

# CATTLE *Visions*

**WELCOME!**

**Artificial Insemination Training School**

## CATTLE VISIONS TEAM

**CARL NEWBROUGH – FOUNDER**

- **BEEN IN THE BUSINESS SINCE THE 70's!!!**

**JARED ROYER – Co-OWNER**

**LANCE ELLSWORTH – Co-OWNER**

**PATTY HELMKA – OFFICE MANAGER**

**HEATHER DODD – CUSTOMER SERVICE**

**KATIE YOUSE- CUSTOMER SERVICE**

**CHRISTINA MOSLEY- CUSTOMER SERVICE**

**DOUG MCDOWELL- WAREHOUSE MANAGER**

**ADRIANNA HAYES-ASSISTANT WAREHOUSE MANAGER**

**ERIC ADKINS –BULL COLLECTIONS, BREEDING SERVICES AI**

**JACOB HEIMER- BULL COLLECTIONS, BREEDING SERVICES AI**

## WHAT WE DO

- **BOVINE SEMEN DISTRIBUTION**
- **AI CERTIFICATES**
- **AI ARM SERVICES**
- **AI TRAINING SCHOOLS**
- **AI SUPPLIES**
- **LIQUID NITROGEN REFILLS**
- **SYNCHRONIZATION CONSULTATION**
- **CUSTOM COMMERCIAL BULL COLLECTIONS**

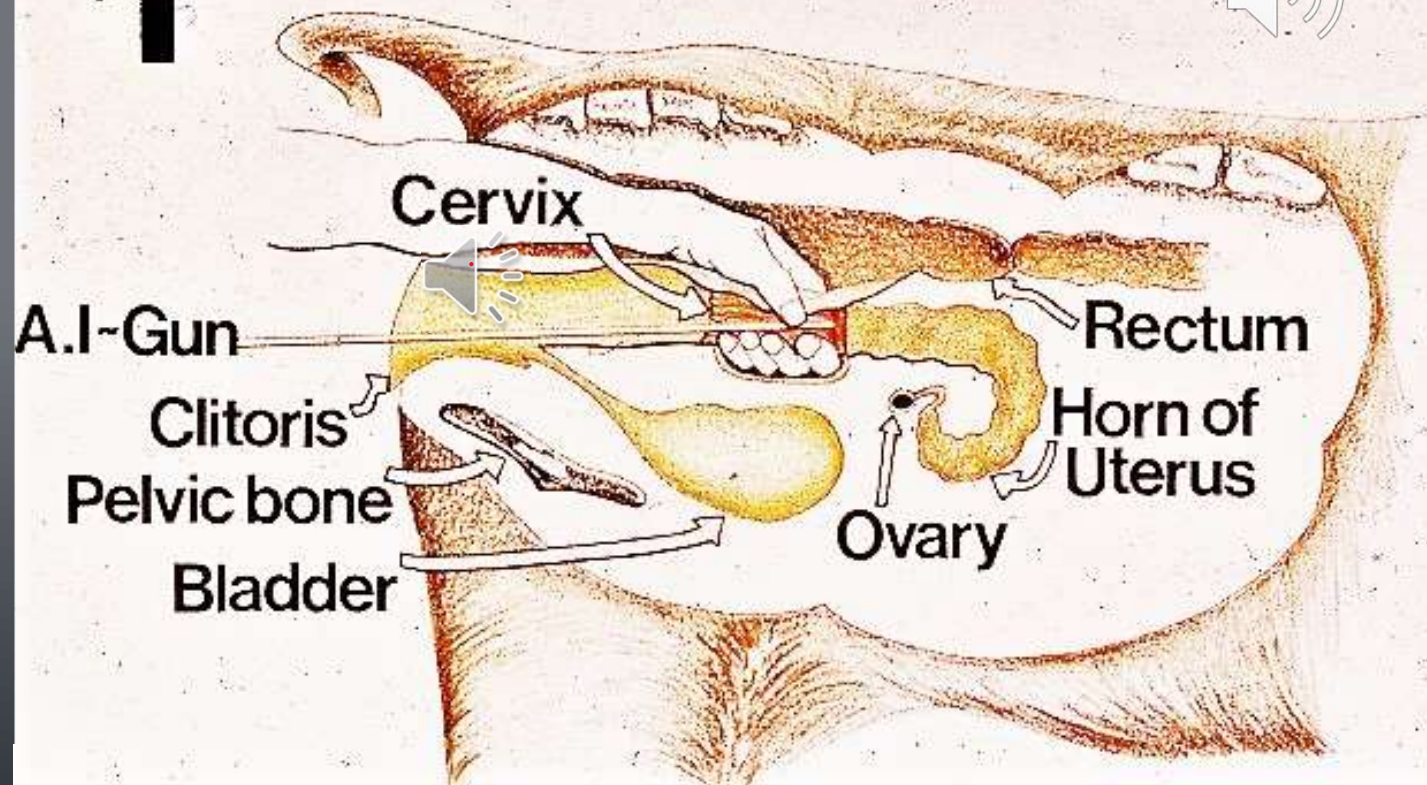
**12/07/2009**

# ARTIFICIAL INSEMINATION in Cattle

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- PRACTICAL DO-IT-YOURSELF TECHNIQUE
- CERVICAL FIXATION METHOD
- MOST POPULAR AND EFFECTIVE METHOD OF AI TODAY
- ONE BULL CAN BREED MORE FEMALES THROUGH AI THAN HE CAN USING NATURAL SERVICE.



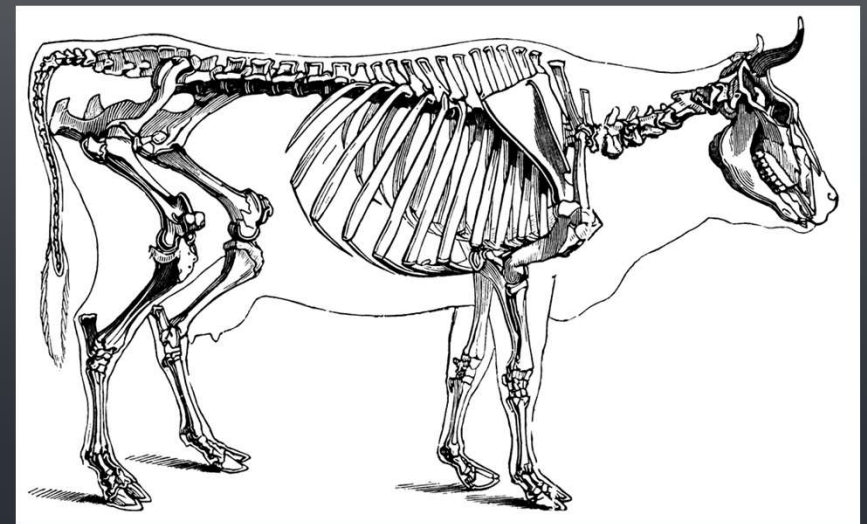
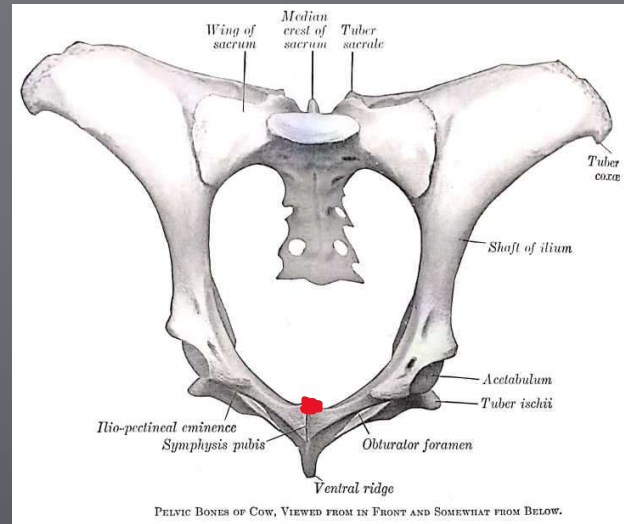


- SENSE OF TOUCH
- MUST RELY ON FEELING IN FINGERTIPS
- EXERCISE FOREARM, WRIST, HAND AND FINGERS
  - STRESS BALL/TENNIS BALL
- PRACTICE COORDINATION
  - PASS RIGHT FINGER THROUGH HOLE IN LEFT HAND WITH EYES CLOSED



# INTERNAL STRUCTURES

- **PELVIC GIRDLE**
  - OVAL SHAPED CANAL
- **HOOKS AND PINS**
  - TRIANGULAR PELVIC CAVITY
- **PELVIC BRIM**
  - MUSCLES FROM HERE FORWARD SUPPORT ABDOMINAL CAVITY
- **2 STRUCTURES TO FIND**
  - **ELEVATED RIDGE ON FLOOR OF PELVIS**
    - RUN FINGERS FORWARD ALONG PELVIC FLOOR
  - **RUMEN (PAUNCH)**
    - DOUGHY INNER MASS, SOMETIMES HARD LIKE AN OVER INFLATED BALLOON
    - TYPICALLY FORWARD AND TO THE LEFT OF PELVIC BRIM



# RECTAL PALPATION

- **PROMINENT AND CENTRAL RIDGE**
- **REDUCE STRESS AND STRAIN OF INSEMINATOR AND ANIMAL**
  - USE LEFT HAND FOR PALPATION
    - REPRODUCTIVE ORGANS NATURALLY PUSHED TO THE RIGHT
    - LEFT HAND TENDS TO LEAD TOWARDS RIGHT
  - SLEEVES
    - LUBRICATE GLOVE THEN ANUS
    - INSERT CONE SHAPED HAND INTO RECTUM
    - USE GENTLE FORCE
  - POWERFUL RECTAL CONTRACTIONS
    - INVOLUNTARY PERISTALTIC WAVES
    - DO NOT REMOVE HAND FROM RECTUM ONCE INSIDE
    - FLATTEN HAND AND ALLOW WAVES TO PASS OVER
  - RECTAL WALLS ARE FLEXIBLE AND MANEUVERABLE
  - STRUCTURES CAN BE PALPATED WITH DISTINCTION
  - IDENTIFY STRUCTURES IN AS MANY COWS AS POSSIBLE



# PALPATION SESSION #1



IDENTIFY PELVIC BRIM & INTERNAL STRUCTURES

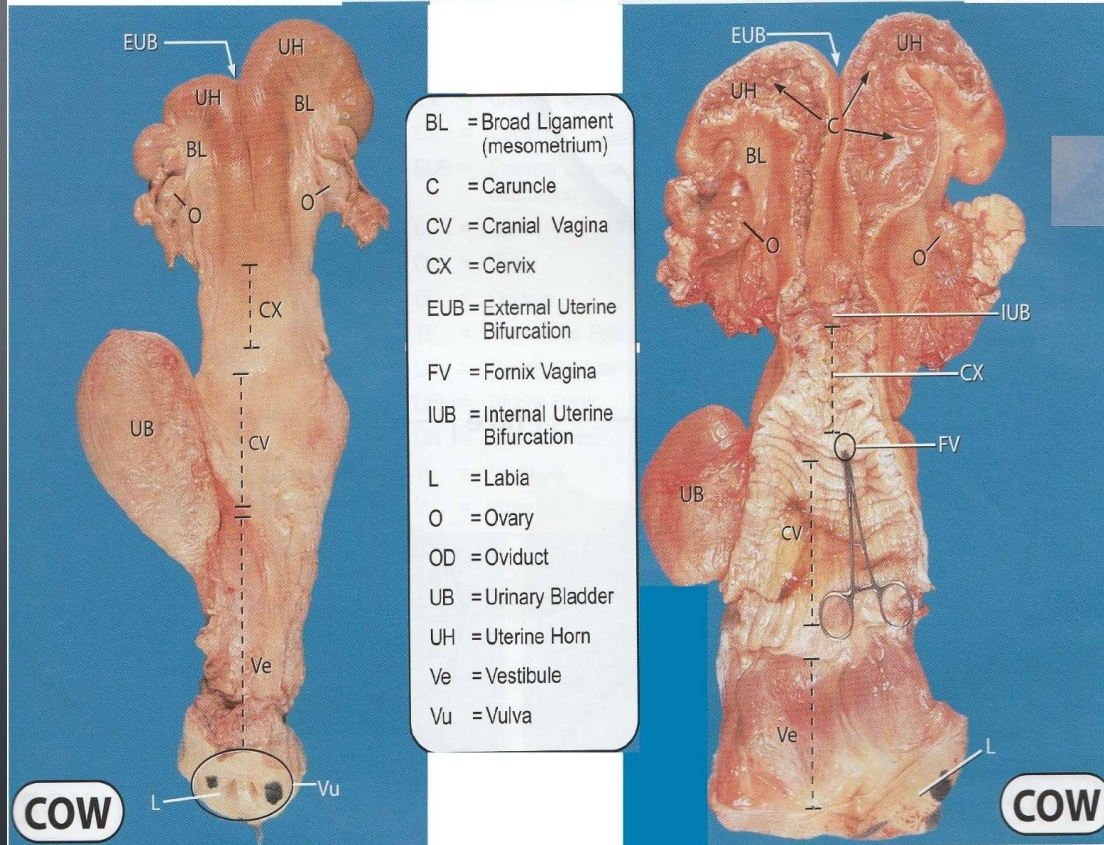


NOTE RECTAL PRESSURE & STRONG PERISTALTIC WAVES



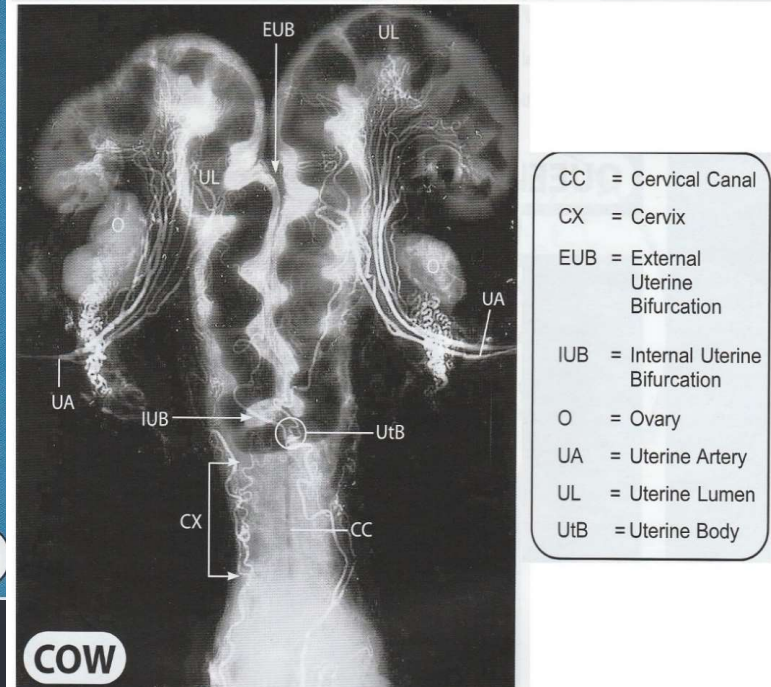
# REPRODUCTION TRACT DEMONSTRATION

## Dorsal View of Excised Reproductive Tracts



## Radiographs of Excised Reproductive Tracts

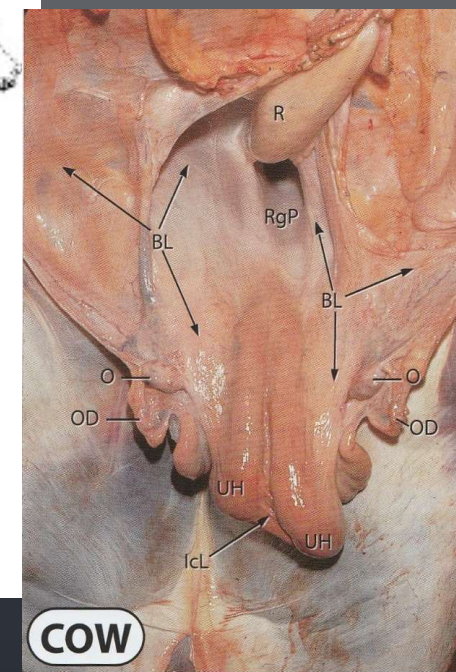
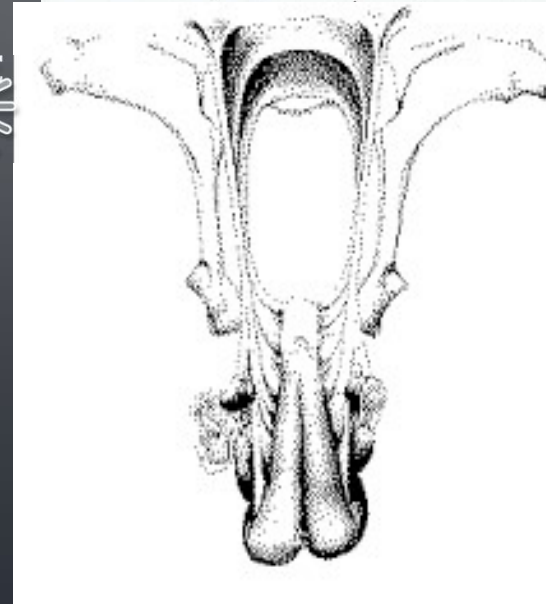
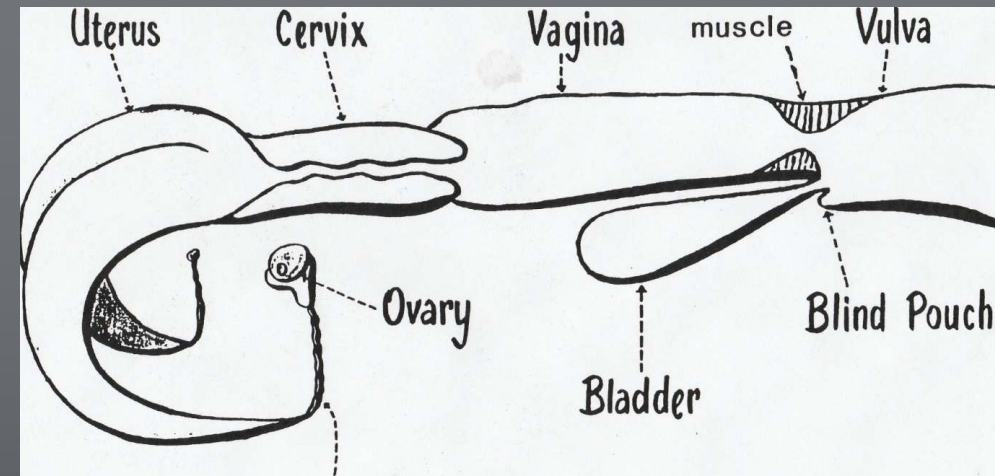
(The uterine artery was infused with radiopaque contrast medium so that the blood supply to the uterus can be visualized. The lumen of the tract can be visualized because it was infused with air.)





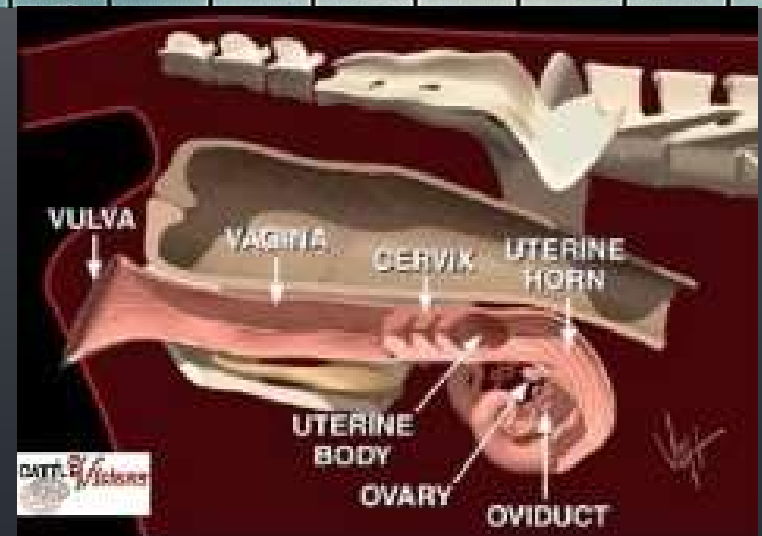
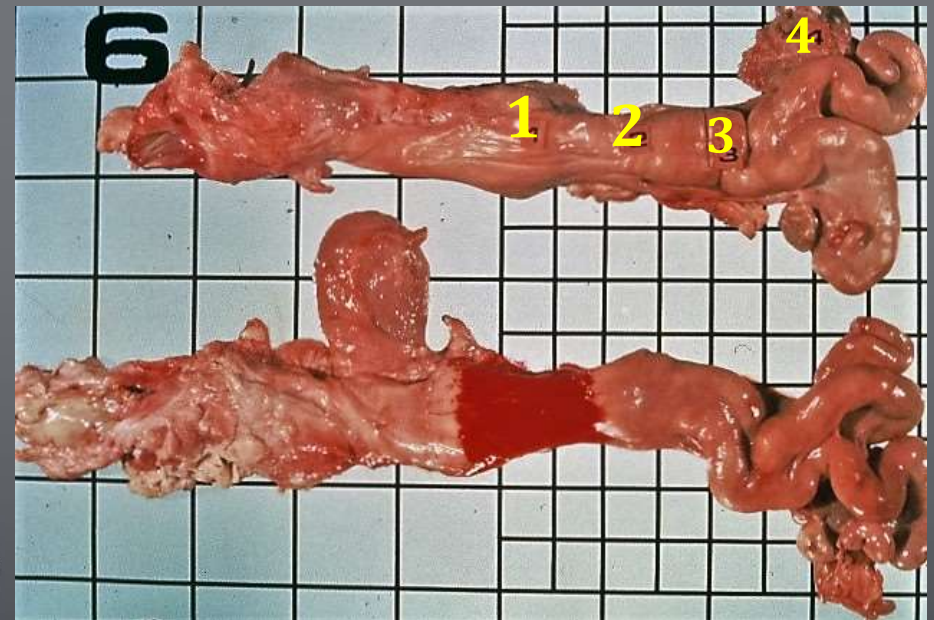
# ANATOMY OF REPRODUCTIVE ORGANS

- **STARTS AS TWO TUBULAR TRACTS**
  - OPENINGS AT OVARIES TO UTERUS
  - LEADS BACK TO SINGLE TUBULAR STRUCTURE ALL THE WAY TO THE EXTERNAL REAR OF THE ANIMAL
- **SUSPENDED IN PELVIC CANAL BY SUSPENSORY LIGAMENTS**
  - ALLOWS MOVEMENT IN ALL DIRECTIONS
  - RESILIENT ENOUGH TO HOLD IN RELATIVELY CONSTANT POSITION
  - REQUIRES EXTREME FLEXIBILITY



