INFERTILITY IN SHEEP

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INFERTILITY IN SHEEP

- Infertility of sheep, may be analyzed according to whether it is due to
  - environmental,
  - structural,
  - functional
  - Uterine pathology and
  - infectious factors.

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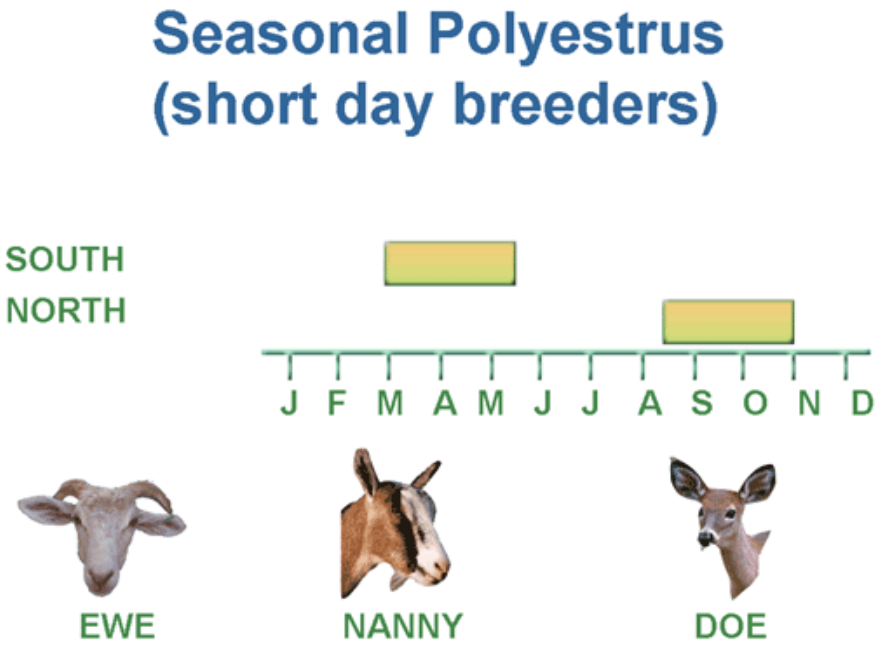
I-ENVIRONMENTAL CAUSES

- Seasonality & photoperiod
- Nutritional abnormalities
  - Plant toxicity
  - Estrogen-producing plants
  - Decreased Energy, mineral and vitamin intake
- Heat stress

Seasonality

- Seasonality of estrous is controlled by the hours of light to which the ewe is exposed.
- In temperate areas of the world, ewes tend to enter a non-reproductive state during the spring and summer, and start cycling in the fall as the day length decreases.
- Peak breeding activity usually falls between **September(9) and January(1).**



