

### 3-1-3 Endocrine Disease

Most of the endocrine disease are ovarian disease. The detail will be discussed in next chapter, 3-2.

### 3-1 Classification by Reproductive Organs

#### 3-2-1. Ovarian Diseases

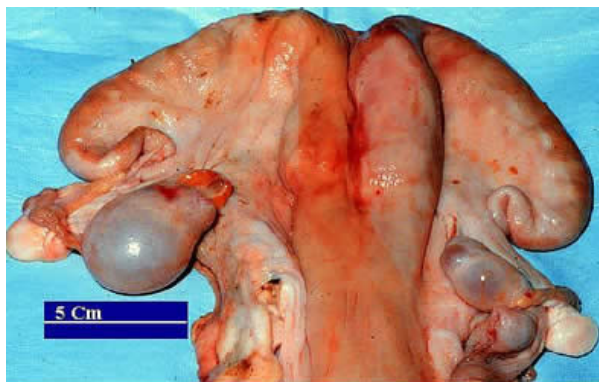
- |                   |   |                                       |
|-------------------|---|---------------------------------------|
| (1) Ovarian Cysts | Follicular Cysts<br>(or Cystic Follicles) | (Anestrus type)<br>(Nymphomania type) |
|                   | Luteal Cysts                              |                                       |

There are 2 types of ovarian Cysts, Follicular Cysts and Luteal Cysts. Luteal Cysts is considered as obsolete type of Follicular Cysts (long-time passed Follicular Cysts without treatment).

Follicular Cysts can be classified to 2 types, Anestrus type and Nymphomania type. Though, Anestrus type is more usually seen than Nymphomania type. In Nymphomania type, cows will show frequent estrus such as 10 days interval, but in Anestrus type no estrus is seen.

In Follicular Cysts one or several large cysts exist in the ovary, and there is no Corpus Luteum (CL). This will be occurred because of lack of LH surge, as a result no ovulation occurred and the follicle become abnormal size. The real cause of this hormonal abnormality is not yet clarified, but inappropriate nutrition (such as prolonged low energy intake, low dry matter intake, too high protein etc.), continuous stress to the cow, or inheritable predisposition etc. are suggested.

**Fig.21 Follicular Cysts**



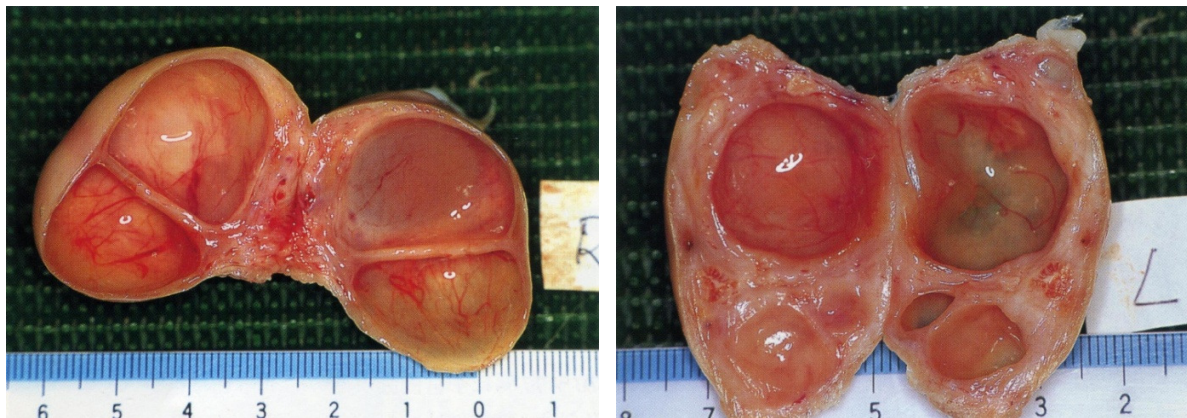
(left) In both ovary, there are large or medium sized follicles exist. There is no CL.

(right) In left ovary, there are very large (>8cm of diameter) cyst, unusual but there is CL in right ovary

**Fig.22 Multiple Cysts in both ovaries**



**Fig.23 Sectioned ovary of Follicular Cysts**



**Fig. 24 Luteal cyst**



Inside the wall of the Cystic Follicle, there is a formaion of luteal tissue. However the luteal tissue is not derived from the ovulation.

(Treatment)

Follicular Cysts : GnRH or hCG  
Luteal Cysts: PGF2 $\alpha$  or PGanalog

(2) Persistent corpus luteum (with some problem in uterus)

In this disease CL continuously exists for long time. Because of some problem in the uterus (such as pyometra, mucometra), it is considered that the female fell in pseudo-pregnancy condition. As a result there is no estrus cycle like a pregnant animal. From the name of the disease we might consider this disease as a ovarian disease, but actually this is a combined form of ovarian and uterine disease.

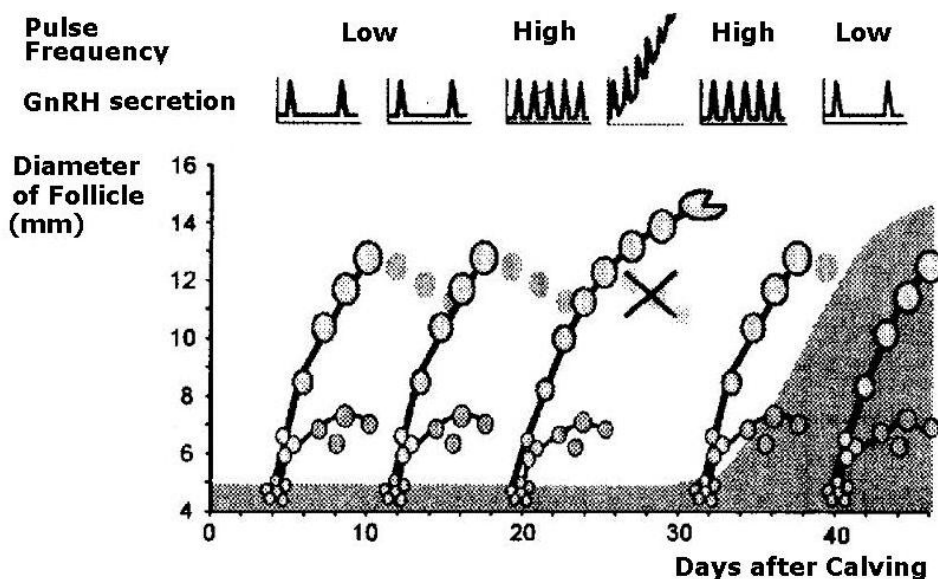
Technicians tend to diagnose cows as this disease when they don't show estrus but have a seemingly normal CL. Frequent palpations are necessary to diagnose this disease.

