RUMINANT REPRODUCTIVE DISEASES & DISORDERS: THEIR IMPLICATIONS TO PROFITABILITY OF DAIRY PRODUCTION

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PRESENTATION OUTLINE

I. INTRODUCTION
II. WHY REPRODUCTIVE DISORDERS ARE ECONOMICALLY IMPORTANT
III. WHAT ARE THE DIFFERENT REPRODUCTIVE DISORDERS AFFECTING BOVINES AND OTHER Ruminants
IV. HOW DO REPRODUCTIVE DISORDERS CAUSE ECONOMIC LOSSES – IN WHAT WAYS? AT WHAT SCALE OF ECONOMIC LOSSES?
V. COW SIGNALS - SHOW HOW THESE REPRODUCTIVE PROBLEMS CAN BE IDENTIFIED, PREVENTED, MITIGATED OR CONTROLLED.
WORLD-WIDE PRODUCTION HEALTH CONCERN IN THE DAIRY INDUSTRY

HEALTH & REPRODUCTIVE PROBLEMS

- DYSTOCIA
- DOWNER COW
- MILK FEVER
- FATTY LIVER SYNDROME
- KETOSIS
- DISPLACED ABOMASUM
- RETAINED FETAL MEMBRANE
- METRITIS
- ENDOMETRITIS
- DELAYED INVOLUTION OF THE UTERUS
- DELAYED ONSET OF POST PARTUM ESTRUS DUE TO OVARIAN INACTIVITY
- PNEUMOVAGINA
- PYOMETRA
- PROLONGED TIME BETWEEN ESTRUS
- NO ESTRUS DETECTED
- WEAK OR SILENT ESTRUS
- PERSISTENT ESTRUS OR NYMPHOMANIA
- BRUCELLOSIS
- LEPTOSPIROSIS
- TRICHOMONIASIS

POOR REPRODUCTIVE PERFORMANCE IN BOTH DAIRY AND BEEF CATTLE

- DECLINING CONCEPTION RATE - 20-30% AVERAGE CONCEPTION RATE
- INCREASE IN LENGTH OF DAYS OPEN / CALVING INTERVALS (13-18 MONTHS) VS. NORM OF 365 DAYS
- INCREASED RATE OF EMBRYONIC LOSSES (~30 - 40% @ 28-30 DAYS), FETAL RESORPTION (~20% @ 60-100 DAYS PREGNANCY) & ABORTION (~10-15% @ 3-8 MONTHS AGE)

REPRODUCTIVE DISEASES AND DISORDERS

HAVE A TREMENDOUS ECONOMIC IMPACT ON THE PROFITABILITY OF DAIRY FARMING OPERATION MAINLY DUE TO THE FOLLOWING FACTORS:

- LEADS TO PROLONGED CALVING INTERVAL DUE TO INCREASED DAYS OPEN OF THE COW
- LOSSES DUE TO EARLY EMBRYONIC DEATH / FETAL RESORPTION
- INCREASED CONTROL COSTS SUCH AS REPRODUCTIVE TREATMENTS, VETERINARY INTERVENTIONS, BREEDING COST & LABOR
- THE CULLING RATE (INVOLUNTARY CULLING) OF COWS DUE TO INFERTILITY IS INCREASED
- REDUCED MILK PRODUCTION OF AFFlicted COWS
GUIDEPOSTS FRESH COW* HEALTH & REPRODUCTIVE PROBLEMS

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>GUIDEPOST</th>
<th>ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DYSTOCIA/ASSISTED CALVINGS</td>
<td>&lt; 10 %</td>
<td>10-20 %</td>
</tr>
<tr>
<td>RETAINED FETAL MEMBRANE (RFM)</td>
<td>&lt; 10 %</td>
<td>15 %</td>
</tr>
<tr>
<td>METRITIS</td>
<td>&lt; 10 %</td>
<td>15-50 %</td>
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<tr>
<td>DISPLACED ABDOMASUM (DA)</td>
<td>&lt;0.5 %</td>
<td>3%</td>
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<tr>
<td>KETOSIS</td>
<td>&lt; 5 %</td>
<td>25%</td>
</tr>
<tr>
<td>PYOMETRA</td>
<td>&lt; 0.1 %</td>
<td>5%</td>
</tr>
<tr>
<td>MILK FEVER (MF)</td>
<td>&lt; 3 %</td>
<td>8-15%</td>
</tr>
<tr>
<td>ENDOMETRITIS</td>
<td>&lt; 0.1 %</td>
<td>15-25%</td>
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<tr>
<td>FATTY LIVER SYNDROME (FLS)</td>
<td>0 %</td>
<td>1-2%</td>
</tr>
<tr>
<td>MASTITIS</td>
<td>&lt; 0.3 %</td>
<td>2-10 %</td>
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<tr>
<td>LAMENESS</td>
<td>&lt; 0 %</td>
<td>10-25%</td>
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<tr>
<td>NON-CYCLING FRESH COWS (ESTRUS NOT OBSERVED)</td>
<td>&lt; 1 %</td>
<td>30-50%</td>
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<tr>
<td>CYCLING FRESH COWS AT DAY 21-25</td>
<td>&gt; 99 %</td>
<td>10-35%</td>
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<tr>
<td>CALVING INTERVAL</td>
<td>365 DAYS / 12 MONTHS</td>
<td>13-18 MONTHS</td>
</tr>
<tr>
<td>CONCEPTION RATE – 1st AI</td>
<td>&gt; 75 %</td>
<td>~60%</td>
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<tr>
<td>CULLING RATE FOR INFERTILITY (INVOLUNTARY CULLING)</td>
<td>&lt; 9%</td>
<td>~30-40%</td>
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<tr>
<td>CONCEPTION RATE – 2nd AI +</td>
<td>&gt; 60 %</td>
<td>30-40%</td>
</tr>
<tr>
<td>PREGNANCY RATE</td>
<td>&gt; 100 %</td>
<td>75%</td>
</tr>
<tr>
<td>HEAT DETECTION RATE 10-25 DAYS POST CALVING</td>
<td>~ 80 %</td>
<td>10-25%</td>
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Post-Partum Interval to 1st Estrus

