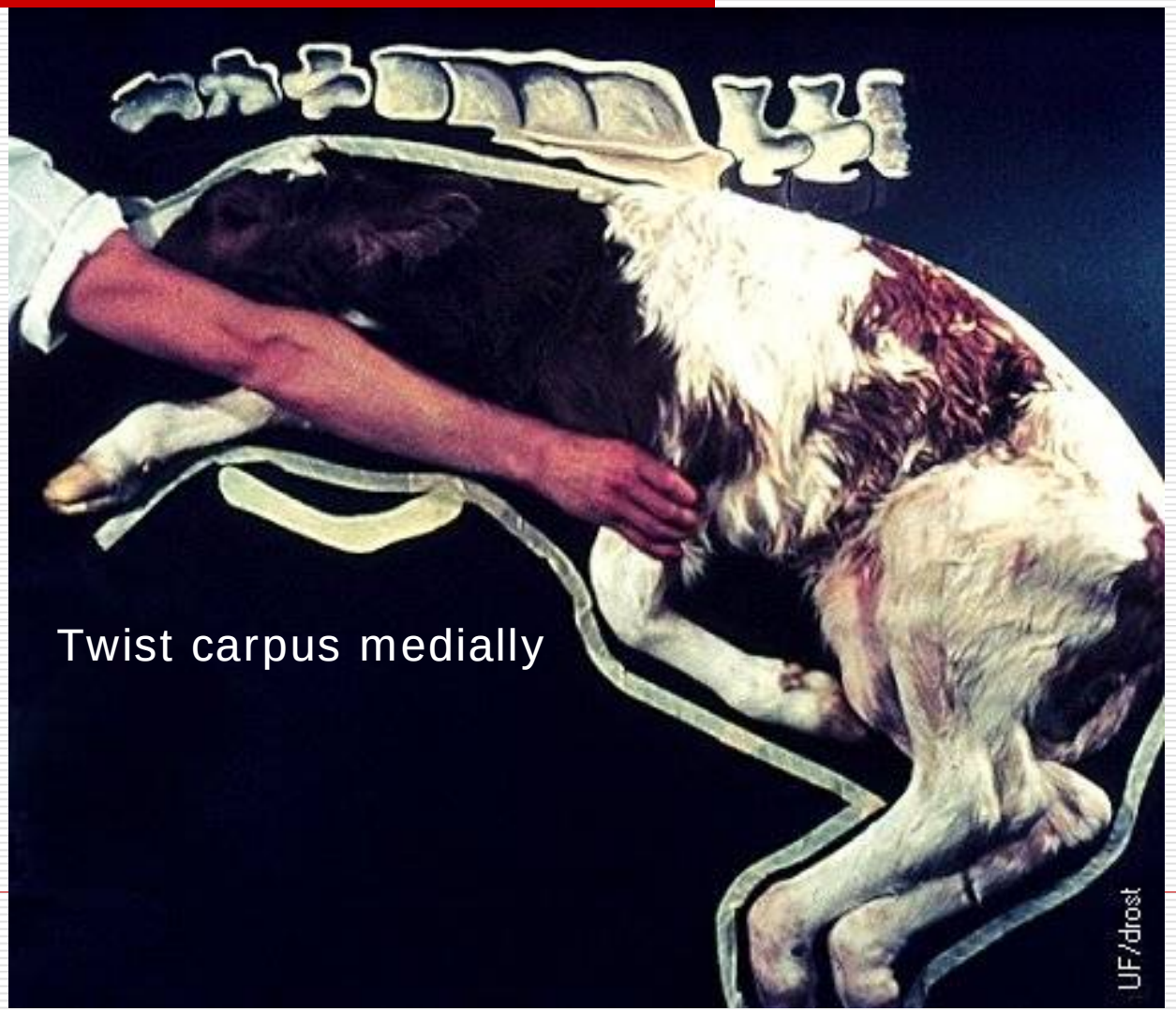
Shoulder flexion

Repel calf

Convert to carpal flexion

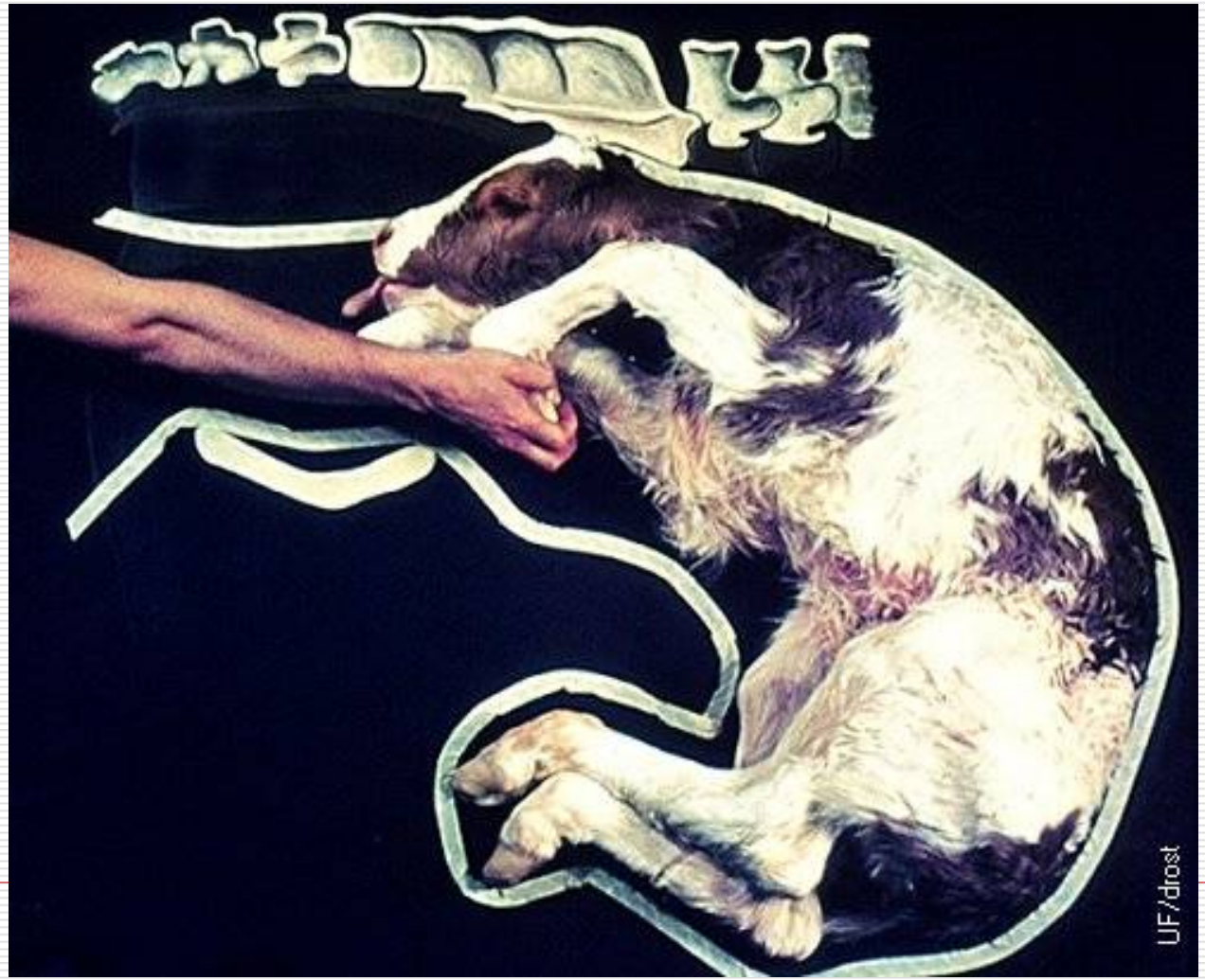


