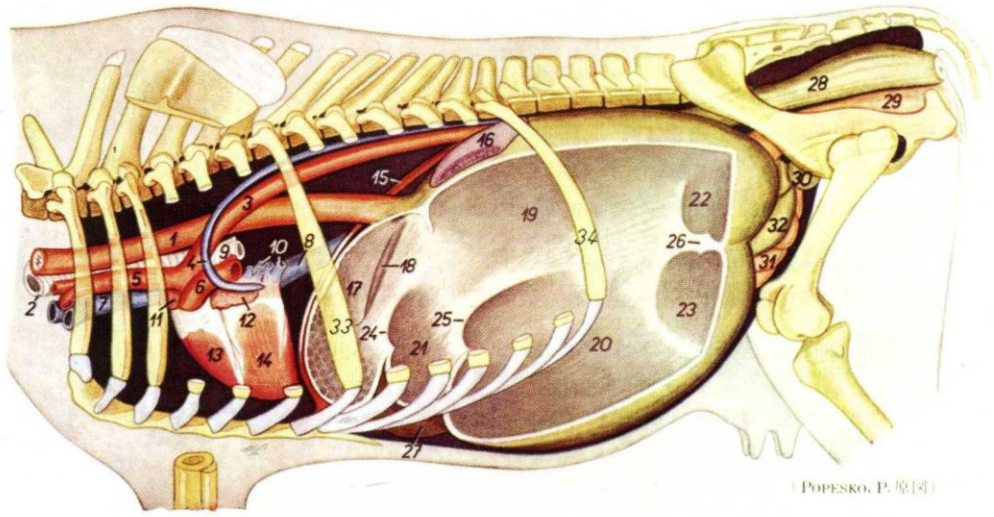
Table of content

I - Introduction

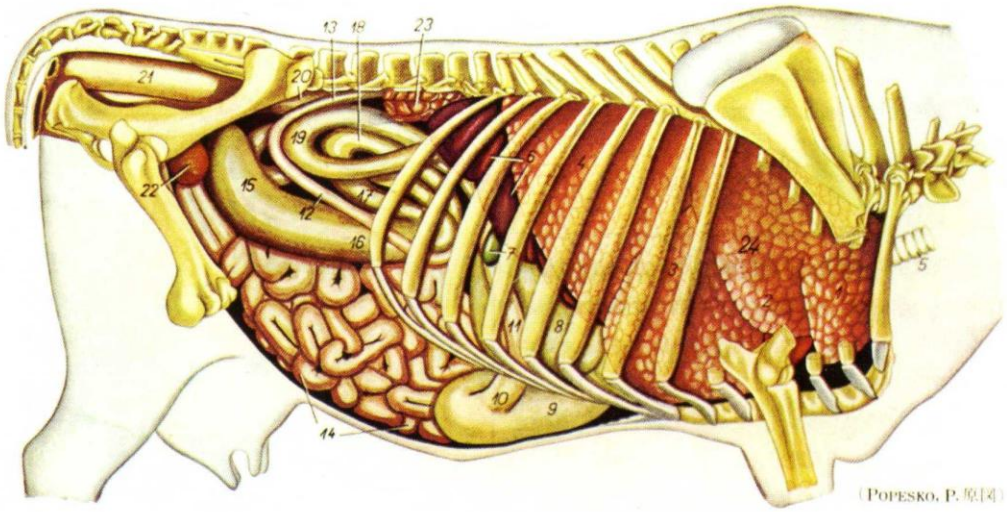
1. Bovine atonomy

Digestion organs from left flank



6- Gan
7- Túi mật
8- Dạ múi khế
9- Dạ dày
10- Đoạn nối giữa dạ dày và ruột
12- Tá tràng
14- Không tràng
15- Manh tràng
17, 18, 19- Kết tràng
22- Bàng quang
23- Thận phải
24- Phổi

Digestion organs from right flank



5- Phổi
10- Dạ múi khế
11- Dạ cỏ trên trước
12- Dạ cỏ dưới trước
13- Dạ cỏ trên sau
14- Dạ cỏ dưới sau
15- Dạ dày
18- Bàng quang
19- Hồi tràng

2 . Ruminant digestion physiology

a. *Functions of digestion organs.*

❖ There are 4 bags inside stomach of ruminant:

- Rumen: This is the bigest organs. Its main function is to ferment feed.
- Reticulum: It has responsible to push hard feed to rumen and grinded feed to omasum.
- Omasum: It absorb water, mineral and vitamin.
- Abomasum: Its function like a single rumen is to digest feed.

b. *Intestine*

➢ The absorption of feed is done mainly in small intestine under the effect of intestinal fluid, pancreatic fluid and gall fruid.

➢ In large intestine, there is the second microorganizm fermentation. Feed, which has not digested in rumen yet, continue to be digested in large intestine.

c. *Ruminant digestion physiology*

▪ Rumen is considered as a fermentation store with the main function of feed digestion (concentrate and rougage feed). Rumen is a favourable condition for anaerobe so the temperature is quite stable around 38-40^{o}C, pH: 5,5-7,4.

▪ In rumen, about 50-80% of feed is fermented. The main products of this process is ABBH, mass of living organisms and methane.

▪ Mass of living organisms and other matters which can not be fermented is moved to the next digestive stage.

d. *Rumination*

➢ Feed after going to rumen will be fermented. Feed which have not ruminated well in rumen and reticulum sometimes go upward and are ruminated again.

➢ Rumination happens from 5 to 6 times per day. Each time lasts around 50 minutes. Time of re-rumination depends on type of feed, cattle health and environment temperature.

e. Salivary gland

- Feed are penetrated with saliva.
- Saliva is secreted and swallowed continuously in cattle. With Na^+, K^+, Ca^{2+}, Mg^{2+}, saliva helps adjust N and P in rumen.
- The secretion of saliva is affected by type of feed, fibrous matter contend in feed, digestion track volume and cattle health. Cattle eats more rougage feed will secrets more saliva.
- When cattle reduces to secret saliva, the digestion will be less effective.

f. Microorganism's role in rumen

- Bacteria: Bacteria are divided into some groups according to their role in disintegration matters like xenluloza, hemixenluloza, starch, glucose, protein, etc. They can use NH_3
- Protozoans: Protozoans have function to break botanic cell membrane and increase contacting area. Thus, they are easily affected by microorganism and can not use NH_3.
- Fungi: Fungi are the first microorganism which enter into feed. They secret fruid to digest fibrous matter and support for microorganism's disintegration capacity.

In summary:

- ***Ruminat stomach includes 4 bags, in which rumen is the bigest bag where stores and ferments feed by microorganism.***
- ***Rumination is a important process to grind well feed. It is necessary to supply enough forage feed for cattle to carry out ruminating.***
- ***Microorganism which disintegrate starch and microorganism which disintegrate forage feed work in defferent pH environment. Thus, it is very important to provide balance between concentrate and forage feed for cattle.***
- ***Division into many times per day is the best way in supplying concentrate feed for cattle. It is not good when providing concentrate feed before providing forage feed.***

- ***Urea supplementation in feed is necessary.***

II - Chapter 1. CLINICAL VETERINARY DIAGNOSIS TECHNIQUE

1- Necessary goods:

Stethoscope
Thermometer
Watch
Medical Record
Veterinary Uniform

2- How to get Diagnosis:

2.1- Ask the farmer:

Calving date, Age & Calving rate, When started, Main symptom, Milk production

2.2- Listen:

Pulse rate
Respiratory rate
Rumen movement
Intestine sound
Ping sound

2.3- Look

- Body temperature
- Eye
- Mucous membrane
- Feces condition
- Body condition
- Hair condition
- Urine color

2.4- Smell

Respiratory smell
Feces smell

2.5- Touch

Rectal palpation
Skin temperature
Pain place
Manipulation
Rumen size

2.6- Take samples for inspection

Blood
Feces
Urine
Bacteria culture
Milk

2.7- Recording information into treatment sheet:

Treatment sheet

Date…month…year…

A. General information

Name of farmer/owner:……..

Address:……..

.. ……Ear mark……..Breed……

Symptoms

B. Treatment information

I. Chiệu trứng:

Body temperature: …… ^{0}C. pulse:…../minute. Rumen contraction:…. Intestine contraction:…..

……...

……...

……...

II. Diagnosis……

……...

……...

…… ……..

III. Medicine

1 2

➢ Notes:

- Technician/veterinarian must record information like body weight, body temperature, pulse, rumen contraction and sounds when get diagnosis.
- Farmer should kep record for next diagnosis.

2.8- Inspection in Lab.

2.8.1- Inspection for disease

Take samples of blood, milk, urine and feces for inspection.

a) Blood sample:

❖ Taking method: Blood sample can be taken from neck vena or tail artery:

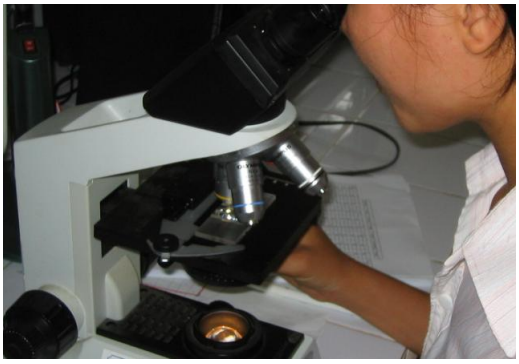
Blood sample is taken from neck vena

Blood sample is taken from tail artery

- ❖ Centrifuge 11000~12000r/min. 5min
- ❖ Bood inspection by indicators:
  - Hematocrit (Ht)

  - WBC
  - PP.
  - SP

- Fibrinogen
- WBC count



❖ In which, Ht, WBC, PP, SP, Fibrinogen are key indicators in recognizing diseases.