Why do you need to monitor PPI to 1st Estrus?

It will tell you something is hampering the fertility of post-calved cows, e.g., nutritional intake, metabolic problems, cow comfort and uterine health...

DAIRY COWS

Average length in days 47.5
Range of length interval in days 35-60
% of cows involved 65-75% of calved cows

BEEF COWS

Average length in days 75
Range of length interval in days 50-100 days
% of cows involved 65 % of calved cows
INDIRECT CONSEQUENCES OF REPRODUCTIVE DISEASES AND DISORDERS

These additional expenditures consist of:

- Extra straws and extra charges for repeat services by AI technicians of other service providers.
- Extra labor-time if artificial insemination is practised by the farm staff.
- Extra labor time for the farmer & its employees to manage the problem cows.
- More frequent veterinary examinations & interventions.
- Extra hormonal & other treatment unit costs.
- Other diagnostic tests costs (laboratory examinations).
- Additional expenses in other corrective or preventive measures, e.g., nutritional supplementation, heat detection aids/devices, etc.

MATRIX OF UNDETECTED UTERINE INFECTION FROM DAY 0 TO 70 DAYS POST PARTUM

![Matrix Diagram]

- Normal endometrium
- Retained fetal membrane
- Subclinical endometritis
- Metritis
- Endometritis

Days post partum range from 0 to 70 days.
FLOW CHART ECONOMIC IMPLICATION OF REPRODUCTIVE PROBLEMS/DISORDERS

IMPROPER DRY COW MANAGEMENT
- Less 60-65 days dry period
- Poor dry cow feeding management
- BCS 1 thin / BCS too fat BCS 4 or +
- No hoof check before drying off
- No mastitis intramammary
- Antibiotic treatment
- No confirmatory pregnancy diagnosis

CALVING TIME
- Dystocia
- Uterine tract damage
- Retained fetal membrane
- Dead calf
- Dead cow
- Downer cow
- Retained fetal membrane can lead to severe metritis
- Retained fetal membrane 15-25% of calved cows

POST CALVING TIME
- Fresh cow period
- Puerperal metritis 15-25%
- Endometritis 3-5%
- Retained fetal membrane 2-3%
- Prolonged calving interval
- Euthanasia ended up as culls
- Milk discarded
- Reduced milk production
- Mastitis
- Endometritis 15-25%
- Puerperal metritis 15-25%
- Lameness
- Fatty liver syndrome
- Downer cow
- Retained fetal membrane
- Dead calf
- Dead cow
- Downer cow
- Retained fetal membrane

ECONOMIC LOSSES

PhP € ¥ $
REDUCED INCOMES RESULTING FROM PROLONGED CALVING INTERVALS
(a.k.a. – AVOIDABLE LOSSES)

- REDUCTION IN MILK YIELD – PEAK LACTATION WILL BE AFFECTED / TARGET ROLLING HERD AVERAGE (RHA) OF 8,000 LITERS OF MILK = ACTUAL RHA = 6,000 LITERS

- REDUCTION IN CALF CROP PER UNIT OF TIME
  - EXAMPLE: CALVING INTERVAL OF 14 MONTHS IN COMPARISON TO 12 MONTHS, THE FINANCIAL LOSS IS COMPUTED AS FOLLOWS:
  - GIVEN: THE COST OF THE CALF IS PhP 30,000 IN A 12-MONTH CALVING INTERVAL OR AT PhP 2,500/MONTH) THEN IN A 15 MONTH CALVING INTERVAL THE CALF-LOSS IS PRICED AT PhP 7,500
  - AND IF YOU HAVE ABOUT 20 COWS OF AN AVERAGE CALVING INTERVAL OF 15 MONTHS @ PhP 2500
  - WHAT ABOUT THE COST OF FEED, VETERINARY TREATMENT COST, LABOR COST, ETC. AND LOSS INCOME FROM MILK PRODUCTION, ASSOCIATED WITH MANAGING THESE COWS WITH REPRODUCTIVE PROBLEMS???