# ANATOMY

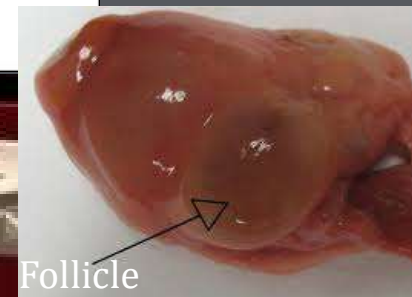
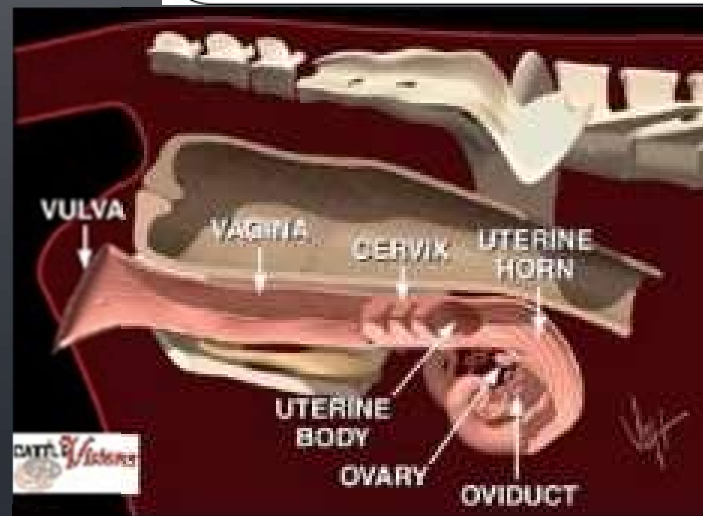
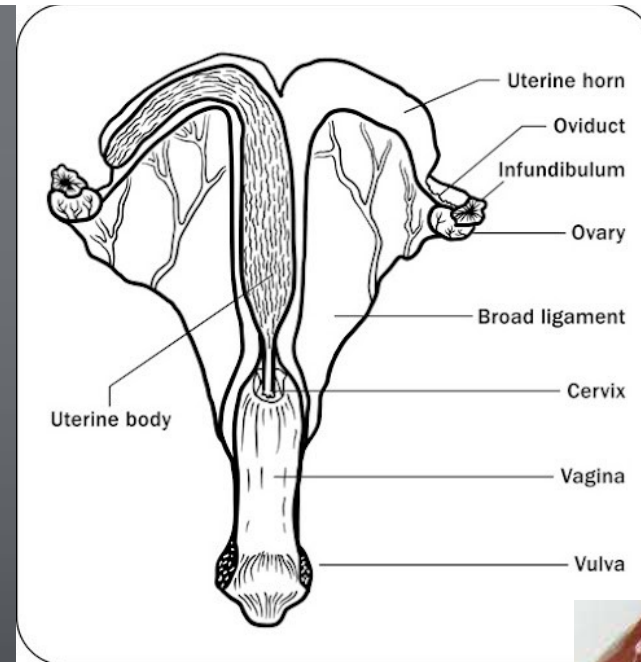
- **VULVA**
  - EXTERNAL OPENING TO REPRODUCTIVE SYSTEM
- **VAGINA**
  - SITE OF SEMEN DEPOSITION IN NATURAL MATING
- **CERVIX**
  - PRIMARY LANDMARK WHEN INSEMINATING CATTLE
  - FORNIX CREATES BLIND POUCH
  - INTERIOR CERVIX CONTAINS 3 ANNULAR RINGS



# ANATOMY

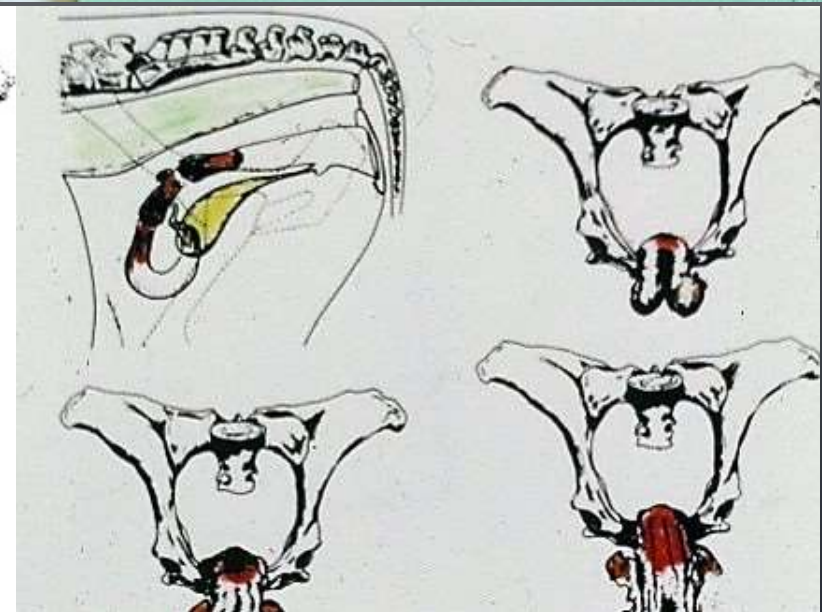
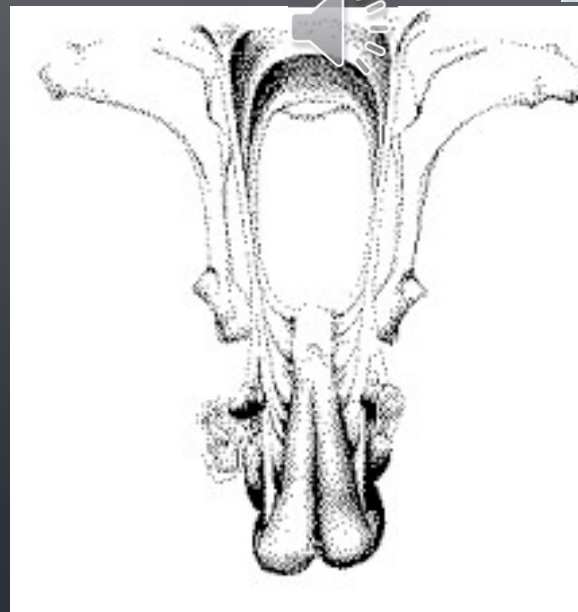
## • UTERUS

- ENVIRONMENT FOR FETAL DEVELOPMENT
- UTERINE BODY
  - ABOUT 1" LONG
  - SITE OF SEMEN DEPOSITION DURING ARTIFICIAL INSEMINATION
- UTERINE HORNS (2)
  - CONTRACT TO AID IN SPERM TRANSPORT
- OVIDUCTS (2)
  - CARRY OVA (COW'S EGG)
  - SITE OF FERTILIZATION
- OVARIES (2)
  - SPARK PLUGS OF REPRODUCTIVE SYSTEM
    - PRODUCE ESTROGEN AND PROGESTERONE
  - FOLLICULAR DEVELOPMENT
    - PRODUCE AND RELEASE EGGS
  - CORPUS LUTEUM (CL)
    - FORMS AFTER FOLLICULAR RUPTURE
    - SECRETES PROGESTERONE

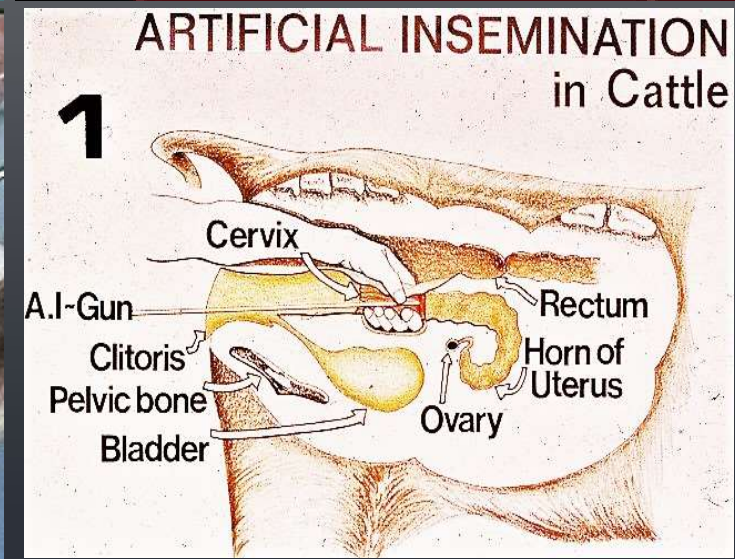
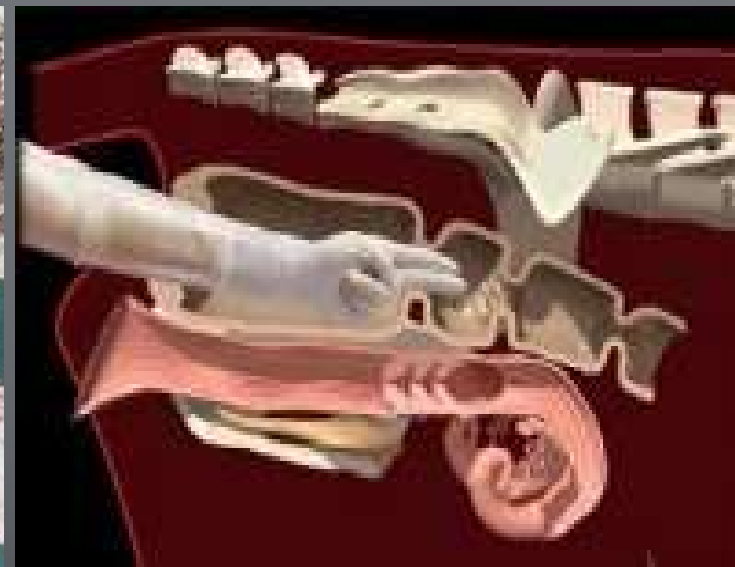



# TRACT PLACEMENT

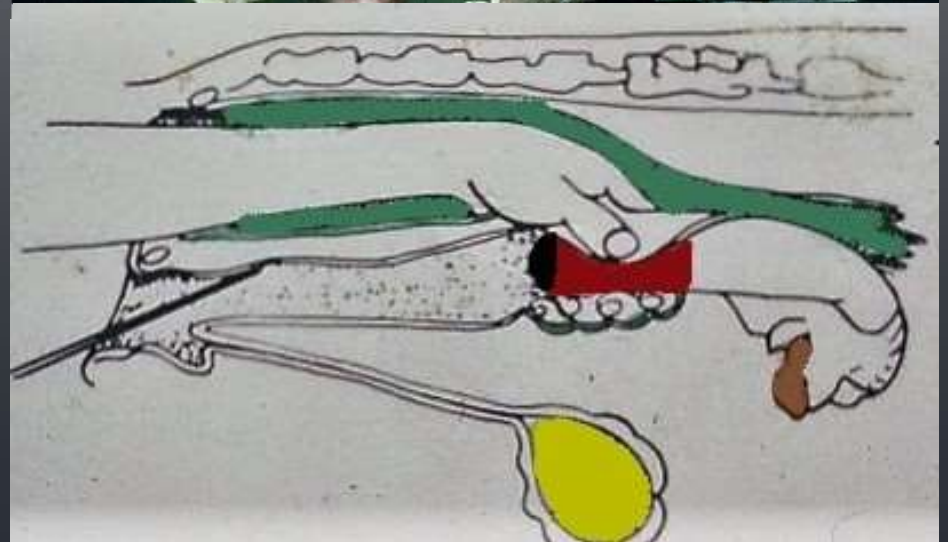
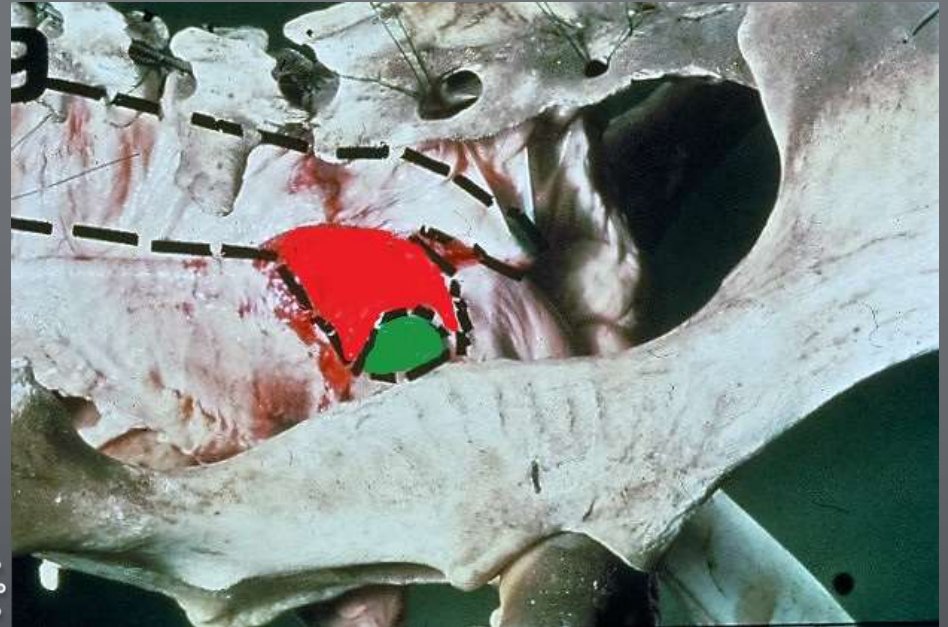
- UTERINE HORNS HAVE A DOWNWARD CURVATURE
- TIPS OF UTERINE HORNS AND OVARIES LIE JUST AT THE PELVIC RIM
- YOUNGER COWS
  - TRACT MAY BE CLOSER TO REAR OF ANIMAL THAN EXPECTED
- POSITION MAY DIFFER CONSIDERABLY FROM COW TO COW
- ALMOST ALWAYS CAN PICK UP TRACT AT PELVIC RIM
- LOCATION OF REPRODUCTIVE ORGANS CHANGES CONSTANTLY



- REPRODUCTIVE TRACT IS LYING ON THE PELVIC FLOOR
  - UTERINE HORNS AND OVARIES JUST PAST THE PELVIC RIM
- SUSPENSORY LIGAMENTS ALLOW RECTAL PALPATION OF THE REPRODUCTIVE TRACT TO BE POSSIBLE
- RECTAL CONSTRICTION RINGS CAN BE RELIEVED BY PULLING BACK ON THEM
- TRY TO VISUALIZE YOUR HAND INSIDE THE COW

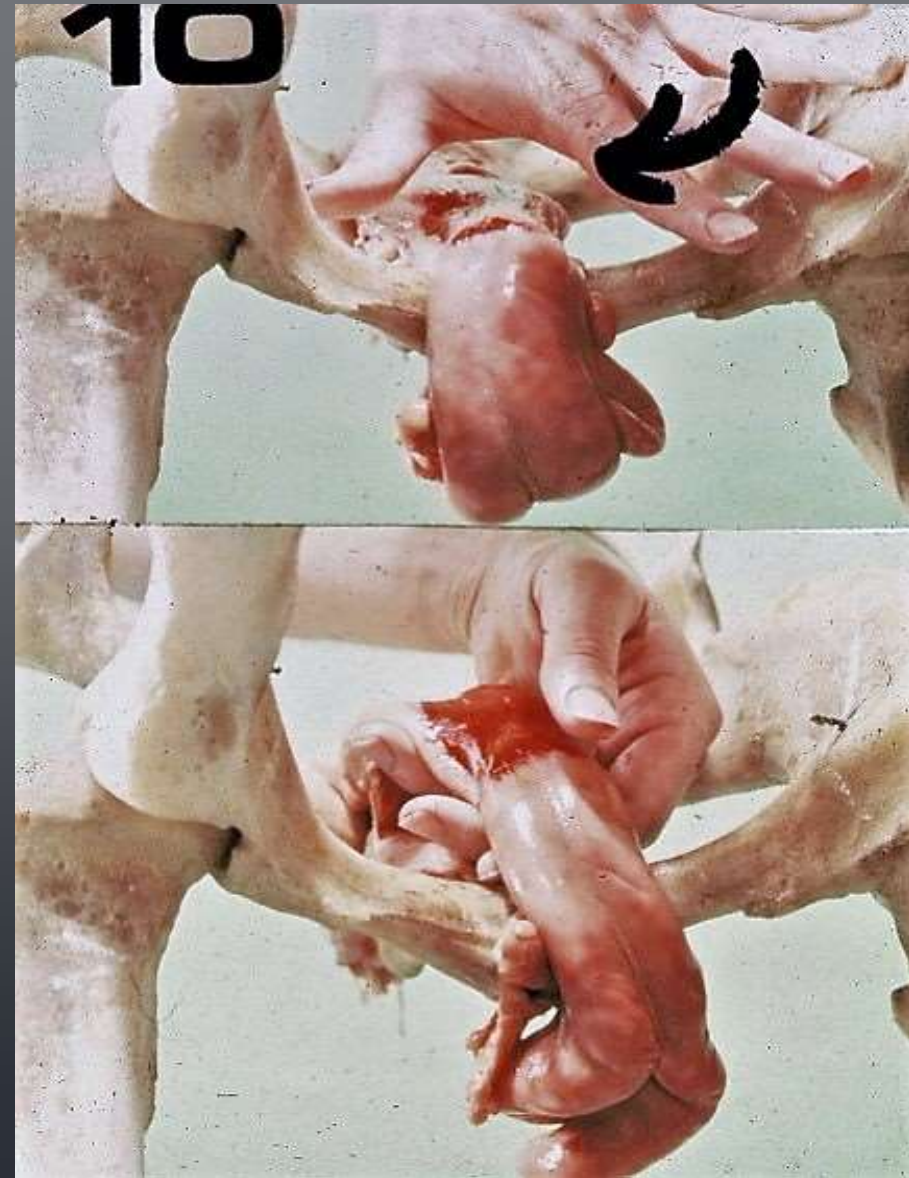


- POSITION OF THE **CERVIX** AS SUSPENDED IN THE PELVIC CANAL
- **HAND** POSITION ON CERVIX
  - FLEX HAND DOWNWARD FROM WRIST
  - THUMB ON TOP, FOREFINGERS BENEATH
  - HOLDING CERVIX, NOT GRASPING
  - LEAST FATIGUING HOLDING POSITION
- PALPATE ALONG TRACT TO FEEL DIFFERENT TEXTURES AND RESILIENCIES 
  - CERVIX FEELS SIMILAR TO A TURKEY NECK
  - MANIPULATE CERVIX BY FLEXING YOUR WRIST
    - CERVIX CAPABLE OF BENDING UP TO 90° ANGLE

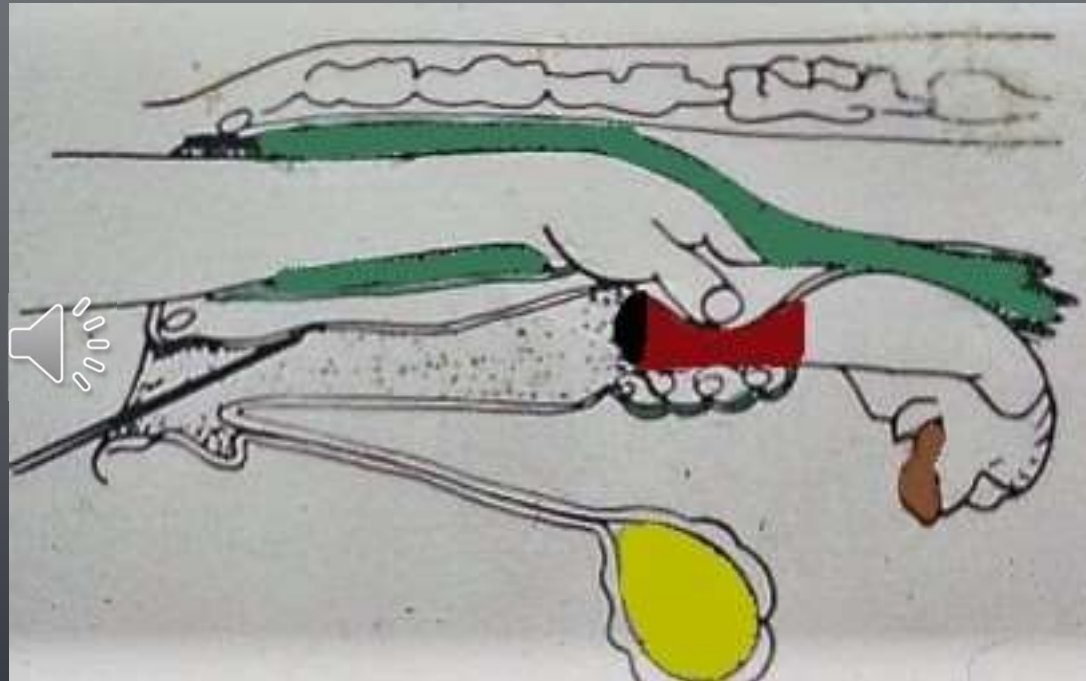


## PELVIC SWEEP

- BEGIN WITH HAND OPEN, PALM DOWN
- “SWEEP” FROM LEFT SIDE OF PELVIC WALL DOWN TO BOTTOM OF PELVIC BONE
  - KEEP HAND AGAINST PELVIC BONE
- TURN HAND PALM UP WHILE GRASPING
  - SOME PORTION OF THE TRACT SHOULD BE PICKED UP
- REPEAT THIS STEP UNTIL YOU FIND THE TRACT
- IF NO LUCK, TRY ADJUSTING THE DEPTH OF YOUR REACH
  - THE TRACT IS OFTEN CLOSER TO THE REAR THAN ONE THINKS
- THE TRACT IS IN THERE SOMEWHERE!



- FOREARM, WRIST, THUMB AND FINGER POSITION IS KEY
  - PRACTICE, PRACTICE, PRACTICE!
- CERVICAL FIXATION METHOD
  - LOCATE AND IDENTIFY CERVIX QUICKLY
  - GRASP CORRECTLY
  - PROPERLY MANIPULATE
  - MOST EFFECTIVE TECHNIQUE TODAY
- RELAX!