Retrieve carpus



Now twist carpus laterally

Extend foreleg

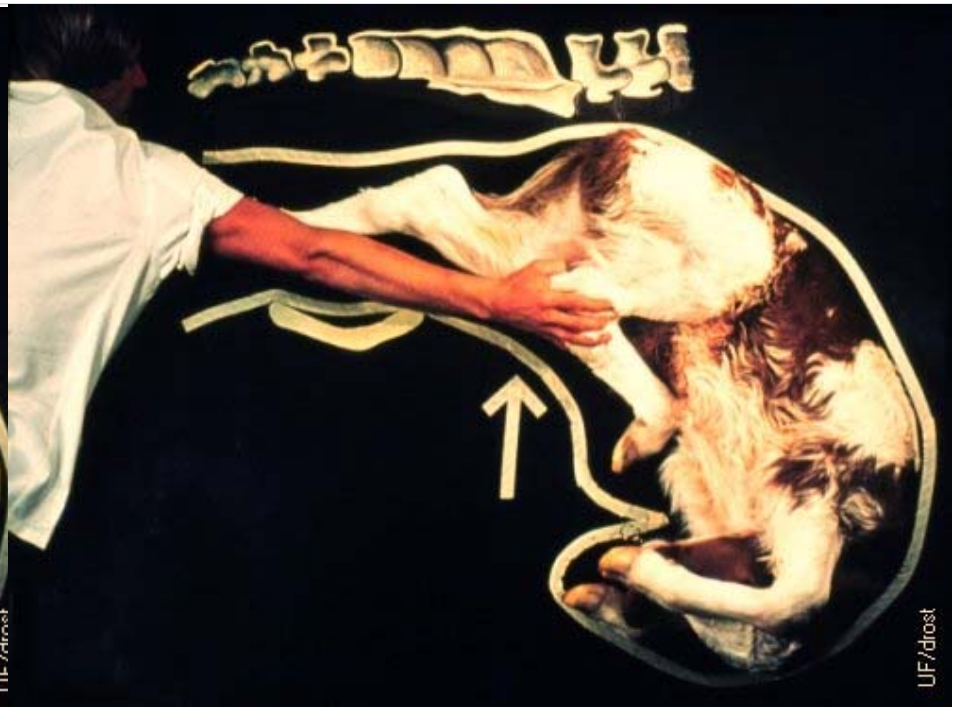


Caudal Longitudinal Presentation (Backwards)

