NOT ANOTHER CALF TALK……. KEEPING THEM ALIVE AFTER DAY 1

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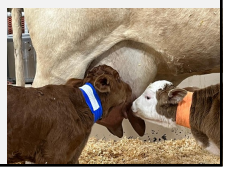
COLOSTRUM – BEEF & DAIRY

- #1 entity to ensure that they have the best chance of survival
- Consume sufficient mass of IgG
- Successfully absorb sufficient IgG → achieve adequate passive transfer

- 3 Q's of Colostrum
  - Quality* approximates IgG - always want it > 50 g/L & maybe even approaching 100 g/L
  - Quantity* - 10-20% of BW (15% BW), AEA, "what we always did"
  - Quick – within 6 hours



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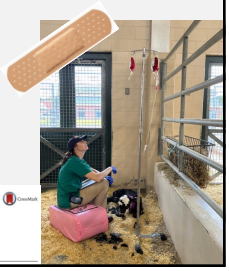
PLASMA & BLOOD TRANSFUSIONS

- Provides → clotting factors, albumin, Ig
- 20-40ml/kg administered over 20-30 minutes
- Supplement colostrum & reduce risk of disease
- Likely ineffective at providing complete protection against disease

- Utilize → cases of PLN & other inflammatory diseases



Intravenous immunoglobulin transfusion in colostrum-deprived dairy calves

A. Boccardo [a,b,*], A. Belloli [a,b], S. Biffani [c], V. Locatelli [a,b], P. Dall'Ara [d], J. Filipe [d], I. Restelli [a,b], D. Proverbio [e], D. Pravettoni [a,b]

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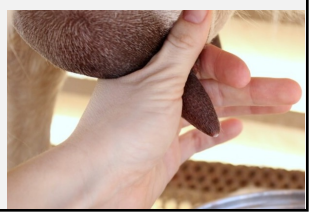
A WORD OF ADVICE ABOUT COLOSTRUM

- Death → Dam or Neonate
- COLLECT THE COLOSTRUM!!
  1. Test It.
  2. Freeze It.
  3. Use it.
- EDUCATE your producer or client!
- Your Farm. Your Colostrum. Your Bugs.



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CATEGORIES OF TRANSFER OF PASSIVE IMMUNITY-2019

Table 75.1 Herd-level categories and optimal values of serum IgG, STP, and Brix, with recommended proportion of calves for each category.

	Categories of transfer of passive immunity			
Value/proportion at 24–48 hours	**Excellent**	**Adequate**	**Reasonable**	**Failure**
IgL (g/l)	>25	18–24.9	10–17.9	<10
STP (g/dl)	>6.2	5.8–6.1	5.1–5.7	<5.1
Brix (%)	>9.4	8.9–9.3	8.1–8.8	<8.1
Calves (%)	>40	~30	~30	<10

Source: Adapted from [6].


Consensus recommendations on calf- and herd-level passive immunity in dairy calves in the United States

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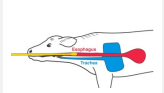
OROGASTRIC TUBING

- Esophageal feeders
- "Two-tubes" → trachea & esophagus
- 1 & Done
- Two different esophageal feeders
  - Colostrum
  - Sick calves
- Fluid – body temp 38C/100F



https://www.beefresearch.ca/blog/calf-911-tube-feeding-video/

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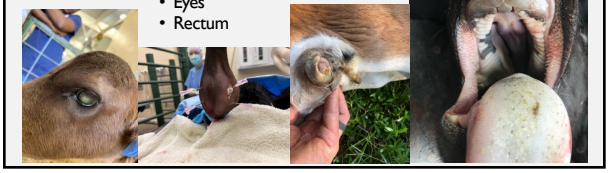
RULES OF THE NEONATE

- Palate
- Umbilicus
- Joints
- Eyes
- Rectum



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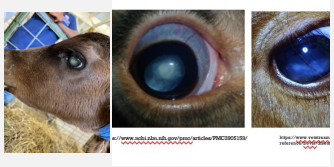
RULE 1 → EYES



- Cloudy
  - Hypopyon
  - Cataracts
  - Uveitis
- Normal reddening at the scleral/limbic junction post partum
- Other abnormalities

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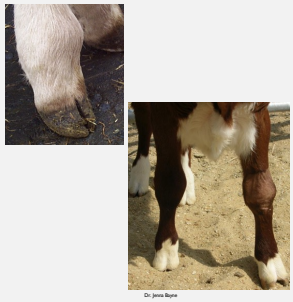
RULE 2 → JOINTS