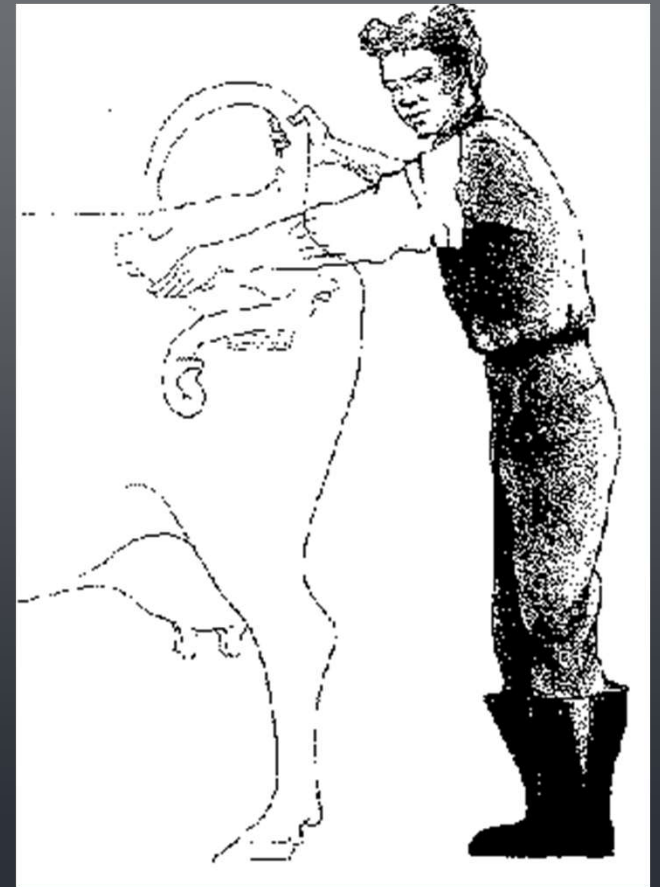
## PALPATION SESSION #2

PRACTICE PELVIC SWEEP

USE PROPER HAND, FINGER  
AND THUMB POSITIONING



LOCATE AND IDENTIFY THE  
CERVIX

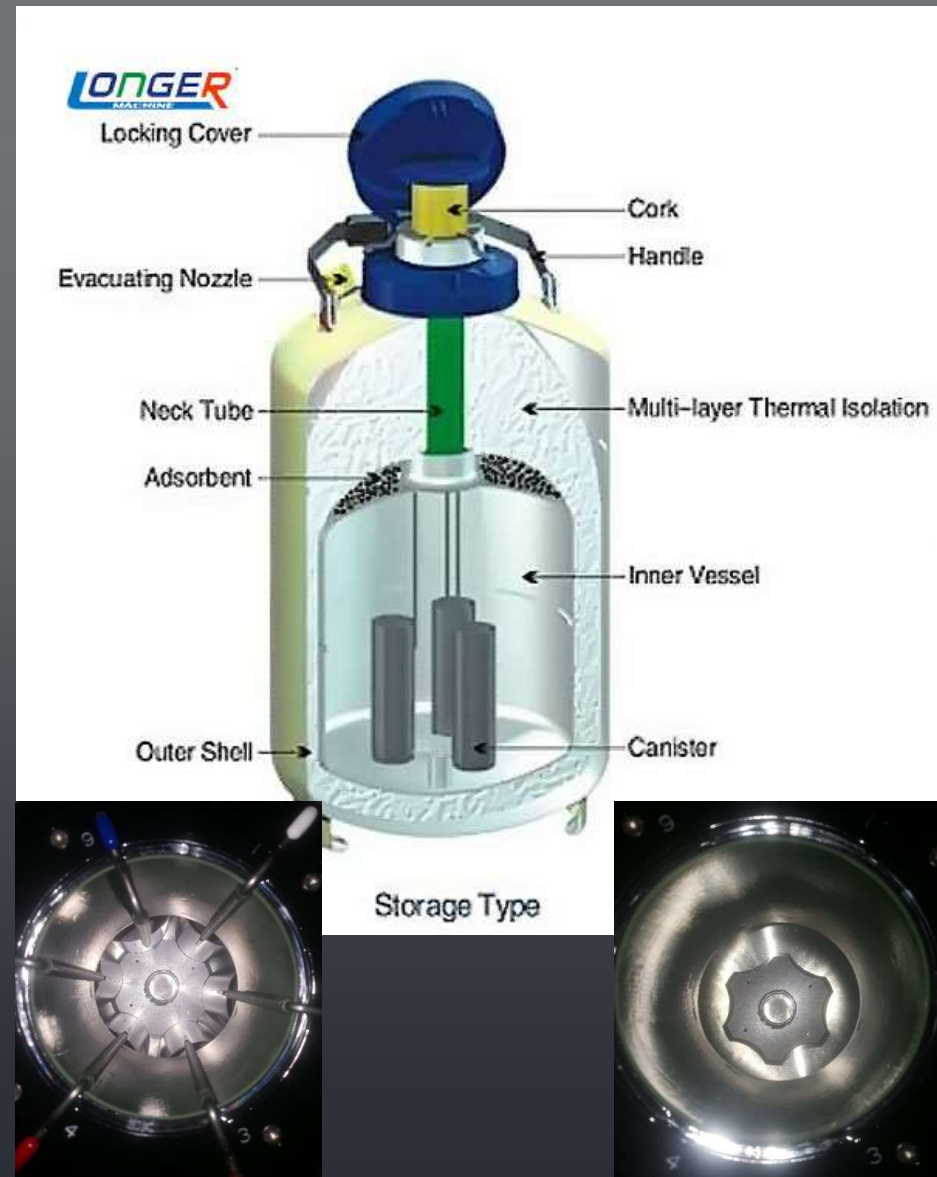


# TANK CARE

- WET TANK

- PROPERTIES:

- VACUUM SEAL & INSULATION
  - DOUBLE-WALLED CONSTRUCTION
  - INSULATED VACUUM SPACE BETWEEN INNER & OUTER WALLS
  - KEEP COLD IN, HEAT OUT
  - CAN BREAK IF JARRED
- NECK TUBE & CORK
- CANISTERS
- SPIDER DESIGN
- LIQUID NITROGEN (LN<sub>2</sub>)
  - BOILS AT -320°F
  - ODORLESS, COLORLESS, AND TASTELESS



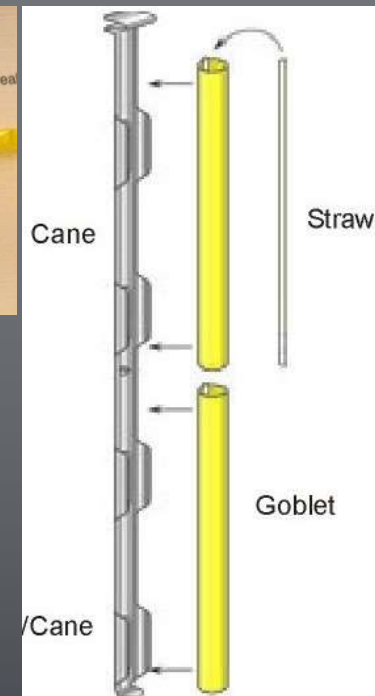
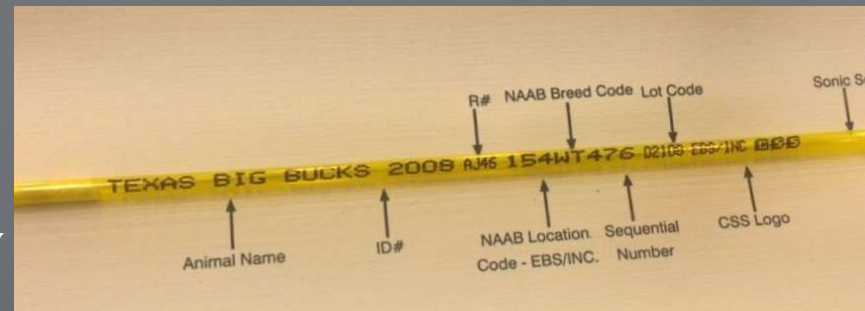
# TANK CARE

- TANK STORAGE
  - CLEAN, DRY AREA
  - CHECK NITROGEN LEVELS OFTEN
- TRANSPORTING
  - BUCKLE IN VEHICLE
  - TIRE TUBE
- TANK FAILURE
  - HEAR BOILING, CONDENSATION AROUND NECK
  - TRANSFER SEMEN IMMEDIATELY!
- **DRY VAPOR TANKS**
  - MEANT FOR SHIPPING
  - NOT ECONOMICAL FOR LONG TERM STORAGE
  - EXPENSIVE



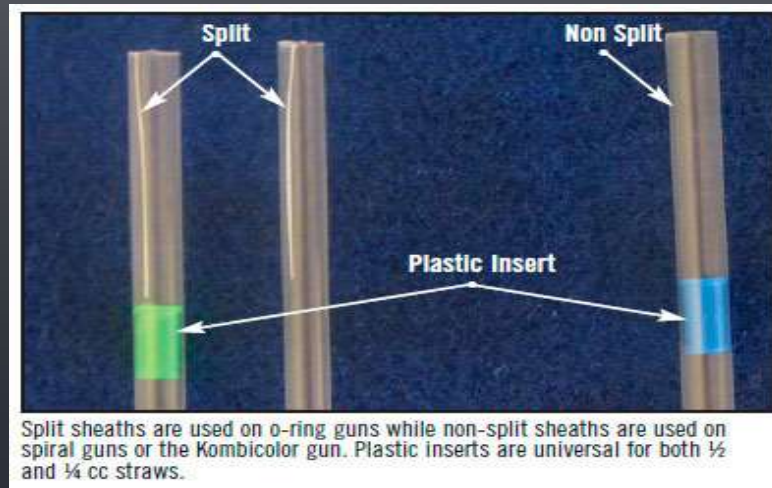
# STORING SEMEN

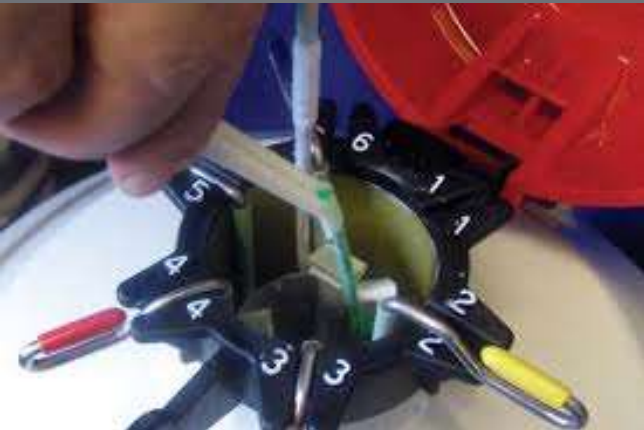
- LARGEST SINGLE INVESTMENT!
- GOOD INDEFINITELY WHEN CONSTANTLY SUSPENDED IN LN<sub>2</sub>
- STRAW LABELING
  - CONVENTIONAL ½ ML STRAWS
    - 30 MIL LIVE CELLS, 10 MIL POST THAW
  - SEXED ¼ ML STRAWS
    - 2, 3, 4 OR 5 MIL COUNT
  - SEMEN QUALITY INDUSTRY STANDARDS
    - % INITIAL & INCUBATED MOTILITY
    - % NORMAL
    - % HEAD MALFORMATIONS
    - % DROPLETS
    - % BENT TAILS
    - % FREE HEADS
  - COTTON PLUG END VS. CRIMPED END



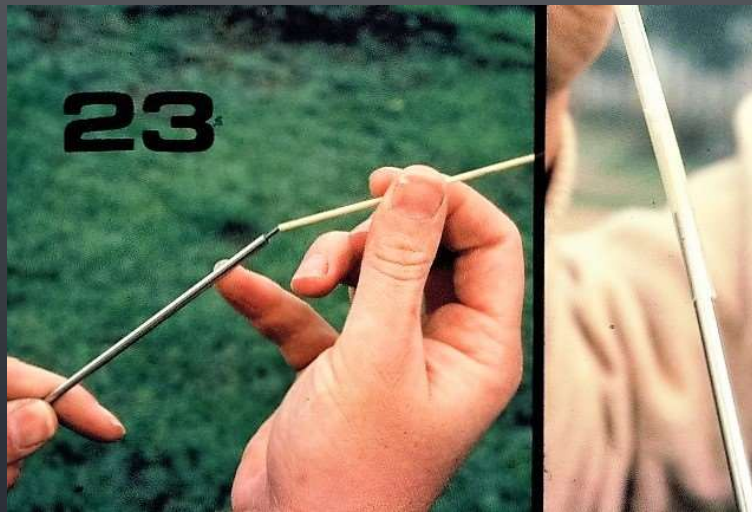
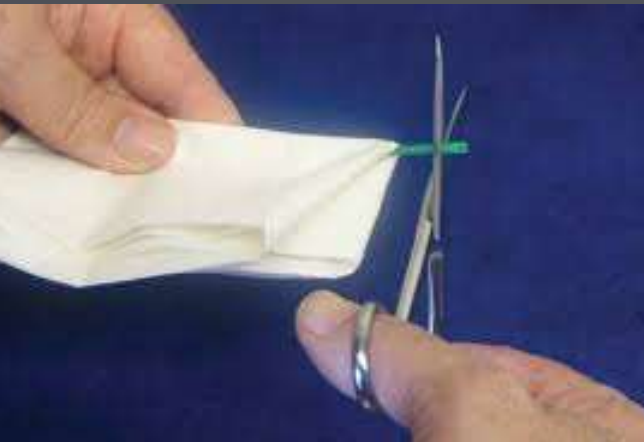
# AI SUPPLIES

- TYPICAL CANE/GOBLET/STRAW SETUP
- TYPES OF AI GUNS
- TYPES OF SHEATHS
- AI KIT





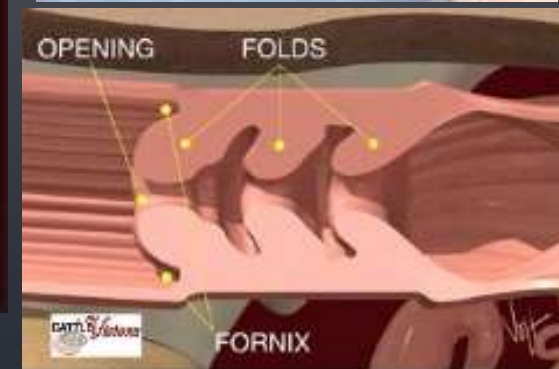
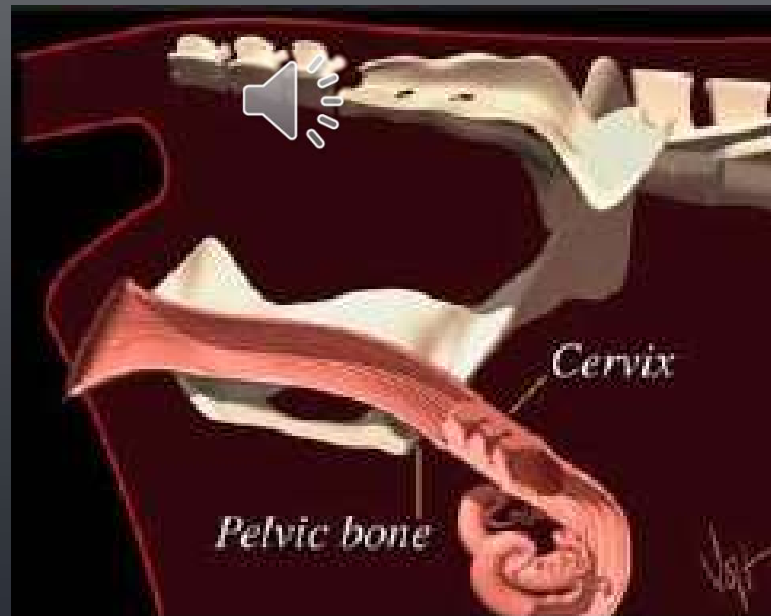
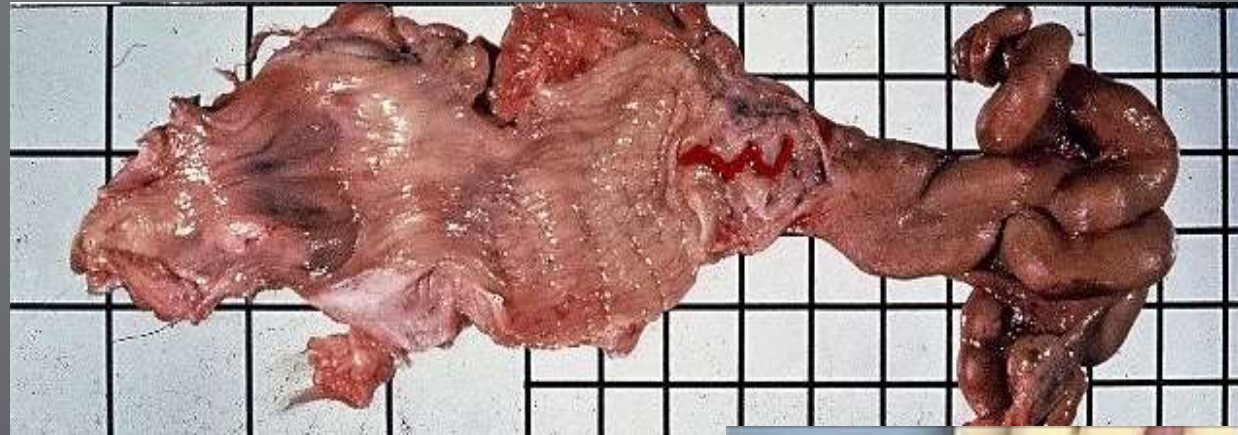
Pull plunger back before loading semen in AI rod



Proper seal between straw and sheath is extremely important.

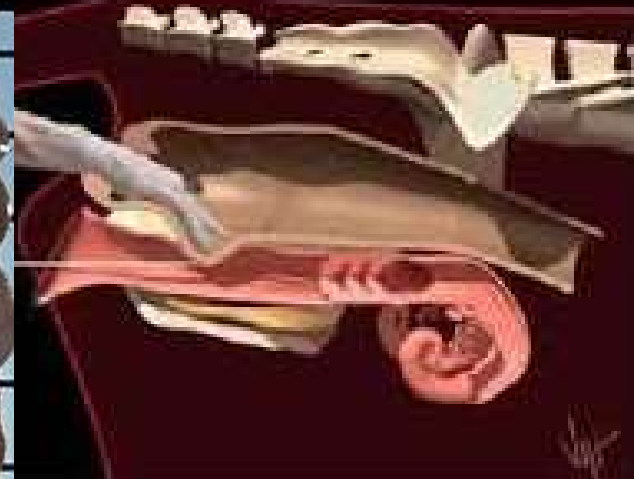
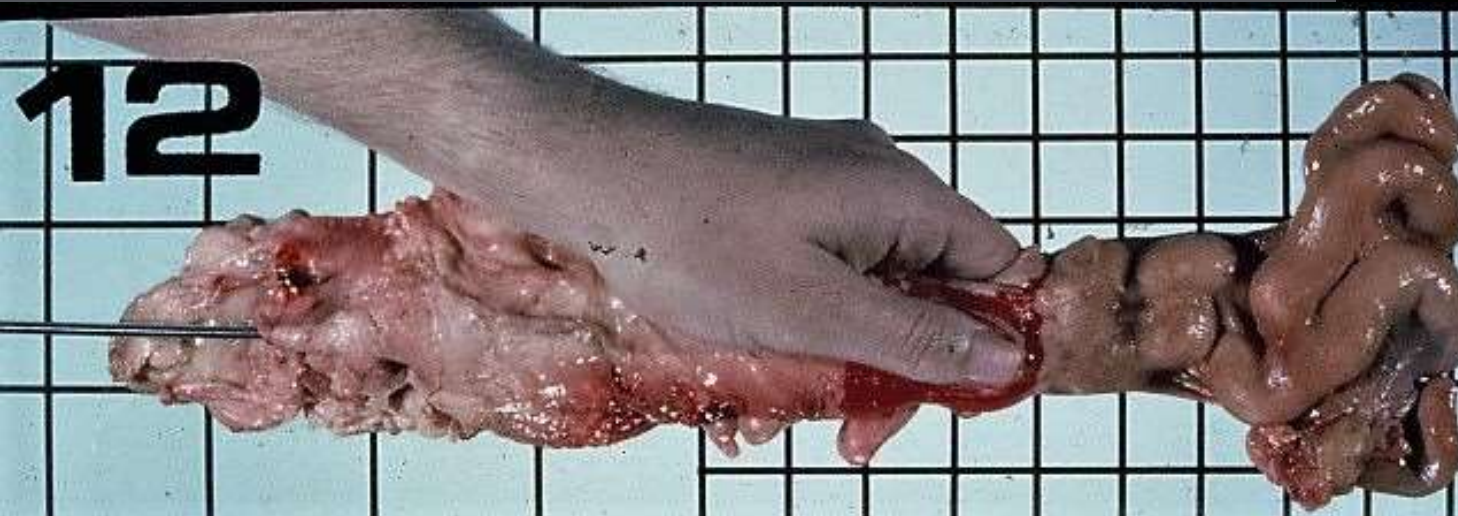
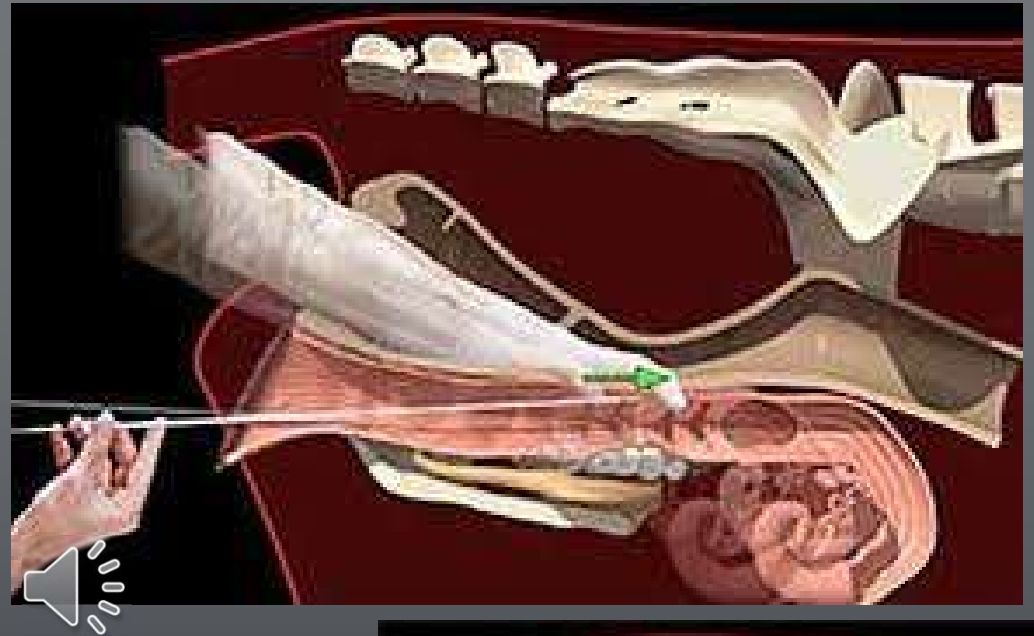
# INTERNAL STRUCTURES & FUNCTIONS

- VAGINA
- BLADDER
  - URETHRA
  - DIVERTICULUM
- CERVIX
  - FORNIX – BLIND POUCH
  - 3 SPIRAL MUSCLE FOLDS, OR RINGS
- UTERINE BODY