- Ht gives the signs of blood diseases or dehydration. In case of anemia, if Ht ranges from 7% to 15%, it is time for blood transfusion immediately. You can transfuse from 2 liters to 3 liters of blood, depending on blood available. However, in case there is only 200cc or 300cc of blood, you can still make transfusion. If Ht is higher than 50%, it is dehydration.
- WBC shows the signs of inflammation, poisionings or white blood cell diseases.
- PP indicator talks about the signs of jaudice.
- SP tell us the signs of chronic inflammation or malnutrition.
- Fibrinogen shows the sings of chronic inflammation, ileus.

❖ Ht, WBC, SP and Fibrinogen in a normal strong cattle:

- Ht: 24-44%
- WBC: 4000-12000/µl

- PP: 7.0 – 8.2 g/dl
- SP: 6.0-7.5 g/dl
- Fib: 300-700 mg/dl

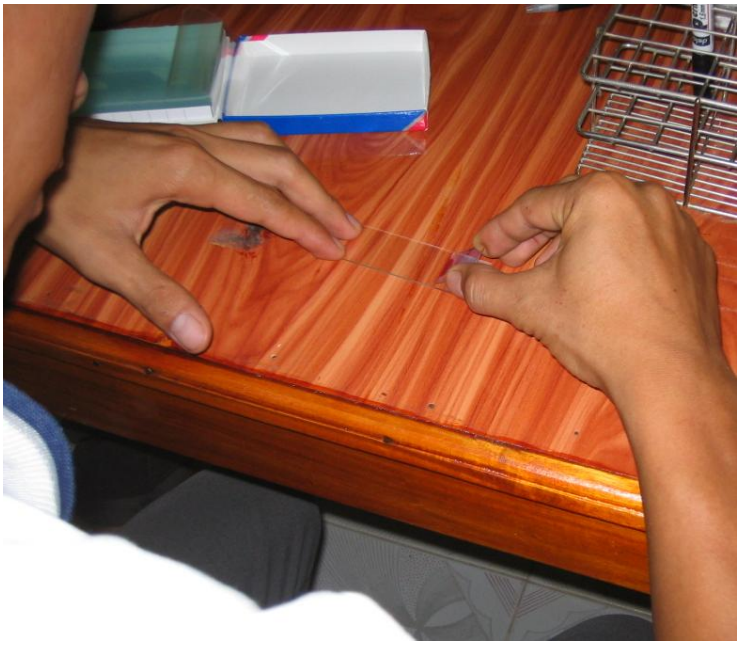
Indicator	Unit	Average	Rate
Ht	%	35	24 – 44
WBC	/µl	8,000	4,000 – 12,000
PP	g/100ml	7.6	7.0 - 8.2
SP	g/100ml	7.1	6.0 – 7.5
Fib	g/100ml	0.5	0.3 – 0.7

❖ When indicators change (increase or decrease), they show signs of some disease as follow:

	Increase	Decrease
Ht	Dehydration, heat stroke, endotoxemia	Anemia, piroplasmosis, blood parasite, anaplasmosis
WBC	Inflammation, infection disease, purulent disease	Poinsionings, endotoxemia, viral infection
SP	Increase of albumin Dehydration, chronic inflammation, diarrhea	Decrease of albumin, nephritis
PP	Jaundice	
Fib	Acute infection, chronic inflammation	Hepatic insufficient

❖ To differentiate WBC, you use Giemsa stain method. The steps as follow:

- Put blood in glass sheet



- Giemsa stain

- Observe in microscope

❖ The results can compare with the below table of "normal strong cattle indicators":

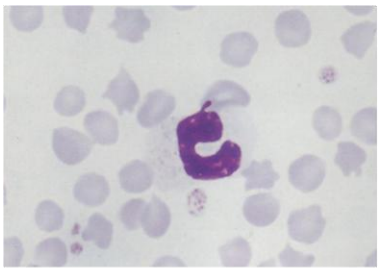
		Ave (%)	Range (%)
Neutrophil	Band	0.5	0 - 2
	Segment	28	15 - 35
Lymphocyte		58	45 -75
Monocyte		4	2-7
Eosinophil		9	2-20
Basophil		0.5	0-2

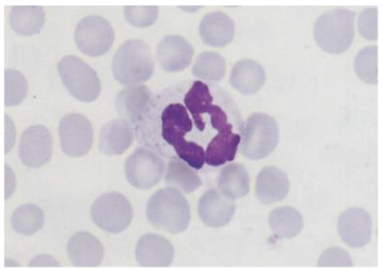
❖ The results are explained in below table:

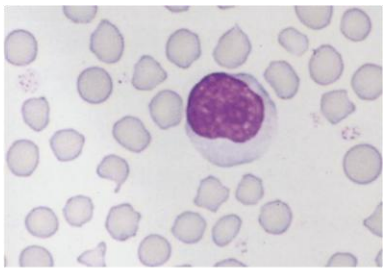
		Increase	Decrease
Neutrophil	Band	The first stage of acute disease	
	Seg	Chronic disease	Acute disease
Lymphocyte		Acute disease	Acute disease
Monocyte		Bacterial contamination	Acute disease
Eosinophil		Blood parasite diseases	Anaplasmosis
Basophil		Chronic disease	

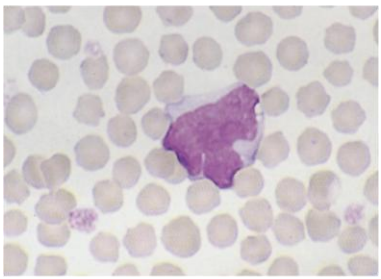
Especially, Giemsa stain method is used to differentiate type of blood parasites.

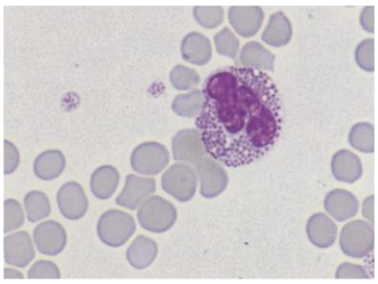
❖ Images of different types of white blood cell:

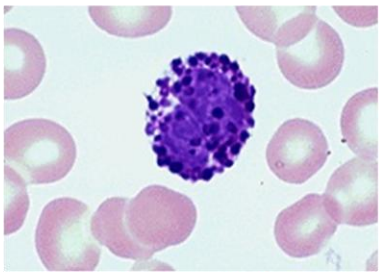

Band


Segment


Lymphocyte


Monocyte


Eosinophil


Basophil

❖ **Advanced part**: ***Using blood inspection result to diagnose ileus (intestine disease) (this part will be described in III- 3).***

b) Urine inspection

Urine sample taking method: Using colposcope and rubber catheter as in picture:

In urine, we will inspect Protein, ketone, leukocyte, nitrite, urobilinogen, pH, blood, bilirubin, glucose, etc.

To check, we use urine examination paper stick and then compare the results with color reagent strip.

The positive result explanation:

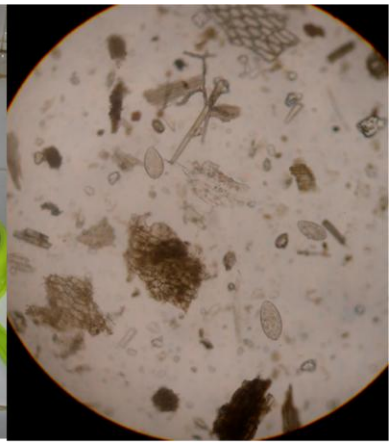
Phenomenon	**Diagnosis**
Protein in urine	Nephrosis
Blood in urine	Cytitis, babesiosis, anaplasmosis
Ketone	Ketosis, abomasal displacement

c) ***Feces inspection***:

Inspect eggs of parasite, worm, fasciola.

Feces collection

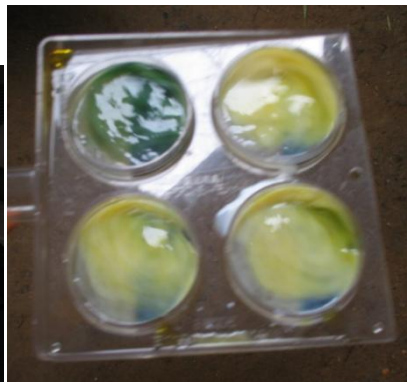
Watanabe's method



Fasciona hepatica

d) Milk inspection

Inspect electricity conductance (EC), mastitis (CMT method).



RC test *CMT*

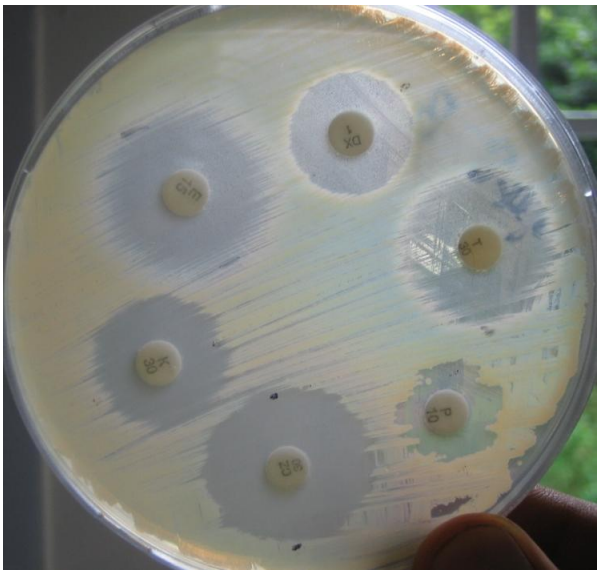
Milk inspection help prevent mastitis therefore milk for inspectin should be aseptic.