EXPECTED LOSSES INDIVIDUAL COW BASIS DUE TO REPRODUCTIVE PROBLEMS/DISORDERS

- DYSTOCIA / RFM / METRITIS
  - REDUCED MILK PRODUCTION: 20-25% OF DAILY MILK PRODUCTION IN 60 - 120 DAYS IN MILK
  - DISCARDED MILK DUE TO METRITIS ANTIBIOTIC TREATMENT & MASTITIS: 6-8 LITERS OF MILK DAILY DISCARDED FOR 10 DAYS
  - PROLONGED DAYS OPEN: ADDITIONAL 3-5 MONTHS OR A TOTAL OF 15-18 MONTHS CALVING INTERVAL
  - FERTILITY/MEDICAL TREATMENT COST - PhP 500 PER DAY PER AFFECTED COW FOR 10 DAYS
  - VETERINARY & LABOR COSTS

- LOSS OF BREEDING / PREGNANCY OPPORTUNITIES DUE TO FAILURE TO CONCEIVE
  - REPEAT BREEDING – AI SEMEN STRAW @ PhP 500 PER INSEMINATION
  - UNDETECTED ESTRUS – EQUATED TO AN INCREASE OF DAYS OPEN @ PhP 83.00 PER DAY
  - CALF LOSS PER MONTH DUE TO PROLONGED CALVING INTERVAL @ PhP 2,500 PER MONTH
  - CULLING DUE TO INFERTILITY - PhP 100-200K PER COW
  - VETERINARY & LABOR COSTS - PhP ???
TYPICAL FLOW OF EVENTS FOR A >13-MONTH CALVING INTERVAL

1. Estrus detected & bred 70-80% / Pregnant ~40-60% 1%~2% AI
2. Pregnancy Diagnosis 1 (Ultrasound) between day 28 and 31 from AI/NS
3. Pregnancy Diagnosis 1 (Rectal Palpation) at 45-50 days from AI/NS

PD1 (+) EED/EEL

- Under a Cloud of Cow Comfort & Correct Breeding System
- Pregnancy Diagnosis 1 (Ultrasound) between day 28 and 31 from AI/NS
- Pregnancy Diagnosis 1 (Rectal Palpation) at 45-50 days from AI/NS
- PD (+) Proceed to PD2 60-100 days
- PD2 (-) Abortion / Fetal Resorption
- PD (+) 3-6 Services - Cull
- PD (+) Pre-DRY
- PD2 (+)
- PD1 (+)

Dry - 7 Mos PD+

Dry Cow Conditioning Grouping

Dry Cow Transition Feeding

CALVING

Prolonged Calving Interval

Normal Calving Interval

Resume ovarian activity ~70-80%

Involution ~95%

Chronic repeat breeders > 3 AI services

Go to Bull Pen or Become Inferfert Culls

NEVER BREED EARLIER THAN 42 DAYS FROM CALVING

3-5 Services - Cull

NEVER BREED EARLIER THAN 42 DAYS FROM CALVING

Post Partum Check

Pregnancy Losses: Fetal resorption at 90-100 days, Mummification & Abortion at > 120 days P+ Born dead calves
RETAINED FETAL MEMBRANE CAN LEAD TO SEVERE METRITIS

BOVINE UTERUS WITH METRITIS
UTERUS WITH PUERPERAL METRITIS

THE DRY COAT OF A CALF ON DYSTOCIA CAUSES A SAND PAPER EFFECT ON THE UTERINE LINING LEADING ABRASIONS WHICH BECOMES INFECTED BY BACTERIA, HENCE METRITIS. THE SITUATION IS LATER ON AGGRAVATED BY A RETAINED FETAL MEMBRANE.
CONSEQUENCES OF DYSTOCIA

- CALVING-RELATED INJURIES – SPLIT, VULVAR LACERATION, RECTO-VAGINAL TEAR
- UTERO-CERVICAL PROLAPSE
- METRITIS
- RETAINED FETAL MEMBRANE
- ENDOMETRITIS
- PYOMETRA
- FERTILITY PROBLEMS – PROLONGED CALVING INTERVAL/INCREASED DAYS OPEN, REPEAT BREEDING

ECONOMIC LOSSES
- 20% LESS ON DAILY MILK PRODUCTION TILL 120 DIM AS AN EFFECT OF METRITIS
- PROLONGED CALVING INTERVAL >13-18 MONTHS
- CALF OPPORTUNITY LOSS @ PhP2500 PER CALF/MONTH
- DEAD COW @ 200K PESOS