## FINDING THE CERVICAL OPENING

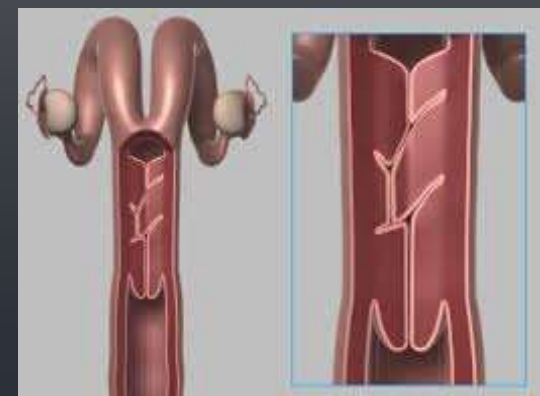
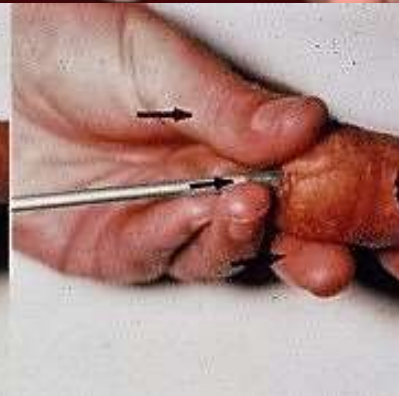
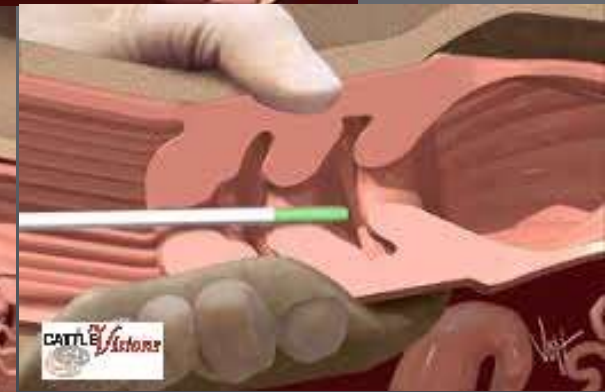
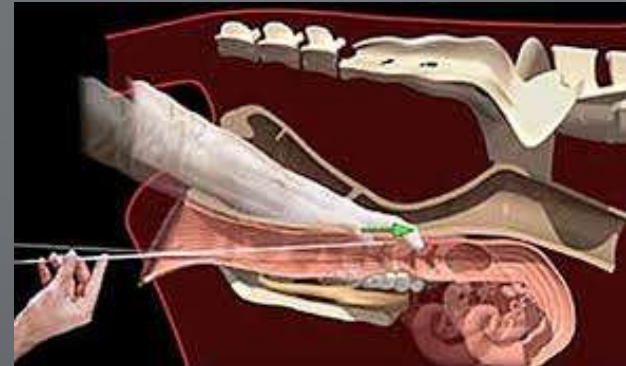
- GRASPING AND LIFTING CERVIX
- FINGER POSITION
  - ONLY TIPS UNDER CERVIX
  - VERY LITTLE FEELING IN PALM OF HAND
- ALWAYS KNOW WHERE THE GUN TIP IS





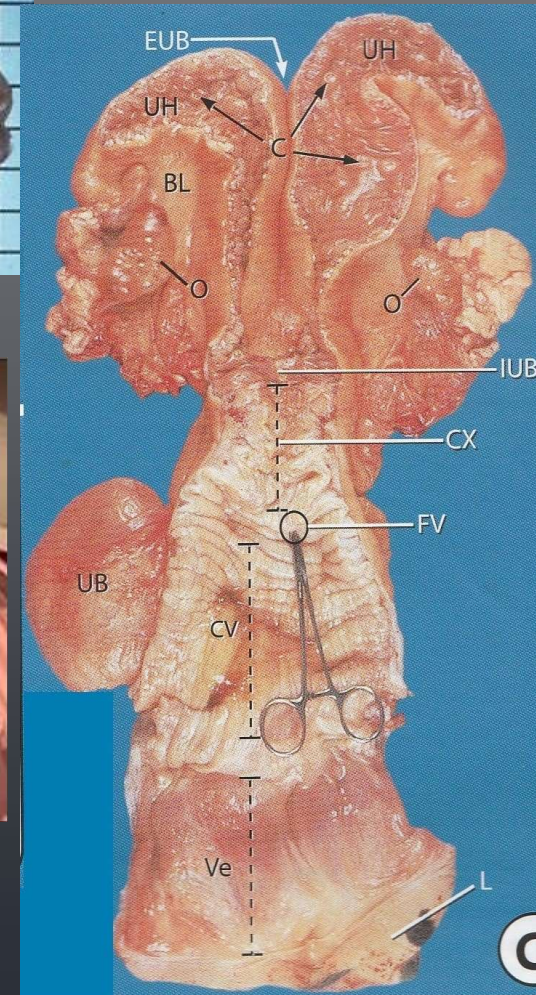
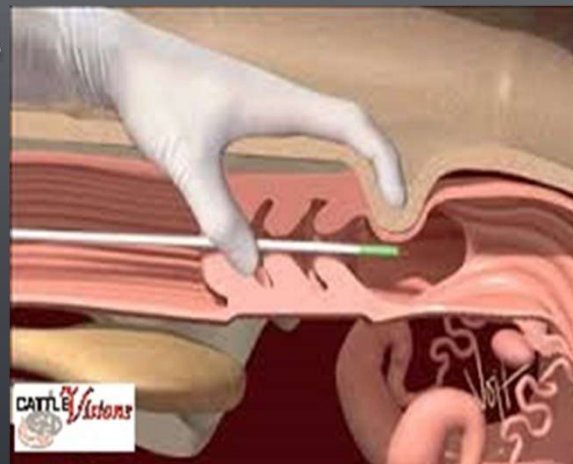
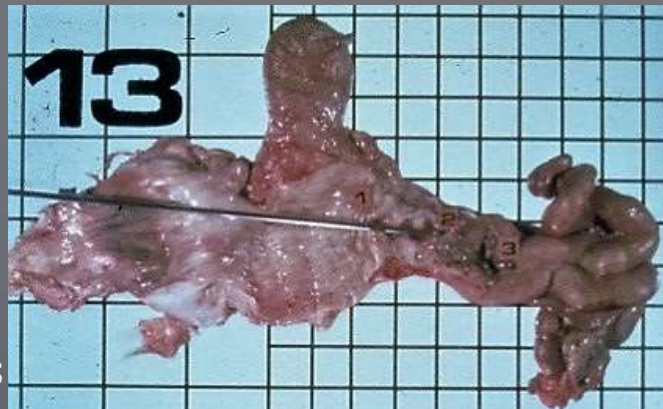
# MANIPULATING THE CERVIX

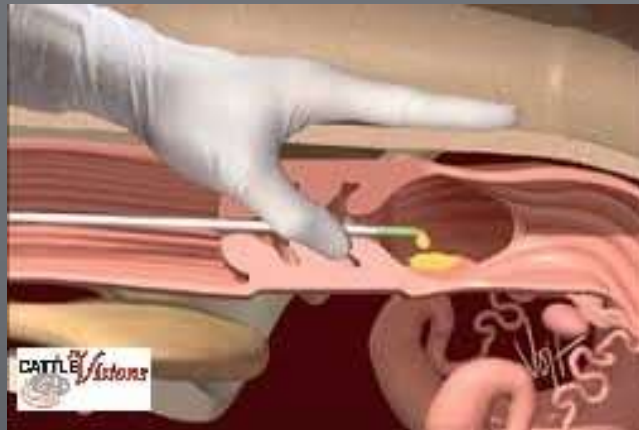
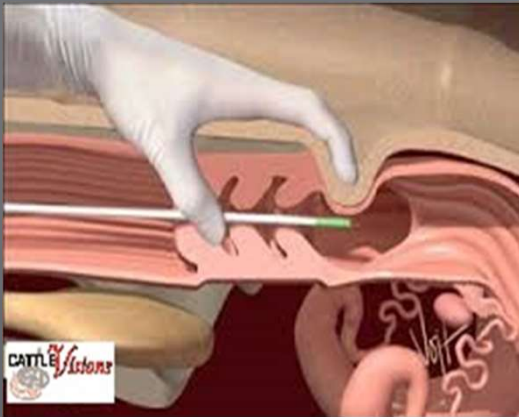
- **MANIPULATING CERVIX**
  - NOTE FINGERTIP AND THUMB POSITIONS
  - REST MOUTH OF CERVIX ON TIPS OF FINGER
  - GUIDE TIP OF GUN TOWARD CERVIX
  - SMALL VIBRATIONS BACK AND FORTH AT CERVICAL OPENING
    - KEEP IN CONTACT WITH CERVIX
  - MANIPULATE CERVIX OVER TIP OF GUN



# SEMEN DEPOSITION

- GUN INSERTED TO BODY OF UTERUS
- LINING OF EACH SECTION OF THE TRACT
  - VAGINA – SMOOTH LONGITUDINAL TISSUE
  - CERVIX IS RIGID WITH CARTILAGE-LIKE FOLDS
    - VERY TOUGH
    - PROTECTS UTERUS
    - MUCOUS PLUG BLOCKS UTERUS DURING PREGNANCY
- UTERUS
  - SMOOTH TISSUE
  - BLOOD VESSELS & ARTERIES – VERY SENSITIVE
  - SOFT AND TENDER – VERY VULNERABLE TO DAMAGE
  - NO PROTECTIVE LINING – AVOID INTRODUCING BACTERIA
  - SEMEN DEPOSITED  $\sim \frac{1}{4}$ " INSIDE UTERINE BODY DO NOT ENTER EITHER ONE OF THE HORNS





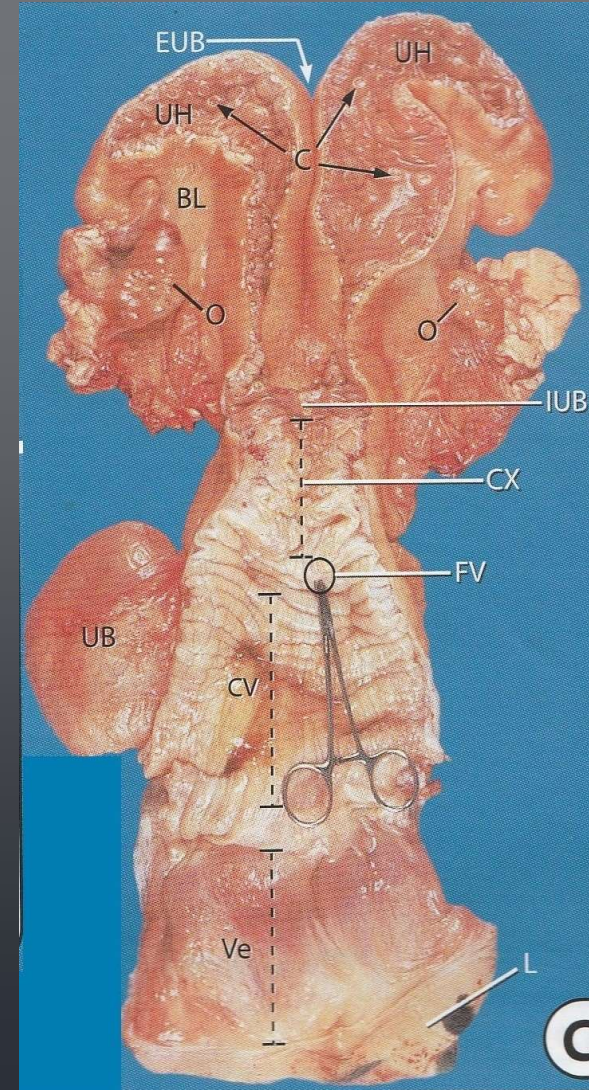
- **UTERINE BODY**

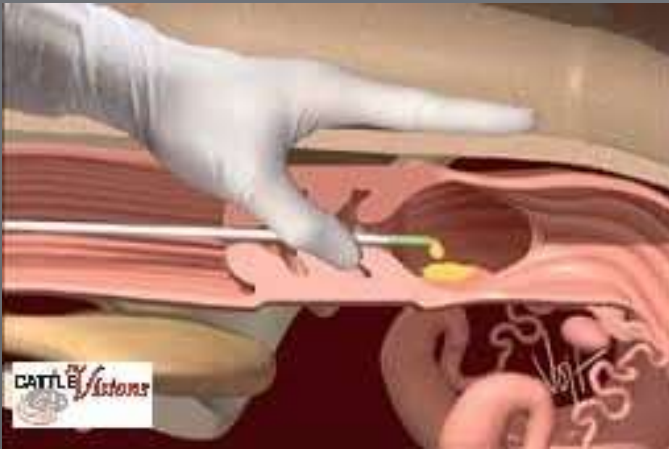
- GUN WILL SLIDE FREELY
- CAN FEEL TIP OF GUN THROUGH UTERINE LINING
  - SOFT AND TENDER, VERY VULNERABLE TO DAMAGE



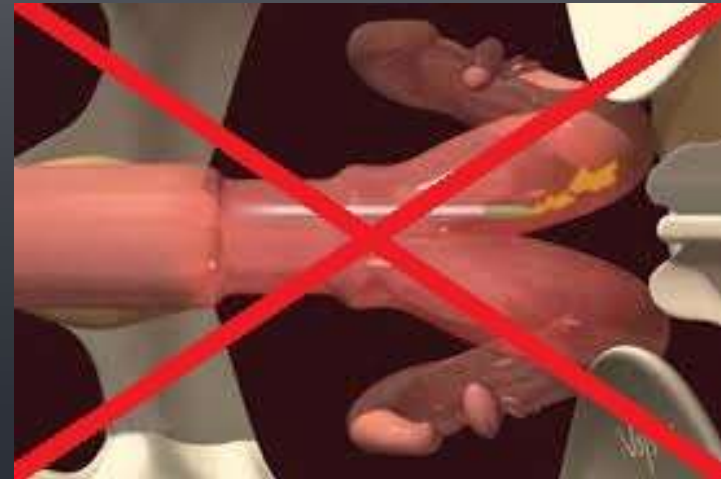
- **SEMEN DEPOSITION**

- POSITION GUN TIP BELOW INDEX FINGER
- SEMEN DEPOSITED  $\sim 1/4$ " INSIDE UTERINE BODY
- RAISE FINGER, SLOWLY DEPRESS PLUNGER
- DO NOT PULL BACK ON GUN



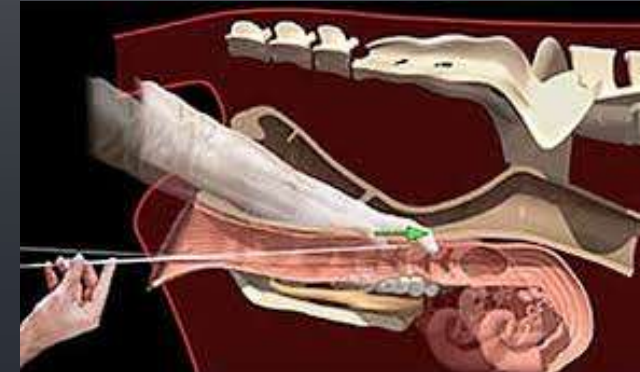
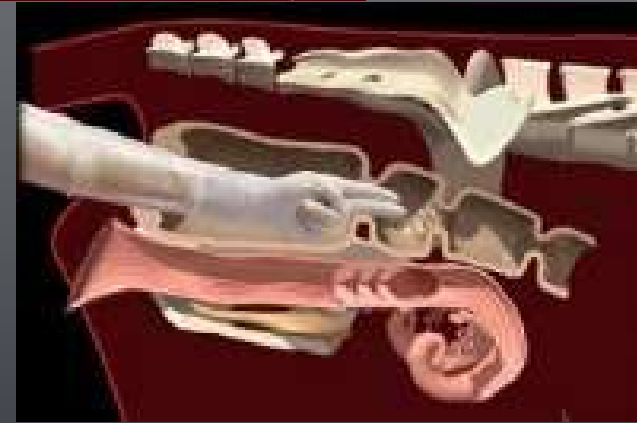


- SEMEN DISTRIBUTION
  - UTERINE CONTRACTIONS WILL AID IN SEMEN TRANSPORT TO BOTH HORNS
  - AVOID HORN BREEDING
    - MAY COMPROMISE CONCEPTION
    - CAN CAUSE DAMAGE TO UTERINE LINING
- CERVICAL PLUG
  - THICK MUCUS SECRETION FILLS CERVIX
  - PROTECTS UTERUS FROM INFECTIONS IN VAGINA



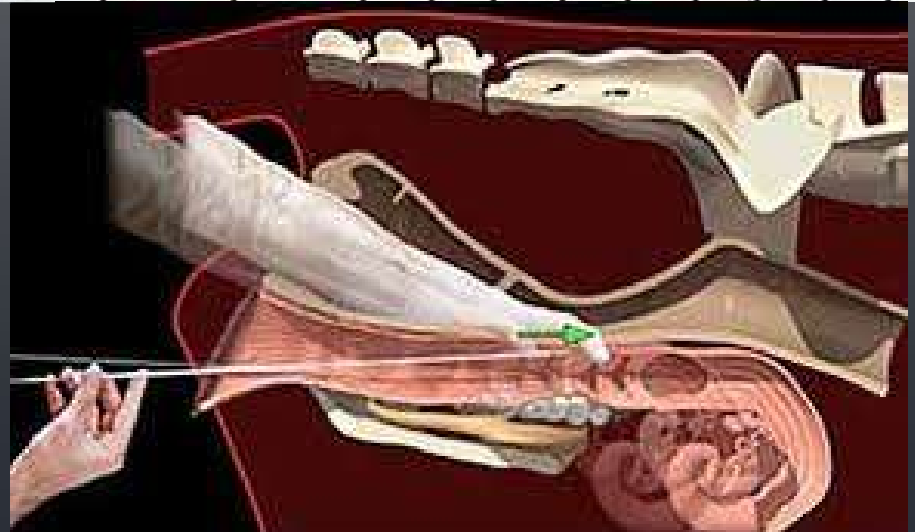
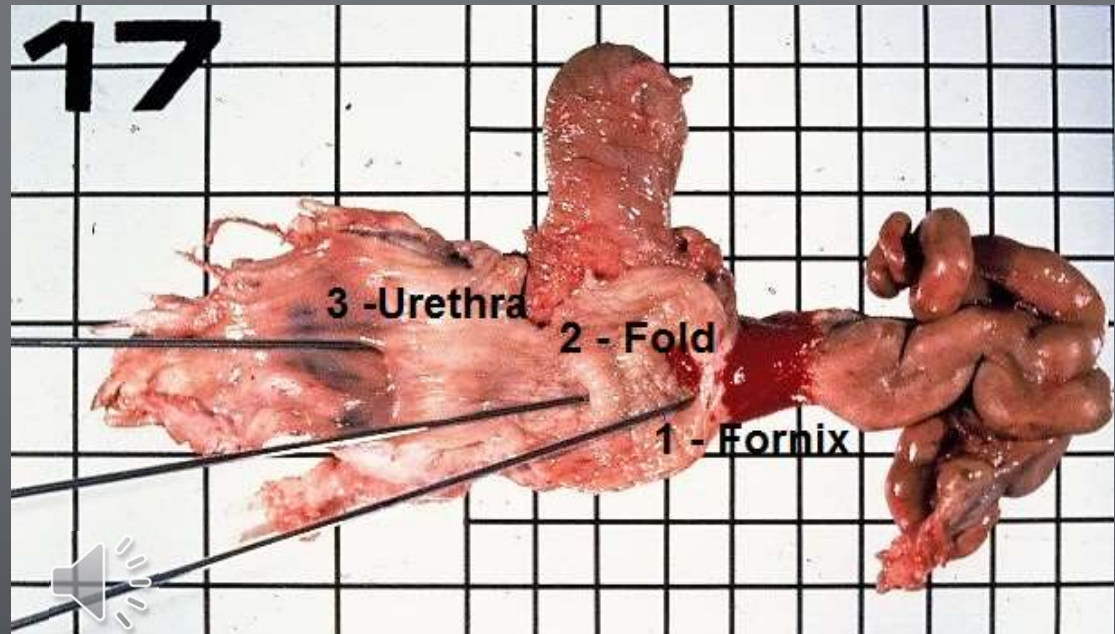
# OBSTACLES

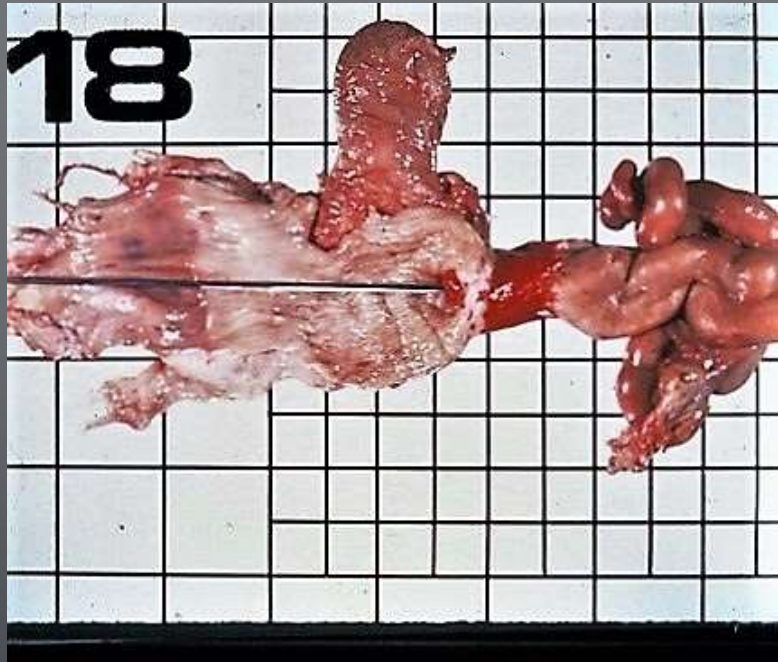
- **MANURE IN RECTUM**
  - SELDOM NEED TO REMOVE MANURE
  - KEEP OPEN HAND FLAT ON FLOOR OF RECTUM
  - ALLOW MANURE TO PASS OVER
- **RECTAL CONSTRICTION RINGS**
  - HOOK INTO AND MASSAGE BACK AND FORTH
  - RING WILL PASS OVER YOUR HAND AND ARM
- **STRONG RECTAL AND ABDOMINAL CONTRACTIONS**
  - CAUSE FOLDS TO FORM IN VAGINA
  - GUN OFTEN GETS CAUGHT IN THESE FOLDS
  - GRASP CERVIX IT AND PUSH IT FORWARD
  - GUN SHOULD THEN PASS FREELY UP TO CERVIX



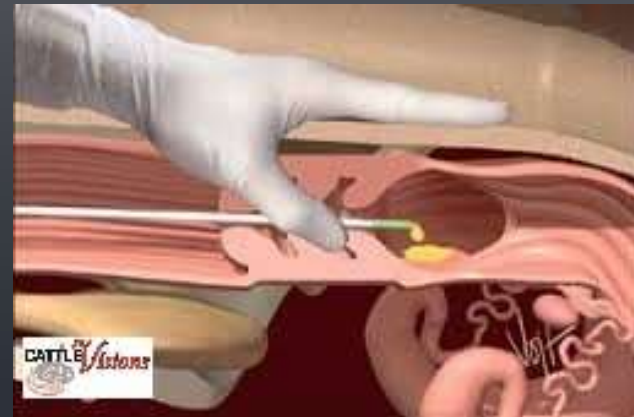
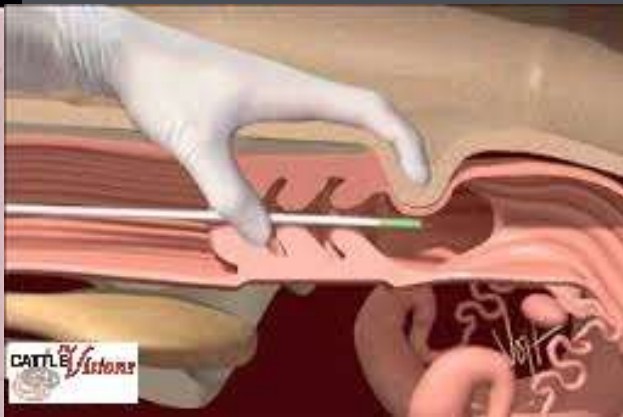
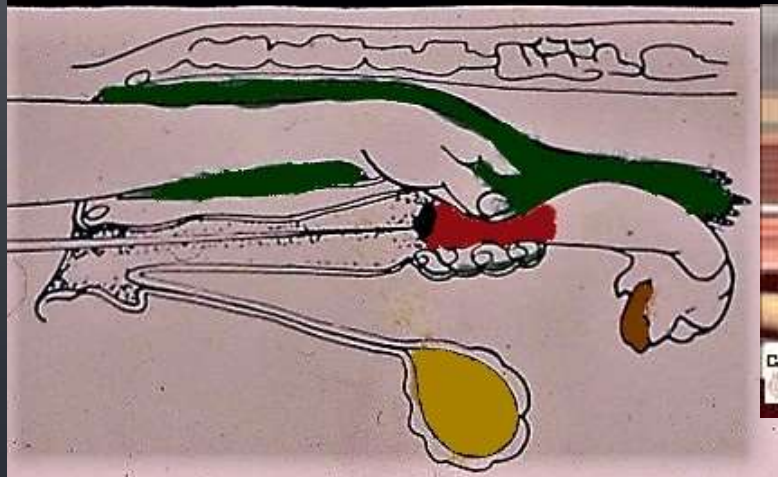
## COMMON MISTAKES

- **FORNIX (BLIND POUCH)**
  - CONCEPTION RATE DROPS DRAMATICALLY!
- **VAGINAL FOLDS**
  - STRETCH THE TRACT FORWARD TO ELIMINATE FOLDS
- **URETHRA**
  - STIMULATES URINATION
  - DISCOMFORT IN COW
    - MAY DANCE AROUND AND/OR KICK
  - INSERT GUN AT UPWARD 45° ANGLE
  - LAY GUN INTO VULVA, DO NOT SPEAR IT IN





IT CAN BE DONE!