The results of EC and mastitis inspection are explained as follow:

	Positive	Disease
EC	Increasing penetrability of blood vessel	The first stage of clinical mastitis
CMT	Increasing leucocytes and SCC	Subclinical mastitis

After inspecting EC and CMT, in order to identify bacteria type and antibiotics, which is suitable with each type of bacterium, you can carry out culturing in lab. 24 hours after culturing in incubator, observe and identify type of bacteria.

To find out antibiotics suitable with each type of bacterium, using sensitivity test (method of Muller Hinton Agar):



The results are explained in below table:

Result	Notes
Sensitiveness	If using this antibiotics you can get unsuccessful result.

Insensitiveness	If using this anitbiotics, you can get more successful result but this is not true for all cases.

To check bacteria types inside the milk, carrying out bacteria culture in agar.

- Take milk sample:

- Put agar inside incubator within 24 hours, then take out and check:

2.8.2- Differential diagnosis in laboratory examination

Ht, Increased	Absolute erythrocytosis	Chronic hepatic disease	
		Congenital cardiovascular disease	
		Hemangioblastoma	
		Hepatoma	
		Living in high altitudes	
	Relative erythrocytosis	Dehydration	
		Endotoxic shock	Intestinal strangulation / obstruction
			Salmonellosis
			Septic mastitis
			Septic metritis

Ht Decreased (Anemia))	blood loss	Abomasal ulcer
		Moldy sweet clover toxicity
		Parasites (Internal and External)
	Hemolysis	Anaplasmosis
		Bacillary hemoglobinuria
		Brassica toxicity
		Copper toxicity
		leptospirosis
		Onion toxicity
	Inadequate RBC production	Bracken Fern toxicisis
		Chronic abscess
		Chronic bovine viral diarrhea virus (BVD)
		Chronic pneumonia
		Johne's disease
		Liver abscess
		Lymphosarcoma
Neutrophilia		Chronic metritis
		Chronic pyelonephritis
		Enteritis
		Internal abscess
		Liver abscess
		Neonatal septicemia
		Peritonitis
		Septic arthritis
		Stress
		Toxins
		Umbilical abscess
Lymphopenia		Acute pneumonia
		Diffuse peritonitis
		Gram negative septicemia / endotoxemia
		Infectious bovine rhinotracheitis (IBD)
		Steroid administration
		Stress
Monocytosis		Chronic bacterial infectious
		Granulomatuos disease
		Acute pneumonia
		Acute pneumonia
		Clostridial infection
		Fat cow syndrome
		Gram negative septicemia / endotoxemia
		Peritonitis
		Septic mastitis
		Septic mettritis
Eosinophilia		Acute bovine pulmonary emphysema
		Allergies
		Atypical interstitial pneumonia
		Migrating parasites
		Milk allergies
		Sarcocystosis
		Toxoplasmosis

(Hyperfibrinogenemia)		Acute inflammatory disease
		Acute mastitis
		Omphalophlebitis
		Pleuritis
		Pneumonia
		Traumatic reticuloperitonitis / pericarditis
		Umbilical infection
(Fibrin / Fibrinogen Degradation Product, Elevated)		Disseminated intravascular coagulation
		Immuno-mediated thrombocytopenia
		Postoperative states
		Severe inflammatory disorders
(Hyperproteinemia)		Coccidiosis
		Diarrhea
		Panhyperproteinemia - dehydration
		Peritonitis
		Ruminal acidosis
		Salmonellosis
		Salt toxicity
		Septic toxemia (Mastitis / Metritis)
		Toxins
		Vagal indigestion
		Hyperparathyroidism
		Postparturient hemoglobinuria
		Starvation
(Hypoproteine-mia)	Giảm albumin (Hypoalbumi-nemia)	Amyloidosis
		Glomerulonephritis
		Johne's Disease
		Pyelonephritis
		Salmonellosis
		Trichostrongyle infection
	(Panhypopro-teinemia)	Acute blood loss
		Excessive IV fruid or water intake
		Gastrointestinal ulceration
		Parasites (Internal and External)

III – CHAPTER 2. Practice of Clinical Technique

1- Injection

4.1.1 Intra muscle
4.1.2 Under skin
4.1.3 Intra veinus
4.1.4 Conjunctive
4.1.5 Trachea

2- Oral

4.2.1 Give magnet（Check magnet）
4.2.2 Pipe & Tube
4.2.3 Catheter by nose

3- Anesthesia

4.3.1 General
4.3.2 Local
4.3.3 Local at foot, at horn

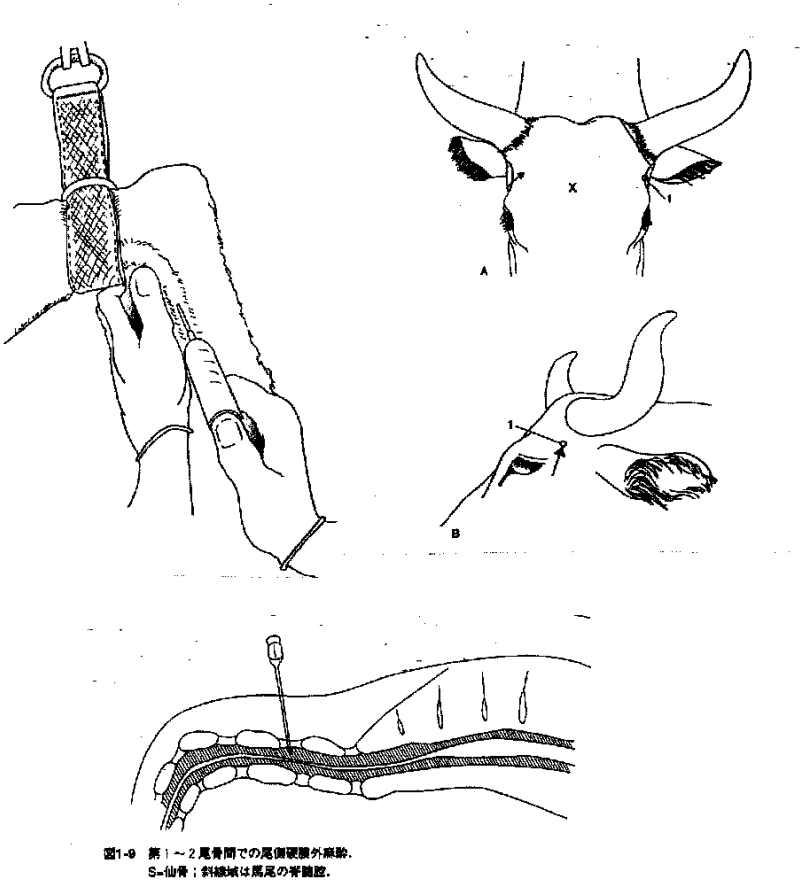


図1-9 第1～2尾骨間での尾側硬膜外麻酔.
S-仙骨；斜線域は馬尾の脊髄腔.

4- Restrain

5- Fell down method

6- Take Urine

7- Blood transfusion

7.1 Anti coagulant

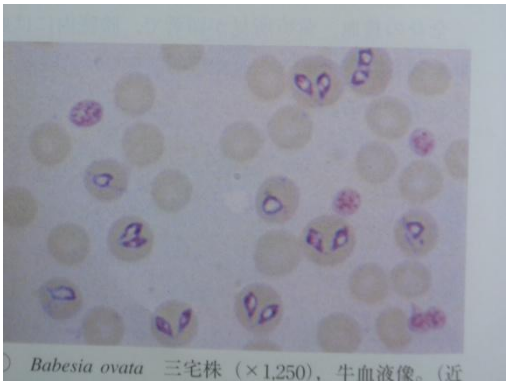
- Citrate 500mg for 100 ml blood
- Heparin 500iu for 100 ml blood

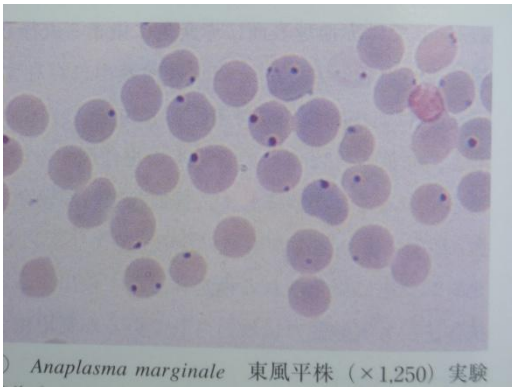
7.2 Amount

7.2.1 Adult cow 2-3 lt
7.2.2 Calf 200 ml – 500 ml

7.3 Adaptation

7.3.1 Anemia (Ht 15%>)





7.3.2 Disseminated Intravascular Coagulation

7.3.3 No crostnum

7.3.4 Caution for taking blood
7.3.4.1.1 Certainly restrained
7.3.4.1.2 Tie its neck by thin rope
7.3.4.1.3 Shake slowly
7.3.4.1.4 Use big infuse tube or small troker
7.3.4.1.5 Observe speed
7.3.4.1.6 Dilute A.C. by ringer
7.3.4.1.7 full D.A.C until top of needle

7.3.5 Caution for infusing blood
7.3.5.1.1 Restrain properly
7.3.5.1.2 Wash by ringer

7.3.5.1.3 Infuse fast

IV- COMMON DISEASES IN DAIRY CATTLE TREATED BY OPERATION METHOD

1. Clinical symptoms table of some diseases

Clinical symptoms	Disease
Animia	Theileriosis
	Babesiosis
	Anaplasmosis
Heart diseases	Traumatic pericarditis
	Endocarditis
Respiratory diseases	Pneumonia Bronchitis, laryngitis Heat stroke
Cogh	Bronchitis , pneumonia
	Bovine dictyocauliasis, Bovine lung worm infection, Verminous bronchitis, Fascioliasis, Liver fluke disease
	Tuberculosis
Salivate	Oesophageal obstruction
	Blood parasite
	Foot and mouth disease
Low appatite for a long time or unstability	Peritonitis
	Dilation of rumen contraction
	Abomasal displacement
	Abomasal ulcer
	Ketosis
Stomach parin	Peritonitis
	Hair in rumen of calf
	Uterus torsion
Diarrhea	Diarrhea in calf
	White feces in calf
	Enteritis
	Starch transformation disturbance
Bloody feces	Coccidiasis
	Acute pointionings
	Selmonelloisis
Constipation	Dilation of ceacum, blood congestion
Abnormal urination posture	Cystisis
Bloody urine	Bacillary pyelonephritis
	Leptospirosis, Babesiosis
Abnormal foot and claw	Sole ulcer