(Treatment) PGF2 $\alpha$  or Pganalog

(3) Ovarian Dysfunction (ovarian atrophy)

In this disease the ovary is usually small (for very small one, it is called "ovarian atrophy") and no CL (which means there is no estrus cycle). The direct cause of the disease is

### Follicle Growth after Calving & GnRH/LH Secretion



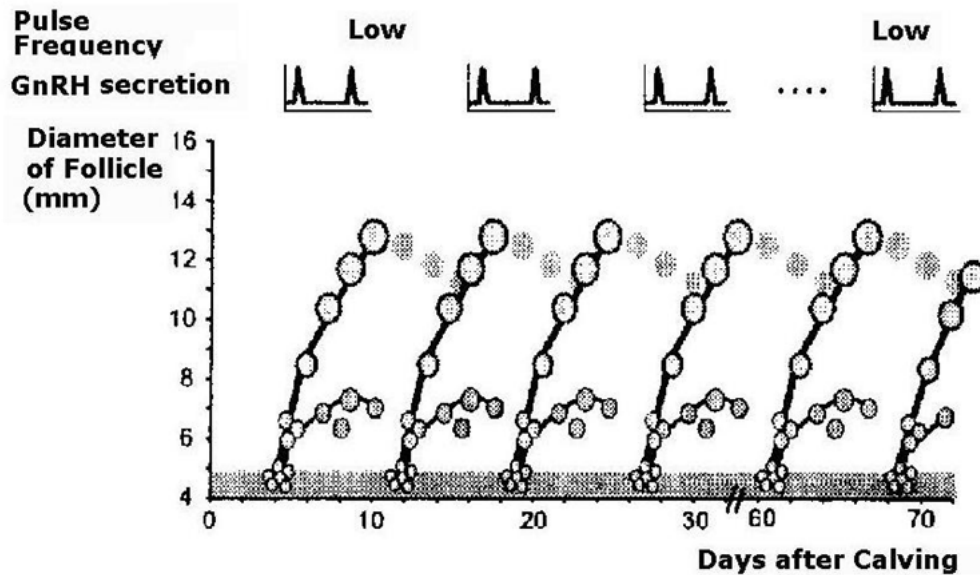
**The growth & maturation of follicle after calving depend on the recovery of the frequency of GnRH/LH pulse.**

considered as abnormal LH pulse frequency during the follicular maturation.

**Fig.25-1**

Fig. 25-2

## Etiology of Ovarian Dysfunction after Calving & GnRH/LH Secretion



**Because of the low frequency of GnRH/LH frequency, the follicle can't mature and Estrogen can't be synthesized.  
Estrogen will induce GnRH/LH surge.**

Fig. 25-1 shows GnRH secretion pattern at first ovulation after calving. Because GnRH's pulse frequency changed from low to high, the follicle can mature and ovulate by LH surge. This pulse frequency change is observed in every normal estrus cycle. In case of ovarian dysfunction, this pulse frequency doesn't change and the follicle cannot fully mature.

By rectal palpation we can detect only small or medium size follicle in the ovaries, but no CL. The cause of the hormonal abnormality is considered as continuous low nutrition (energy and dry matter), poor body condition before calving, stressful condition before/after calving. In Vietnam many cows who don't show estrus after calving fell in this disease.

(Treatment) Improvement of nutritional condition

GnRH or hCG

Cuu

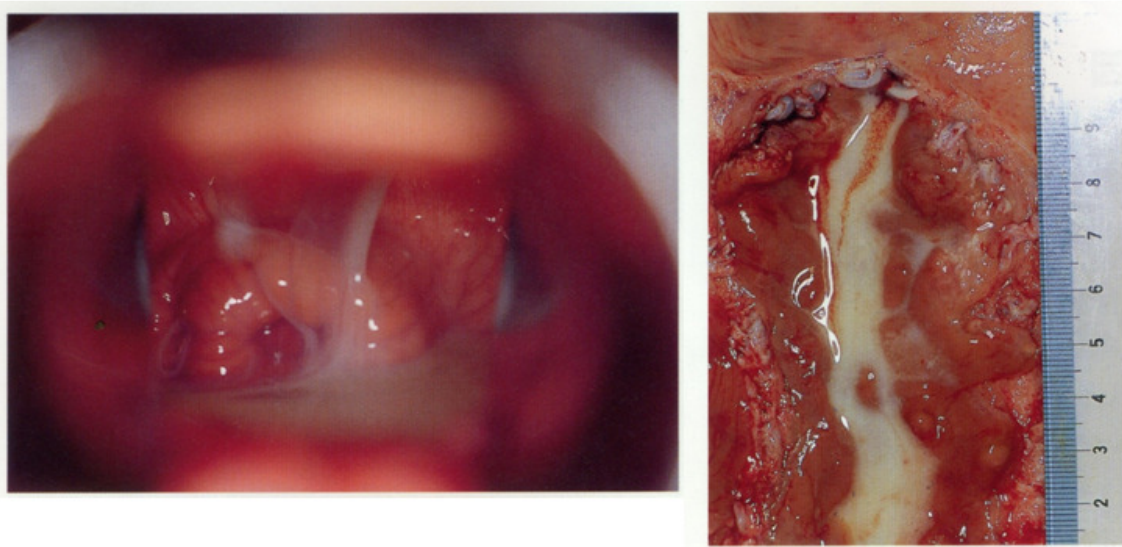
### 3-2-2. Uterine Diseases

(1) Endometritis

Endometritis is a inflammation of the endometrium (inside membrane of uterus) caused by many kinds of bacteria, virus, fungi or protozoa. The symptoms are very wide range from clinical to subclinical type. In clinical type, it is easily diagnosed by the discharge of purulent mucus, though the differentiation with simple vaginitis is necessary. (this can be done by checking vagina using vagina scope).

We have to be careful to avoid artificial infection such as manual removal of the Retained Placenta or mistaken Artificial Insemination to not-estrus cows. These mistaken operations will cause man-made Endometritis.

**Fig. 26 Chronic Purulent Endometritis**



- \* (Left) Mucous containing pus is coming out from external os.
- (Right) inside uterus (after sectioned)

## (2) Pyometra

In this case, much pus is accumulated inside uterus. The uterus is very expanded like a 2-3 month pregnant uterus, therefore the differentiation with pregnancy is necessary (usually “Fetal membrane slip” is used for the checking). This disease often occurs because of delayed uterus recovery after Retained Placenta or Endometritis. There is no estrus cycle because Persistent Corpus Luteum also occurred.

(Treatment) PGF<sub>2</sub>α or PG analog  
Cuu (supporting)

**Fig.27 Pyometra**



### 3-2-3. Other Organ's Diseases

#### (1) Vaginitis

Vaginitis is the inflammation of vagina. It often occurs accompanying with Endometritis and Cervicitis. It is necessary to use vagina scope to differentiate the condition. When the cows have also Endometritis and/or Cervicitis, the treatment should be done altogether. Recently the insertion of intra-vaginal device such as CIDR causes Vaginitis. In mild case without other diseases, the disease doesn't cause much problem and sometimes spontaneously recovers.

(Treatment) Vaginal Irrigation (use non-irritant disinfectant such as 0.2-0.5% PVP-iodine)

#### (2) Urovagina

Urovagina is a condition that the urea flow backward and remain in vaginal floor because of the sinking of the deep part of the vagina. The cause of the condition is considered as loosened ligaments for supporting vagina and uterus. Also in many cases there are accompanied ovarian diseases such as Follicular Cyst and Ovarian Dysfunction, it is suggested that the hormonal abnormality also has some relation. Too emaciated cows also shows this condition with sinking of hind back and lifting-up of hip and tail-head.

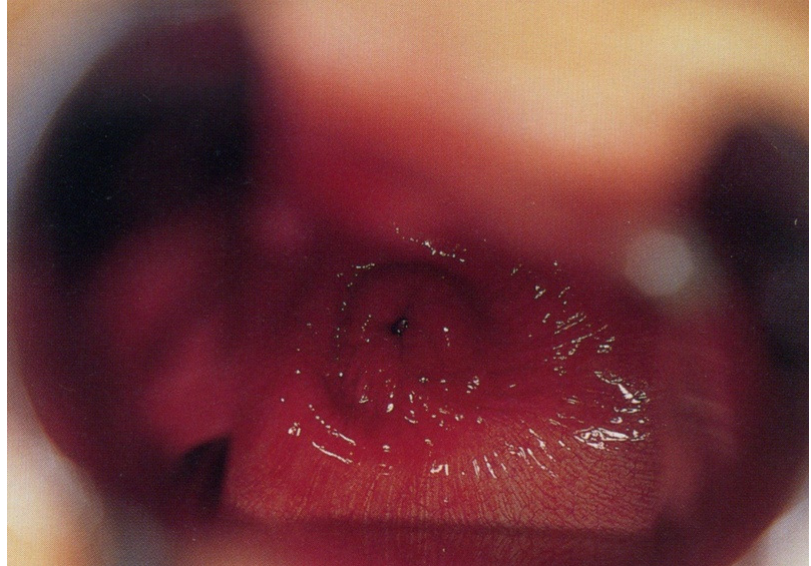
Because of always remaining urea inside vagina, it will cause Vaginitis, Cervicitis and Endometritis. If there is no clear reason for the abnormal body posture, the complete recovery is difficult.