# REPRODUCTIVE TRACT VARIATIONS

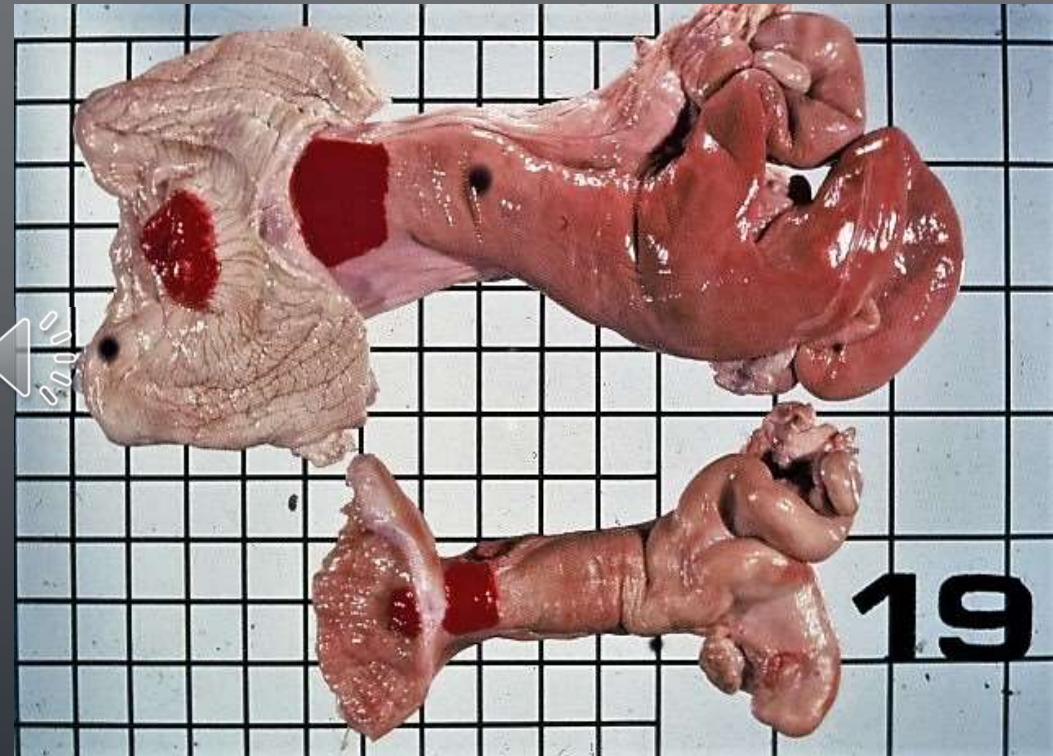
- **Cow**

- STRONG CERVICAL FOLDS
- LARGER CERVICAL MOUTH
- LARGE UTERINE HORNS
  - RIGHT LARGER = MORE PREGNANCIES

- **HEIFER**

- HORNS NEVER BEEN EXTENDED
- CERVICAL MOUTH SMALL IN DIAMETER

- **WIDE VARIATIONS BETWEEN ANIMALS!**





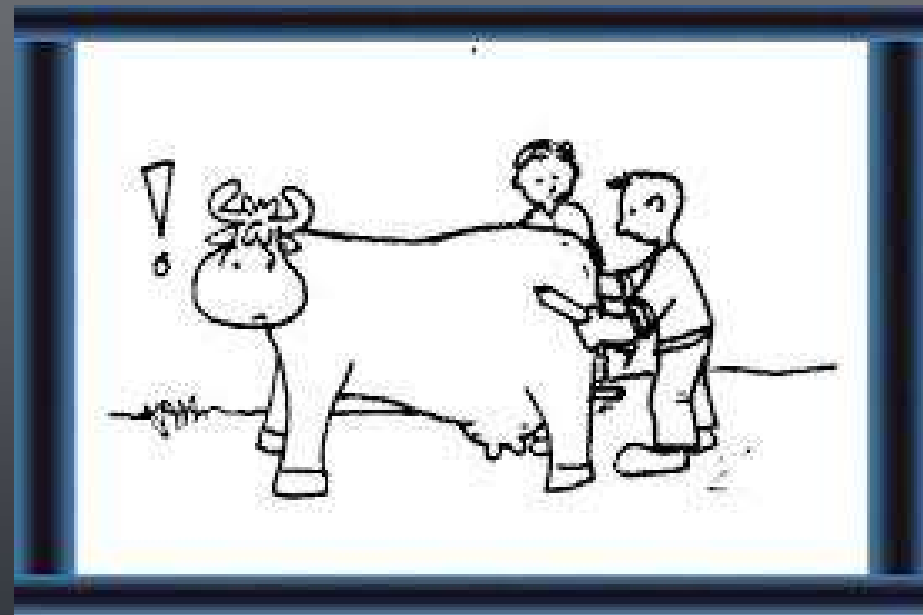
## PALPATION SESSION #3

LAY AI GUN INTO VULVA AT 45° ANGLE



PRACTICE GUIDING AI GUN TO CERVIX

MANIPULATE CERVIX OVER AI GUN



END DAY 1

BEGIN DAY 2 WITH RECAP OF DAY 1 AND PLAY  
NEXT SESSION

# AI TECHNIQUE

- RESTRAIN ANIMAL(S) (I.E. CHUTE, BREEDING BARN, HEADLOCKS)
- PROPERLY THAW SEMEN AND LOAD AI GUN
- CALMLY APPROACH ANIMAL
- LEAVE TAIL UNTOUCHED OR RAISE WITH RIGHT HAND (KEEP ON LEFT SIDE OF ARM/SHOULDER)
- GENTLY MASSAGE RECTUM WITH LUBRICATED GLOVE ON LEFT HAND
- CUP FINGERS TOGETHER IN POINTED FASHION
- INSERT HAND INTO RECTUM UP TO WRIST
- ALLOW TAIL TO FALL ON BACK SIDE OF LEFT FOREARM



- GENTLY WIPE VULVA WITH PAPER TOWEL TO REMOVE EXCESS MANURE
- MAKE FIST WITH LEFT HAND AND PRESS DOWN ON TOP OF VULVA
  - SPREADS VULVA LIPS & ALLOWS CLEAN ACCESS TO INSERT GUN INTO VAGINA
- LAY GUN INTO VULVA AT 45° UPWARD ANGLE
  - AVOIDS ENTERING URETHRAL OPENING AND BLADDER ON VAGINAL FLOOR
- WITH GUN WELL INSIDE VAGINA, RAISE TO LEVEL POSITION
- SLIDE GUN FORWARD UNTIL IT CONTACTS CERVIX
  - NOTE DISTINCT GRISLY SENSATION ON GUN



- **HOLDING AI INSTRUMENT**

- LIGHTLY HOLD IN FINGERTIPS

- NOT SO HARD TO POKE TIP THROUGH WALL OF REPRODUCTIVE TRACT
- NOT SO LIGHTLY YOU MAY DROP IT
- ONCE THE GUN IS INSERTED INSIDE THE VAGINA THE SEMEN IS SAFE SO TAKE YOUR TIME

- **MUCUS DISCHARGE**

- THICK, CLEAR
- GOOD SIGN OF HEAT

- **CLITORAL STIMULATION**

- MASSAGE MAY STIMULATE UTERINE CONTRACTIONS
  - HELPS SEMEN MOVE THROUGH TRACT
- COW IN HEAT SHOULD DIP BACK WITH STIMULI



- **RELAXED TECHNICIAN**

- BOTH ANIMAL AND TECHNICIAN CALM AND QUIET
  - ANIMAL STRESS CAN DECREASE CONCEPTION RATES
- ARM AND GUN INSERTED TO SHALLOW DEPTH
  - NOT ALWAYS THE CASE

- **CORRECTLY HOLD AI GUN**

- INDEX & MIDDLE FINGER AHEAD OF O-RING
- THUMB DEPRESSING PLUNGER
  - DO NOT PULL THE GUN BACK!
  - DOUBLE CHECK GUN IS IN UTERINE BODY
  - SLOWLY EXPEL SEMEN (8-10 SECONDS)



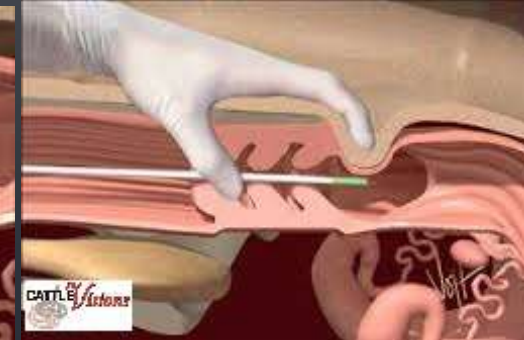
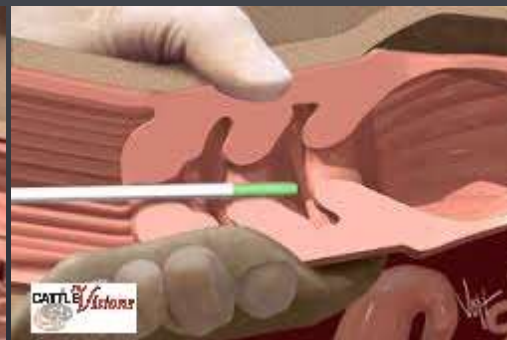
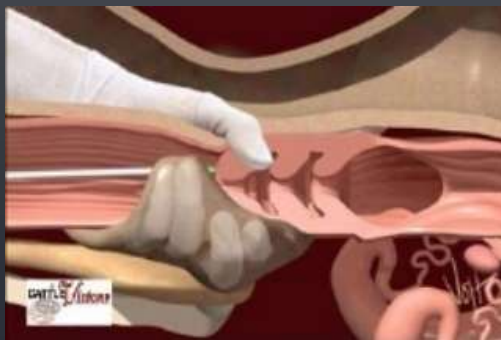
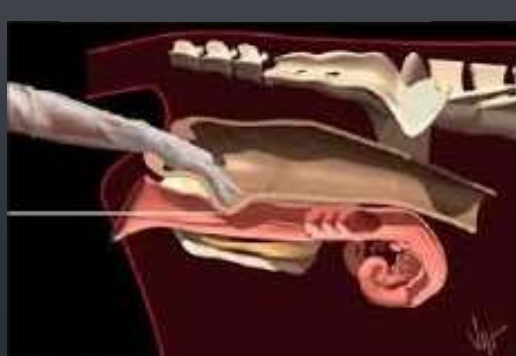
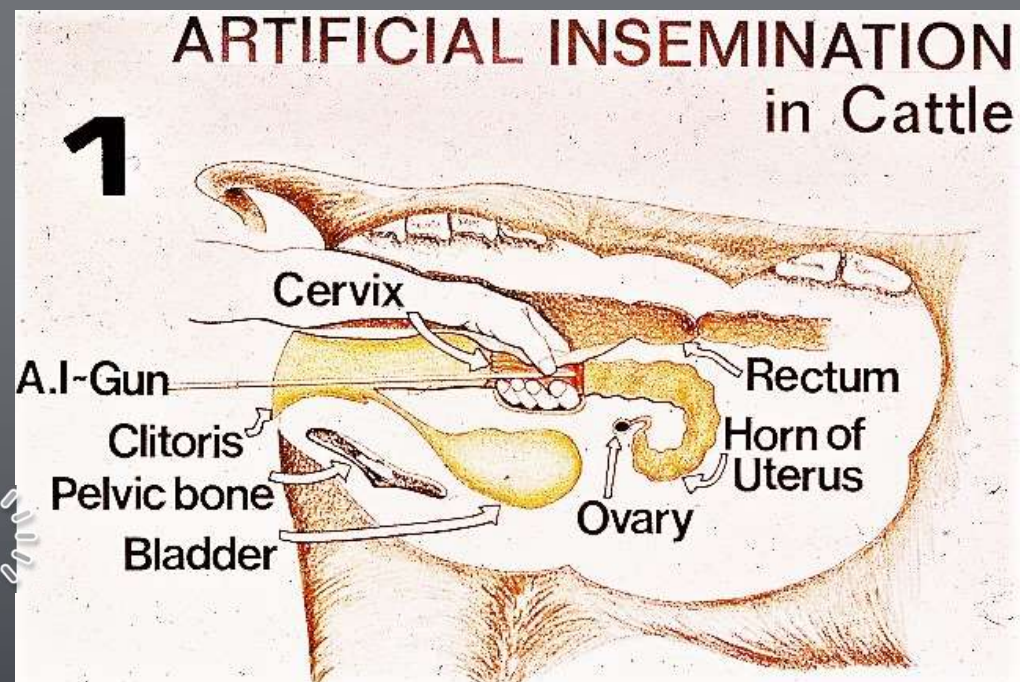
- **WITHDRAW GUN**

- LOOK OVER GUN
  - NOT ANY UNCOMMON DISCHARGE
  - ENSURE SEMEN DID NOT BACKFLOW INTO SHEATH
- REMOVE SHEATH WITH GLOVED HAND
  - VERIFY CORRECT BULL WAS USED!
  - DISPOSE OF SHEATH WITHIN GLOVE



## AI TECHNIQUE RECAP

- BE GENTLE, DO NOT USE TOO MUCH FORCE
- INSEMINATING A COW IS A 2-STEP PROCESS
  - STEP 1 – GETTING GUN TIP TO THE CERVIX
  - STEP 2 – PLACING CERVIX ON/OVER INSEMINATION GUN
- DEPOSIT SEMEN JUST THROUGH THE CERVIX INTO THE UTERINE BODY
- TAKE YOUR TIME
- **RELAX!**



## PALPATION SESSION #4

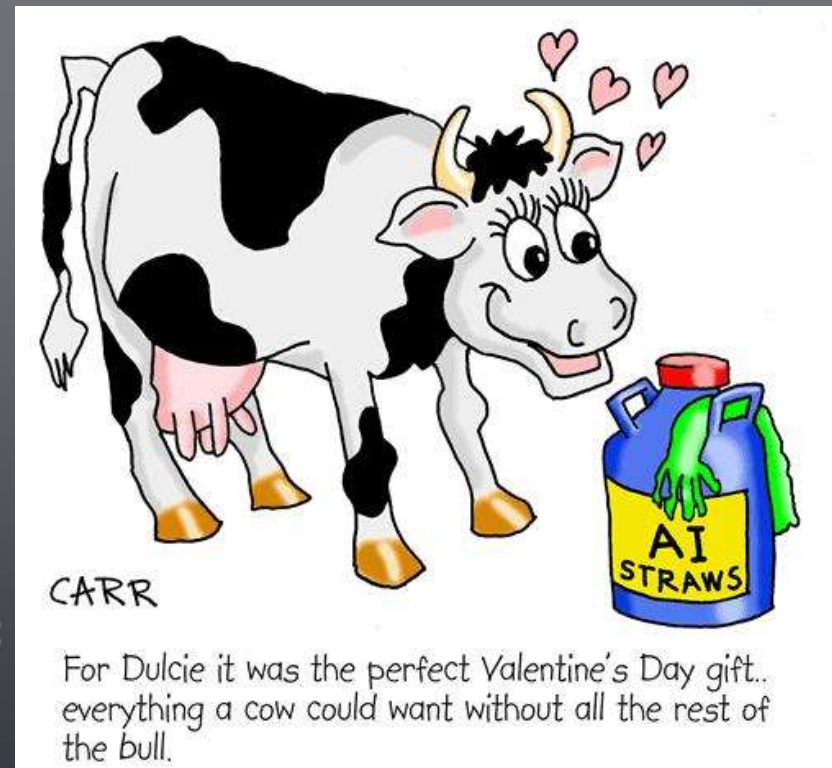


- PROPERLY THREAD AI INSTRUMENT THROUGH CERVIX
- IDENTIFY TIP OF AI GUN JUST INSIDE UTERINE BODY
- PRACTICE SLOWLY DEPRESSING PLUNGER AS IF DEPOSITING SEMEN



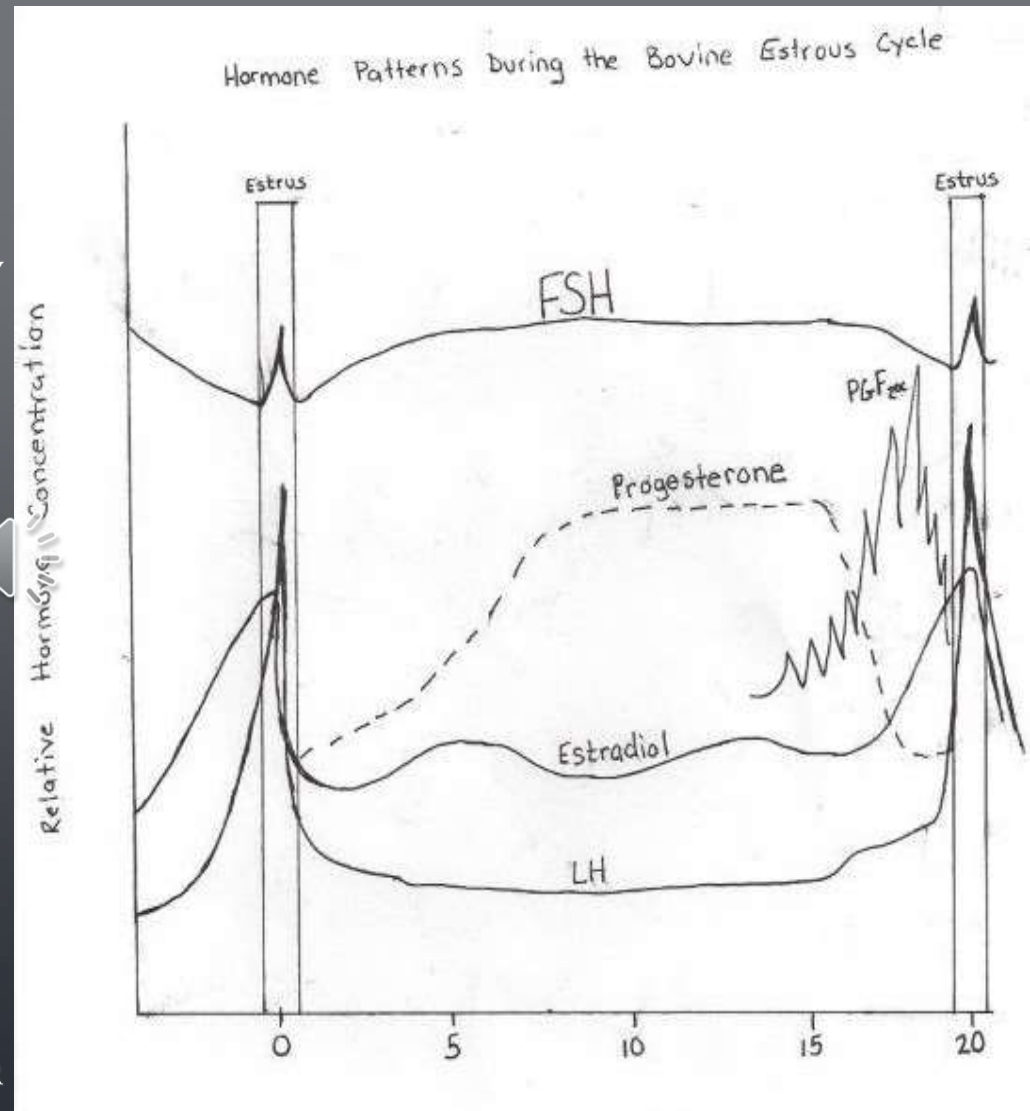
## ADVANTAGES OF ESTRUS SYNCHRONIZATION & AI