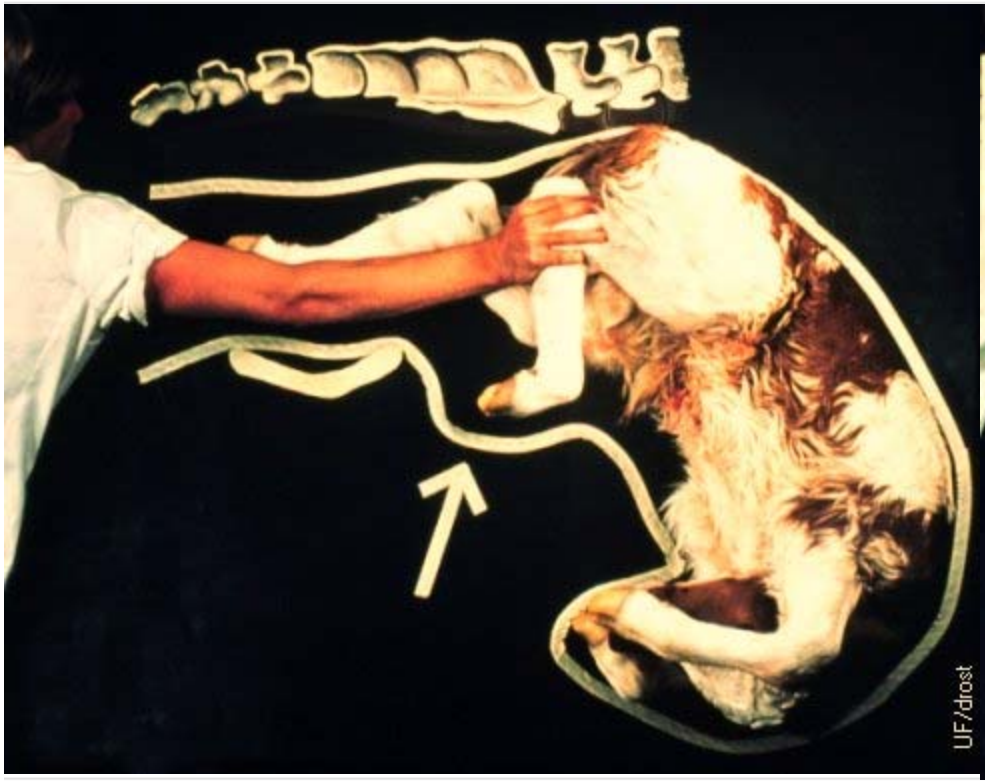
- Cause of increased fetal mortality
  - umbilical cord ruptures prior to parturition
- Delivery should be more rapid than with head-first presentation