(Treatment) If there is other diseases which cause the abnormal posture, treat them at first.

Frequent Vaginal Irrigation (same as Vaginitis treatment, especially before AI)

**Fig. 28 Urovagina**

Urea remained inside of vagina,  
congested external os

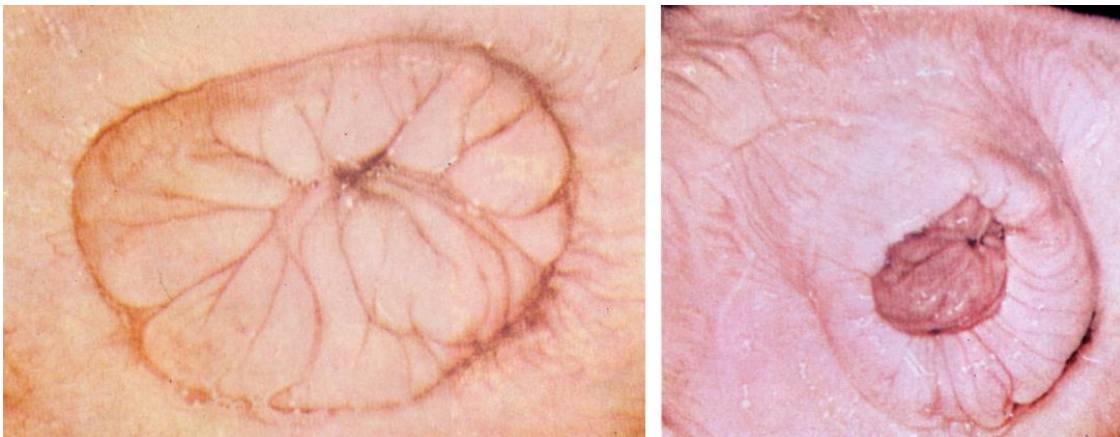


(3) Cervicitis

Cervicitis is inflammation of the cervix. This disease is usually accompanied with Endometritis or Vaginitis. It can be occurred by rough insertion of devices for AI and treatment when passing through cervix.

(Treatment) Treatment for Endometritis, for Vaginitis, or both

**Fig.29 Cervicitis (Left:normal, Right: Cervicitis congested external os)**

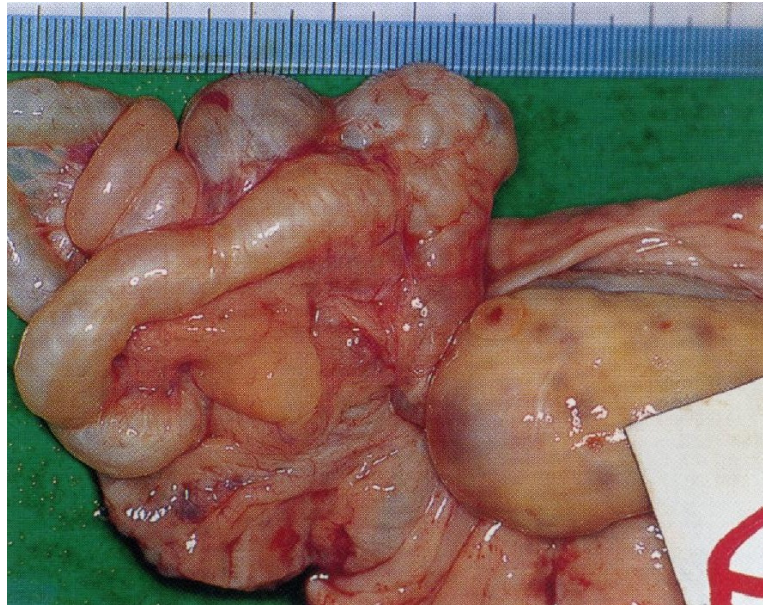


(4) Salpingitis, Hydrosalpinx



Salpingitis is inflammation of oviduct, and Hydrosalpinx is the condition in which the oviduct lumen become closed maybe because of the adhesion of oviduct mucous membrane and watery exudates are accumulated inside oviduct. The correct diagnosis and treatment are very difficult, but if these were occurred one-side oviduct, there is a possibility of pregnancy in unaffected oviduct.

**Fig. 30 Hydrosalpinx**



### **3-2 Diagnosis of Reproductive Disorders**

#### **3-3-1 Principle of Diagnosis and Treatment in Reproductive Disorders**

The principle of Diagnosis and Treatment in Reproductive Disorders is “Early Diagnosis (or Detection), Early Treatment”. This is true in both heifer and cows. For the heifer, the important thing is that the first insemination should be not too late. For that objective the heifers should be properly raised. Especially in heifers, it is important to check whether they have an inheritable disease that cause infertility.

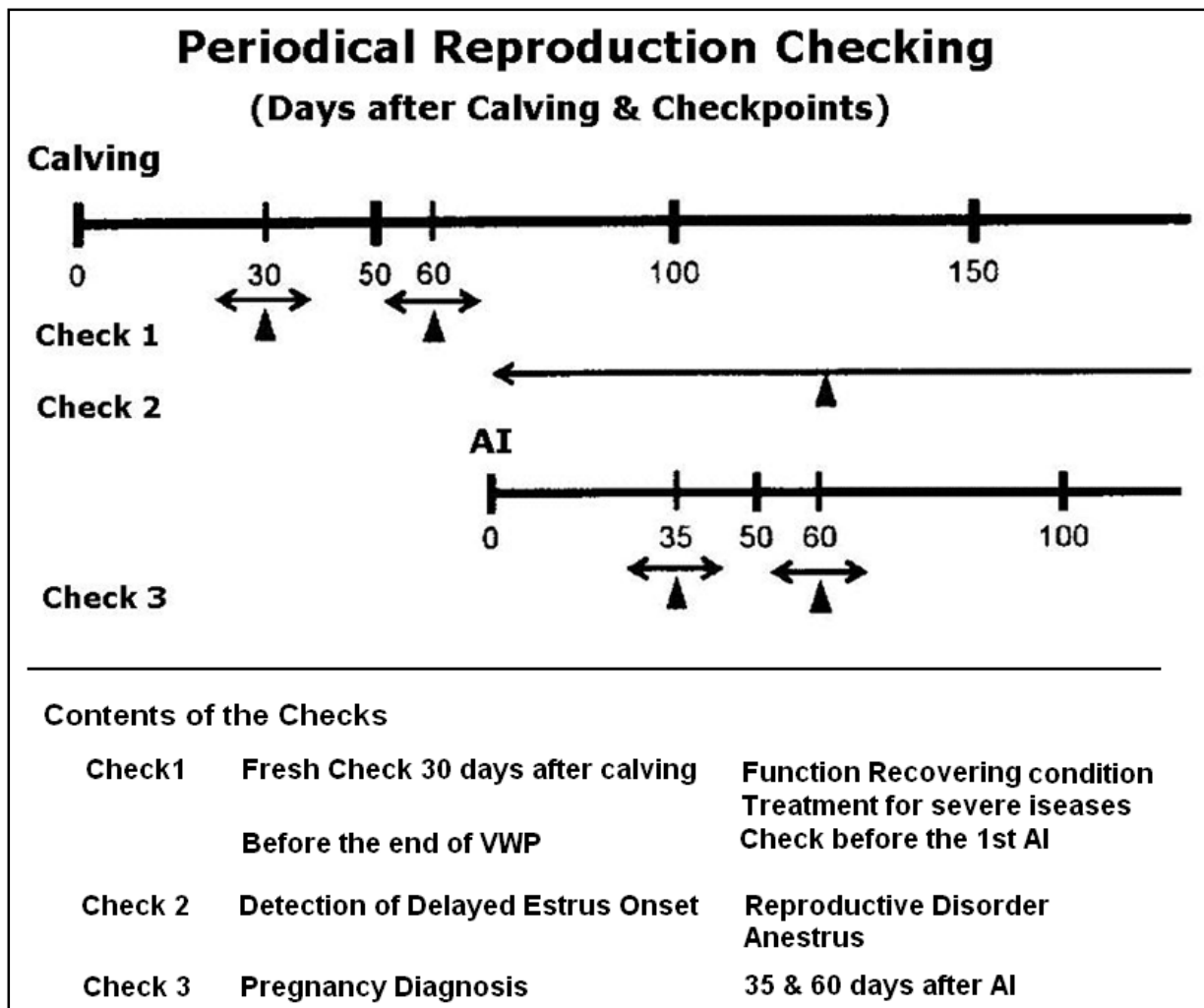
In delivered cows, the important thing is when we can inseminate after their deliveries. Most of the cows will have the first ovulation about 20 days after calving. However, usually the estrus cannot be seen at this time, and will be 40 days after calving. But this interval might be delayed, affected by the cow’s nutrition especially low energy intake, or cow’s health condition. Low nutrition and/or diseases after calving will delayed the recovery of uterus and ovary after calving.