- Non-painful & Non-effusive
- Normal animals → small amount of fluid
- Elbows & Stifles too
  - Sneak up on you



Dr. Jenna Bayne

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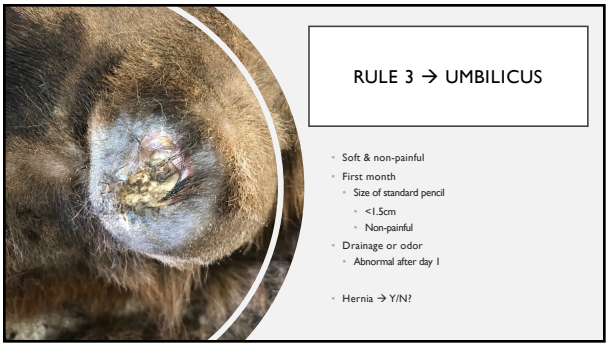
RULE 3 → UMBILICUS
Soft & non-painful
First month
Size of standard pencil
<1.5cm
Non-painful
Drainage or odor
Abnormal after day 1
Hernia → Y/N?

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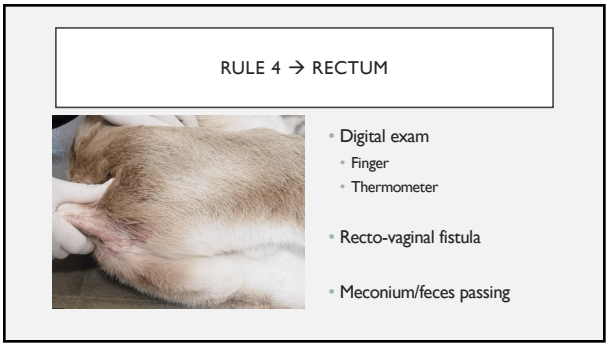
RULE 4 → RECTUM
Digital exam
Finger
Thermometer
Recto-vaginal fistula
Meconium/feces passing

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RULE 5 → PALATE
Run your hand along the entire palate
Midline from dental pad & caudal
Dam often kicks off neonate
Won't let it suckle
Milk from nose

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BLOOD WORK

- What are the differences? Does it matter?
- Neutrophils → predominant WBC weeks to months
  - Not a large reserve
  - 2L:1N ratio or a 1L:1N ratio
  - Neutrophilia/penia, increased immature forms
- Creatinine – elevation in the acute neonatal period
- Glucose - ⇩ Or ⇧
- Acidosis/Alkalosis
- Severe electrolyte abnormalities

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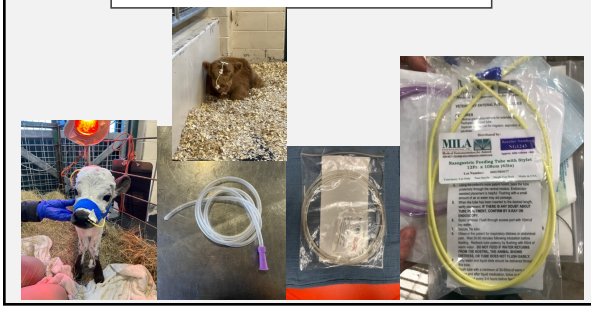
NASOGASTRIC TUBES



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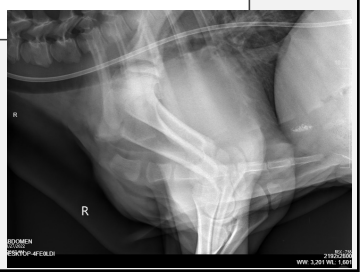

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ABOMASAL DISEASE

- Abomasal ulceration
- Abomasitis
- Gastroenteritis

- Multifactorial
- Large milk volumes, cold milk, esophageal tube feeding
- Pathogens → Clostridium spp, *E. coli*, *Lactobacillus* spp, *Campylobacter* spp
- Anti-inflammatories
- Halofuginone lactate – approved outside of US

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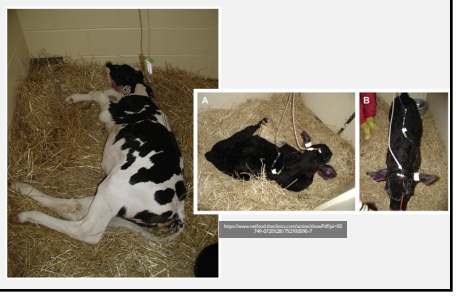
CLINICAL SIGNS – ABOMASAL DZ