Posterior - Pull slightly up to start

Right hip flexion

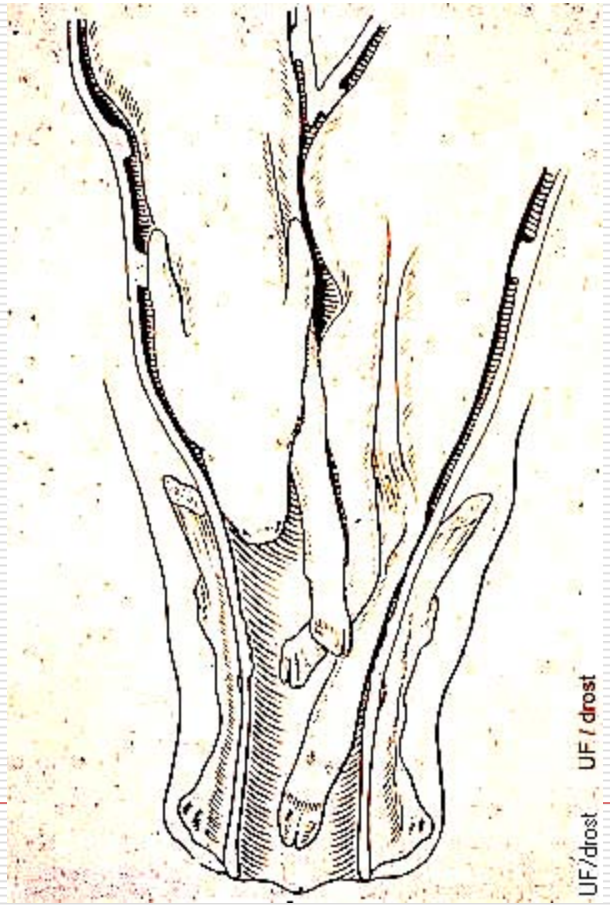


Push hock dorsally and laterally Extend from hoof

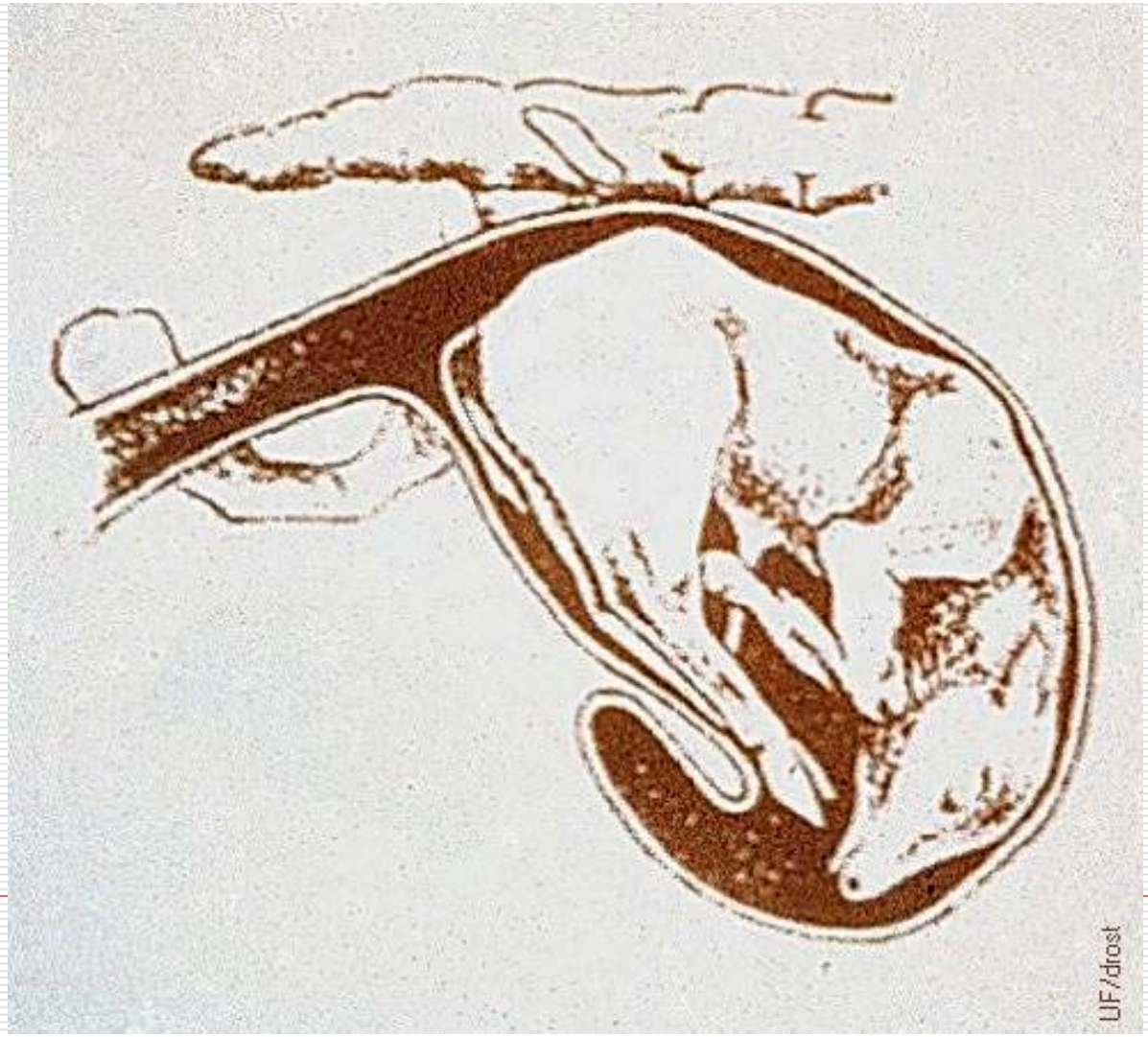


Twins

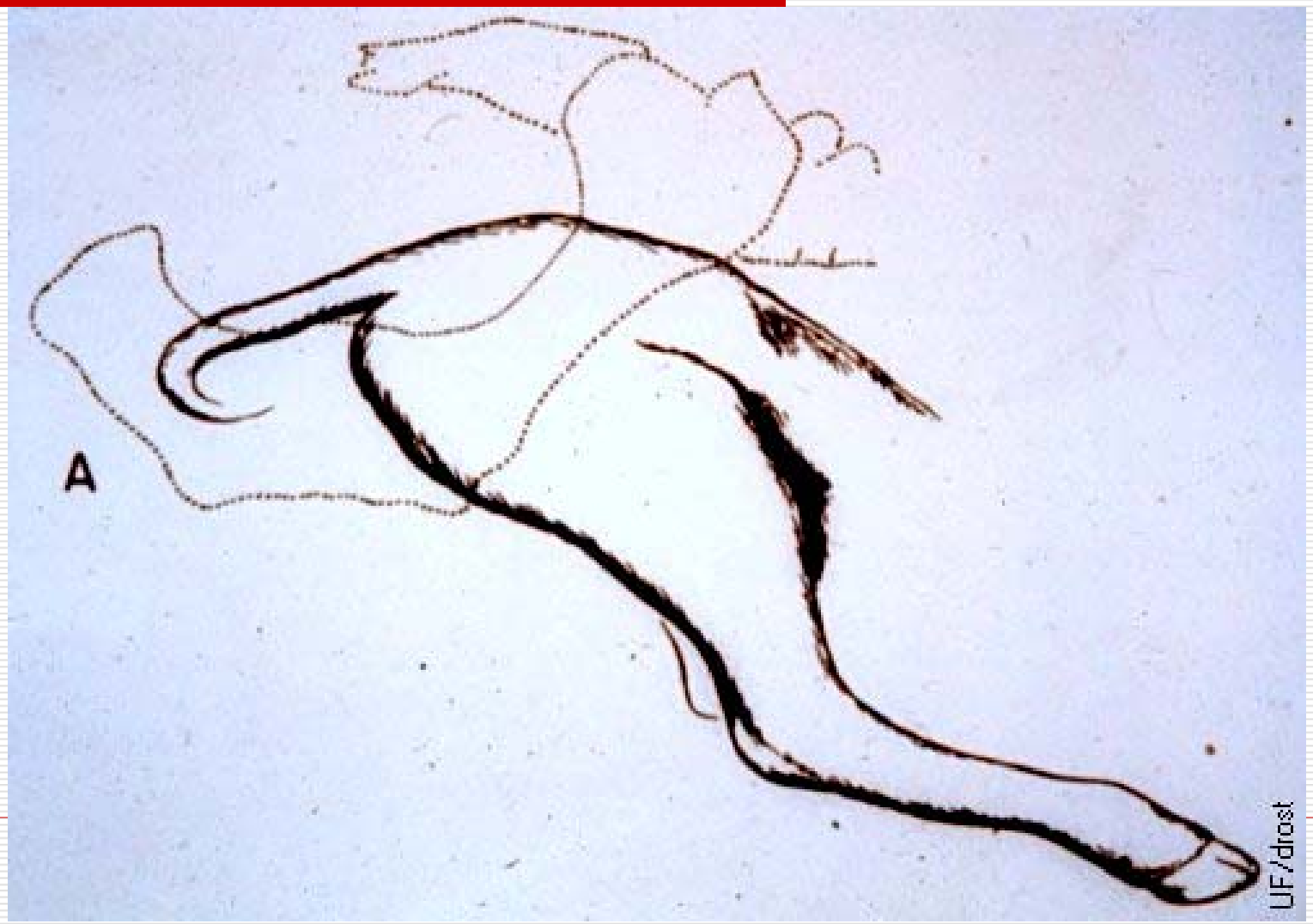