- BREED TO GENETICALLY SUPERIOR SIRE
- KNOWN BREEDING & CALVING DATES
- UNIFORM CALF CROP
- CROSSBREEDING
- DISEASE CONTROL
- REDUCE THE NUMBER OF BULLS ON THE FARM
- REDUCE TIME AND LABOR
- FIXED-TIME AI ELIMINATES NEED FOR ESTRUS DETECTION
- SHORTEN BREEDING SEASON
- 60-DAY BREEDING SEASON ALLOWS 3 CHANCES TO CONCEIVE
- JUMP-START NONCYCLING COWS TO INITIATE CYCLICITY
- INCREASE PROPORTION OF COWS THAT CONCEIVE EARLY
- IMPROVE SUBSEQUENT REPRODUCTIVE PERFORMANCE
- INCREASE AVERAGE CALF AGE AT WEANING



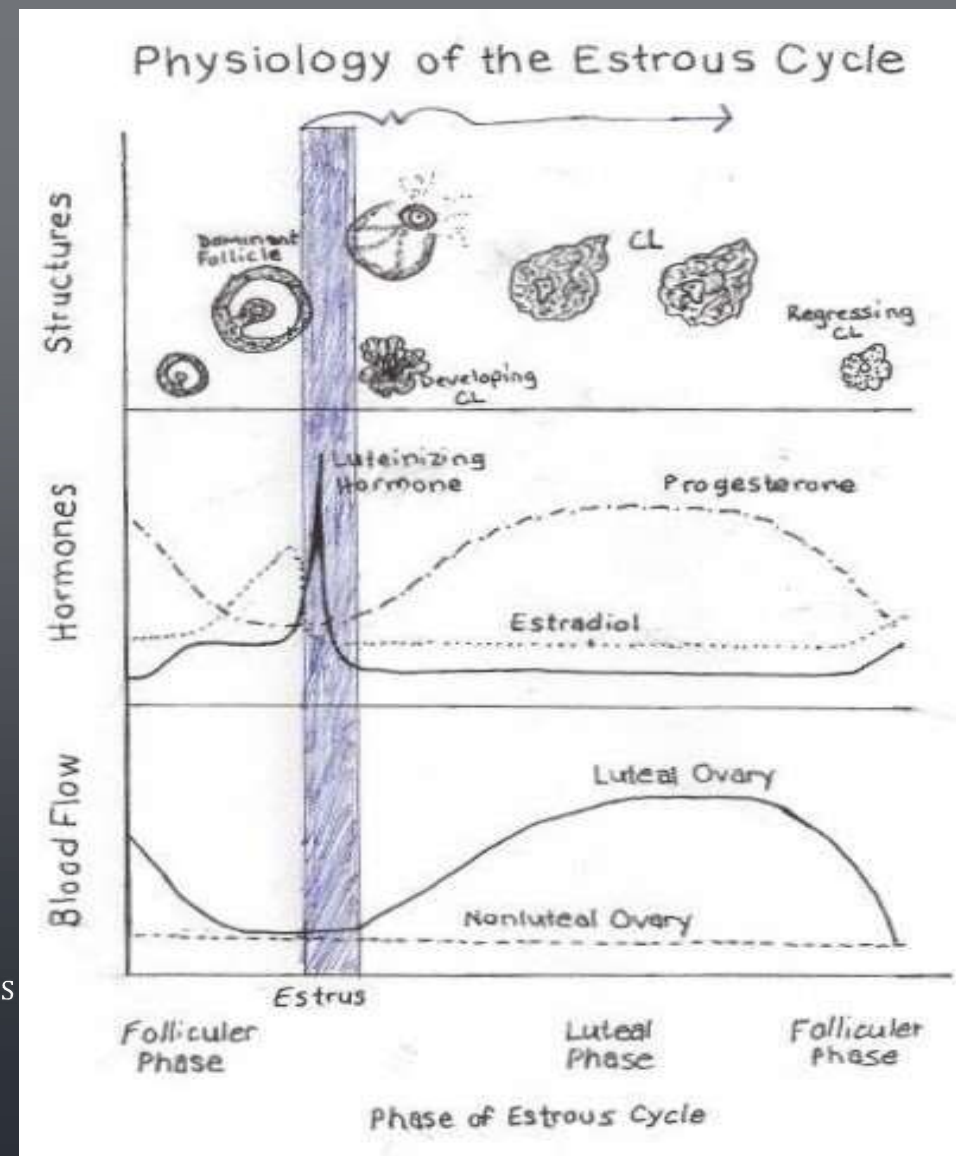
# ESTROUS CYCLE

- SERIES OF PREDICTABLE EVENTS BEGINNING AT ESTRUS (HEAT) AND ENDING AT THE SUBSEQUENT ESTRUS
  - ESTRUS – DEFINED PERIOD WHERE FEMALES ARE SEXUALLY RECEPTIVE (HEAT)
  - PROVIDES FEMALES WITH REPEATED OPPORTUNITIES TO COPULATE AND BECOME PREGNANT
  - CONTINUES THROUGHOUT FEMALE'S LIFE
    - INTERRUPTED BY PREGNANCY AND NURSING
    - ANESTRUS – A PERIOD WHEN CYCLICITY STOPS
      - INADEQUATE NUTRITION
      - STRESSFUL ENVIRONMENTAL CONDITIONS
      - UTERINE INFECTION
      - PERSISTENT CORPUS LUTEUM
      - MUMMIFIED FETUS
- POLYESTROUS SPECIES
  - ESTROUS CYCLES OCCUR REGULARLY THROUGHOUT ENTIRE YEAR
  - FEMALES CAN BECOME PREGNANT THROUGHOUT THE YEAR WITHOUT REGARD TO SEASON



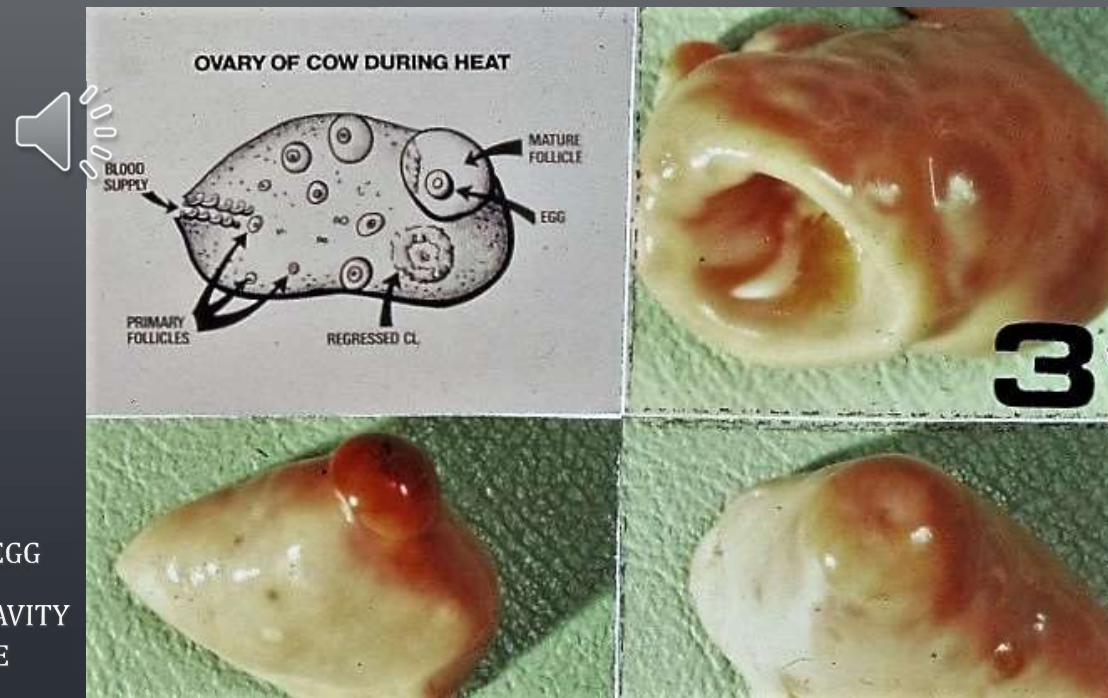
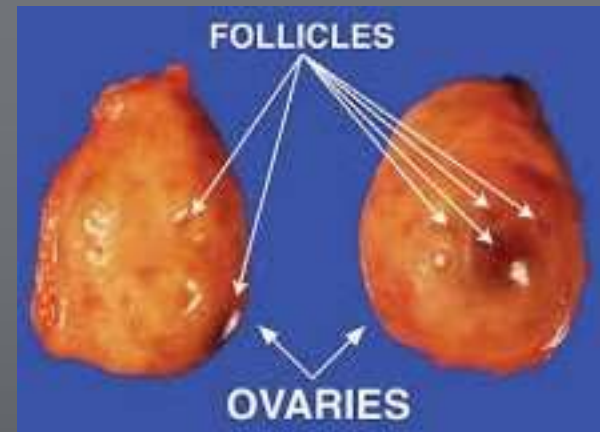
# PHASES OF ESTROUS CYCLE

- **3 PHASES**
  - **FOLLICULAR PHASE (SHORT PHASE)**
    - REGRESSION OF CORPUS LUTEUM TO OVULATION
    - OVARIAN STRUCTURES GROWING DOMINANT FOLLICLES THAT SECRETE ESTRADIOL
  - **ESTRUS**
    - FEMALE IS SEXUALLY RECEPTIVE
    - INCREASE IN UTERINE CONTRACTIONS
      - (FACILITATE SPERM TRANSPORT)
    - GnRH SURGE RUPTURES FOLLICLE
      - ALLOWS EGG TO BE RELEASED FOR FERTILIZATION
  - **LUTEAL PHASE (LONG PHASE)**
    - OVULATION UNTIL CORPUS LUTEUM (CL) REGRESSION
    - 2 WAVE VS. 3 WAVE COWS
    - CL BECOMES DOMINANT OVARIAN STRUCTURE THAT SECRETES PROGESTERONE
      - CONTROLS OVARIAN CYCLE (INHIBITS OVULATION AND ESTRUS)
      - MAINTAINS PREGNANCY



# OVARIES

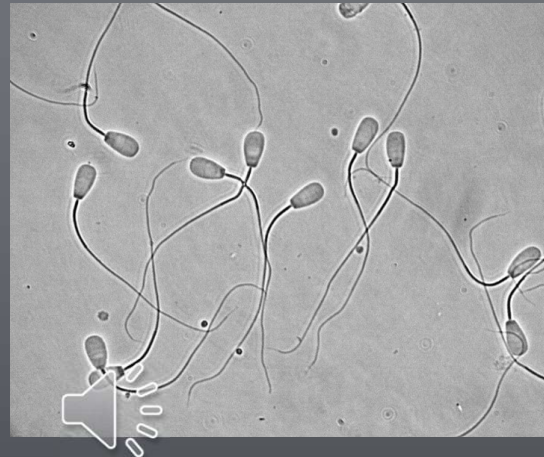
- **2 OVARIES**
  - 1 OVARY REQUIRED PER CYCLE
  - “SPARK PLUGS” OF THE ENTIRE REPRODUCTIVE SYSTEM
  - BRING ABOUT ENTIRE PHENOMENON OF CONCEPTION, GROWTH AND BIRTH OF CALF
    - OVARIAN FOLLICLES CONTAINS ESTROGEN
      - CARRIED THROUGHOUT BLOODSTREAM
      - STIMULATES BRAIN TO ACCEPT MALE
      - SPIKE BRINGS COW INTO HEAT
- **OVULATION**
  - OCCURS AFTER COW IS IN HEAT
  - FOLLICLE RELEASES EGG
  - AI COW SHOULD BE BRED LATE IN HEAT PERIOD
- **RELEASE MATURE EGG EVERY 21 DAYS ON AVERAGE**
  - INFUNDIBULUM WRAPS OVER THE OVARY TO HOLD EGG
  - CORPUS LUTEUM (YELLOW BODY) FORMS WHERE CAVITY LEFT FROM FOLLICULAR RUPTURE AND EGG RELEASE OCCURRED



# SPERM CELLS & SEMEN COLLECTION

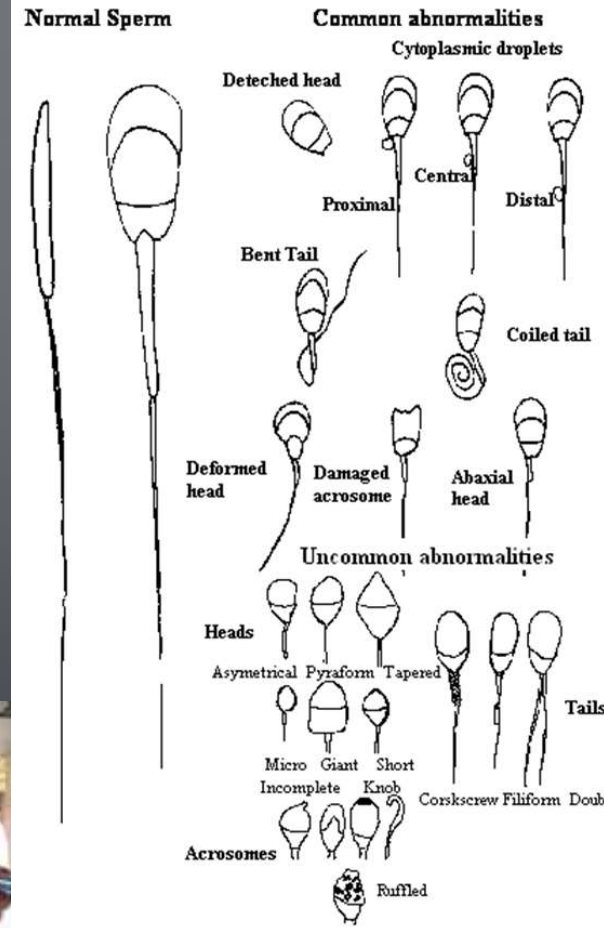
## • SPERM CELLS

- BULL DEPOSITS SEMEN IN ANTERIOR VAGINA
  - 800x10<sup>6</sup> LIVE SPERM CELLS PER mL
  - 90% SPERM IN CERVIX FLUSHED OUT
- AI DEPOSITS SEMEN IN UTERINE BODY
  - 5-15 LIVE PROGRESSIVE MOTILE SPERM CELLS IN EACH ½CC OR ¼CC STRAW AFTER THAWING
  - 60% SPERM IN UTERUS IS PUSHED OUT
- SPERM CELL ABNORMALITIES
  - NO VALUE AT FERTILIZATION

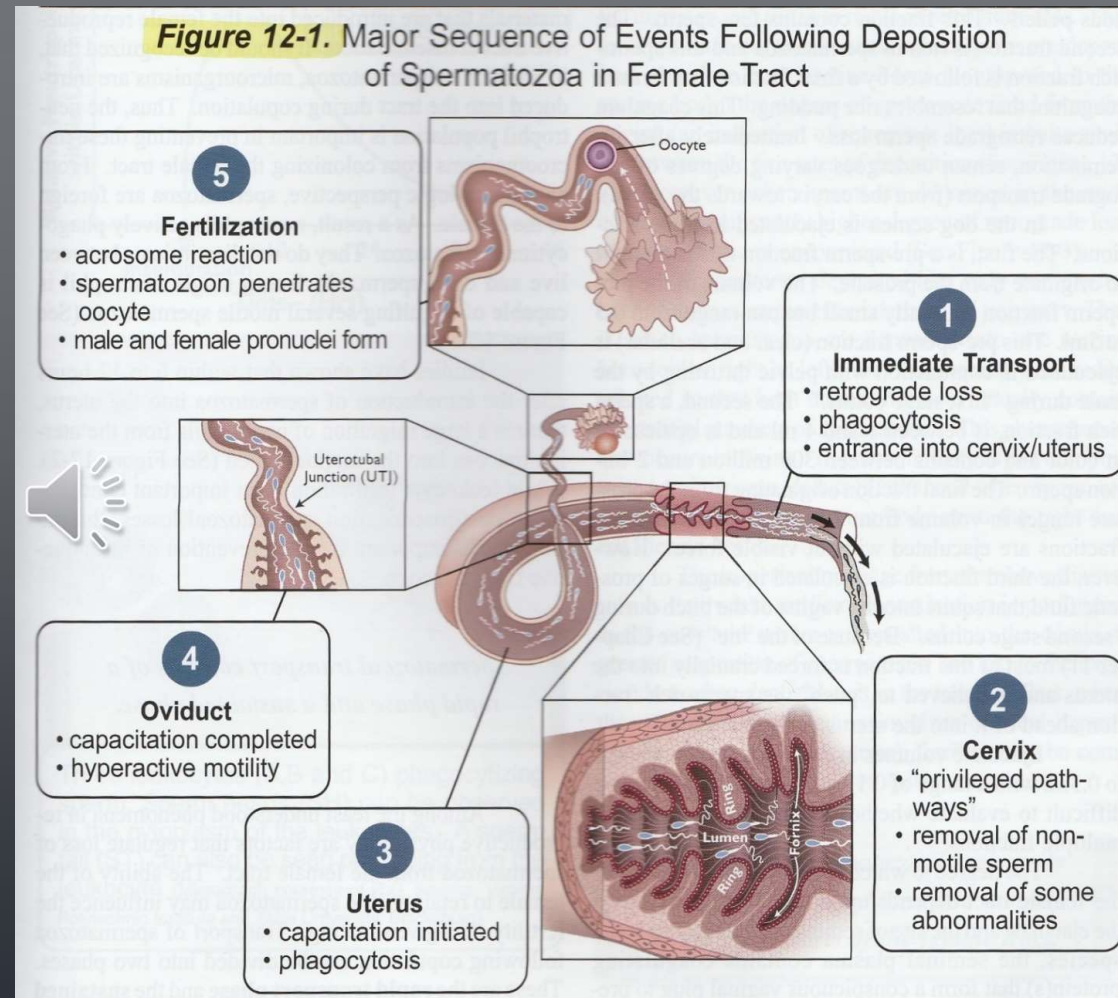


## • BULL COLLECTION

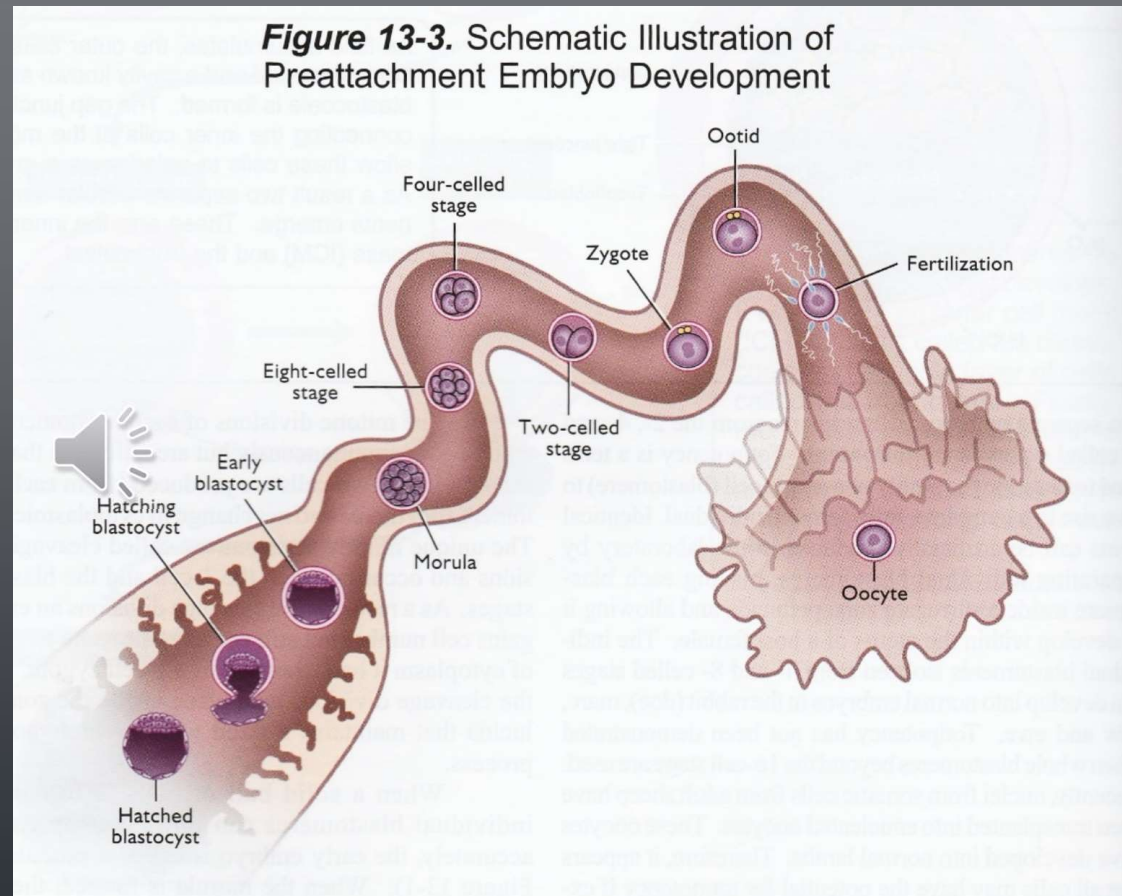
- ARTIFICIAL VAGINA (AV) USED FOR COLLECTION
- PENIS DIVERTED INTO AV PRIOR TO EJACULATION
- VOLUME, CONCENTRATION, MOTILITY & PERCENT NORMAL LIVE SPERM CELLS EVALUATED
- DILUTED TO 15-35 MILLION SPERM BEFORE THAW



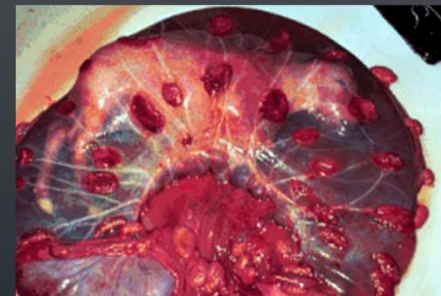
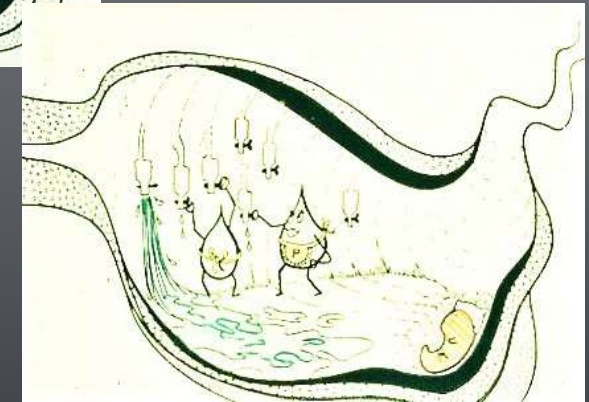
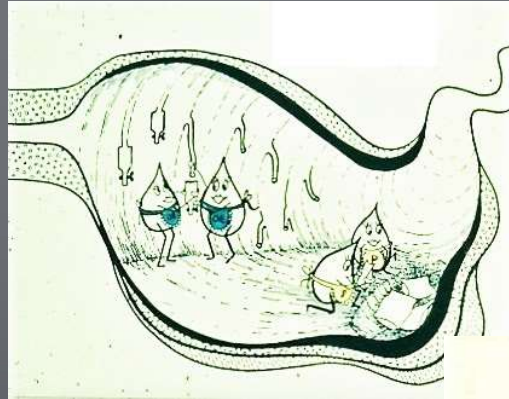
- PERISTALTIC WAVES ASSIST SPERM TRANSPORT IN REPRODUCTIVE TRACT
- SPERM CELLS MOVE AT RATE OF 1CM PER 2 MINUTES
- AVERAGE LIFESPAN IN TRACT ONLY 24 HOURS
- OUTER UTERUS MADE UP OF MUSCULAR FIBERS
  - OXYTOCIN CREATES WAVELIKE CONTRACTIONS
  - ESTROGEN KEEPS UTERINE PERISTALSIS MOVING (MAKES MUSCLES SENSITIVE TO OXYTOCIN)
  - REQUIRES NORMAL FUNCTIONING OVARY