	Arthritis
	Foot and mouth disease
	Digital dermatitis
	Laminitis
Abnormal gait	Polyarthritis
	Dilation of fore limb ligament
Downer before calving	Mineral insufficient, malnutrition
	Periparturient downer
Downer after calving	Milk fever
Nervous signs	Forage tetanus (Magieum insufficient)
	Tetanus
	Malignant catarrhal fever
Retardation disease	Virus diarrhea
Malnutrition	Fascioliasis, Liver fluke disease
	Traumatic splenitis
Flatulence	Rumen bloating, organics poisionings, cassava poisionings
Abnormal skin	Dermatophytosis
	Papillomatosis
	photosensitization
	Actinomycosis
Swollen lymphonode	Leukemia, tuberculosis,
Abnormal eyes	Conjuctivitis
	Cornea disease
Abnormal phenomena after calving 3 days	Retained placenta
	Milk fever
Abnormal udder	Mastitis
Neonatal diseases	Umbilical infection, swollen umbilicus, pneumonia, diarrhea, virus fever
Sudden death	Anthrax
	Blackleg
	Malignant edema
	Acute blood congestion
	Acute poinsionings
	Enterotoxenemia
	Gangrenous mastitis

2. Abomasal displacement

2.1 – Introduction

- Concept: Abomasal displacement is case when abomasum goes out of its normal position inside cattle stomach.
- Occuring time: This disease often occurs around 60 days after calving.
- Causes: In actual, it is very difficult to identify direct cause of abomasal displacement exactly. Some objective reasons are considered. They are feeding

and management periparturition, inadequate exercise, space in stomach after calving, milk gland troubles, uterin problems or fatty liver. All those posibilities make rumen and intestine movement slowly, as a result, there is a continuous change in position of abomasum and it starts dilation (due to air coming inside).

- A.D types: There are 3 types of A.D. They are left A.D, right A.D and volvulus.

2.2 - Diagnosis

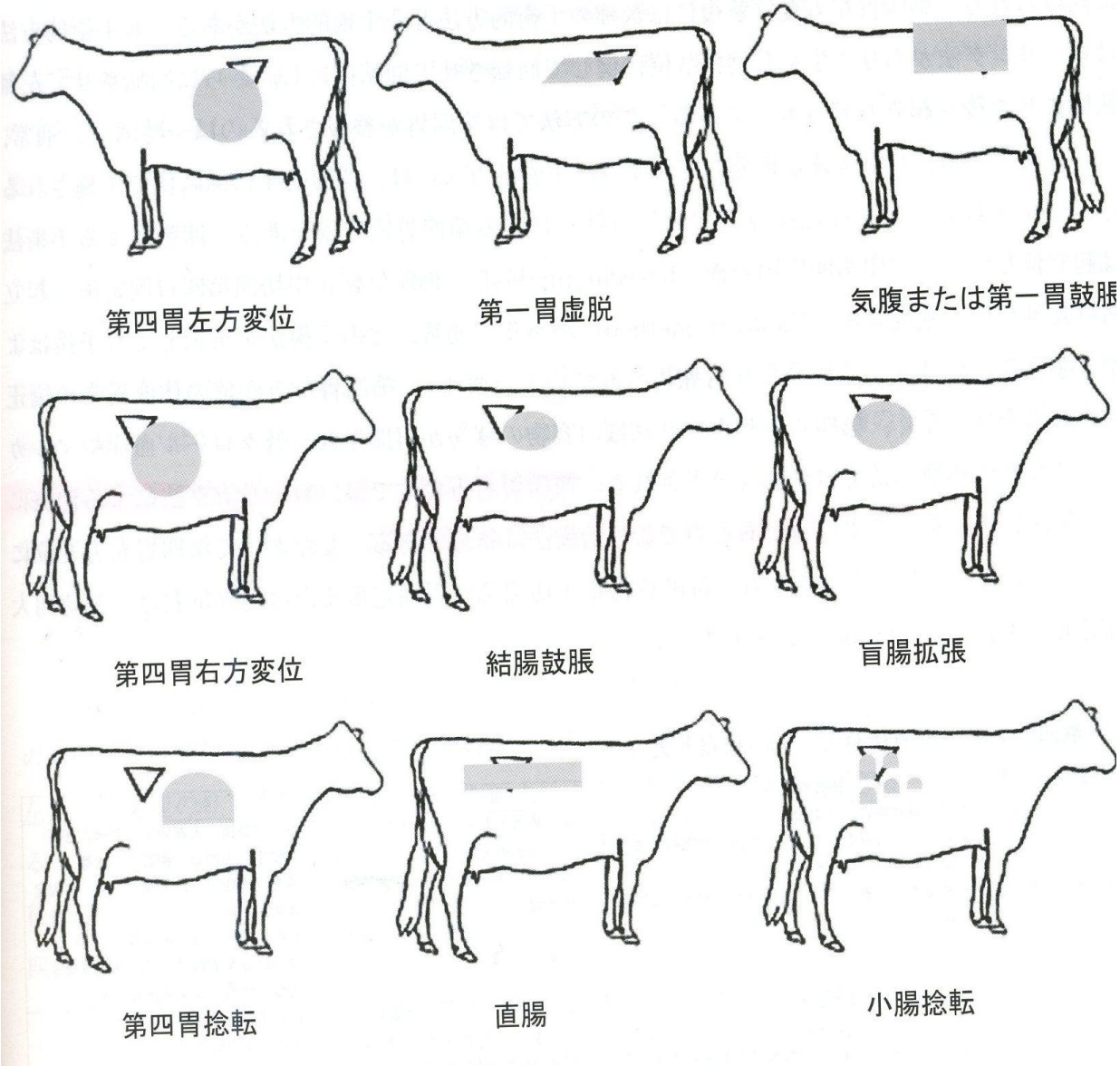
❖ Symptoms: Low appetite, no feces and milk yield decrease.

❖ Diagnosis:

- You can use many different method to diagnose this disease precisely. A popular method, which is chosen by almost of current veterinarians, is percussion. It means that veterinarian use stethoscope to listen to ping sound in cattle stomach. However, because some other digestion organs like intestine, ceacum, rectum also create ping sound, it requires a highly precise diagnosis. Normally, ping sound created by abomasum can discovered and listened to in the middle place between 9th rib and 13th rib. Concerning to picture 1:

Hình 1: The place of ping sound created by abomasum.

- Diffrentiate place of percussion in A.D disease and other diseases:



Hình 2: *Differentiate place of percussion in A.D disease and other diseases*.

- If ping sound is not clear, you can get diagnosis by other methods to be sure your diagnosis result. One of them is pH checking method to identify where fluid comes from. Using troca tube to check pH in rumen and blood abnormal circulation.

  + If pH<3.5, fluid from abomasum, it means A.D disease.

  + If pH>5.5, fluid from intestine or other digestion organs.

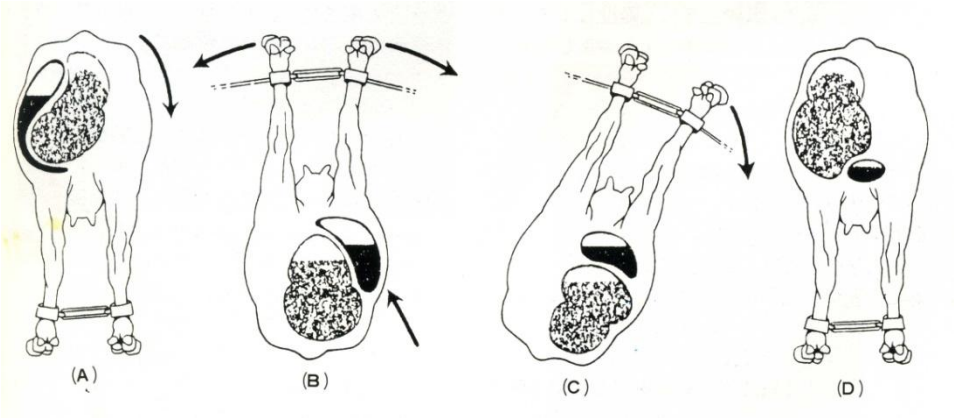
2.3 - Treatment

The purposes of treatment are to reposition abomasum into its normal position, to prevent this disease coming back and to minimum cost for farmer. A.D

disease can be treated by two main methords: closing method (or rolling method) and opening method (surgery). Among them, rolling method is less cost and more simple. However, denpending on each case, veterinarian chooses suitable method.