- How to tell a foreleg from a hindleg



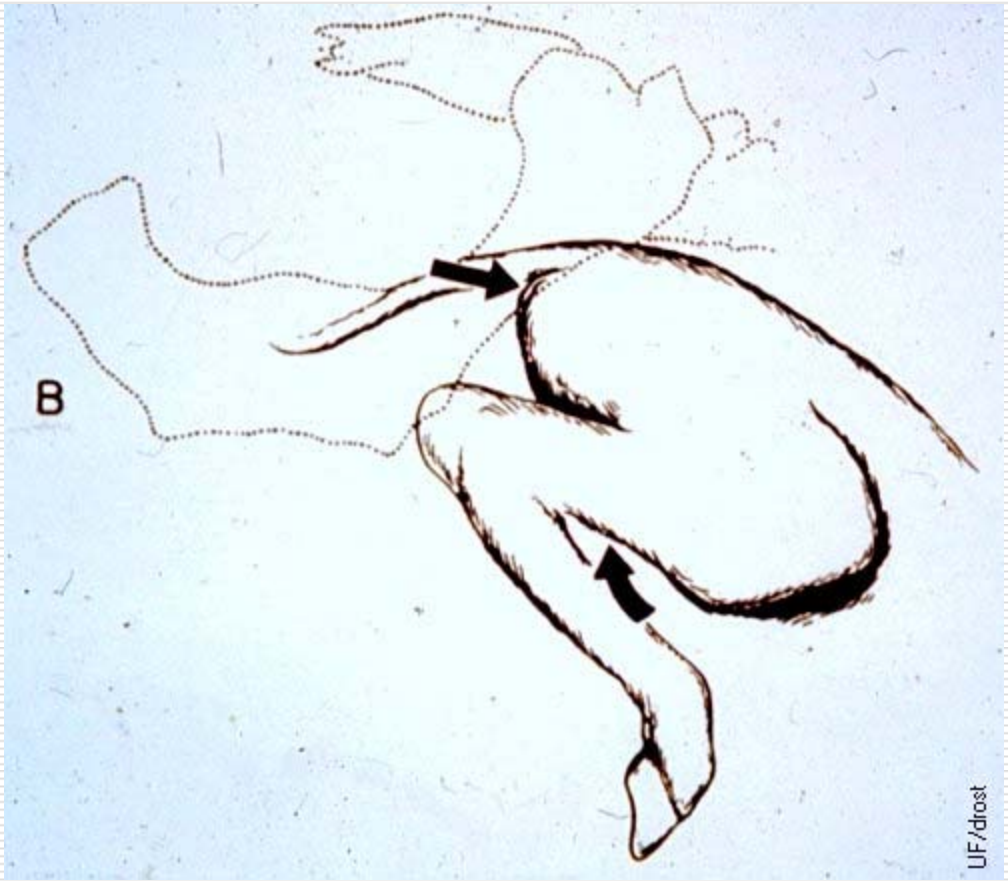
True breech

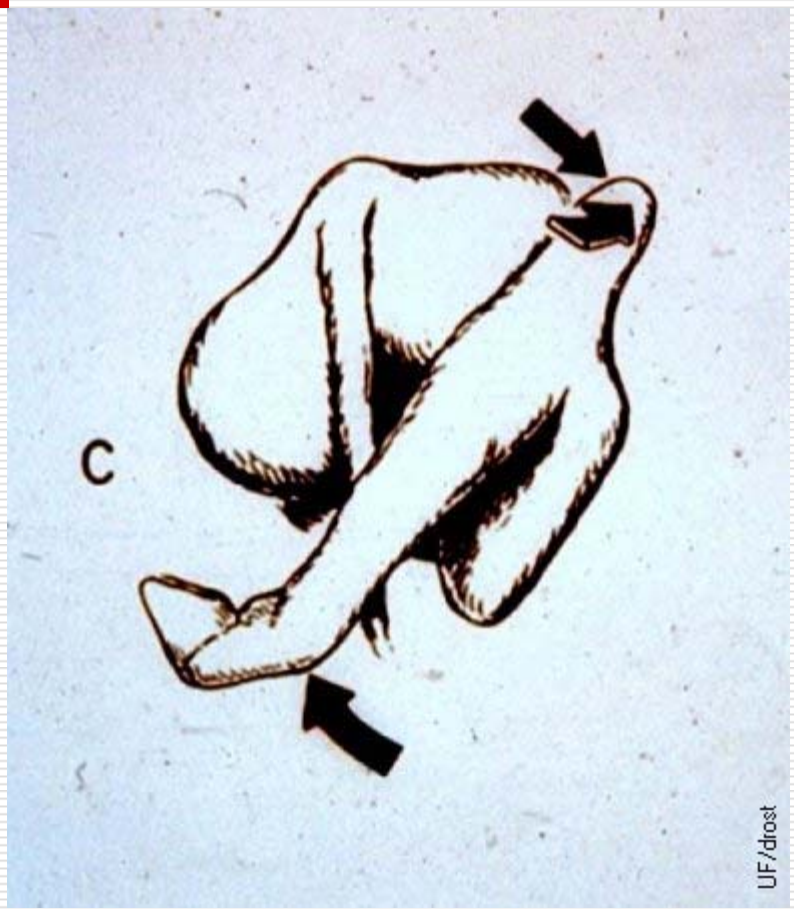


Correction of True Breech

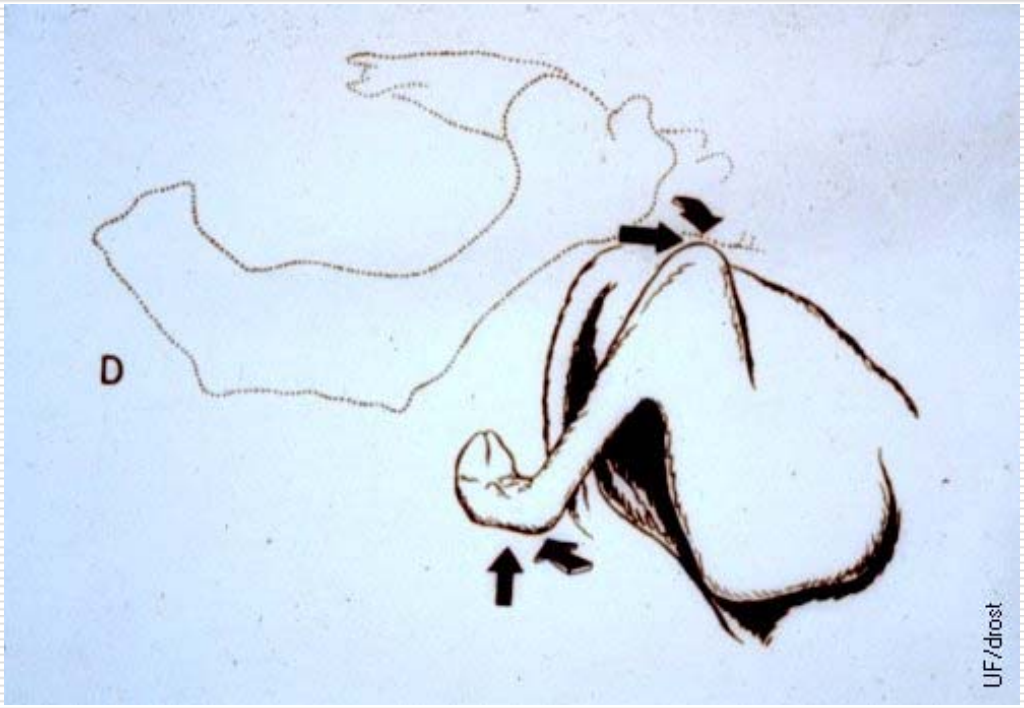