- **PROGESTERONE**
  - SECRETED BY CL
  - ENDS ESTRUS (HEAT)
- **GENETIC MATERIAL OF SPERM AND EGG COMBINED**
  - NEW LIFE FORMED!
- **FERTILIZATION**
  - SINGLE-CELLED ZYGOTE
  - MULTIPLE-CELLED MORULA
  - FLUID-FILLED BLASTOCYST
  - FREE-FLOATING EMBRYO
    - DEPENDENT ON UTERINE ENVIRONMENT



- UTERUS PREPARES “NEST” FOR EMBRYO
  - RESTS ALONG UTERINE WALL
- CL PRODUCES PROGESTERONE UNTIL ~14 DAYS AFTER OVULATION
  - IF PREGNANT, CL REMAINS
    - PREVENTS ESTRUS AND MAINTAINS PREGNANCY
  - IF PREGNANCY DOES NOT OCCUR, CL REGRESSES DUE TO PROSTAGLANDIN
    - NEW FOLLICLE DEVELOPS, PRODUCES ESTROGEN
    - COW RETURNS TO HEAT ~21 DAYS
    - CYCLE RESUMES AGAIN UNTIL BECOMING PREGNANT
- UTERINE “MILK”
  - NURTURES EMBRYO
- FETAL COTYLEDONS ATTACH TO MATERNAL CARUNCLES
  - NURTURES FETUS ~45 DAYS ONWARD





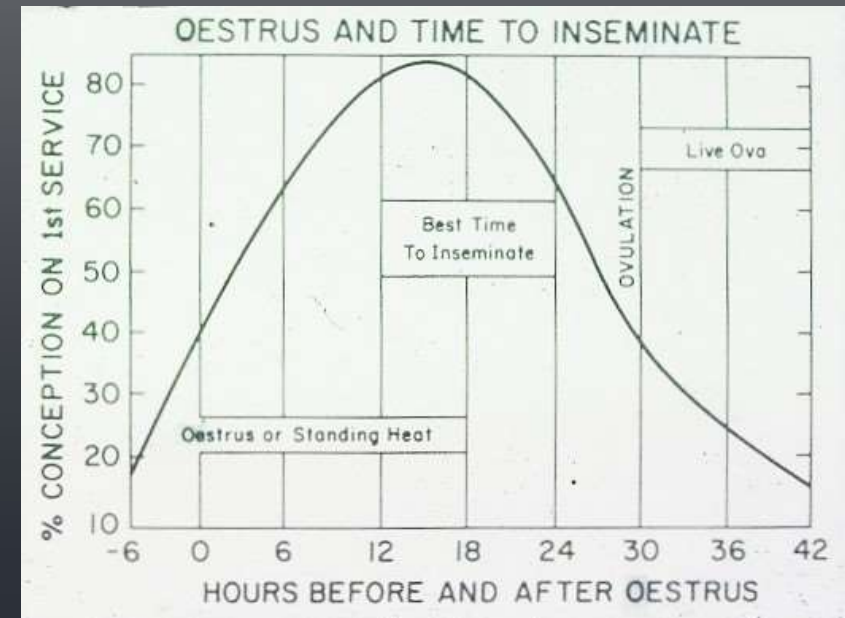
# REPRODUCTIVE LOSS

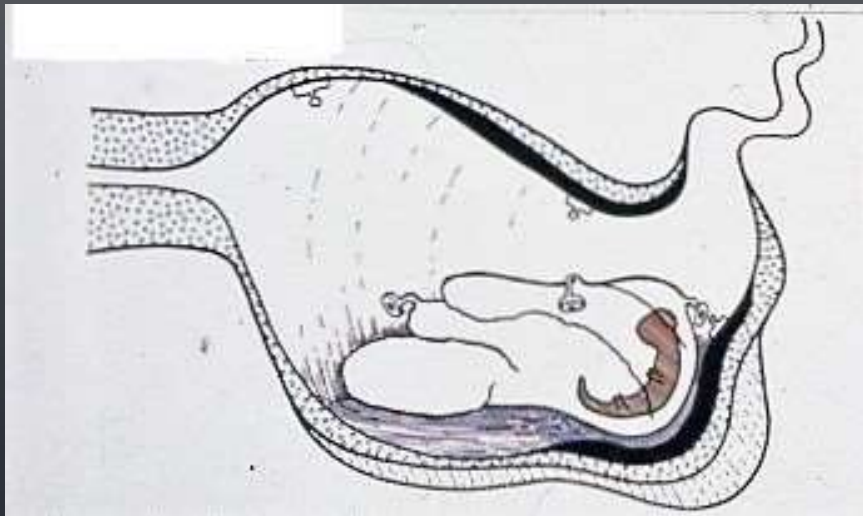
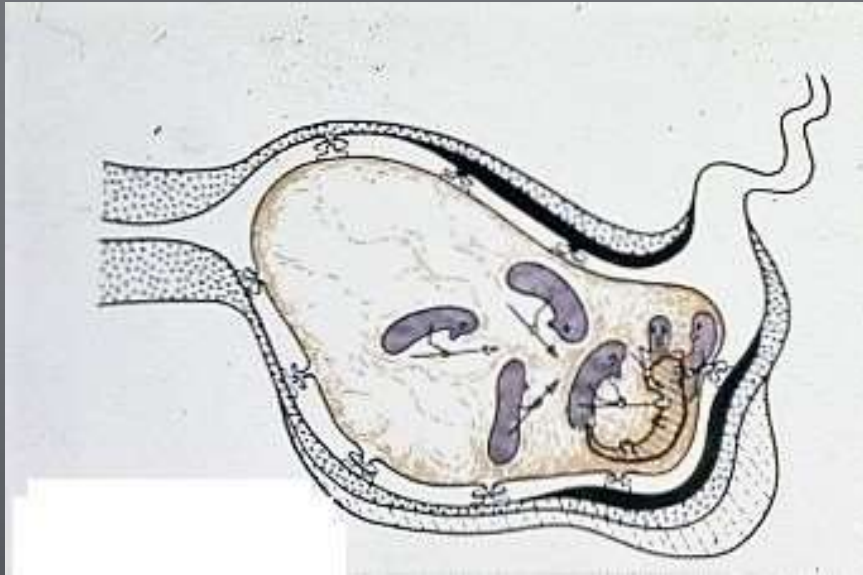
- **PRIMARY LIMITATION TO REPRODUCTIVE EFFICIENCY**

- FAILURE OF FEMALES TO SHOW ESTRUS AT START OF BREEDING SEASON
- EARLY EMBRYONIC MORTALITY
  - REDUCES CONCEPTION RATE

- **COMMON CAUSES**

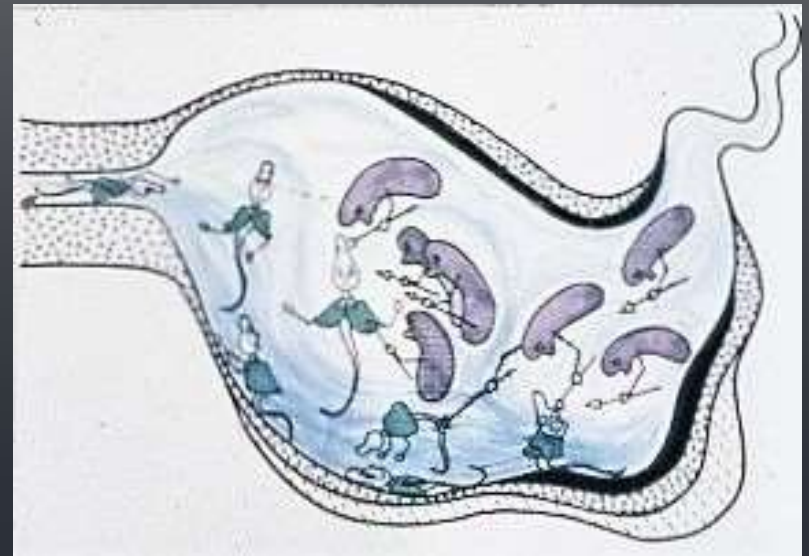
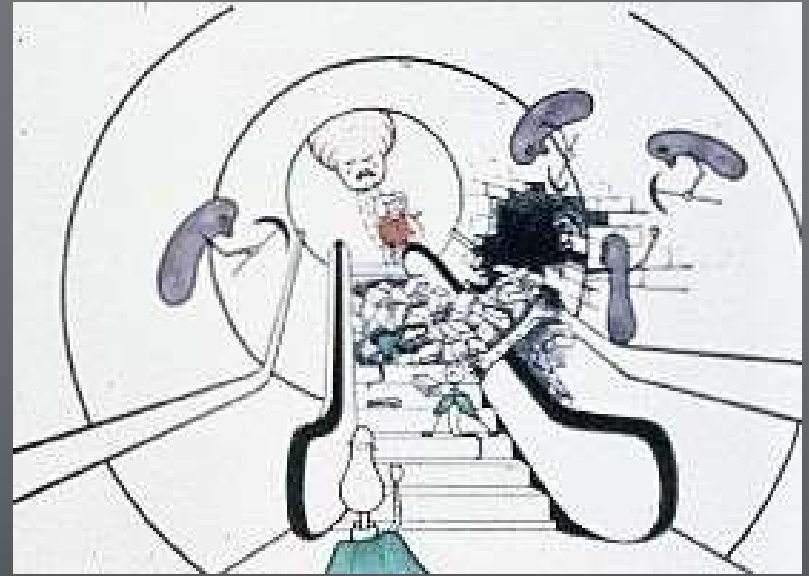
- OVULATION FAILURE
  - EGG IS NOT RELEASED OR RELEASED TOO LATE
- CYSTIC OVARY
  - CLUSTER OF FOLLICLES CAUSES COW TO SHOW HEAT EVERY FEW DAYS BUT WITH NO OVULATION
- INSEMINATION TIME
  - AI BRED TOO EARLY OR TOO LATE





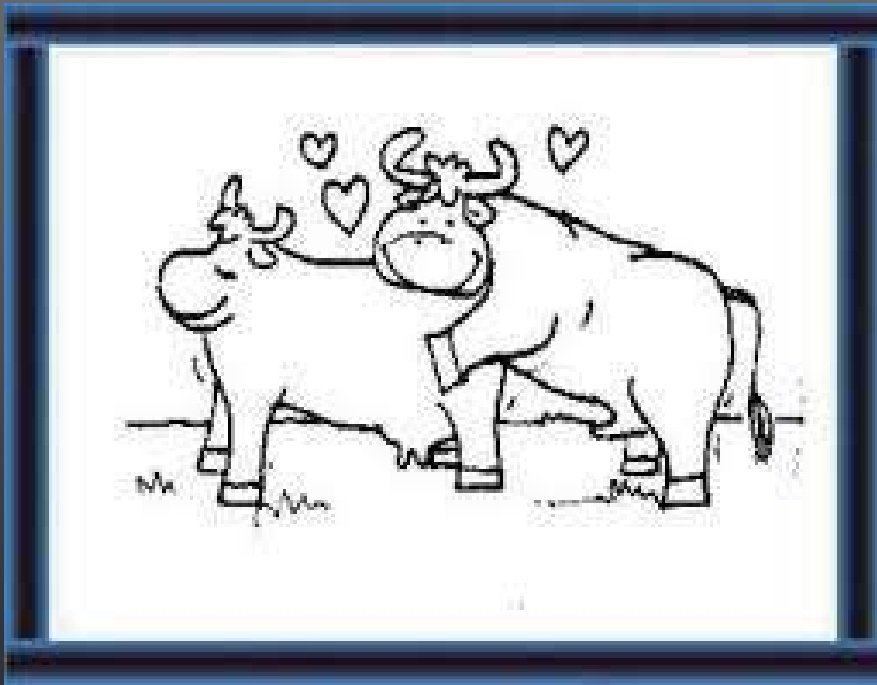
- **BLOOD FILTER CONTACT MALFUNCTION**
  - POISONS FETAL FLUID
  - “ATTACKS” FETUS
- **BACTERIA IN UTERUS**
  - CAN BE CARRIED IN AT INSEMINATION
  - MAY BE PRESENT FROM CALVING IF BRED TOO EARLY POST PARTUM
  - GROWS ALONG WITH EMBRYO
    - MULTIPLIES & SMOTHERS EMBRYOS
- **SICKNESS/INFECTION**
  - CAN CAUSE DISCONNECTION OF FETAL COTYLEDONS FROM MATERNAL CARUNCLES
    - BLOOD FILTER CONTACT RUINED
    - FETUS SUCCUMBS
    - COW RETURNS TO HEAT

- SCAR TISSUE
  - HAS NO FUNCTION
  - CAN INHIBIT EGG AND SPERM TRANSPORT
- POST PARTUM BACTERIA
  - UTERUS HAS NOT FULLY INVOLUTED
  - KILLS SPERM CELLS
- NUTRITION
  - COW NOT NUTRITIONALLY FIT TO CARRY A CALF





“HEAT DETECTION IS JUST A MATTER OF KNOWING WHAT TO PAY ATTENTION TO. BUT YOU HAVE TO TAKE IT SERIOUSLY. IF A COW IS IN HEAT AND YOU MISS HER, YOUR AI PROGRAM TAKES A STEP BACKWARD.”



## HEAT DETECTION AND TIMING OF INSEMINATION

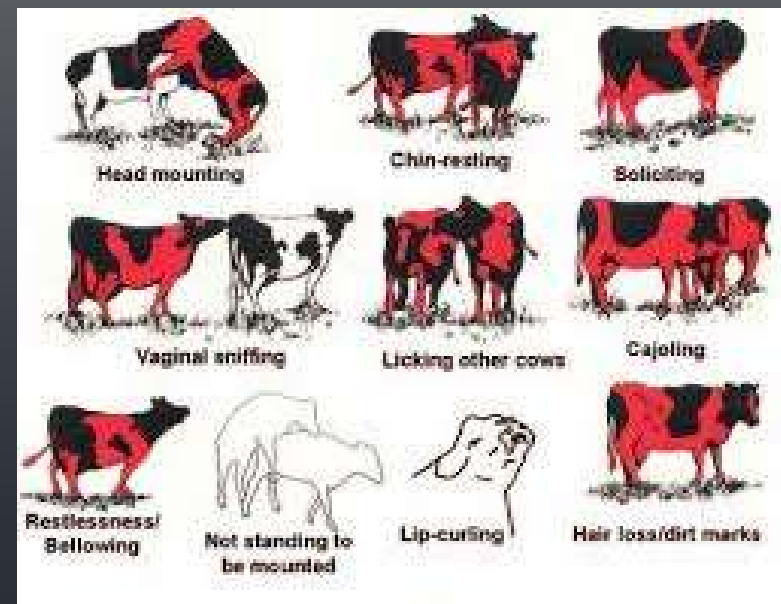
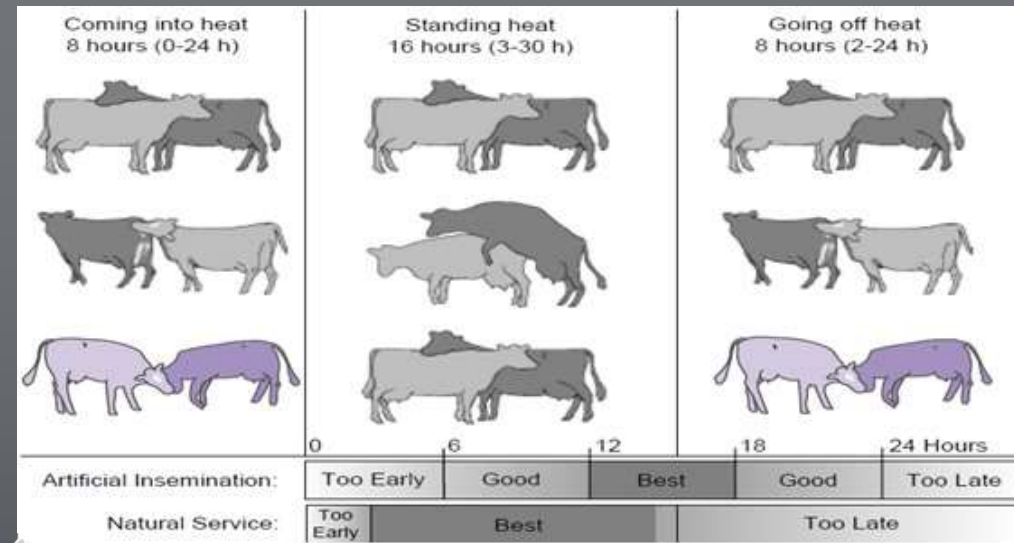
# HEAT DETECTION

- **MAKE SOMEONE RESPONSIBLE**
  - MAKE HEAT DETECTION HIGH PRIORITY
- **IDENTIFY ANIMALS**
  - EAR TAGS, BRANDING, ETC.
  - EASY TO READ FROM A DISTANCE
- **WHEN TO DETECT HEAT**
  - EARLY MORNING, AFTERNOON, LATE EVENING
  - 30+ MINUTES OBSERVING
- **FACILITIES**
  - LARGE ENOUGH TO MINGLE FREELY
  - SMALL ENOUGH TOO SEE ALL ANIMALS AT ONCE
  - AVAILABLE SHADE
  - SOFT, DRY GROUND FOR MOUNTING



# RECOGNIZE HEAT SIGNS

- STANDING HEAT ONLY PRIMARY SIGN OF HEAT
  - OVULATE AFTER STANDING HEAT
- SECONDARY SIGNS ARE UNRELIABLE
  - MAY SHOW SECONDARY SIGNS 48 HOURS BEFORE
  - MAY LAY HER HEAD ON BACKS OF OTHER ANIMALS
  - LOTS OF LICKING AND SNIFFING
  - BELLOWING, RESTLESS, NERVOUS
  - VULVA MAY SWELL AND BECOME DARKER IN COLOR
  - TAILHEAD MAY BE RAW OR VOID OF HAIR
  - SALIVA ON BACK, DIRTY FLANKS
  - BACKS OFF FEED
- AFTER HEAT
  - LETHARGIC
  - BLOODY DISCHARGE

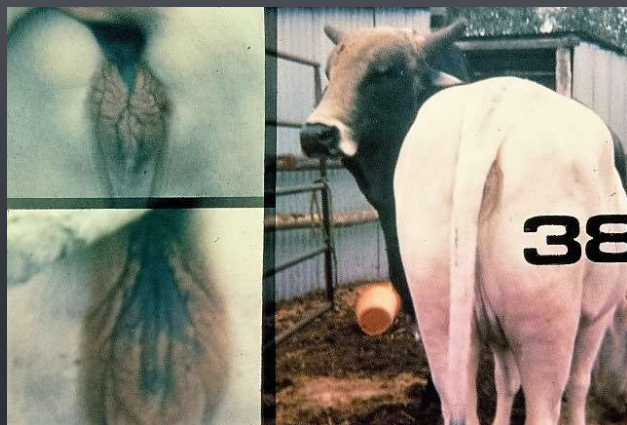
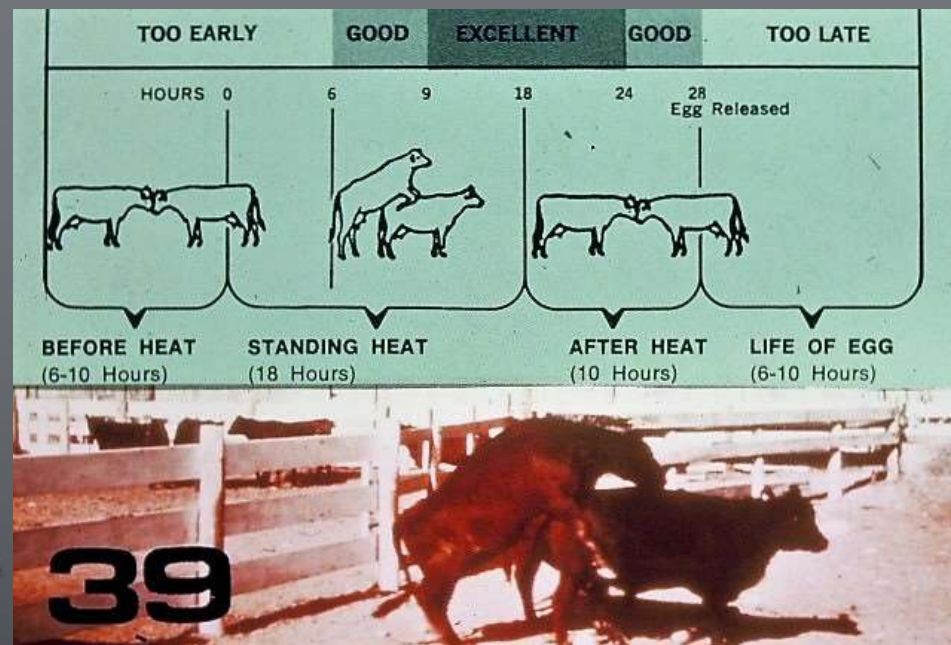


- HOW TO CHECK HEAT

- COWS ACTING DIFFERENT THAN NORMAL
- MUCUS SECRETIONS
- ALLOW ANIMALS TO MINGLE LIKE NORMAL
- KEEP NOTES

- WHEN TO INSEMINATE

- OVULATE 25-30 HOURS AFTER FIRST STANDING
- SPERM CELLS ONLY LIVE 24 HOURS IN TRACT
- INSEMINATE 10-14 HOURS AFTER FIRST STANDING
- AM/PM RULE