2.3.1- Rolling method

❖ Steps:



Hình 3: *Rolling method*

- Let the cattle lie down
- Tie cattle's legs with rope
- Upturn cattle's abdomen
- Roll cattle's abdomen and then push strongly
- Keep the cattle lie with that position within 5 to 10 minutes
- After 5 to 10 minutes, let the cattle stand up and use stethoscope to check abomasum (abomasum often locates in the right).
- Transfuse Ca and glucose for cattle

❖ Attention:

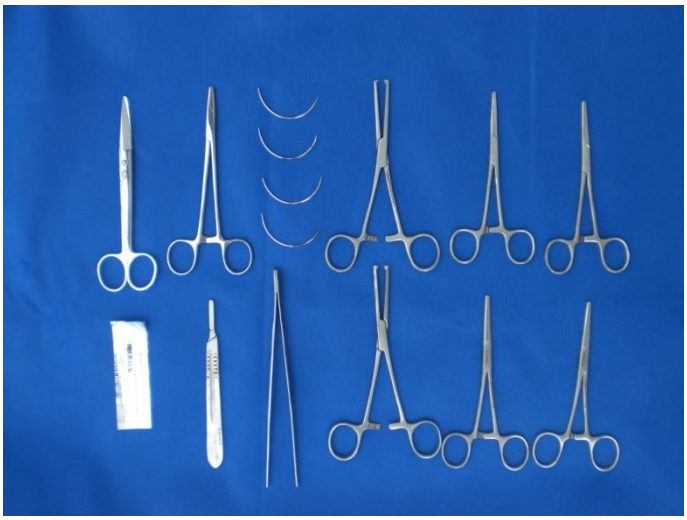
- After giving treatment, do not feed cattle too much concentrate feeds but feed gradually. After 1 week, feed them a normal amount of concentrate food.
- After treatment, let cattle play around paddock to do exercise.
- Rate of recovery: 20%; cattle can get this disease again after treatment.
- To help avoid repetition of this disease, we can use nail to fix the abomasum after rolling. However, this way is very dangerous as nail can destroy or infect inner organs of the cattle.

- This method should only be applied in case cattle have very light abomasal displacement from the left, and should not be applied to cattle whose abomasal displacement is more severe and those can not breath easily

2.3.2- Operation method

1.3.2.1 Preparation of Operation

- Equipment



Surgical equipment set
Deflating tube, Surgical suture (absorbable, non-absorbable)
Gauze, Surgical glove , Glove for RP, Cotton

- Local anesthesia
  2%Lidcain 50~100ml under skin of right flank
- Disinfectant
  Povidone Iodin,70%Alchol,Chlrlhexidine
- Medicine
  Antibiotic(Penicillin 6m.iux2 , Sodium chloride 500mlx2)

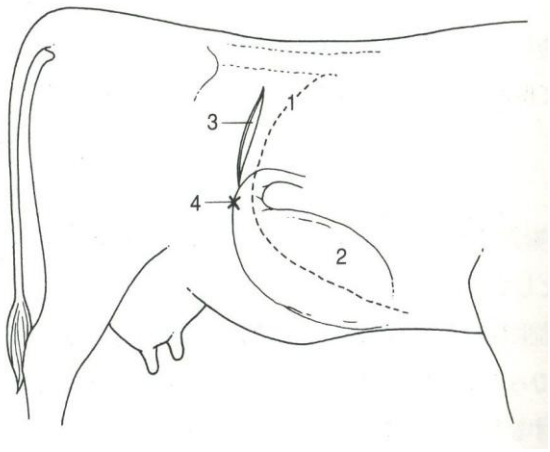
2.3.2.2- Operation

- Washing by soup at right flank area
- Shaving
- Local anesthesia S.C. 2% Lidcain 50~100ml

- Antibiotic I.M. （penicillin 6m.iu）

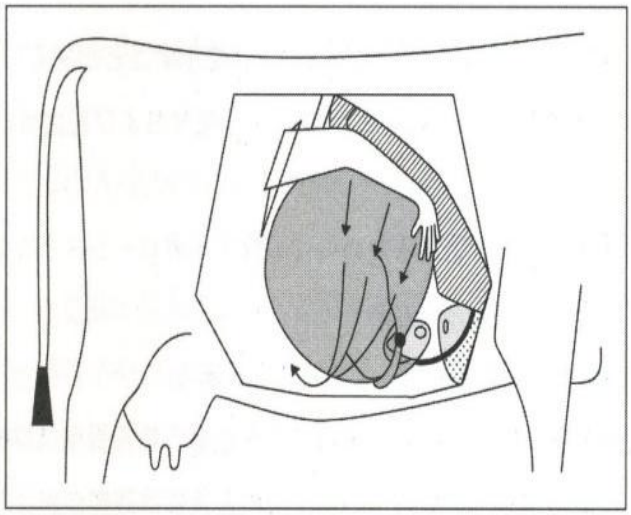
- Disinfection (PI-AL-PI-AL-PI-AL)

- Cut skin 20~25cm by blade

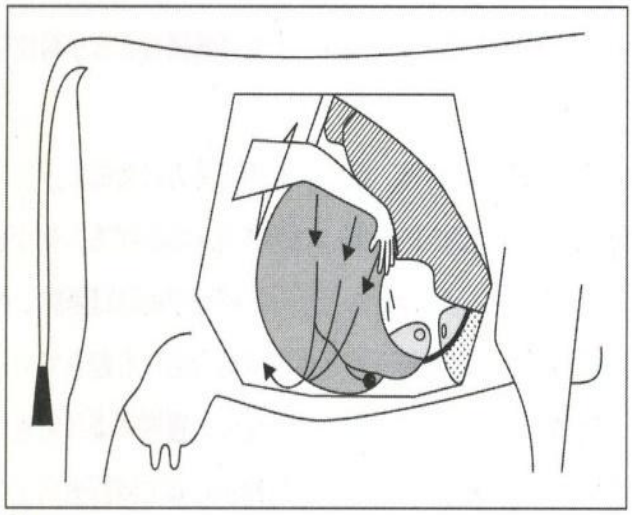


- Cut muscle
- Cut peritoneum by seizer
- Deflating by tube

- Repositioning



A



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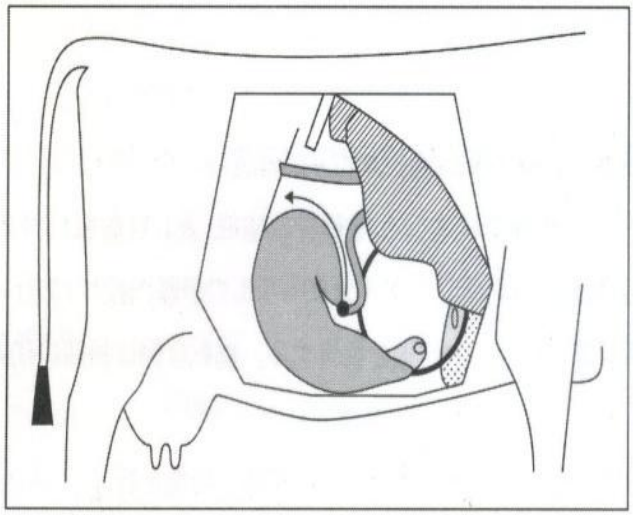


C

- Catch up pylorus

- Anchoring 2 points to peritoneum and muscle by non-absobable suture

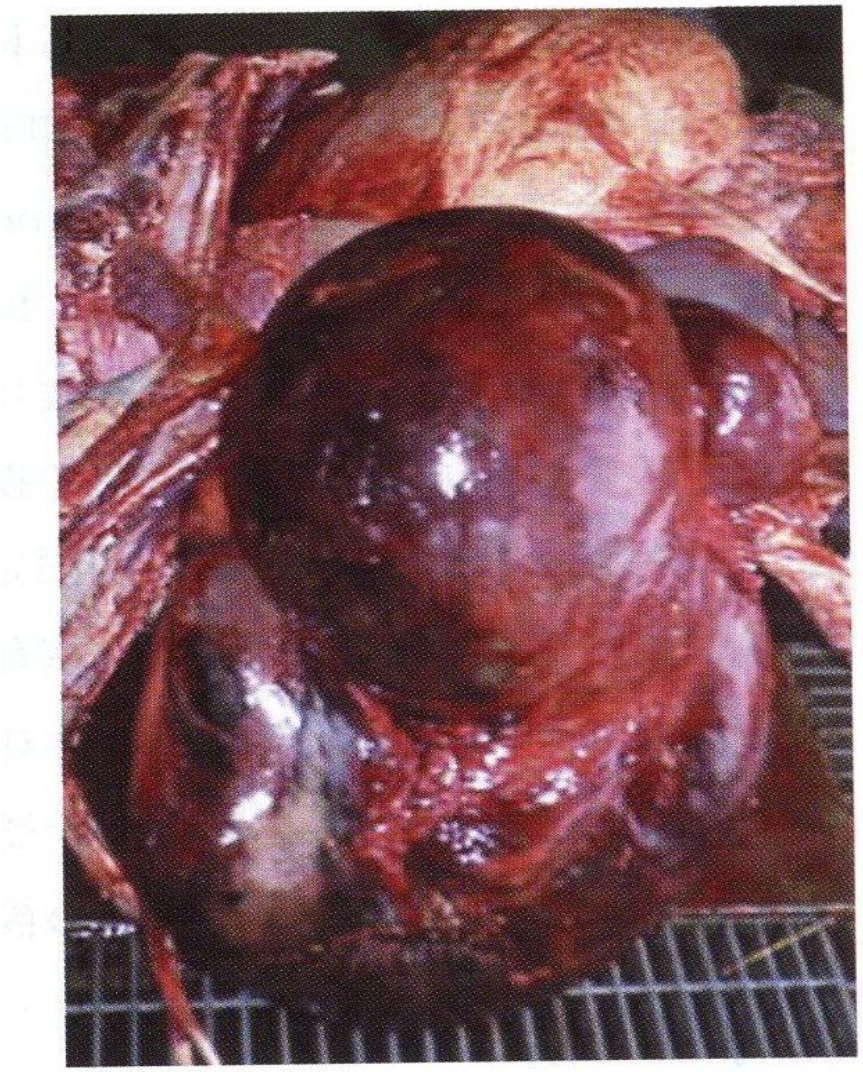
- Infuse (Sodium chloride 500ml&Penicillin 4.5m.iu) into Abdomen
- Continuous stitch peritoneum by absorbable suture
- Washing by SCW(Sodium chloride 500ml & Penicillin 1.5m.iu)
- Continuous stitch muscle 1~2 times by absorbable suture
- Washing by SCW
- Stitch skin by non-absorbable suture