DOWNER COWS
RETAINED FETAL MEMBRANE (RFM) OR RETAINED PLACENTA

- THE CALVED COW HAS KEPT THE FETAL MEMBRANE ATTACHED TO THE UTERINE COTYLEDONS/CARUNCLES FOR >24 HOURS FROM CALVING
- RFM MUST BE ALLOWED TO BE DROPPED OFF NATURALLY BY THE CALVED COW
- NEVER TO BE MANUALLY PULLED AND DISENTANGLED FROM THE UTERINE COTYLEDONS OF THE UTERUS
- IF DONE THAT WAY, CAN LEAD TO DAMAGE OF THE UTERUS, SEVERE METRITIS, PERITONITIS AND SEPTICEMIA
- NEVER PUT A COUNTERWEIGHT ON THE RFM
- BETTER CUT OFF THE RFM BUT LEAVE A VISIBLE STUMP
- RFM WILL FALL AWAY EITHER IN FULL LENGTH OR PARTIALLY WITHIN 10 DAYS OR MORE BUT WILL BE ROTTEN AND FOUL AND FOUL- SMELLING
- DISCHARGE FROM A UTERUS WITH RFM CONTAINS A LOT OF MICROBIAL ORGANISMS WHICH COULD ALSO LEAD TO MASTITIS INFECTION

RFM IS A SEQUELAE OF DYSTOCIA WHICH IN TURN LEADS TO EITHER A Puerperal METRITIS OR ACUTE ENDOMETRITIS WHICH PROLONG THE CALVING INTERVAL DUE TO THE EFFECT OF THE INFECTION TO THE OVARIES OF THE POST-CALVED COW.

METRITIS

- INFLAMMATION / INFECTION OF THE UTERUS
- CHARACTERIZED BY SWOLLEN UTERUS FILLED WITH REDDISH, WATERY, FOUL- SMELLING DISCHARGE
- COW HAS ELEVATED TEMPERATURE AT 40ºC, POOR APPETITE, REDUCED MILK PRODUCTION, RUMEN FILL SCORE OF 1, HAS A MANURE SCORE OF 1 OR 2
- CAUSED PRIMARILY BY DYSTOCIA LEADING TO RETAINED FETAL MEMBRANE OR MANUAL HANDLING WHEN ASSISTING DIFFICULT CALVING
- USE OF POOR “CALVING EASE” AI SIRE OR NATURAL MATING WITH A BULL THAT HAS NOT BEEN PREQUALIFIED AS CALVING EASE BULL
- CALVING EASE SIRE SCORE MUST BE A THE HIGH SCORE OF 8 TO 10
- CALVING EASE SCORE MUST NOT BE LOWER THAN 8
SEPTIC METRITIS THAT LED TO THE DEATH OF A COW 1 WEEK AFTER CALVING
UNILATERAL METRITIS IN COW
A first calf lactation heifer with post partum problem will peak later at 20th week.

First-calf lactation heifers have more persistent lactation curves; peak in milk production by 14 weeks at 75% of mature cows.

Mature cows peak at 8 weeks of lactation but lacks persistency compared to 1st calf-lactation heifers.

A mature cow with post partum problem will usually peak later at 15th week. The implication is the momentum to peak lactation is lost at the rate of 15-20% of potential high milk yield.

Milk Yield

Week Lactation

Lactation Curve – Multiparous vs. Primiparous

1st Lactation with post partum problem will peak usually at 5th month of lactation.

2nd Lactation & above with post partum problem will peak usually between 3rd and 4th month of lactation.

The implication is the momentum to peak lactation is lost at the rate of 15-20% of potential high milk yield.

Milk Yield

Months Lactation

The implication is the momentum to peak lactation is lost at the rate of 15-20% of potential high milk yield.
THE PRE-/POST-CALVING SYNDROME IN DAIRY COWS

**PPCS SYNDROME**

- **DYSTOCIA**
- **HYPOCALCEMIA**
- **RPM**
- **METRITIS/ENDOMETRITIS**
- **KETOSIS/FATTY LIVER SYNDROME**
- **MASTITIS**
- **CESARIAN OPERATION**
- **RECOVERY**
  - PROLONGED DAYS OPEN /
  - AVERAGE OF 90-150 DAYS OPEN
  - REPEAT BREEDER
  - INFERTILITY CULLS

**DOWNER COW**

- EUTHANASIA
- SOLD

COMPUTE THE LOSSES BASED ON COST ESTIMATES GIVEN

MANAGEMENT OPTIONS ON THE PRE-/POST CALVING SYNDROME IN DAIRY COWS

**PPCS CALVING SYNDROME**

- **DYSTOCIA**
- **CESARIAN OPERATION**
- **HYPOCALCEMIA**
- **RETAINED FETAL MEMBRANE**
- **METRITIS/ENDOMETRITIS**
- **KETOSIS /FATTY LIVER SYNDROME**
- **MASTITIS**
- **DOWNER COW**

- **POST-NATAL CHECK (PNC)**
  - BETWEEN DAY 10-15
  - REPEAT PNC AT DAY 20, 25 & 30 POST-CALVING
  - MONITOR HEALTH CLOSELY & UTERINE DISCHARGE