- Inappetance
- Abdominal distention
- Dehydration
- Systemic shock
- Diarrhea
- Colic
- Febrile
- Death



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TREATMENT – ABOMASAL DISEASE

Decompression
- Nasogastric/orogastric tube
- Abomasocentesis
- Exploratory laparotomy

Antibiotics
- PPG – oral & systemic
  - 22000 IU/kg
- Oxytetracycline
- Sodium ampicillin

Refeeding/Restoring
- Withhold milk for 12-24 hours
- SLOW w/small volumes
  - Q4-6 hours small amount
- 10-20% BW
- Transfaunation

Pain Management
- Flunixin meglumine – lower doses more frequent?
- Lidocaine CRI
- Opioids – C/I → GI motility

Pain Management Cont
- 2% Lidocaine CRI
  - 1.3mg/kg – loading dose
  - 0.05mg/kg/min – CRI
- **Morphine – 0.2-0.4mg/kg**
- Butorphanol – 0.1-0.4mg/kg

IV Fluids
- Next slide

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FLUID THERAPY

- Fluids → Maintenance + dehydration + ongoing losses
- 8.4% Sodium bicarbonate → acidotic at presentation
  - BW(kg) x Base deficit (mEq/L) x 0.3-1 (L/kg)
  - 45kg x (24-6.5 mEq/L) x 0.5L/kg = 400mmol = 400mEq
- Dextrose → crisis – 1ml/10# BW
- CRI vs bolus

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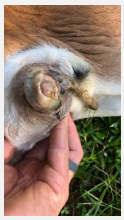
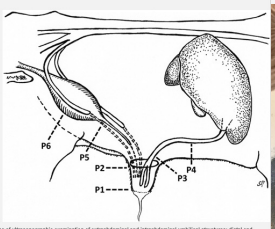
UMBILICAL DISEASE





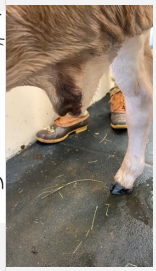


Figure 1Positions of ultrasonographic examination of extraabdominal and intraabdominal umbilical structures: distal end of umbilical stalk (P1), base of umbilical stalk (P2), umbilical vein immediately cranial to the inner umbilical ring (P3), umbilical vein halfway between the umbilical ring and the liver (P4), and urachus adjacent to its junction with the urinary bladder apex (P5). The umbilical arteries were assessed either at P5, or further caudally (lateral side of the urinary bladder; P6) in the case of completed physiological retraction to this position. Journal of Dairy Science
Volume 100 Issue 1 Pages 513-524 (January 2017)
DOI: 10.3168/jds.2016-11854

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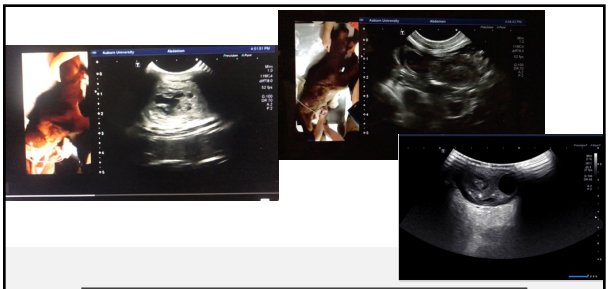

UMBILICAL - ULTRASONOGRAPHY

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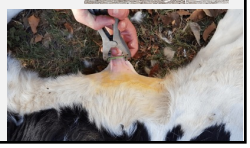
MEDICAL MANAGEMENT

- Imperative to know the structures & abnormalities present
- Owner goals
- ELDU & AMDUCA & VCPR

- Nuflor® 300mg/ml → 40mg/kg SQ → every 4 days
  - Effective at treating some of these infections
  - Monitor animal response & with ultrasound



- Pinning or hernia clamps
  - NO infection present

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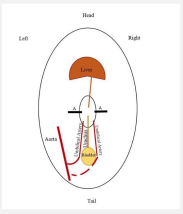
SURGICAL MANAGEMENT