2.3.2.3- After care

- After operation, take the cattle back to the cowshed. However, to ensure that the cattle will recover well, use additional drugs properly, especially to the area where operation was taken place
- IM Penicillin 6m.iu 3days
- After operation, if cattle's heart beat is under 90, it is a good sign, but if heart beat is more than 120, there is possibility of water loss, which means the rate of recovery is very low
- Provide cattle with 20l of warm water mixed with 30g of salt twice a day
- If no appetite, infuse 5%glucose 500ml
- Increase concentrate step by step until 7days later
- Take off suture 10 days later
- If cattle get other diseases such as mastitis during this time, it is necessary to consider special treatment method for these diseases

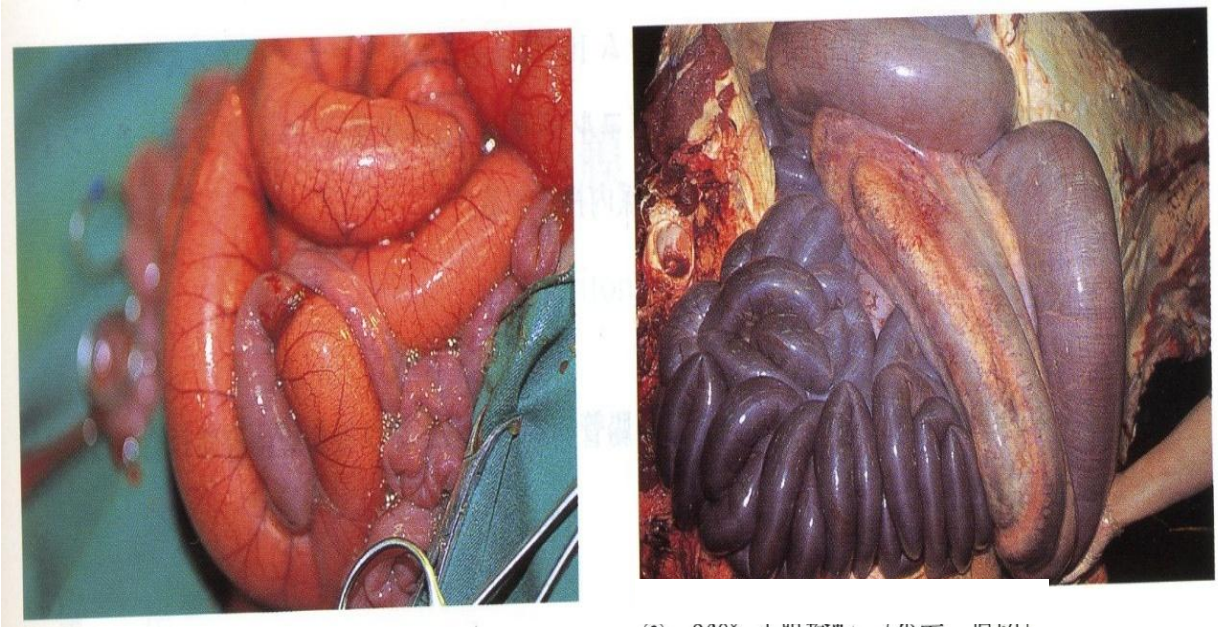
Attentions when operating abomasal displacement (torsion type) :

- If cattle have torsion-typed abomasal displacement, when we conduct percussion test, we can hear sounds like water.
- If cattle already suffered from this disease for long time, we should not give treatment.
- In case cattle lose a lot of water, transfuse physiological saline during and after the operation.



Picture 6: Abomasum torsion*: Abomasum and omasum hemorrhage and gangrene*

3. Ileus (Intestinal Obstruction/Torsion)



Picture 7: An image of ileus condition

3.1. Introduction

- Definition: Ileus (or intestine obstruction/torsion) is full or partial obstruction/constipation of the flow of gas, liquid or solid substances inside the intestine.
- Subjects: Among heifer and cows

3.2. Symptoms

- Cattle are very painful, strain a lot, often kick the hind leg and abdominal area, show unstable and uncomfortable appearance and stance.
- Acute case: after showing very painful look, cattle turn to be very quiet, lose appetite totally and stop producing milk.
- Heart beat: at first, heart beat will reach up to 120 and then reduce.
- Feces have black color and cows stop producing feces.
- After 24h, cattle still feel very painful and keep straining and crying.
- After 5 or 7 days, cattle will die if they are not treated.

3.3. Diagnosis

- We can diagnose this disease by rectal palpation.
- Or by using laboratory test: Blood test.

  + How to do: Collect blood sample, put blood sample into specialised test tube, centrifuge within 5 minutes. After that, immerse the blood tube in

water of 56^{o}c in 3 minutes. Next, centrifuge in 1 minute and finally, read out the results of Fibrinogen.

+ How to interprete Fib's results: we need to read results of Serum Protein (SP) and Plasma Protein (PP) first. Then, calculate the amount of Fib using the formulae: PP – SP = Δ

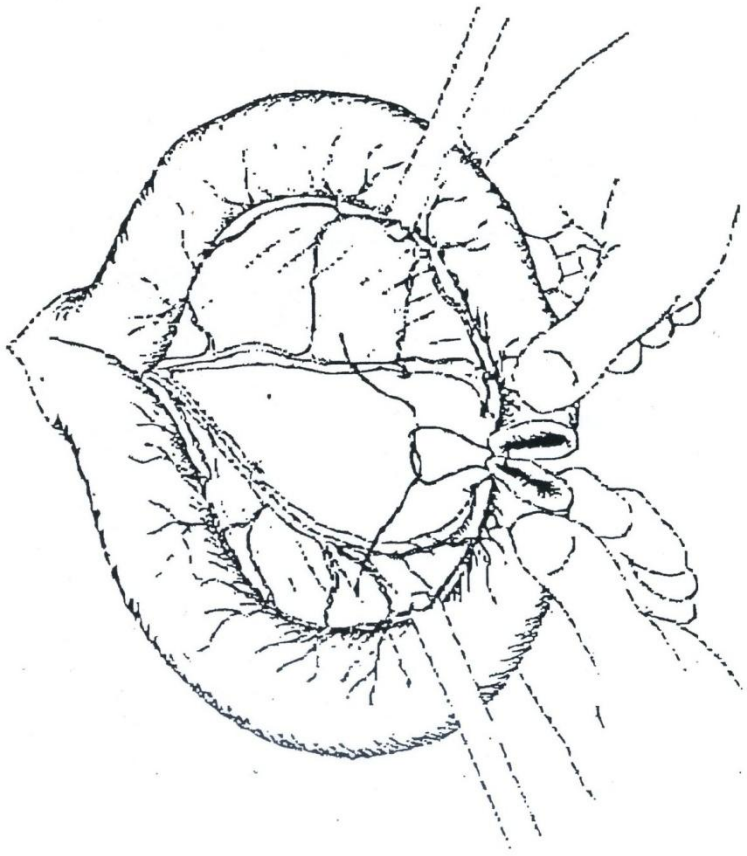
The amount of Fib (mg) = Δ x 1000

+ Results:

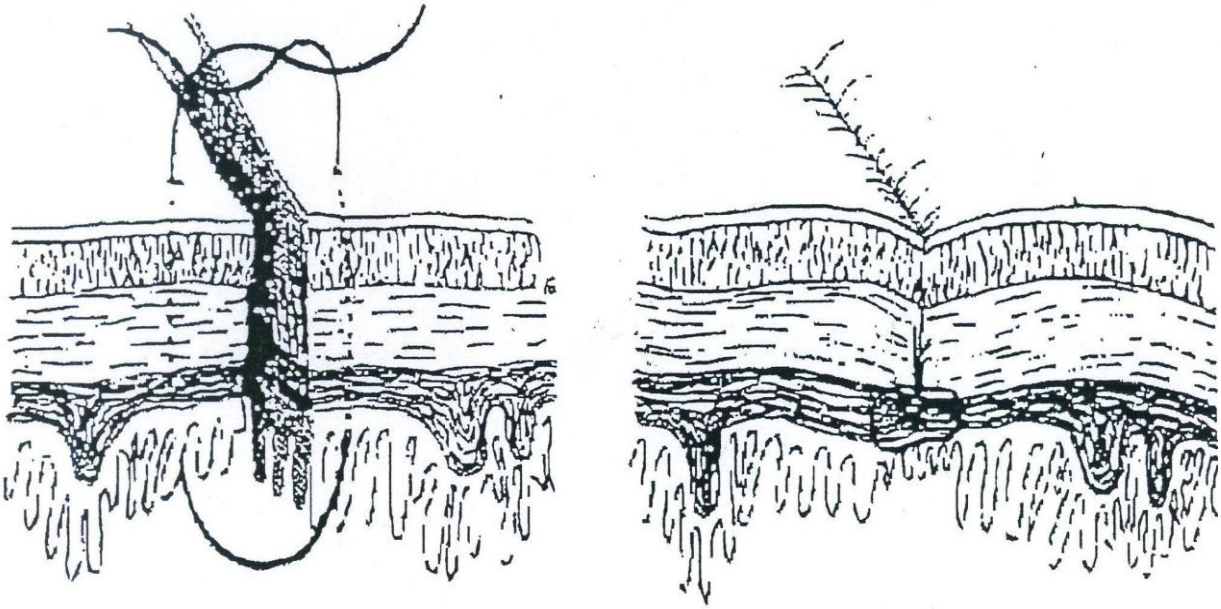
- If PP > SP, which means Δ has positive result, we can conclude that the cattle does not have intestinal obstruction/torsion.
- If PP < SP, which means Δ has negative result, we can conclude that the cattle has intestinal obstruction/torsion.