- **INJECTABLE ANTIBIOTICS**
- **SUPPORTIVE THERAPY IF COW IS KETOTIC**
- **UTERINE INFUSION OF WASH-OUT SOLUTION**
- **WAIT FOR THE RPM TO FALL OFF – DON'T EXTRICATE MANUALLY!**

**CHRONIC UTERINE INFECTION**

- **PROSTAGLANDIN AT DAY 10 & 20 POST CALVING + UTERINE INFUSION OF INDICATED ANTIBIOTIC SOLUTION (BASED ON RESULT OF UTERINE SWAB ON BACTERIAL CULTURE)**
- **SYSTEMIC ANTIBIOTIC**
- **OTHER TREATMENTS AS INDICATED FOR KETOSES, MASTITIS & HYPOCALCEMIA**

CULL FOR INFERTILITY OR JOIN A BULL PEN WITH OTHER PROBLEM BREEDERS
IDENTIFY and RECORD COWS AT RISK ON CALVING

AT RISK COWS WILL HAVE HAD:
- ASSISTED CALVINGS
- INDUCED CALVINGS
- DEAD CALVES/STILLBIRTHS
- TWINS
- RETAINED FETAL MEMBRANES
- PREGNANT HEIFERS WITH POOR BODY CONDITION SCORE / LIGHT BODY FRAME
- OVER-CONDITIONED DRY COWS
- HISTORY OF DYSTOCIA IN PREVIOUS CALVINGS

MILK PRODUCTION LOSS FROM METRITIS OR RFM

THE MILK PRODUCTION LOSS ASSOCIATED WITH METRITIS AVERAGES ALMOST 20-25 % ON DAILY MILK PRODUCTION DURING THE FIRST 120 DAYS OF MILK.

GIVEN:
- DAIRY COW IS MILKED TWICE A DAY PRODUCING A DAILY AVERAGE OF 12 LITERS OF MILK
- PhP 25 PER LITER OF RAW MILK
- @ 20% MILK LOSS = 2 LITERS DAILY FOR 120 DAYS = 240 LITERS X PhP 25 = PhP6,000.00
- WHAT IF YOU HAVE A MILKING HERD OF 350 COWS WITH A METRITIS INCIDENCE OF 15% (52 HEADS)
- THE MILK LOSS WOULD BE : 52 COWS X PhP 6,000 = PhP 312,000.00 IN 120 DAYS IN MILK
PROLAPSED UTERUS
- Commonly a result of dystocia and inexperienced manual calving assistance
- 80% of these cases do not return to pregnancy even if corrected — CULL!!

COW HEALTH & REPRODUCTION SIGNALS
- Practical aids to dairy herd health and reproduction management
- Can provide important information on the dairy animals’ health and production status
- Observation can be done during morning and afternoon herd walk by the dairy farmer, herd manager or foreman
- Dystocia or calving difficulty signals are red flags for dry cow management
- Cow behaviour or demeanor
- Can be integrated with general herd work of farm staff through structured training intervention
CHARACTERISTICS OF A GOOD LOCHIA (FRESH COW UTERINE DISCHARGE)

- NO BAD SMELL
- CONTAINS LIBERAL AMOUNT OF CLEAR MUCUS AND UTERINE SCRAPINGS
- CLEAR MUCUS DISCHARGE IS MORE DOMINANT
- PROFUSE IN QUANTITY – SIGN OF SELF CLEANING UP OPERATION OF THE UTERUS
- GENERAL COLOR OF UTERINE DISCHARGE IS A GOOD BLEND OF PINKISH TO LIGHT REDDISH DISCHARGE AND CLEAR MUCUS
- GOOD LOCHIA EVENTUALLY BECOME JUST A NO SMELL CLEAR MUCUS AT 20 DAYS FROM CALVING
- UTERUS HAS ALREADY UNDERGONE SIZABLE INVOLUTION AT DAY 20 AND OVARIAN STRUCTURES ARE PALPABLE SUCH AS MATURING FOLLICLES
THIS IS NOT A GOOD LOCHIA: NOTE THE PUS DISCHARGE, POSSIBLY FOUL SMELLING, TOO. VERY CHARACTERISTIC OF A RETAINED FETAL MEMBRANE WHICH EVENTUALLY TURNS INTO METRITIS.

NOT A GOOD LOCHIA: NOTE THE ABSENCE OF THICK CLEAR MUCUS BLENDING WITH THE UTERINE DISCHARGE. A METRITIS CASE.
DISCHARGE FROM A SEVERE ENDOMETRITIS / PYOMETRA: NOTE THE THICK CREAMY BUT FOUL SMELLING DISCHARGE

UTERINE DISCHARGE SCORING FROM DAY 1 TO 42 DAYS POST PARTUM

UDS 1 – DAY 21 TO DAY 42 POST PARTUM
Thick, viscous discharge; clear, opaque or red to brown in color; no odor or mild, non-offensive odor.
UTERINE DISCHARGE SCORING FROM DAY 1 TO 42 DAYS POST PARTUM

UDS 2 – DAY 18-42 DAYS POST PARTUM – SUBCLINICAL ENDOMETRITIS
White or yellow pus; moderate to thick discharge; no odor or mild, non-offensive odor.