Depending on each farm’s reproductive management, VWP (Voluntary Waiting Period) is set. Because too early pregnancy after calving will cause a problem especially in high milk-yield cows, the VWP is 60-70 days. In Vietnam condition this might be 50-60 days. Anyway when cows did not show the estrus before VWP finished, we should check

those cows. It is said that “One calving per year” is the most economic, and if the calving interval become longer than one year, the farmer will lose money day by day. And also prolonged abnormal condition makes the disease condition worse and become difficult to recover. For example, if Cystic Follicle were neglected for a long time, it will also have a bad effect on uterine endometrium maybe because of continuously high estradiol level.

Fig. 31 shows recommended checking schedule for delivered cows.

Fig.31 Reproduction checking schedule for delivered cows



### 3-2-2 How to diagnose Reproductive Disorders

Although Ultrasonography or Hormonal assay is possible to use for diagnosis of reproductive disorder in recent years, the Rectal Palpation is the most useful and practical

method for the diagnosis. We can make more correct diagnosis by collecting other information on the cow, not only relying on the palpation findings. The information includes the cow's history (age, calving times, last calving date, last AI date, last estrus date etc.), the cow's body condition, the rearing condition and if she doesn't have any other disease.

When collecting data, you have to keep in mind that the farmer doesn't always talk the truth. Sometimes their memory is not so sure, or they forgot, especially when no record was taken. Sometimes we found out the cow is pregnant, even though the farmer claimed that no AI was done. We cannot know it is a fault memory or is there a strayed bull?

The following table shows the important check points when we examine the cows in problem.

| Usual problem (Farmers' complain)  | Important checkpoint  |
|--|---|
| <ul style="list-style-type: none"> <li>• No estrus (anestrus)</li> <br/> <li>• Abnormal length of estrous cycle</li> <br/> <li>• Many AI, but no pregnant</li> <br/> <li>• Dirty mucus was expelled</li> </ul> | <ul style="list-style-type: none"> <li>• Pregnancy ?</li> <li>• Ovary (CL) ⇒ Farmer's skill to detect Heat?<br/>Weak heat<br/>Persistent CL</li> <li>• (no CL) ⇒ Ovarian Dysfunction<br/>Cystic Follicle</li> <li>• Uterus ⇒ Pyometra ?</li> <br/> <li>(25-35 days)<br/>Early Embryonic death ⇒ Endometritis?</li> <br/> <li>(about 10 days)<br/>Cystic Follicle?</li> <br/> <li>(if no abnormality is detected)<br/>Semen quality ? (check semen, data)<br/>Endometritis ?</li> <br/> <li>From Vagina or Uterus ?</li> </ul> |

### 3-5 Treatment Methods of Reproductive Disorders

#### 3-5-1 Drugs used for Reproductive Disorders

The followings are the drugs used for the treatment of reproductive disorder. However, some drugs are difficult to buy in Vietnam.

(Ovarian hormone: steroid hormone)

(Gonadotrophin)

(GnRH: Gonadotrophin Releasing Hormone)

(Prostaglandin F<sub>2α</sub> & the analog)

(Antibiotics, Iodine Solution)

(supportive)            Vitamin ADE  
                                  Dexamethadone

(1) Hormonal treatment

Hormonal treatment methods for Reproductive Disorder are summarized in Tab.2.

Tab.2 Hormonal treatment for Reproductive Disorder

|  | Target disease  | Dose           | Remark   |
|--|---|----------------|--|
| (Ovarian hormone: steroid hormone)       |   |                |  |
| Estrogen                                 | Retained Placenta   | 2-5 mg         | * too high or repeated dose will induce abnormal estrus cycle.   |
|  | Pyometra  | 2-5 mg         |  |
|  | Mummification<br>Maceration   | 4-8 mg         |  |
| Progesterone                             |   |                |  |
| Intra-vaginal<br>(CIDR,Synch-B)          | Estrus synchronization<br>Ovarian Dysfunction                       | 1 piece        | * (CIDR) Inserted in vagina for 7 days.(For the treatment of Ovarian Dysfunction, +2mg of estradiol) One day before removal, PG is injected. |
| For Injection                            | Prevention of habitual abortion                                     | 100-200 mg/mth | * Repeated every month until delivery  |
| (Gonadotrophin)                          |   |                |  |
| • LH (Lutenizing Hormone)                |   |                |  |
| hCG                                      | Follicular Cysts<br>Ovarian Dysfunction<br>Delayed Ovulation        | 3,000-6,000 IU | * Repeated high doses might produce anti-hormone   |
| GnRH                                     |   | 100-200 mg     |  |
| • FSH (Follicular Stimulating Hormone)   |   |                |  |
| PMSG (eCG)                               | Ovarian Dysfunction   | 1,000 IU       | * Too high dose can cause multiple pregnancy   |
| FSH                                      | Delayed Ovulation<br>Follicular Cysts                               | 10-20 AU       |  |
| (PGF2α & the analog)                     |   |                |  |
| Dinoprost Tromethamine<br>(natural type) | Estrus synchronization<br>Persistent CL<br>Pyometra<br>Luteal Cysts | 20-30 mg       | * Regression of Corpus Luteum (usually Day 5-15)<br>* Induce contraction of  |

|                                    |  |     |        |
|------------------------------------|--|-----|--------|
| Cloprostenol<br>(synthesized type) | Mummification<br>Maceration of fetus<br>Retained Placeta | 500 | Uterus |
|------------------------------------|--|-----|--------|

(2) Uterus treatment

For the treatment of the uterus (usually for Endometritis), the following drugs can be used for uterine infusion.

Antibiotics      • Penicillin 300,000IU & Streptomycin 0.3mg  
                          • Ampicillin 500mg  
                          (usually dissolved in 50 ml physical saline or Ringer solution)

Iodine solution   • 2% PVP-iodine solution, 50ml  
                          (“10% PVP-iodine” is diluted 1:4 with physical saline)

Hypertonic Glucose solution  
                          • 30-50% glucose solution, 50ml  
                          (used for long-passed Follicular Cysts with low-contraction uterus)

\* For the infusion the plastic sheath of AI gun can be utilized.