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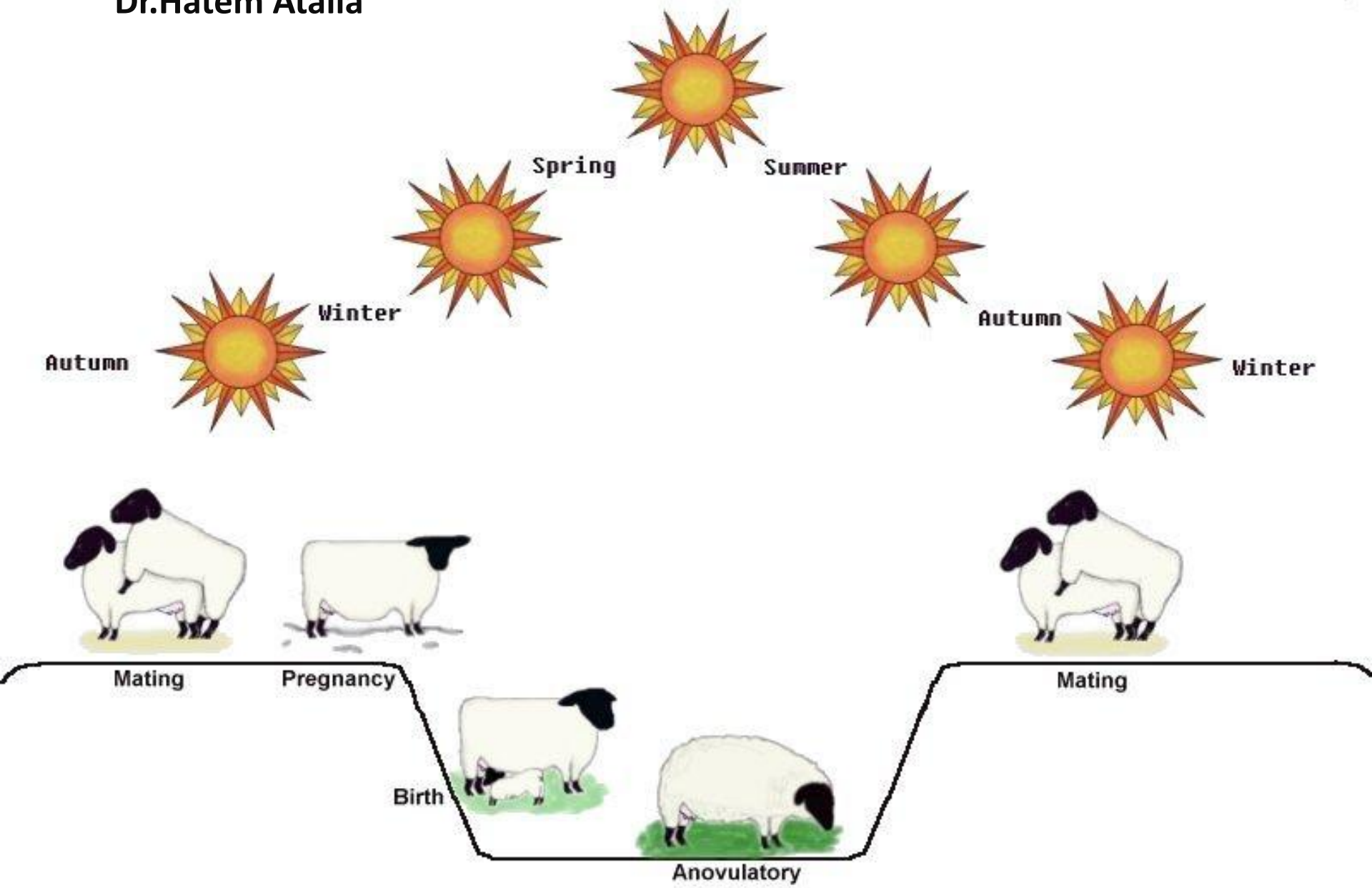

Reproductive characteristics of ewes

Reproductive characteristics of ewes		
Characteristic	**Average**	**Range**
Age at puberty,	5 to 12 months	
Length of estrus cycle, days	17	13-19
Duration of estrus, hours	30	18-48
Timing of ovulation	20-30 hours after start of estrus	
Gestation, days	146-147	138-149