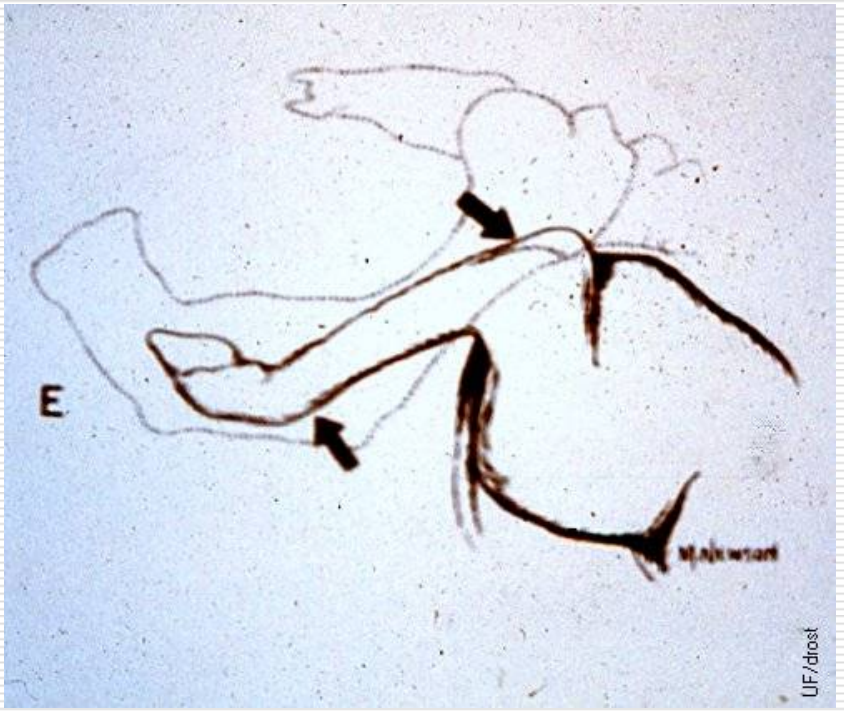
Correction of True Breech





Correction of True Breech II





When you are all alone!

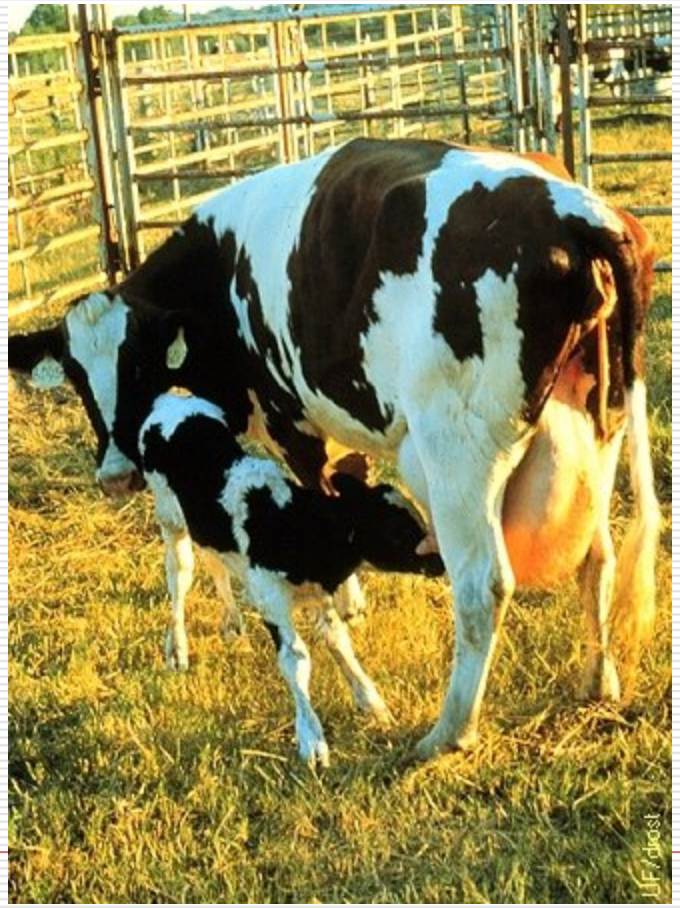
Umbilical cord still attached

Prop calf up to facilitate breathing


UIF/drox

Licking calf

Sucking colostrum



Post-Calving Steps

- **ALWAYS** CHECK FOR TWIN!!
- Check for tears in reproductive tract
- Take note of excessive bleeding and locate source if possible

Do not encourage this!