(3) Cuu Treatment

Cuu treatment is an east and economic ways to treat some disease, not only for reproductive disorders but also effective for gastro-intestinal diseases. “Moxa” for cuu treatment can be prepared for ourselves.

Cuu treatment cannot be applied to too weakened cattle.

**Fig.32 Grass for Moxa (*Artemisia princeps*)**



\* Moxa can be prepared by rubbing the dried grass.

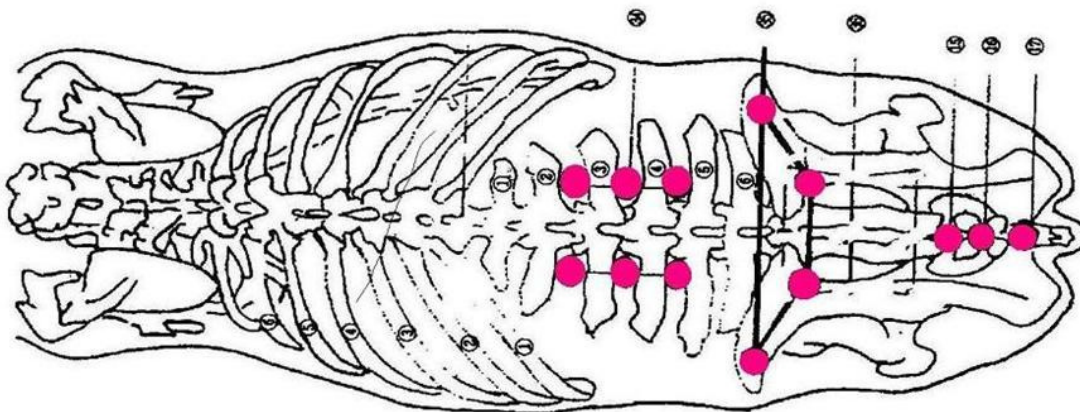
**Fig.33**



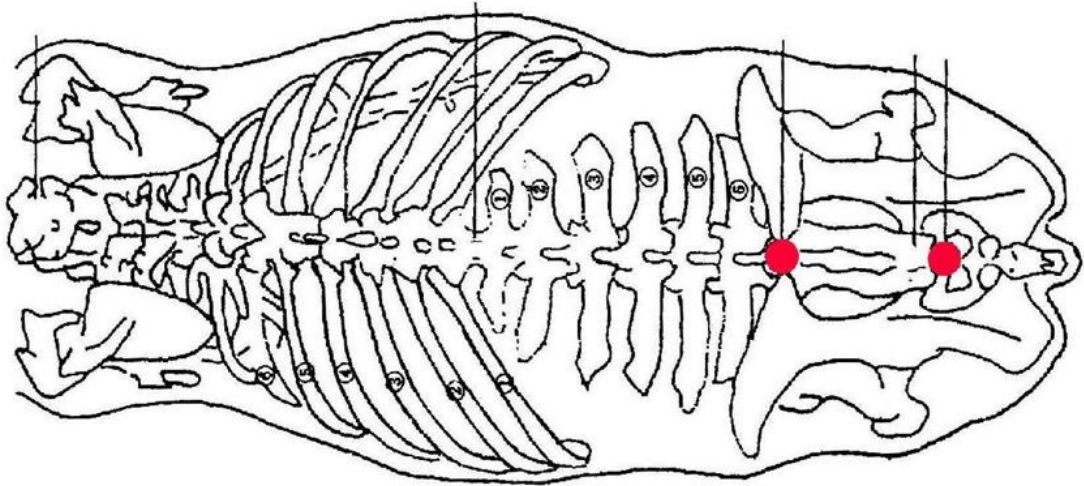
\* Before the cuu treatment the tail should be tied, Moxa burns for 20-30 min.

Fig.34 shows the cuu points for respective diseases. The necessary times for cuu treatment are depending on the disease and its condition. In case of Ovarian Dysfunction, once/day x 3days treatment is recommended.