UDS 3 - METRITIS
Pink, red, dark red, or black watery discharge; detectable offensive odor, possibly intolerable.
ALL BAD UTERINE DISCHARGE (LOCHIA) WITH FOUL ODOR

• THIS IS A PURULENT FOUL SMELLING DISCHARGE FROM A UTERUS WITH SEVERE ENDOMETRITIS THAT LEADS TO PYOMETRA
• THIS WILL AFFECT THE FUNCTION OF THE UTERO-OVARIAN TRACT

USING A GLOVED ARM INSERTED CAREFULLY INTO THE VAGINA TO SCOOP OUT DISCHARGE
UTERINE INFECTION GRADING

0
GR. 1 – CLEAR OR TRANSLUCENT MUCUS

1
GR. 1 – MUCUS CONTAINING FLECKS OR OFF-WHITE PUS

2
GR. 2 – EXUDATE CONTAINING <50% WHITE OR OFF-WHITE MUCUPURULENT MATERIAL

3
GR. 3 – EXUDATE CONTAINING >50% PURULENT MATERIAL

ANOTHER VERSION OF GR. 3 FROM RFM-INDUCED METRITIS – YELLOW OR BLOODY YELLOW

INTRA-UTERINE WASH-OUT SOLUTION WHICH CAN BE PREPARED FROM A FORMULATION INFUSED TO THE UTERUS EVERY 2-3 DAYS FOR A WEEK
Clear Mucus Discharge at 1st Heat
≈ 21 or 42 Days from Calving
RESEARCH SURVEY ON PREGNANCY LOSSES

<table>
<thead>
<tr>
<th>EMBRYONIC LOSS</th>
<th>AGE OF EMBRYO</th>
<th>FETAL RESORPTION</th>
<th>AGE OF FETUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20%</td>
<td>27-45 DAYS</td>
<td>4-30 %</td>
<td>60-100 DAYS</td>
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COW
HEALTH SIGNALS

- PRACTICAL AIDS TO DAIRY HERD HEALTH AND REPRODUCTION MANAGEMENT
- CAN PROVIDE IMPORTANT INFORMATION ON THE DAIRY ANIMALS' HEALTH AND PRODUCTION STATUS
- OBSERVATION CAN BE DONE DURING MORNING AND AFTERNOON HERD WALK BY THE DAIRY FARMER, HERD MANAGER OR FOREMAN
- DYSTOCIA OR CALVING DIFFICULTY SIGNALS ARE RED FLAGS FOR DRY COW MANAGEMENT
- COW BEHAVIOUR OR DEMEANOR
- CAN BE INTEGRATED WITH GENERAL HERD WORK OF FARM STAFF THROUGH STRUCTURED TRAINING INTERVENTION

BECKONS OF COW SIGNALS

 ✓ DRY COW PERIOD BODY CONDITION SCORING – CARRIED OUT A MONTH BEFORE DRYING OFF, DURING THE START OF THE DRY CONDITIONING & DONE BEFORE THE TRANSITION PERIOD
 ✓ CALVING EASE SCORING
 ✓ UTERINE DISCHARGE SCORING
 ✓ POST NATAL UTERINE CHECK
 ✓ RUMEN FILL SCORING
 ✓ FRESH COW BODY CONDITION SCORING
 ✓ WEEKLY MILK PRODUCTION MONITORING DURING THE FRESH COW PERIOD
 ✓ MANURE SCORING
 ✓ MOBILITY SCORING
BODY CONDITION SCORING

**BCS = 1**
Deep cavity around tailhead. Bones of pelvis and short ribs sharp and easily felt. No fatty tissue in pelvic or loin area. Deep depression in loin.

**BCS = 2**
Shallow cavity around tailhead with some fatty tissue lining it and covering pin bones. Pelvis easily felt. Ends of short ribs feel rounded and upper surface can be felt with slight pressure. Depression visible in loin area.

**BCS = 3**
No cavity around tailhead and fatty tissue easily felt over whole area. Pelvis can be felt with slight pressure. Thick layer of tissue covering top of short ribs which can still be felt with pressure. Slight depression in loin area.
Folds of fatty tissue are seen around tailhead with patches of fat covering pin bones. Pelvis can be felt with firm pressure. Short ribs can no longer be felt. No depression in loin area.

Tailhead is buried in thick layer of fatty tissue. Pelvic bones cannot be felt even with firm pressure. Short ribs covered with thick layer of fatty tissue.