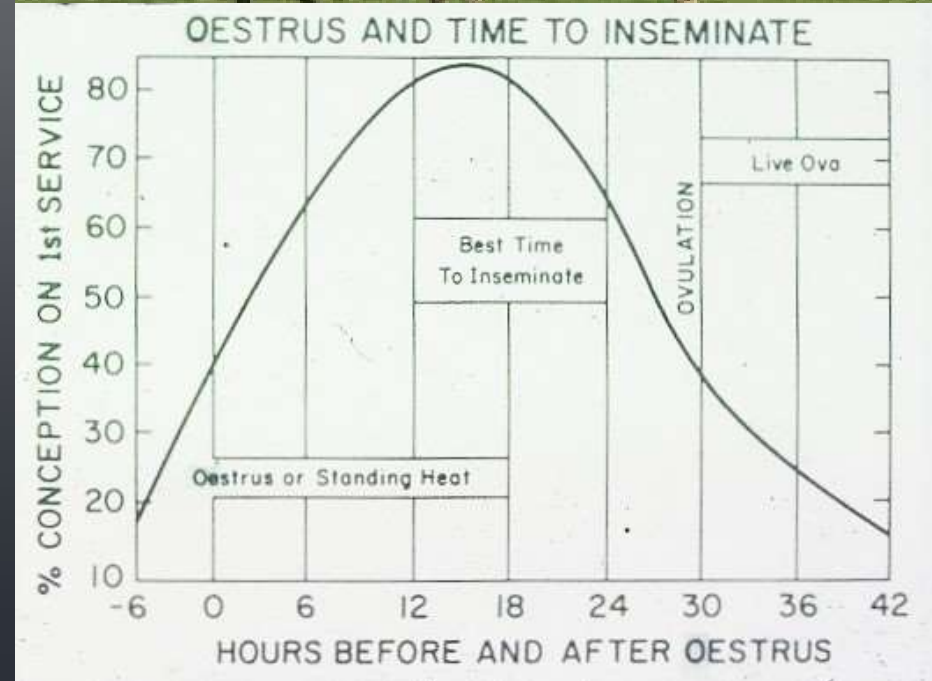
# HEAT DETECTION AIDS

Heat Detection Aid	How it Works	Potential Concerns	Relative Cost
Tail Chalk/Paint	Applied to tailhead. When animal is mounted the color will be rubbed off and hair will be ruffled	Removal by trees, water, fences or licking by other animals	\$
Heat Mount Detectors	Applied to tailhead and turn a bright color when mounted	Partial activation or loss of detector requires interpretation, false activation (trees, fences, other animals)	\$
Heat Watch	Transmitters are attached to tailhead region. When transmitter is depressed a signal is sent to receiver	Expensive to replace lost sensors, data interpretation, appropriate facilities/terrain	\$\$\$
Gomer Bulls	Vasectomized, epididymectomized and/or penile-deviated animals are used as teaser animals and will mount females in estrus	Feeding and maintenance expense, potential loss of desire to mate, disease transmission by non-penile deviated animals	\$\$
Chin Ball Marking Harness	Detector animal is fitted with harness leaving an ink mark on the back and neck of females that have been mounted	Maintenance of equipment, refilling ink reservoir, feeding and maintenance of animal, ill-defined markings	\$\$



# CHARACTERISTICS OF ESTROUS CYCLE

- ESTROUS CYCLE LENGTH – 21 DAYS (17-24)
  - 2 FOLLICULAR WAVES – 17 TO 20 DAYS
  - 3 FOLLICULAR WAVES – 21 TO 24 DAYS
- DURATION OF ESTRUS (HEAT) – 12-18 HRS (8-30)
- OVULATION – 30 HOURS AFTER ONSET OF ESTRUS
- SPERM CELLS LIVE 24 HOURS IN TRACT
- PRIMARY SIGN OF ESTRUS
  - STANDING TO BE MOUNTED
  - ALWAYS BREED THE COW STANDING TO BE RIDDEN
- SECONDARY SIGNS OF ESTRUS
  - FREQUENT MOUNTING
  - CLEAR, WATERY MUCUS DISCHARGE
  - RESTLESSNESS AND VOCALIZATION



# HEIFER DEVELOPMENT – AN ESSENTIAL KEY TO REPRODUCTIVE MANAGEMENT!

- GOAL – TO RAISE REPLACEMENT HEIFERS THAT WILL CONCEIVE EARLY IN THE BREEDING SEASON
- MANAGEMENT STRATEGIES
  - WEANING
    - CULL STRUCTURALLY UNSOUND HEIFERS
    - RETAIN 15-20% MORE HEIFERS THAN NEEDED
      - CULL HEIFERS THAT CONCEIVE LATE IN BREEDING SEASON
    - SELECT HEIFERS WITH HEAVY ACTUAL WEANING WEIGHTS
    - SIRE OF REPLACEMENT HEIFER SHOULD HAVE LARGE SCROTAL CIRCUMFERENCE
      - INVERSE RELATIONSHIP BETWEEN SC OF SIRE AND AGE AT PUBERTY IN DAUGHTERS
  - WEANING TO BREEDING
    - IDENTIFY APPROPRIATE TARGET WEIGHT
    - FEED HEIFERS SEPARATE FROM COWS
    - FEED RATION THAT ALLOWS ATTAINMENT OF PROJECTED TARGET WEIGHT BEFORE START OF BREEDING SEASON
- OBTAIN REPRODUCTIVE TRACT SCORES BEFORE BREEDING SEASON
  - ASSESSMENT OF SEXUAL MATURITY OF HEIFER
  - SCORE OF 1 TO 5 (1=IMMATURE; 5=PRESENCE OF CL)
  - 50%+ SHOULD HAVE RTS OF  $\geq 3$  BY 6 WEEKS PRIOR TO BREEDING
- OBTAIN PELVIC MEASUREMENTS
- PREPARE FOR THE BREEDING SEASON
  - DECIDE ESTROUS SYNCHRONIZATION PROTOCOL
  - ORDER AI SUPPLIES
  - BREEDING SOUNDNESS EXAM FOR BULLS
- BREEDING SEASON
  - BREED HEIFERS 20-30 DAYS BEFORE COWS
  - BREED HEIFERS TO HIGH ACCURACY CALVING EASE BULL
  - 60 DAYS BREEDING SEASON
- AFTER BREEDING SEASON
  - PREGNANCY DIAGNOSIS
    - RETAIN HEIFERS THAT CONCEIVE DURING FIRST 45 DAYS OF BREEDING
  - ENSURE GOOD BCS AT CALVING (85% MATURE BODY WEIGHT)



# REPRODUCTIVE TRACT SCORING TABLE

RTS	Uterine Horns	Ovarian Length (mm)	Ovarian Height (mm)	Ovarian Width (mm)	Ovarian Structures
1	Immature, <20 mm diameter, no tone	15	10	8	No palpable follicles
2	20-25 mm diameter, no tone	18	12	10	8 mm follicles
3	20-25 mm diameter, slight tone	22	15	10	8-10 mm follicles
4	30 mm diameter, good tone	30	16	12	>10 mm follicles, CL possible
5	>30 mm diameter	>32	20	15	CL present

# CRITERIA TO MEET FOR A SUCCESSFUL AI PROGRAM

## HEIFERS

- **PAST BREEDING HISTORY**
  - HEIFER PREGNANCY RATE 85% OVER 60 DAY BREEDING SEASON
  - IF NOT, MAY BE PROBLEM WITH HEIFER DEVELOPMENT OR HERD HEALTH PROGRAM
    - NEEDS TO BE ADDRESSED BEFORE INITIATING AN AI PROGRAM
- **REACH PUBERTY PRIOR TO ESTROUS SYNCHRONIZATION**
- **NO GROWTH PROMOTING HORMONES**
- **65% MATURE BODY WEIGHT BY START OF BREEDING**
- **>50% SHOULD HAVE RTS OF  $\geq 4$  BY 6 WEEKS BEFORE START OF BREEDING**



## COWS

- **PAST BREEDING HISTORY**
  - COW PREGNANCY RATE 85% OVER 60 DAY BREEDING SEASON
  - IF NOT, MAY BE PROBLEMS WITH REPRODUCTIVE MANAGEMENT OR HERD HEALTH PROGRAM
    - NEEDS TO BE ADDRESSED BEFORE INITIATING AN AI PROGRAM
- **INCIDENCE OF DYSTOCIA SHOULD BE LOW**
  - CALVING DIFFICULTY PROLONGS POSTPARTUM INTERVAL
- **BCS AT CALVING  $\geq 5$  (1=EMACIATED; 9=OBESE)**
  - TAKES 80-100 LBS TO INCREASE ONE BCS
- **AVERAGE  $>40$  DAYS POSTPARTUM AT START OF ESTROUS SYNCHRONIZATION PROGRAM**
- **AVERAGE POSTPARTUM INTERVAL OF COWS TO BE BRED  $\geq 60$  DAYS**
- **FIRST CALF HEIFERS**

# ESTRUS SYNCHRONIZATION PRODUCTS

- **PROGESTINS (CIDR OR MGA)**

- ACT LIKE PROGESTERONE
- INHIBIT ESTRUS AND OVULATION
- CIDR FUNCTIONS AS ARTIFICIAL CL

- **PROSTAGLANDINS (LUTALYSE)**

- $PGF_{2A}$  - INDUCES CL REGRESSION IN NON-PREGNANT FEMALE
- INDUCES PREMATURE CL REGRESSION IN ESTROUS SYNCHRONIZATION
- ONLY EFFECTIVE IN CATTLE THAT HAVE CL
- WILL NOT INDUCE CL REGRESSION DURING FIRST 5 DAYS OF CYCLE
- WILL NOT INDUCE CYCLICITY IN NONCYCLING FEMALES DUE TO ABSENCE OF A CL
- LUTALYSE IS ADMINISTERED IN A 5 ML DOSE
- ESTRUMATE IS ADMINISTERED IN A 2ML DOSE

- **GONADOTROPIN RELEASING HORMONE (GnRH) (FACTREL)**

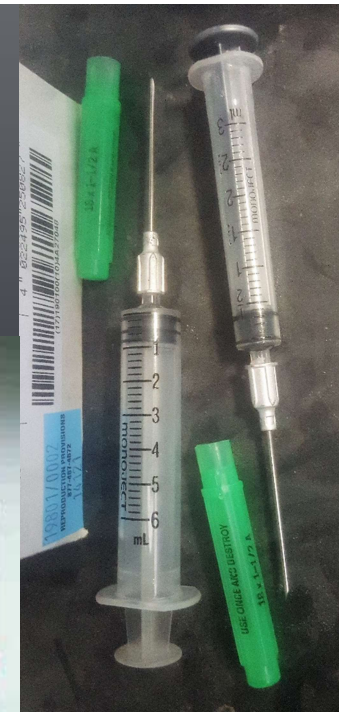
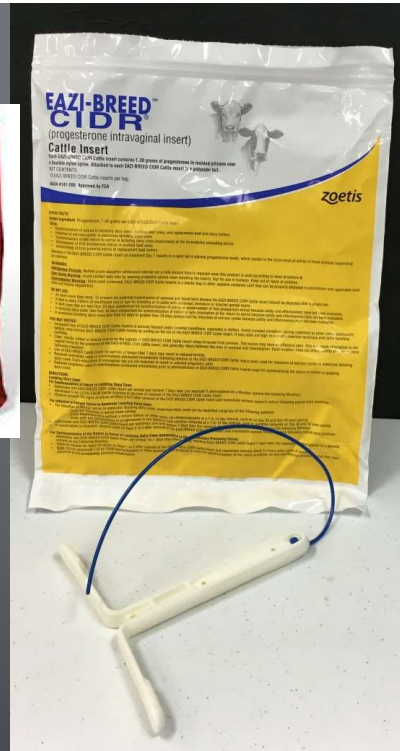
- INDUCES OVULATION
- INDUCTION OF OVULATION RESULTS IN SYNCHRONIZATION OF FOLLICULAR WAVE
- INDUCES CL FORMATION
- SHOULD BE ADMINISTERED IN A 2ML DOSE

- **SINGLE-DOSE SYRINGE**

- ACCURATE DOSAGE ESSENTIAL

- **18G x 1½" NEEDLE**

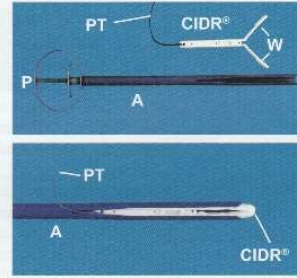
- HORMONES ONLY EFFECTIVE IN MUSCLE



# CIDR (CONTROLLED INTERNAL DRUG RELEASE)



**Figure 9-17.** The CIDR<sup>®</sup> as an Artificial Corpus Luteum in Cattle



The CIDR<sup>®</sup> is a "Y" shaped flexible device containing 1.38g of progesterone. The polyester "tail" (PT) allows retrieval of the CIDR<sup>®</sup> after seven days. The low tension spring-like "wings" (W) provide gentle pressure to hold the CIDR<sup>®</sup> in the vagina. The applicator (A) is a flexible plastic, syringe-like device with a plunger (P), that when depressed, inserts the CIDR<sup>®</sup> into the vagina of the cow.

The "wings" of the CIDR<sup>®</sup> are folded back and the CIDR<sup>®</sup> is inserted into the tip of the applicator (A).



The lubricated applicator is inserted gently into the vagina.



Radiograph showing the applicator containing the CIDR<sup>®</sup> after insertion into the vagina (V). The plunger of the applicator (A) has not been depressed and the "wings" of the CIDR<sup>®</sup> are still folded inside the applicator (CX = cervix; U = uterus).



The plunger of the applicator is being depressed allowing the CIDR<sup>®</sup> to be deposited into the vagina.



Radiograph showing the CIDR<sup>®</sup> inside the vagina (V) with the "wings" expanded to prevent loss after insertion. (CX = cervix; U = uterus).



After seven days, the CIDR<sup>®</sup> is removed by gently pulling on the polyester "tail" (PT).

Note: for more details see [www.cidr.com](http://www.cidr.com).

**BEEF COW PROTOCOLS - 2015**

**BEEF HEIFER PROTOCOLS - 2015**

**HEAT DETECTION**

Select Synch

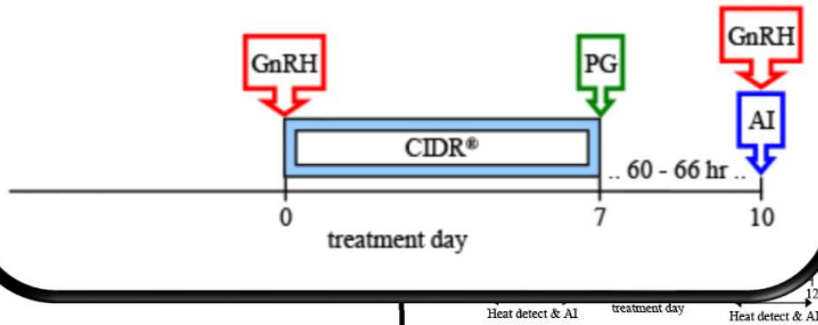
**HEAT DETECT & TIME AI (TAI)**

Select Synch & TAI

**FIXED-TIME AI (TAI)\***

**7-day CO-Synch + CIDR®**

Perform TAI at 60 to 66 hr after PG with GnRH at TAI.



**HEAT DETECTION**

1 Shot PG

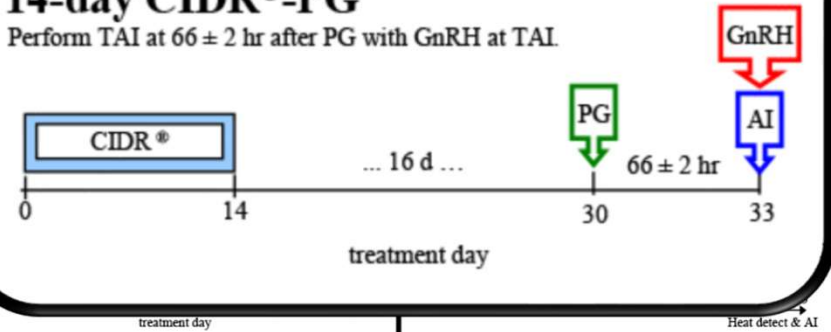
**HEAT DETECT & TIME AI (TAI)**

Select Synch + CIDR® & TAI

**Long-term Protocols**

**14-day CIDR®-PG**

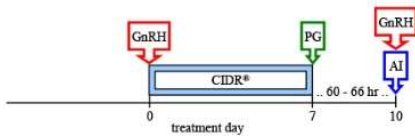
Perform TAI at 66 ± 2 hr after PG with GnRH at TAI.



**FIXED-TIME AI (TAI)\***

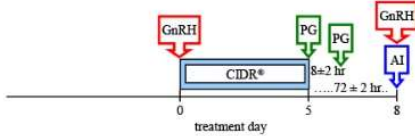
**7-day CO-Synch + CIDR®**

Perform TAI at 60 to 66 hr after PG with GnRH at TAI.



**5-day CO-Synch + CIDR®**

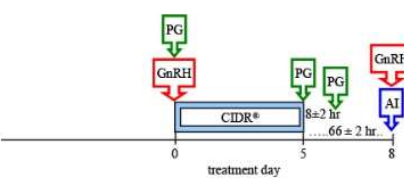
Perform TAI at 72 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



**FIXED-TIME AI (TAI)\*  
for Bos Indicus cows only**

**PG 5-day CO-Synch + CIDR®**

Perform TAI at 66 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



\* The time listed for "Fixed-time AI" should be considered as the approximate average time of insemination. This should be based on the number of cows to inseminate, labor, and facilities.

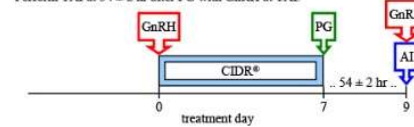
- GnRH Cystorelin®, Factrel®, Fertagyl®, OvaCyst®
- PG estroPLAN®, Estrumate®, In-Synch®, Lutalyse®, ProstaMate®

**FIXED-TIME AI (TAI)\***

**Short-term Protocols**

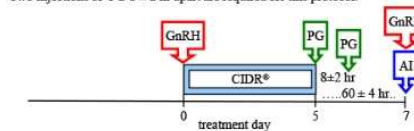
**7-day CO-Synch + CIDR®**

Perform TAI at 54 ± 2 hr after PG with GnRH at TAI.



**5-day CO-Synch + CIDR®**

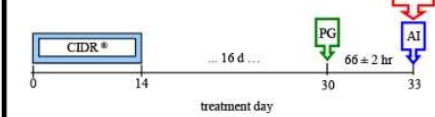
Perform TAI at 60 ± 4 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



**Long-term Protocols**

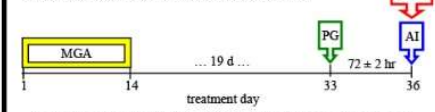
**14-day CIDR®-PG**

Perform TAI at 66 ± 2 hr after PG with GnRH at TAI.



**MGA®-PG**

Perform TAI at 72 ± 2 hr after PG with GnRH at TAI.

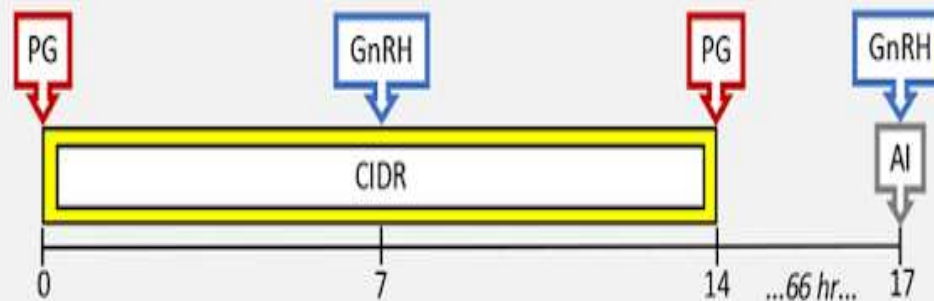


\* The times listed for "Fixed-time AI" should be considered as the approximate average time of insemination. This should be based on the number of heifers to inseminate, labor, and facilities.

- GnRH Cystorelin®, Factrel®, Fertagyl®, OvaCyst®
- PG estroPLAN®, Estrumate®, In-Synch®, Lutalyse®, ProstaMate®



## 7 & 7 Synch




### Fixed-Time AI


AI all cows at  $66 \pm 2$  hr  
after CIDR removal,  
with GnRH at AI

Research results show 82% of cows come into heat before timed AI using 7 and 7 Synch Protocol compared to 64% of cows in heat using the 7-Day Co Synch and CIDR protocol.

# TIPS TO RUNNING A SUCCESSFUL ESTRUS SYNCHRONIZATION AND AI PROGRAM

- ANIMAL IDENTIFICATION
  - KEEP ACCURATE RECORDS
  - ENSURE HERD HEALTH AND DISEASE PREVENTION
    - VACCINATE A MINIMUM OF 30 DAYS BEFORE THE BREEDING SEASON BEGINS
  - HEIFERS SHOULD WEIGH 65% OF THEIR MATURE BODY WEIGHT BY START OF BREEDING SEASON
  - SYNCHRONIZE AND INSEMINATE COWS WITH BCS  $\geq 5$  ONLY
  - COWS SHOULD AVERAGE  $\geq 45$  DAYS POSTPARTUM BY START OF ESTROUS SYNCHRONIZATION
  - PLAN AHEAD AND CAREFULLY FOLLOW ESTROUS SYNCHRONIZATION PROTOCOLS
- 
- IF DETECTING ESTRUS, SPEND AS MUCH TIME OBSERVING ANIMALS AS POSSIBLE
  - USE MINIMUM OF ONE PERSON TO DETECT ESTRUS PER 100 HEAD OF SYNCHRONIZED CATTLE
  - USE ESTROUS DETECTION AIDES
  - USE A PROPERLY TRAINED AI TECHNICIAN
  - PURCHASE SEMEN FROM A TRUSTED COLLECTION FACILITY
  - SELECT PROVEN AI SIRES WITH HIGH ACCURACY EPDs THAT MATCH PERFORMANCE GOALS
  - PREGNANCY CHECK BY 75 DAYS AFTER AI
  - PAY ATTENTION TO DETAILS!!!

# NUTRITION MANAGEMENT & AI

“OUR AI TECHNICIAN TOLD ME THE OTHER DAY THAT POOR NUTRITION IS THE SINGLE BIGGEST OBSTACLE TO SUCCESS IN BEEF  BREEDING PROGRAMS. THAT MAKES SENSE TO ME. IF YOU DON'T FEED THEM RIGHT, THEY'RE NOT GOING TO PRODUCE, EITHER WITH NATURAL SERVICE OR ARTIFICIAL INSEMINATION.”

# A SOUND NUTRITION PROGRAM IS ESSENTIAL FOR AI

- **HEIFER MANAGEMENT**

- 65% MATURE BODY WEIGHT AT BREEDING
- 14-15 MONTHS OLD AT BREEDING
  - 2 YEARS OLD AT CALVING
- REPRODUCTIVE TRACT SCORES (RTS)

- **FIRST-CALF HEIFERS (WET 2 YEAR OLDS)**

- FEED SEPARATE FROM MATURE COWS
  - RECOVERING FROM CALVING
  - LACTATING
  - LOSING TEETH

- **MATURE COWS**

- 60 DAYS POSTPARTUM AT BREEDING
  - TRACT INVOLUTION
  - RETURN TO PROPER BODY CONDITION



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**THANK YOU FOR ATTENDING OUR  
A.I. SCHOOL!**