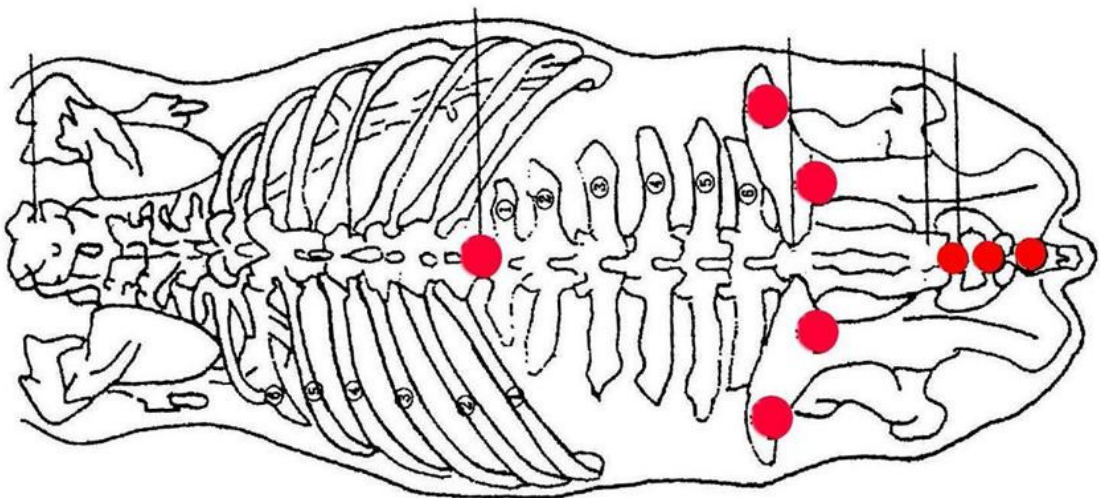
**Fig.34**



Cứu 13 điểm: Chữa chậm sinh, không động dục

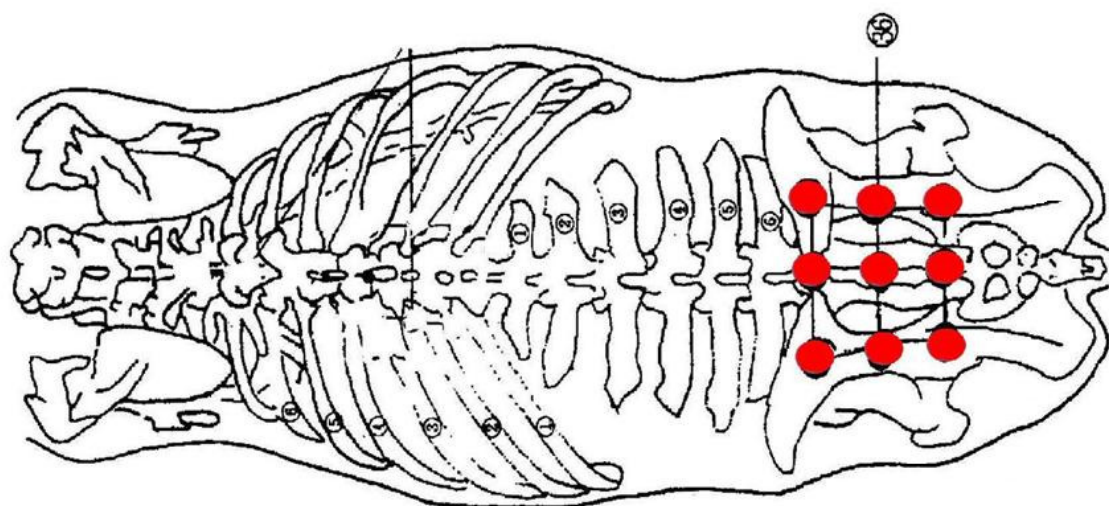


Cứu 2 điểm: Chữa lộn trực tràng, âm đạo

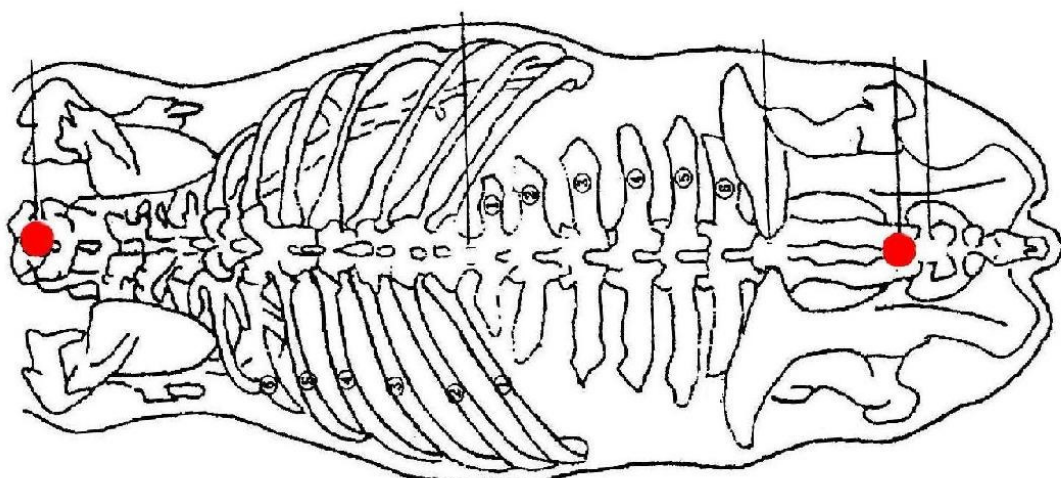


Cứu 8 điểm: Chữa sốt nhau  
Sốt nhau lâu (2 - 3 tuần), nhau bị thối rữa

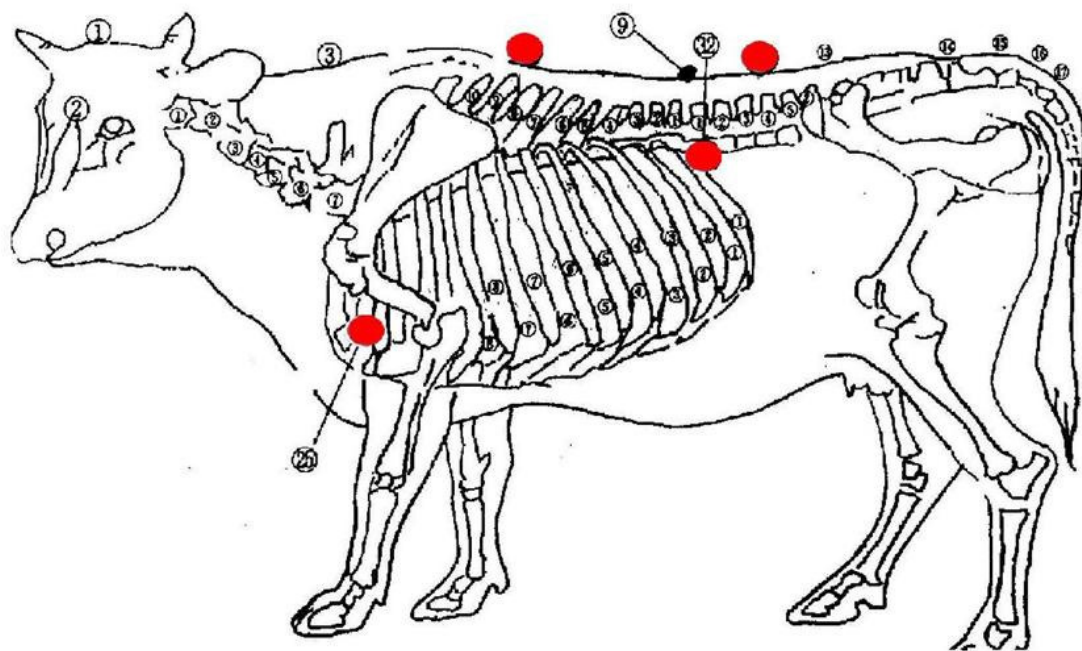




Cứu 9 điểm: Trị liệt, xoạc, sốt sữa



Cứu 2 điểm: trị cảm nóng, cảm lạnh



Cứu 4 điểm: Trị chứng hơi dạ cỏ



## 4. Rectal Palpation Method

Rectal Palpation is a useful tool to identify the problem of the reproductive tracts in cattle. Because of the body size of the animal, we can say that we have a great advantage. However, there are some disadvantages such as that it should rely on the technician's sense of touch of the finger tips. Therefore, this examination needs some training and experience, and the results can be expressed only in a subjective manner.

### 4-1 Before the palpation

To get more accurate diagnosis by rectal palpation, the following points are important.

1. Collect the female's information about reproduction and general health as much as possible.
2. All the reproductive organ should be checked.  
not only Ovary & Uterus but also Oviduct, Vagina, Vulva etc.
3. Record the findings by Rectal Palpation in standardized system. (will be explained in next chapter)

More precisely what you have to do before the rectal palpation is as follows:

“Before you insert your hand to rectum”

Check your nail !

Too much bleeding from rectum will lose the farmer's trust on you.

Ask the farmer about the cow's history

but Don't believe totally

Check the cow's appearance

Observe the cow's body

(Thin or Fat ?)

(Good Appetite or Bad ?)

(Healthy or not ?)

Check the vulva and around the tail

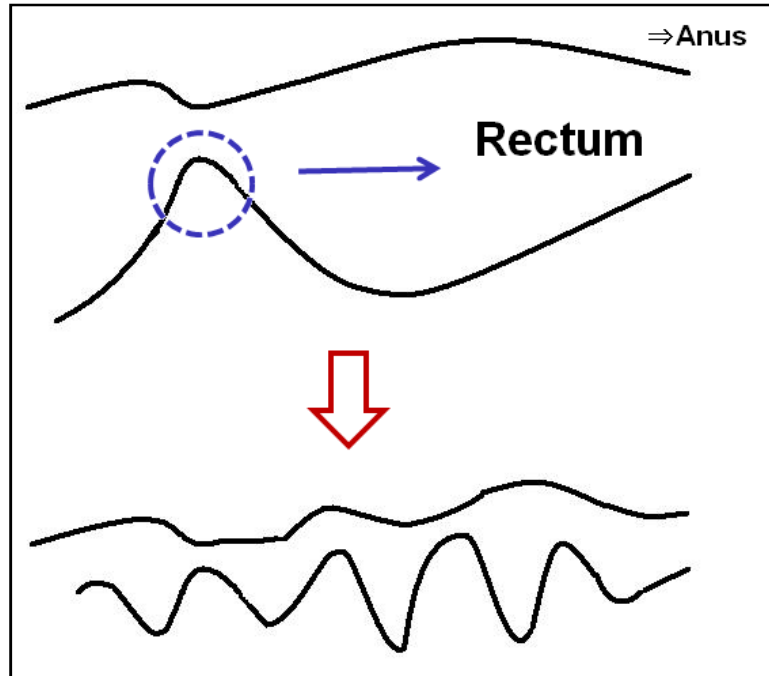
If necessary, clinical examination should be done at first.