- Treatment: By operation and injection. Operate the right flank. Follow fully all operation steps: shave hair and then disinfect the operated area.
- Start the operation by opening the skin layer, and then the muscle layer, using operation knife.
- After opening, use hand to find out the intestinal section where obstruction/torsion occurs.
- Tie the blood tissues of the intestinal section you intend to cut.
- Cut the obstructed or torsive intestinal part.
- Close the intestine, then close the peritoneum.
- Wash the intestine with saline
- Pour the physiological saline into abdominal cavity.
- Stich to close the operated area.

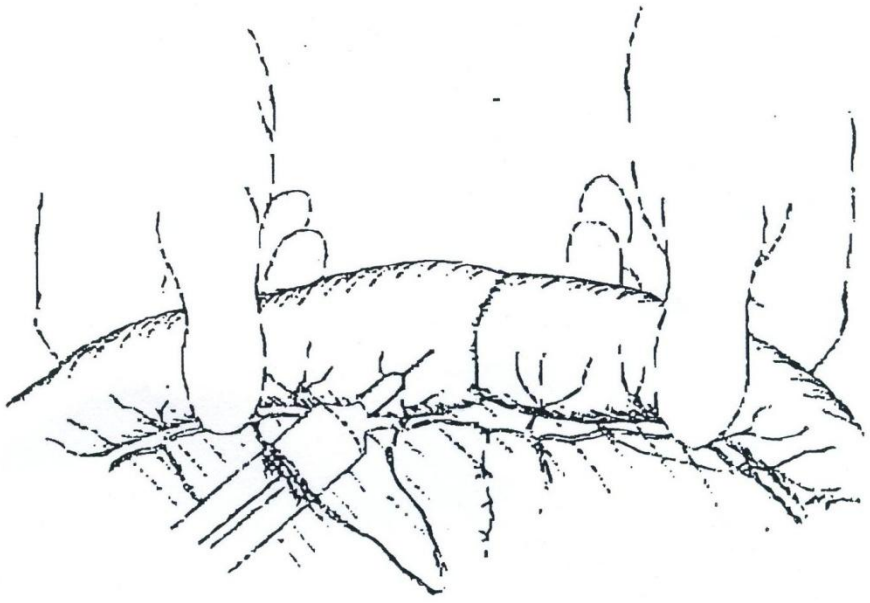
Picture 12: Fix intestine



Picture 13: Cut intestine



Picture 14: Stich intestine and peritoneum

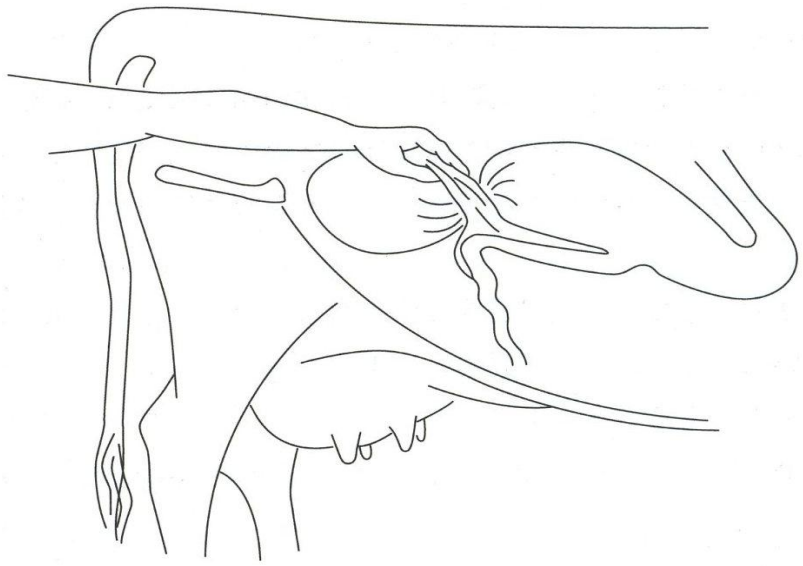


Picture 15: Pour water into intestine after stiching to check stiching techniques

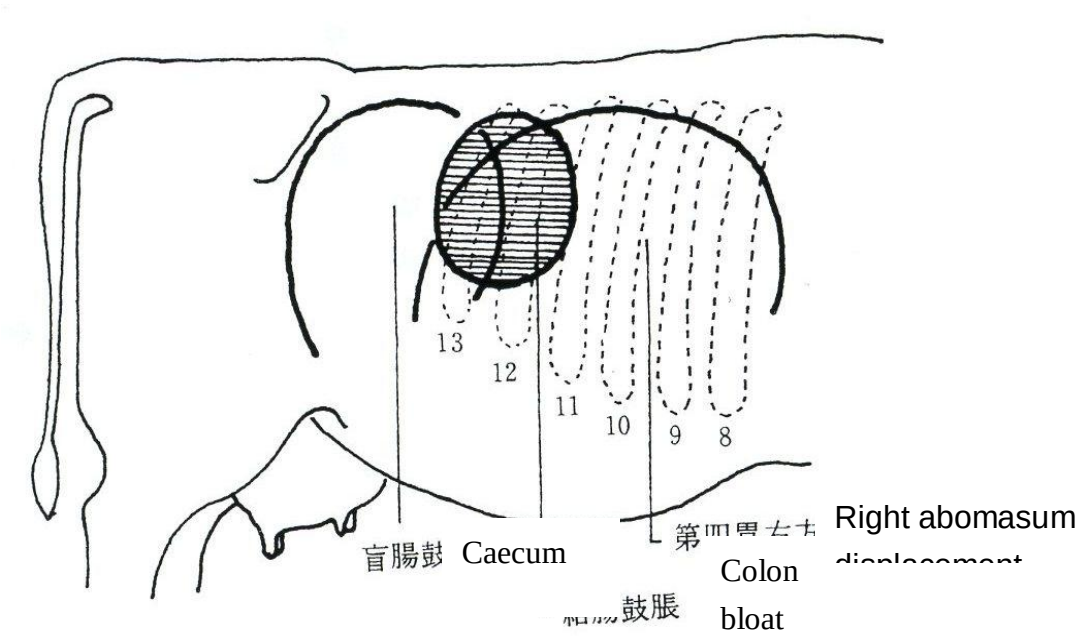
3.4- Remark

- After the operation, treat with antibiotics continuously in 5 days.
- 24h to 48h after the operation, if cattle starts to produce feces, it means that the operation is successful.

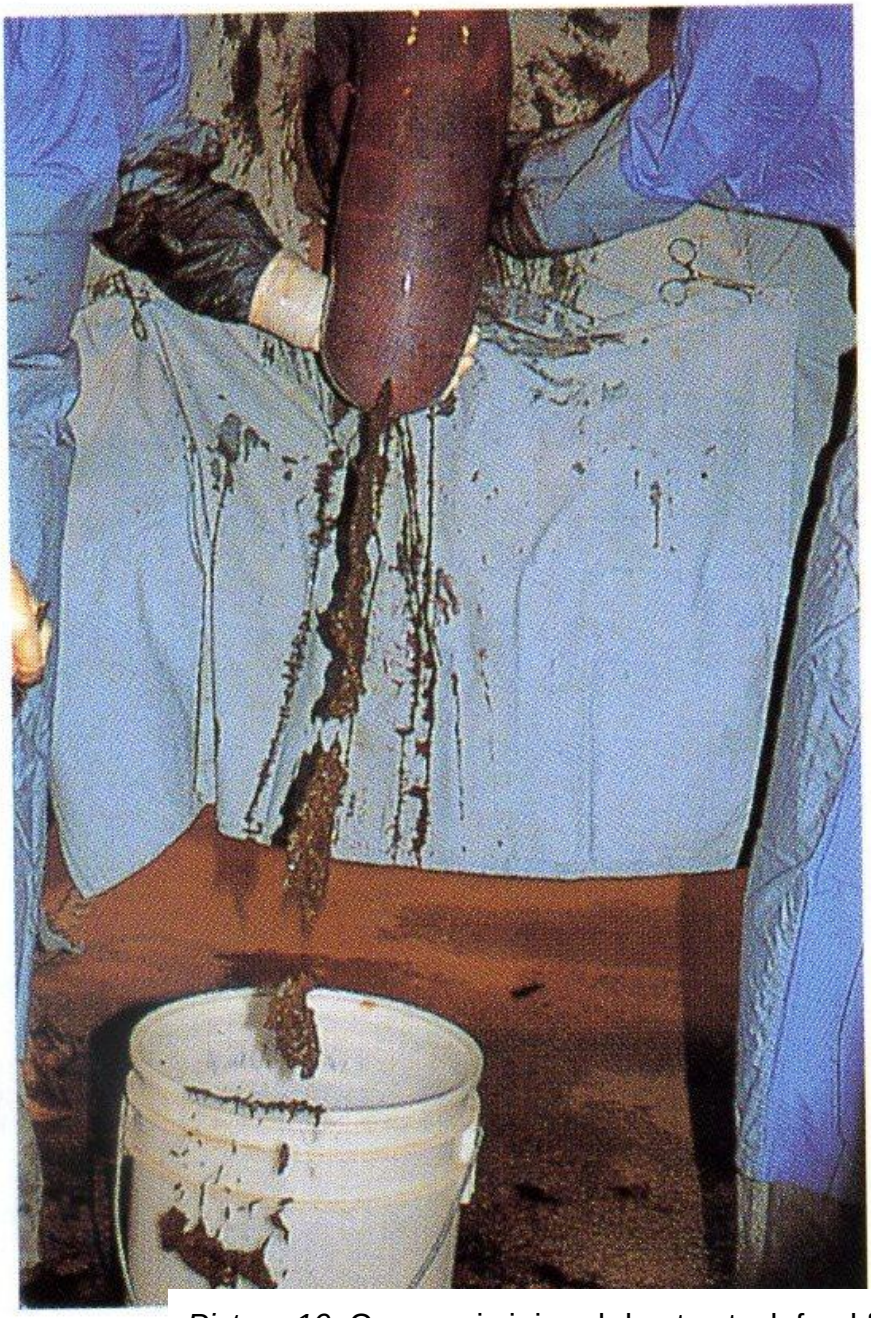
4. Caecum torsion



Picture 8: Caecum torsion



Picture 9: Colon bloat



Picture 10: Caecum is injured due to stuck food from inside

4.1 : Symptoms

- Cattle stops eating, drinking and producing feces.
- Health condition gets worse dramatically, some painful and uncomfortable symptoms near the abdominal area.
- If we touch the abdominal area, it feels hard.