BODY CONDITION SCORE AS IT AFFECTS CALVING INTERVAL

BCS ADAPTED TO A 1 TO 9 SCALE
### CALVING EASE SCORING SYSTEM

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>No problems; cow calves on her own without the assistance of humans.</td>
</tr>
<tr>
<td>2</td>
<td>Slight problem; cow seems uncomfortable and is in labor for hours, but delivers the calf on her own. Usually a heifer 1st lactation, record calving history to guide in the selection of AI sire</td>
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<tr>
<td>3</td>
<td>Needed assistance; calf may need repositioning, but the cow delivers the calf safely after initial human help. Record calving history to guide in the selection of AI sire</td>
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<tr>
<td>4</td>
<td>Considerable force needed; chains needed to pull calf.</td>
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### THE VALUE OF DOING A RUMEN FILL SCORE

- Done during early morning herd health walk
- RFS shows the feed intake over the last two to six hours
- Body condition shows feed intakes over the last month
- Rumen fill is a quick way of identifying BODY CONDITION SCORE
RFS 1 - Paralumbar Fossa: looks very empty, cavitates more than a hand’s width behind the last rib & a hand’s width inside under the transverse processes, looks like a rectangle when observed from the left side of the cow.

Score 1 – unacceptable, cow has eaten little or nothing
Deep shrunken left side; the skin on top of the diagonal protrusion of the lumbar vertebrae is caved in.
RFS 2
The paralumbar fossa cavitates a hand’s width behind the last rib and to a lesser extent inside under the transverse processes. When the observer stands at the left side of the cow, this area looks like a triangle.

Score 2 – acceptable for cows shortly after calving
The skin over the diagonal protrusion of the lumbar vertebra is caved in.

RFS 3
The paralumbar fossa cavitates less than a hand’s width behind the last rib and falls about a hand’s width vertically downwards from the transverse process and then bulges out.

Score 3 – ideal score for milking cows
The skin over the diagonal protrusion of the lumbar vertebra goes vertically down first and then curves to the outside.
The paralumbar fossa skin is covering the area behind the last rib and arches immediately outside below the transverse processes due to an extended rumen.

Score 4 – correct for late lactating and dry cows
The skin across the diagonal protrusion of the lumbar vertebra is curved directly to the outside.

The rumen is quite distended and nearly obliterates the fossa; the last rib and the transverse processes are not visible.

DIFFERENTIATE THIS FROM THE BULGE OF BLOAT!

Score 5 – correct score for dry cows
The diagonal protrusion of the lumbar vertebra is not visible because of a well-filled rumen.
CAN YOU TELL ME THE RUMEN FILL SCORE OF THIS MILKING COW?

Manure scoring is done during herd health walk (early morning or late afternoon)

- Manure consistency related to changes in rations
- Different levels & types of fiber, protein, fat & mineral content cause changes in manure consistency.
- Cows producing more milk and consuming more feed will tend to have feces with lower score
### MANURE SCORE 1

1. Feces are watery thin and not truly recognizable as feces.
2. Manure may actually “arc” for the rump of the cow.
3. Excess protein or starch, too much mineral or lack of fiber can lead to this score.
4. Excess urea in the hind gut can create an osmotic gradient drawing water in the manure.
5. Cow with diarrhea will be in this category.
6. Feces are from a cow on a case of Metritis or Retained Fetal Membrane (RFM).

### MANURE SCORE 2

1. Feces are thin custard-like; fecal structure can be recognized but does not form a distinct pile.
2. At dropping they splash wide out on the floor.
3. Cows on lush pasture will commonly have this type of manure.
4. Low fiber or a lack of functional fiber can also lead to this manure score.
**MANURE SCORE 3**

1. This is the optimal score!
2. Feces are thick and custard-like or has a porridge-like appearance, will stack up 1.5 – 2 inches, have several concentric rings, a small depression or dimple in the middle.
3. Make a light plopping sound when being dropped on the floor.
4. Make a well-circumscribed pad that spreads and has the thickness of about 2 cm.
5. Manure score indicates good feeding ration.
6. Manure score of high yielding milking cows.

**MANURE SCORE 4**

- Stiff feces are observed.
- They make a heavy plopping sound when being dropped.
- They make a well-circumscribed pad that piles in rings and spreads out very.
- This score reflect low quality forages are fed and/or a shortage of protein.
- Adding more grain or protein can lower this manure score.
- This is usually the manure score of dry cows and heifers.
MANURE SCORE 5
1. Stiff feces in balls, looks like horse feces.
2. Reflects feeding of straw-based diet or the animal is dehydrated.
3. A boot sole profile is left when stepped on
4. Cows with digestive blockage or “Hardware Disease” may exhibit this score.