### 4-2 Rectal Palpation

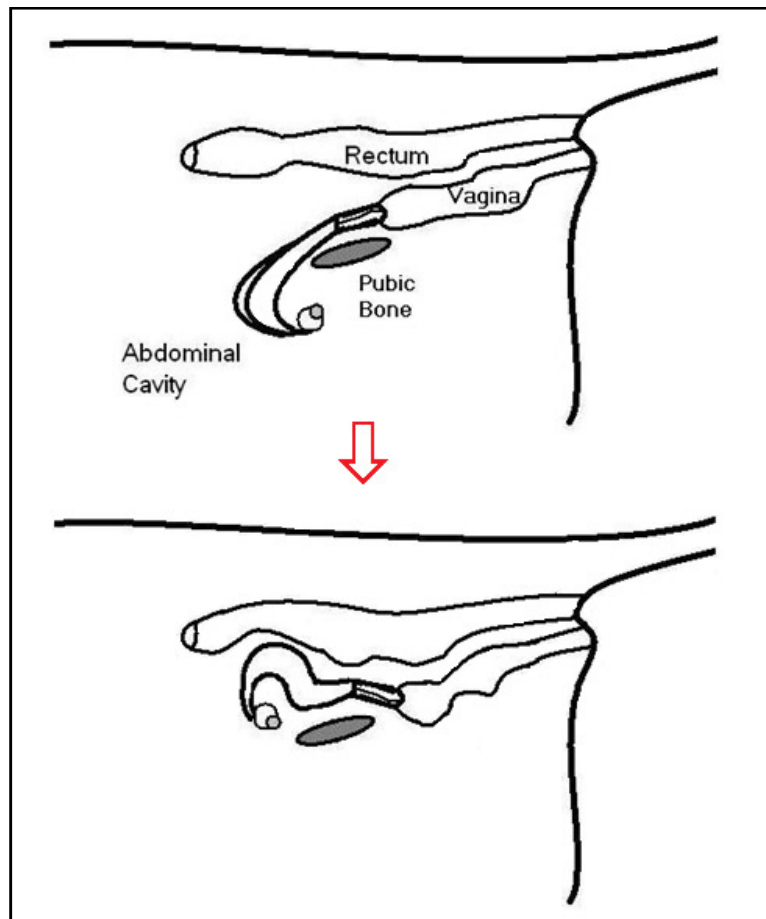
After you insert your hand into the rectum, you have to remove the feces at first. Sometimes the air enters into the rectum and makes the palpation difficult. In such case, the first you have to do is to induce defecation by touching the rectum membrane, if it

doesn't work, you can remove the air by holding the wrinkles of rectum membrane and slowly pulling backward (Fig.35). For the palpation and the whole examination of uterus, it should be lift up and reversed (Fig.36).

**Fig.35** How to remove the  
Air from rectum



**Fig.36** Lift-up and  
Reversion of Uterus



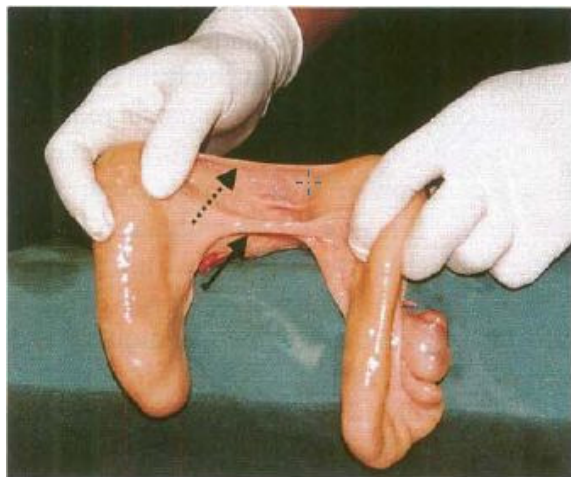
**Fig.37 Check of Uterus & Ovary**



The forefinger is inserted under the outer bifurcation to lift up and reverse the uterus.



The reversed uterus is palpated as if to enclose it by the fingers.



At the outer bifurcation, there are two ligaments. When lifting up uterus, the finger should be put under the lower (ventral) ligament, because the upper (dorsal) ligament is thin and weak.

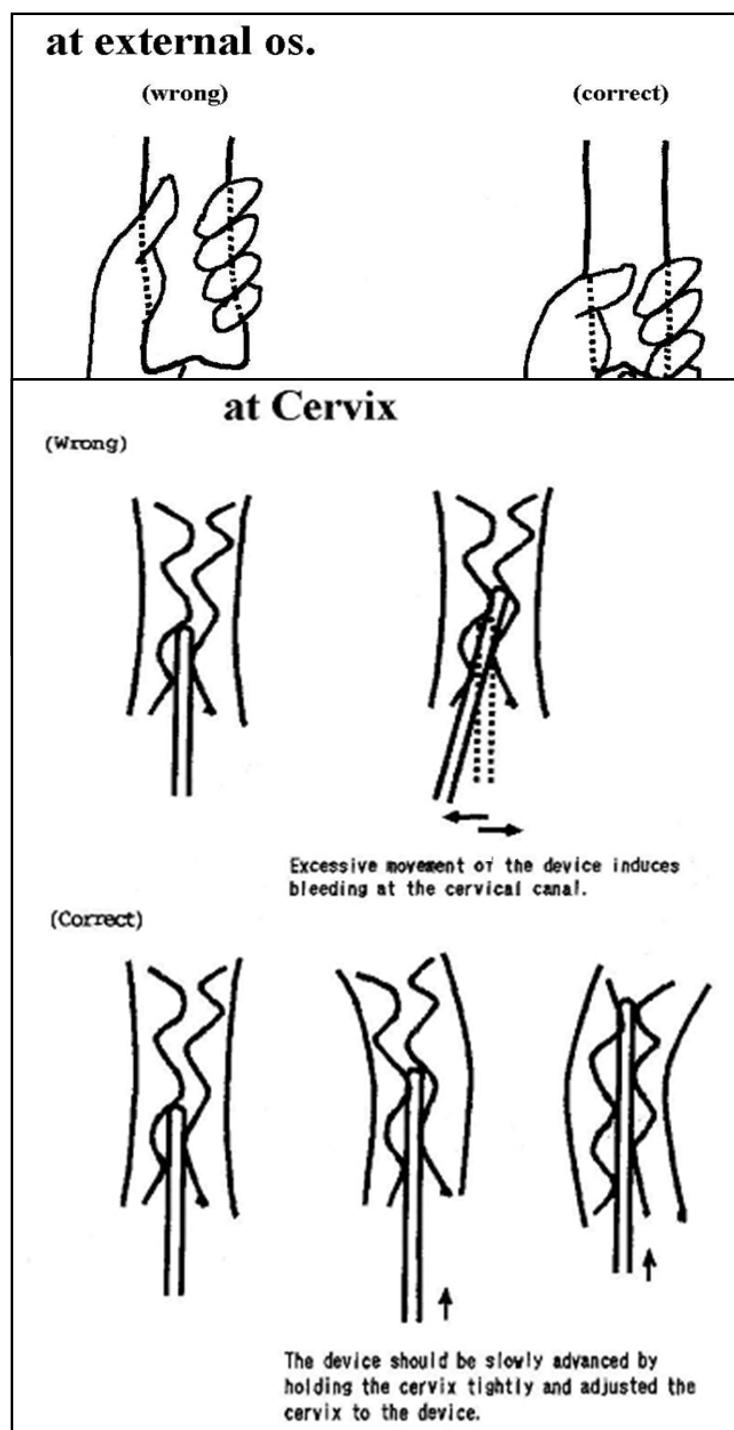


The palpation of ovary is done holding the ligaments by the middle and ring fingers.

### 4-3 Insertion technic

Including AI, when we need devices such as AI gun or catheter to be inserted to the uterus, some technic is necessary. Because the cervix is very different with each females, changed according to the estrus cycle, and sometimes very narrow and bending. Very rough or forceful operation will cause injuries in uterine membrane or inside the cervix. Also, when you insert the devices into uterus in luteal phase, sanitary operation (cleaning of vulva, sterilized devices etc.) is necessary not to induce Endometritis artificially. The followings are technical knacks how to smoothly insert the devices through cervix to the uterus.