4.2: Treatment: By operation

Operation method is same as method used for intestinal obstruction/torsion.

CHAPTER 4. CESARIAN SECTION METHOD (C.S METHOD)

If the cow has dystocia or in case the fetus is too big but still alive and the cow can not deliver by herself, the best way is to conduct CS method to save both mother cow and the calf.

T 

Farm owner is very happy looking at the calf drinking the first milk after the calf was born with the aid of CS method .

- CS method is applied to the following cases:

- Cervix is too narrow, part of fetus membrane has reached the vagina but the cervix does not open largely enough for the fetus to come out.

- The uterus is twisted, which makes technician fail to touch the fetus.

- The mother cow is too weak, technician has already used stimulating drugs to improve labor but no use.

- Fetus is too big and/or fetus's presentation, position or direction is abnormal and we can not simply adjust the fetus by hand.

- Fetus has severe hydro-edema

- Water sac has been expelled too much, the mother cow is in danger and the fetus can not be pulled out.

● CS method can not be applied in these following cases:

- The fetus is dead, starts to smell and rotten. If CS is applied in this case, the mother cow will get peritoneum inflammation, then blood infection and die finally.

– Mother cow is over exhausted after long labors.

1. Basic requirements when using CS method

- Carry out CS method as soon as possible

- Prepare all necessary tools and medicine.

- Operation should be done promptly, exactly and try to avoid mother cow's intestine from slipping/pulling out. .

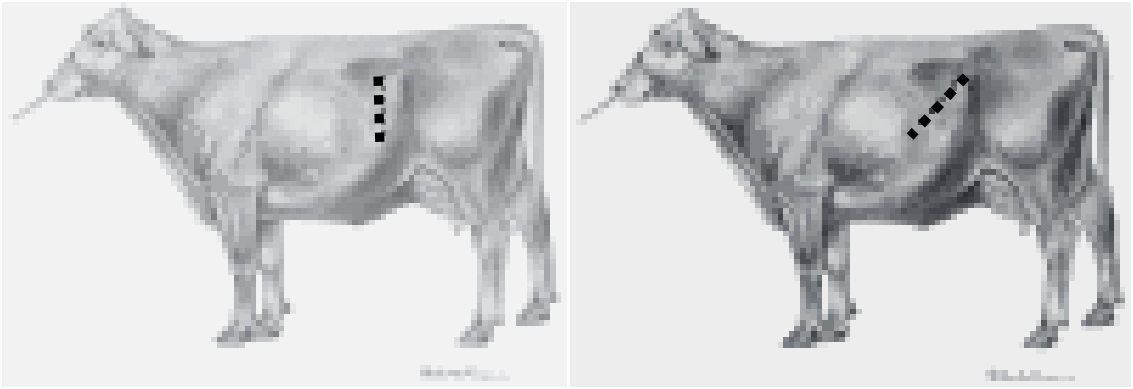
- Do not let water flow into abdominal cavity, otherwise, peritonitis will possibly occur

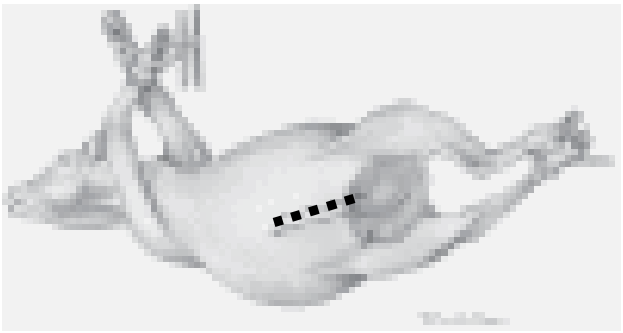
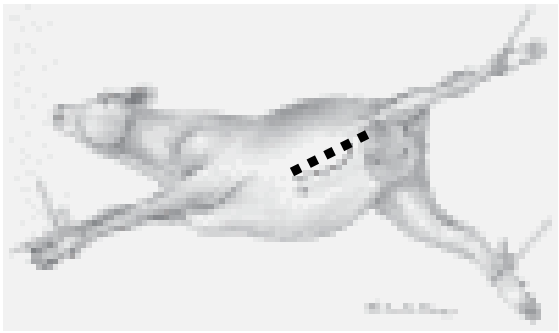
- Make sure that the stitched uterus is tight.

- After the operation, conduct anti-infection treatment for the whole body.

2. CS method

There are two methods: under the abdomen and on one flank.



❖ Operation position: We can choose one of the four operation positions as follows:

- From the left, about 5-8 cm from the left udder vein.

- Between left udder vein and the white line on the middle of the abdomen.

- The white line on the middle of the abdomen.

- 5-8 cm from the right udder vein.

❖ One advantage of operating from the right of the white line is that rumen will not obstruct pulling out uterus, however, as the operation is near the abdominal wall, it will easily cause intestine to expose to outside.

❖ Preparation: Let the cattle lie on a dry, thick and clean hay, the cattle should turn to left direction and her two front legs and hind legs should be tied well. Cattle' head must be kept low always. If there is an operation table, put the cattle on the table.

❖ Disinfection: Shave hair on the operated area, wash with soap and then dry up and apply iodine alcohol. Put disinfectant cloth on the operated area. Operated area, operation tools and operators' hands must be disinfected according to proper surgery method.

❖ Anesthesia: Apply local anesthesia along the incision with Novocain 2%, inject under the skin. Before the cattle lies, we also need to inject the dura mater.

***3. Start operation**:*

4. After operation

- Inject antibiotics and energy drug for cattle everyday.

- If the stitched area is dry, clean and healed well, after 10 days, cut suture.

- Take well care of the cattle and ensure cowshed sanity.

V- Surgical instruments

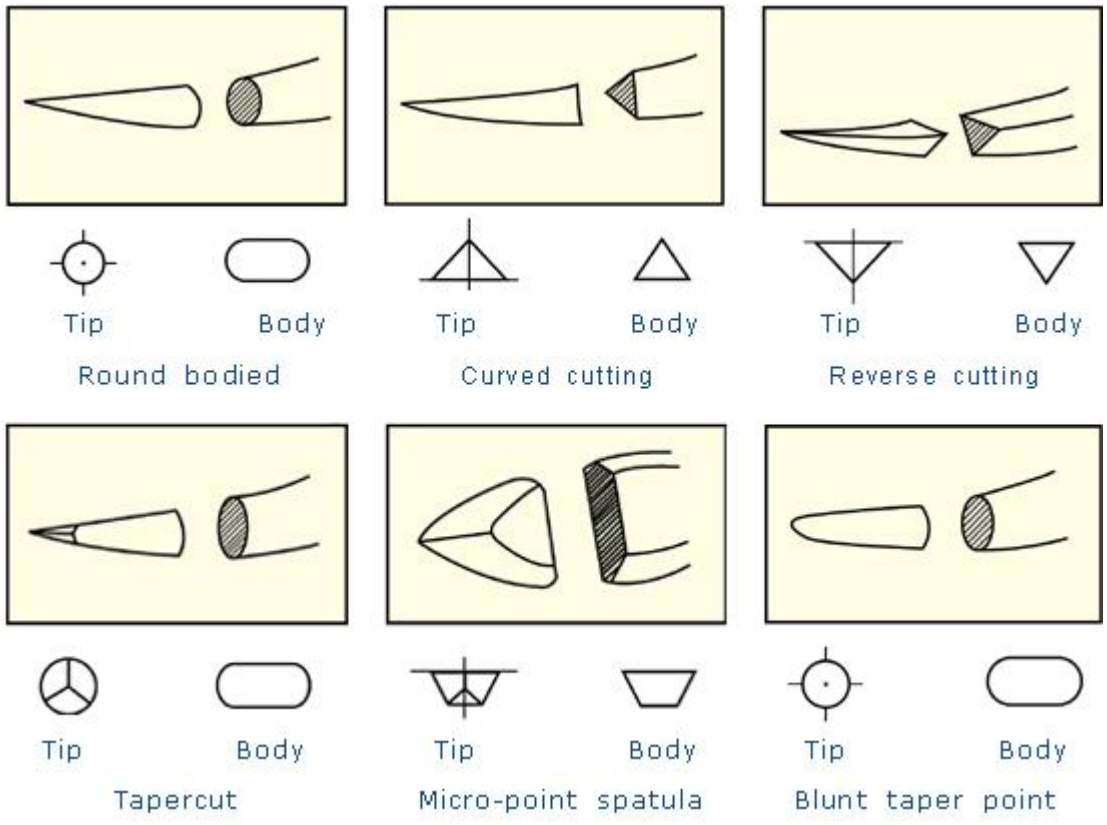
- Operation scissors

- Abdominal holder

- Needle clip

- Holders

- Surgical needles



- Surgical suture: there are two kinds: normal suture and absorbable suture.


POLYGLYCOLICACID
(SYNTHETICABSORBABLE
-SUTURE)
CHROMIC(Catgut)
PLAIN(Catgut)
SILK(Braided)
NYLON
(Monofilament)
POLYPROPYLENE
(Monofilament)
POLYESTER(Braided)
STAINLESS STEEL
WIRE(Monofilament)