UPPER LEFT DOME OF RUMEN WITH CIRCULAR INCISION SUTURED TO THE WALL OF THE HUNGER FOSSA
RUMEN FISTULA SLEEVE WITH REMOVABLE CAP

RUMEN FISTULA
COLLECTING RUMEN INGESTA TO BE INOCULATED ORALLY TO A SICK COW

POST-NATAL UTERINE CHECK (PNUC)

OBJECTIVES:

- TO DETERMINE WHETHER UTERINE INVOLUTION IS PROGRESSING
- TO DETERMINE NO INFECTIONS ARE PRESENT ANYWHERE IN THE UTERINE TRACT

WHEN TO DO:

- 10 -15 DAYS IF NORMAL CALVING
- DYSTOCIA – CHECK AND MONITOR DAILY AS NEEDED – UTERINE DISCHARGE, OVER-ALL HEALTH (INFECTION, PERITONITIS, KETOSIS, MILK FEVER, CALVING INJURY, ETC.)
- CESARIAN DELIVERY - CHECK AND MONITOR DAILY – UTERINE DISCHARGE, OVER-ALL HEALTH (INFECTION, PERITONITIS, KETOSIS, MILK FEVER, CALVING INJURY, ETC.)
POST CALVING INVOLUTION

- Earliest check is done at ten (10) days post calving to detect metritis.
- Twenty (20) days after calving, tissue sloughing and hemorrhaging have ceased.
- Size of the uterus has been reduced by more than 80%.
- Forty (40) days - the uterus has completely involuted except for isolated pockets of leukocytes.
- Any reproductive or metabolic disorders around calving will delay involution.
- A preventive herd health program (PHHP) including a reproductive examination of cows within a month after calving will pay dividends in improved reproductive performance.
- With a sound PHHP, servicing cows on the first heat after 42 days fresh is recommended.
## BOVINE UTERUS INVOLUTION

<table>
<thead>
<tr>
<th>Parity Level</th>
<th>Anatomy</th>
<th>Length in Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primiparous</td>
<td>Outline of the Uterus</td>
<td>10-14</td>
</tr>
<tr>
<td>Multiparous</td>
<td>Gross anatomy of the Uterus</td>
<td>25-30</td>
</tr>
<tr>
<td>Multiparous</td>
<td>Histological</td>
<td>45-50</td>
</tr>
</tbody>
</table>

## INTERVAL IN DAYS FROM CALVING TO THE INVOLUTION OF UTERINE CERVIX AND HORNS IN DIFFERENT PARITIES OF DAIRY AND BEEF COWS

<table>
<thead>
<tr>
<th>Parity</th>
<th>Interval in days from calving to uterine cervix involution</th>
<th>Interval in days from calving to gravid horn involution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primiparous</td>
<td>27 to 36 days</td>
<td>31 to 43 days</td>
</tr>
<tr>
<td>Biparous</td>
<td>29 to 36 days</td>
<td>18 to 29 days</td>
</tr>
<tr>
<td>Multiparous</td>
<td>24 to 35</td>
<td>18 to 27</td>
</tr>
</tbody>
</table>
**Figure 2**

<table>
<thead>
<tr>
<th>Grade of Involution</th>
<th>Nature of Discharge</th>
<th>Size of Uterus at 10 Days Post Partum</th>
<th>Size of Uterus at 42 Days Post Partum</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mix of clear mucoid and pinkish to brownish discharge, no foul smell</td>
<td>Primiparous – Horns can be grasped with the circle of fingers</td>
<td>Primiparous – Size of horns much reduced</td>
<td>Normal, fully involuted size of both horns in primiparous is the size of ring finger in multiparous cows, the size is the middle finger</td>
</tr>
<tr>
<td>2</td>
<td>Whitish or pus discharge – Case of endometritis</td>
<td>Primiparous – 1 uterine horn enlarged the size of the circumference of the forearm</td>
<td>One of the uterine horns is slightly enlarged ~3 fingers width</td>
<td>Cow may or may not be sick, no fever, appetite normal</td>
</tr>
<tr>
<td>3</td>
<td>Reddish watery, foul, offensive smelling, profuse – Case of RFM or metritis</td>
<td>Both horns swollen, dome-like, can not be grasped with the hand</td>
<td>One uterine horn still slightly swollen, fluid in horns, horn diameter is ~4 fingers width</td>
<td>Cow is sick looking, poor appetite, feverish, almost lying down, cow requires injectable antibiotic treatment</td>
</tr>
</tbody>
</table>
THERE IS A NEED FOR A STRUCTURED AND RELEVANT PRACTICAL DAIRY REPRODUCTION HERDSMANSHP TRAINING THROUGHOUT THE PHILIPPINE DAIRY AND BEEF CATTLE INDUSTRY

TETRA-TECH CONSULTING CORPORATION CAN

✓ PROVIDE TRAINING SOLUTIONS FOR YOUR FARM PERSONNEL – TECHNICAL AND MANAGERIAL

✓ SUPPLY SEXED BOVINE SEMEN, BREEDING TOOLS AND EQUIPMENT, VETERINARY SUPPLIES AND MEDICINE, CALF REARING EQUIPMENT, DAIRY TOOLS AND EQUIPMENT AND MACHINERY

✓ PROVIDE DAIRY CONSULTANCY SERVICES

✓ SOURCE SUITABLE SITES TO BUILD YOUR DAIRY FARMS