Fig.38



## 5. Recording Methods of Reproductive Examination

\* These levels will be expressed by (-),( $\pm$ ),(+),(++) and (+++). Usually the contraction and elasticity of heifer are stronger than cow.

Even though the rectal palpation is largely relying on people's sense of touch, the recording of the findings of the examination should be kept in appropriate manner. Without this we cannot understand the condition and the changes of the disease.

The method introduced here is developed by Chiba Prefectural Mutual Insurance Federation of Agricultural Cooperatives, and is widely utilized in Japan.

(Some rules for the recording method)

OVARY: Not a real sketch. The important point is to express its function.

UTERUS: the width (by finger width), contraction, elasticity,  
hypertrophy (uterine wall)

VULVA: Swollen level, Congestion, Mucous

If necessary VAGINA, OVIDUCTS

**Fig. 39 Recording Form for Reproductive Examination**



ID of Female: \_\_\_\_\_

Farmer: \_\_\_\_\_



Area: \_\_\_\_\_



|                        |         |  |                                 |        |               |   |                               |
|------------------------|---------|--|---------------------------------|--------|---------------|---|-------------------------------|
| Date:                  | History |  | Last Calving date (Calving No.) |        | Last AI date  |   |                               |
| Ovary                  |         |  |                                 | Uterus |               |   |                               |
| L                      |         |  |                                 |        | R             |   |                               |
|                        |         |  |                                 |        | Size          | R | <1.0 1.0 1.5 2.0 2.5 3.0 3.0< |
|                        |         |  |                                 |        |               | L | <1.0 1.0 1.5 2.0 2.5 3.0 3.0< |
|                        |         |  |                                 |        | Contract.     |   |                               |
|                        |         |  |                                 |        | Elasticity    |   |                               |
|                        |         |  |                                 |        | Inner Feeling |   |                               |
|                        |         |  |                                 |        | Others        |   |                               |
| Treatment, instruction |         |  |                                 |        |               |   |                               |

(\* Simplified by N.Saito)

At the end of this book, there is a recording form which can be utilized by copying

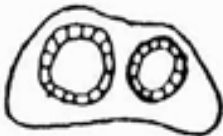

Fig.40

| Findings             | Diagram of ovary   | Remarks                                |
|----------------------|--|--|
| Follicles in estrous |   | Draw a part of the contour of an ovary |
| Ovulation site       |  | Show as a wedgeshape                   |

| Findings                 | Diagram of ovary  | Remarks  |
|--------------------------|---|--|
| Corpus luteum            |  | <p>Draw slanted lines</p> <p>Increase the number of slanted lines according to the mass</p> <p>Fill with crossed slanted lines for a solid corpus luteum</p> |
| Regressive corpus luteum |  | Paint this black   |

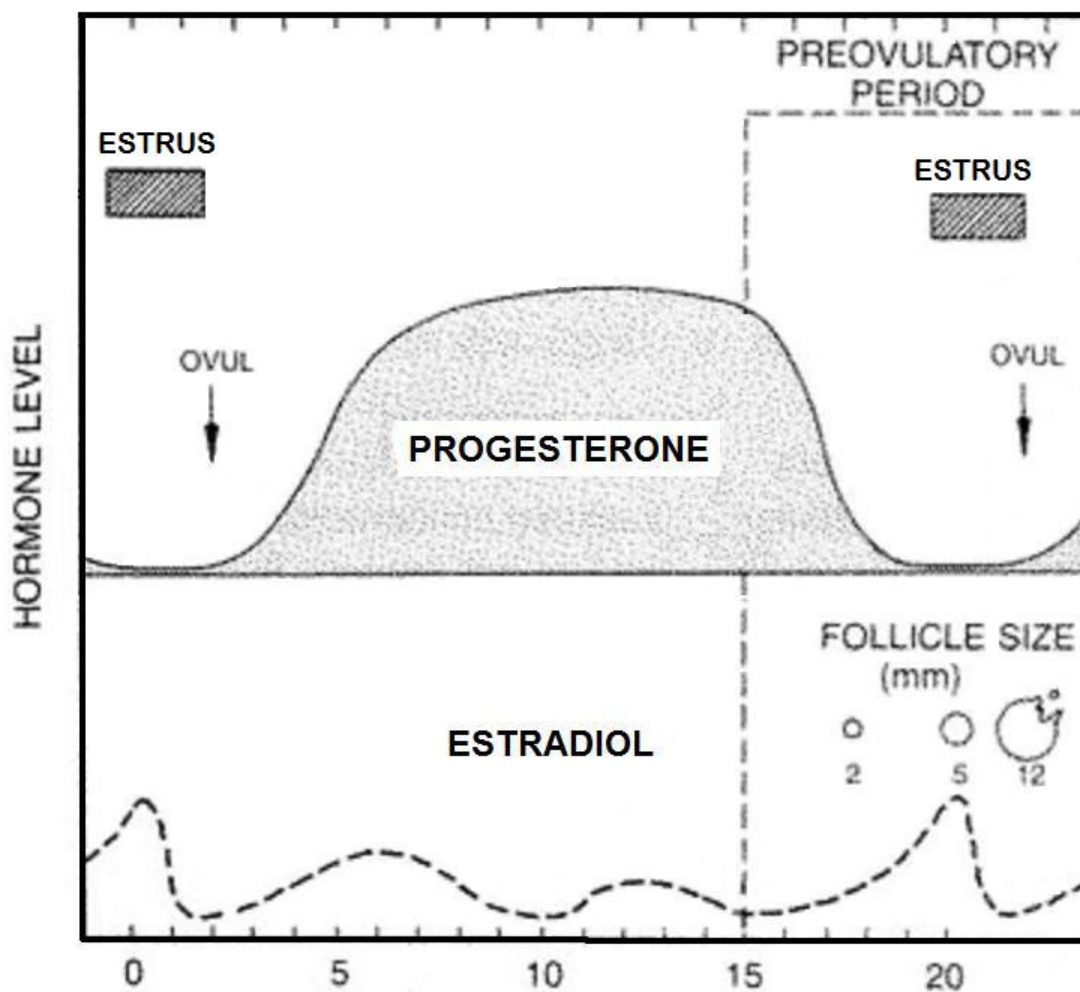
| Findings   | Diagram of ovary | Remarks                             |
|--|------------------|-------------------------------------|
| Regressive corpus luteum or site of induration                   |                  | Paint this black                    |
| Follicular cyst<br><br>Follicles other than follicles of estrous |                  | Draw inside the contour of an ovary |

| Findings             | Diagram of ovary | Remarks                             |
|----------------------|------------------|-------------------------------------|
| Irteal cyst          |                  | Draw inside the contour as shown    |
| Cystic corpus luteum |                  | Draw luminal fluid of corpus luteum |

| Findings             | Diagram of ovary  | Remarks                             |
|----------------------|---|-------------------------------------|
| Irteal cyst          |    | Draw inside the contour as shown    |
| Cystic corpus luteum |  | Draw luminal fluid of corpus luteum |

It is important to remember the hormonal changes in the estrus cycle (as Fig.41), when you make a rectal palpation and record the findings. Because the all reproductive tracts is under control of two hormones, Progesterone(P) and Estradiol(E).

Fig.41 Hormonal changes during the Estrus cycle



Main changes are as below:

|        |                    |              |        |        |       |
|--------|--------------------|--------------|--------|--------|-------|
| Source | Uterus contraction | Clear mucous | Cervix | Vagina | Vulva |
|--------|--------------------|--------------|--------|--------|-------|

|   |      |   |   |       |               |         |
|---|------|---|---|-------|---------------|---------|
| P | CL   | ↓ | ↓ | Close | Dried         | Shrivel |
| E | Fol. | ↑ | ↑ | Open  | Wet<br>Smooth | Swelled |

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