- Not every procedure requires general anesthesia
- Epidural & local block
  - 1ml/10kg BW – LS space
  - 10mg/kg → toxic dose cattle
  - 6mg/kg → toxic dose small ruminants
- Xylazine – **0.05**-0.2 mg/kg IV
- Midazolam - 0.2-0.4 mg/kg IV
- Ketamine – 1-5 mg/kg IV
- Double drip → guaifenesin & ketamine



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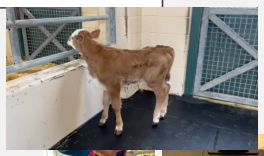
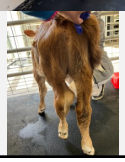
SEPTIC JOINTS

- More joints affected/infected = WORSE PROGNOSIS
- Intended future job

- Sedation
  - xylazine 0.05mg/kg + 0.3mg/kg midazolam
  - Lumbosacral epidural 1ml/10-20kg BW
  - RLP w/2% lidocaine

- Lavage & antibiotics
  - Ingress/egress x 3
  - Arthrotomy & lavage
  - Sodium ampicillin – 2gm vials – stable for 1 hour
  - RLP





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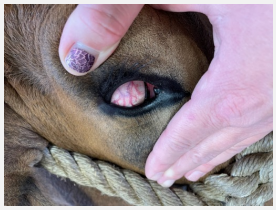
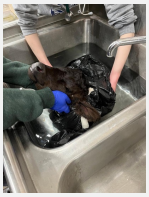
ICE CUBES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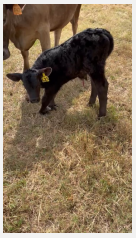
CONTRACTED TENDONS



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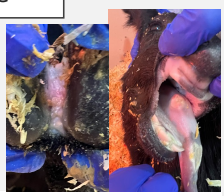
BVDV – APPROPRIATE TESTING

- Prior to any colostrum consumption OR > 2 weeks of age
- Ear notch
  - Individual – ACE
  - Individual – SnapTest
  - Pooled PCR



- Congenital abnormalities → 150-180 d in-utero
  - Cataracts, cerebellar hypoplasia, hydranencephaly

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TREATMENT – NEONATES - SEPSIS

1. Control infection
2. Modulate inflammatory response
3. Support the animal during disease

- Drug distribution, metabolism and excretion differences in neonatal
  - Better GIT absorption of drugs
  - Less binding to proteins
  - Increased apparent volume of distribution → ECF
  - Increased permeability of BBB
  - Slower elimination (longer ½ life)
    - Larger doses administered with longer dosage interval → achieve peak & trough concentrations

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DRUGS

- WHO KNOWS!!!!
- Personal preference, experience ??
- IV preferred
- 3rd & 4th generation cephalosporins – Ceftiofur could be used at labeled dosages & route
- Sodium ampicillin – 10-20mg/kg TID IV
- Florfenicol – 20-40mg/kg
- Fluoroquinolones – other countries
- Combination drugs – may be more important

The characterisation of antimicrobial resistant *Escherichia coli* from dairy calves

Herring Mwenifumbo[1], Adrian L. Cookson[1]*, Shengguo Zhao[2], Ahmed Fayez[1], A. Springer Browne[1], Jackie Benschop[1] and Sara A. Burgess[1]*

- Tetracycline resistance genes → frequently detected in both gut microbiome of dairy calves & their environment
- Tetracycline resistance genes → most prevalent

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OTHER THERAPIES

- Supportive care → warm, good bedding
- Control inflammatory response → **NSAIDS** or steroids
- IV fluids
- Plasma
- PPN/TPN
- Oxygen supplementation – hypoxia without hypercapnia
- Pantoprazole

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REFERENCES

Simpson, K. M., Callan, R. J., & Van Metre, D. C. (2018). Clostridial Abomasitis and Enteritis in Ruminants. *Veterinary Clinics: Food Animal Practice, 34*(1), 155-184. doi:10.1016/j.cvfa.2017.10.010

Guarnieri, E., Fecteau, G., Berman, J., Desrochers, A., Babkine, M., Nichols, S., & Francoz, D. (2020). Abomasitis in calves: A retrospective cohort study of 23 cases (2006-2016). *J Vet Intern Med, 34*(2), 1018-1027. doi:10.1111/jvim.15726

Credille, B. C., & Epstein, K. L. (2016). Food and Fiber Animal Transfusion Medicine. In *Manual of Veterinary Transfusion Medicine and Blood Banking* (pp. 321-333).

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