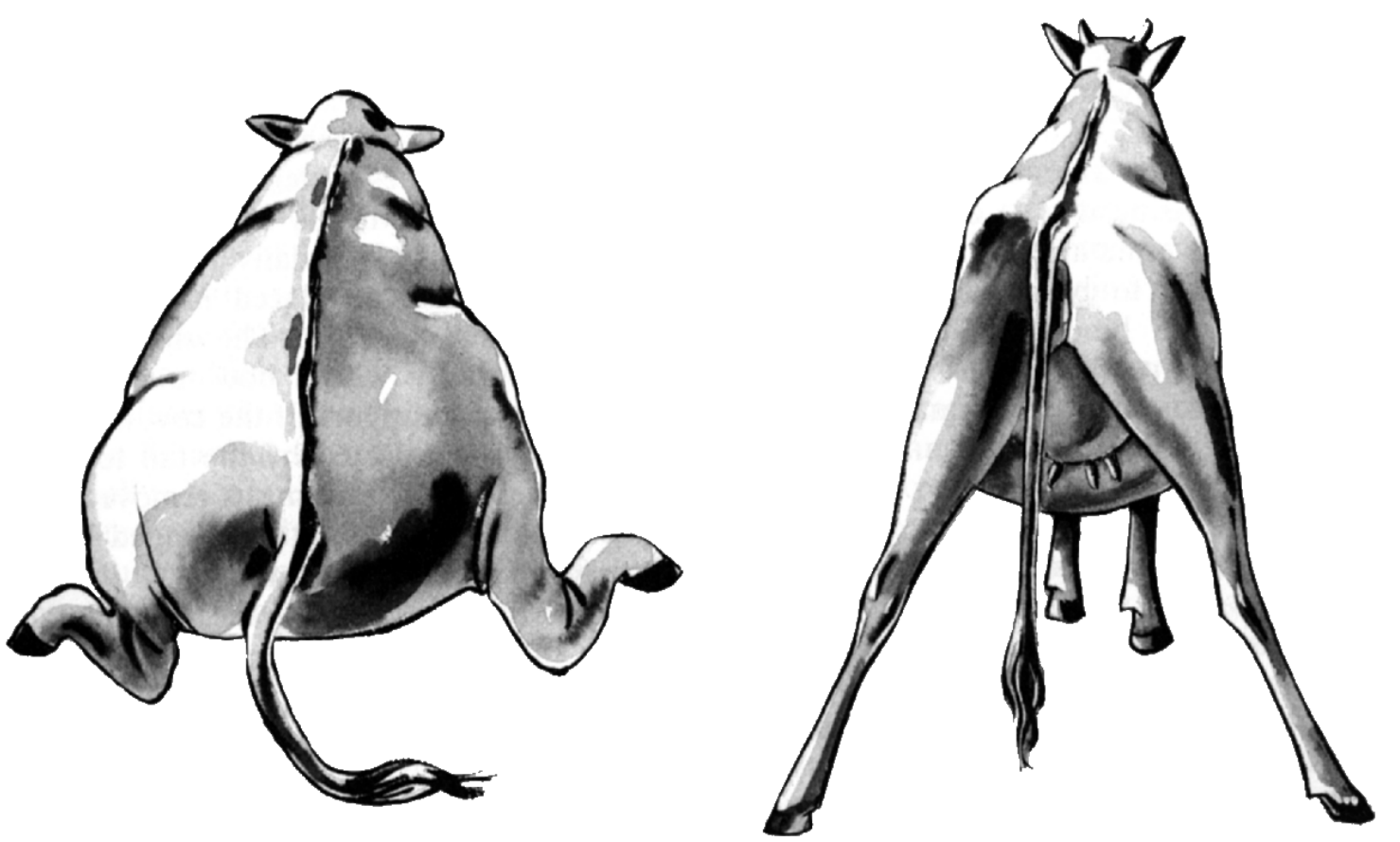
Injuries of cow/heifer after calving

Laceration to Birth Canal

Surgery to repair tears is only partially successful - Cow may never breed back

Bruised vagina

Obturator Paralysis
“Pinched Nerves”



Uterine Prolapse is Avoidable

Uterine Prolapse is a true emergency

Handling the Prolapsed Uterus Cow

- If cow is down, leave her where she is
- If cow is up, allow her to stand quietly
- **DO NOT CHASE COW!!**
- Call vet, wait for help

Prevention of Prolapse

- Give oral or IV calcium as soon as you suspect milk fever
- May need to give calcium before starting to assist
- Give oxytocin IV or IM after delivery
- Keep cow standing
- Keep pen flat and free of holes or uneven areas

Care of newborn calves

- Dry calf off with towels or straw
- Leave calf near rear-parts of mother
- Check cow's udder for milk flow - don't get kicked!
- Turn mother lose- if mother is a heifer keep her confined
- If calf has not stood and nursed within 1 h tube or bottle feed colostrum

DIP NAVEL WITH IODINE

7% Tincture of Iodine is used to dip navel of newborn calf

TUBE CALF WITH COLOSTRUM

- 1 gallon colostrum within 2 hours of birth
- Warm colostrum is best!!

Newborn calf (day 1) procedures

- Identify calf and record
- Dip navel
- Check temperature-warm calf if less than 100F
- Look over calf
- Check for meconium staining
- Oral vaccines BEFORE colostrum
- BoSe injection
- Determine if calf has sucked

Warm-up cold calves