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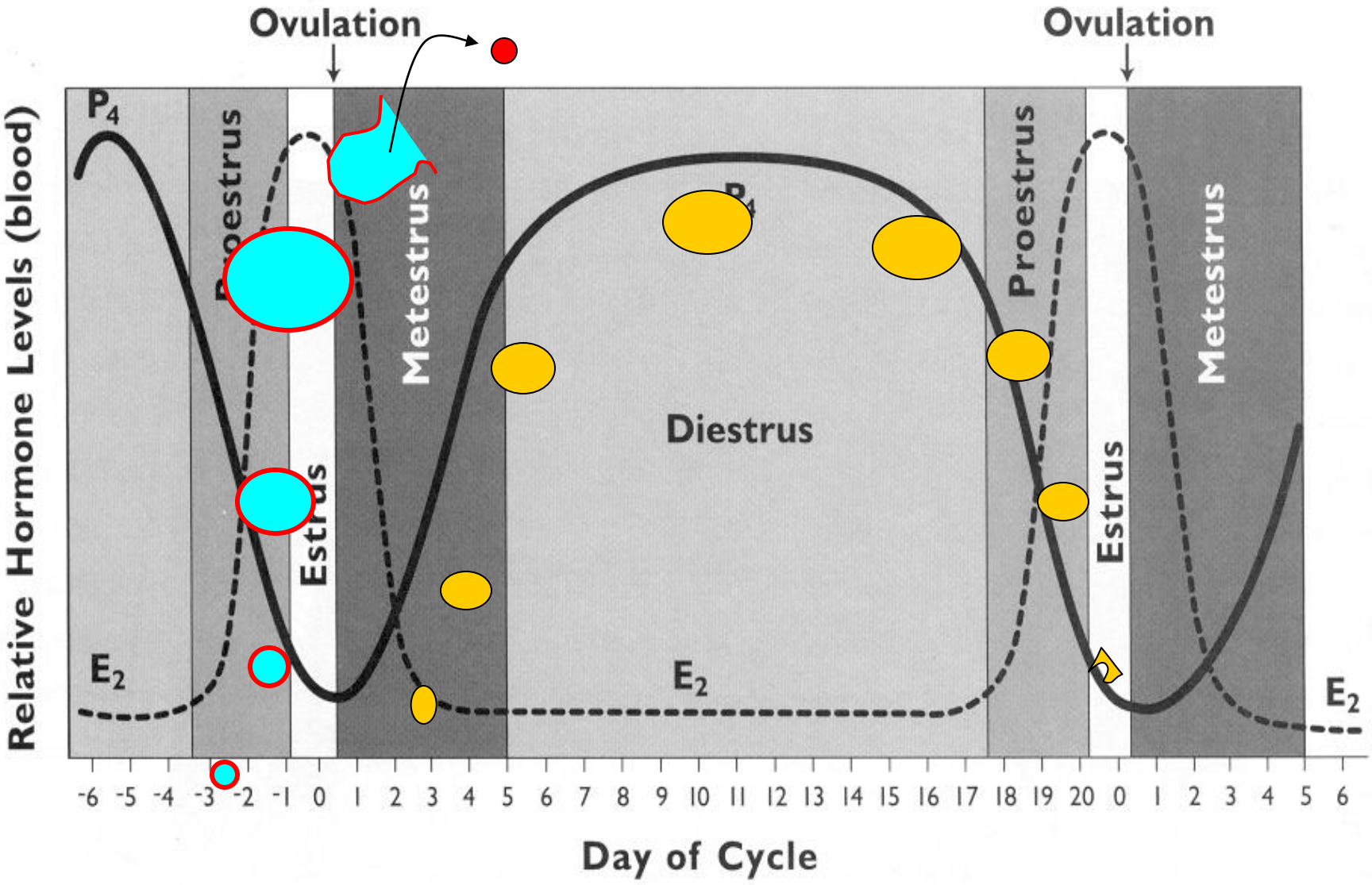

CL

Follicle

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Technical options to break seasonal anoestrus

- Pharmacological methods
  1. Progesterone method
     - Used over all the year
  2. Prostaglandin method (PGF2α)
     - Used just during the breeding season
  3. Melatonin implants
- Natural methods
  - Male effect
  - Dark: light ratio

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Progesterone Method

	Duration of the treatment	Occurrence of estrus after treatment
Sheep	12 – 14 day	2 – 3 days
Goat	16 – 18 day	

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Available Progesterone Devices

- Three types of devices are available:

1. (MAP) Medroxyprogesterone acetate (60mg) impregnated sponges
2. (FGA) Fluorogestone acetate, 30 or 40 mg and 45 mg
3. CIDR(0.3 g progesterone)

Progesterone Application Methods

	sheep		Goat	
Day	Breeding season	Non-breeding season	Breeding season	Non-breeding season
0	Insert sponge		Insert sponge	
	40 mg FGA Or 60 mg MAP	30 mg FGA Or 60 mg MAP	45 mg FGA Or 60 mg MAP	45 mg FGA Or 60 mg MAP
12	Remove Sponges & inject PMSG			
	400 IU	600-750 IU		
	Introduce 5-10% teaser ram			
14	Introduce rams or AI			Inject PMSG 600 – 750 IU
16			Remove Sponges	
			Inject PMSG 400 IU	
			Introduce 5-10% teaser bucks	
18			Introduce rams or AI	

Precautions:

- Each sponge should be treated with antibiotic powder (e.g.chlortetracycline) before insertion.
- The applicator should also be moistened with an antiseptic solution which helps to lubricate as well as disinfect the applicator.
- The female should be in a natural standing position.
- In maiden females, push the sponge into vagina with a finger, don't use the applicator.
- Withdrawal is often accompanied by a discharge of distinctive smelling fluid from the vagina; this is normal, except when the discharge contains blood or pus, signifying vaginal damage or infection. Such females should be treated with antibiotics and discarded from the insemination process until healing.

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Disinfectin of sponge applicator

- 10% benzalkonium chloride solution or
- 5g/L chlorhexidine gluconate solution.
- Do not immerse the sponge in disinfectant.

PGF2α in Ewe and doe

- Use in breeding season only
  - 2 injections of Lutalyse (15 mg) 9 days apart
  - No effect if ewe anestrus - No CL present
- Prostaglandin analogs used to synchronize estrus during the ovulatory season in sheep are:
  - Lutalyse (Dinoprost)– 15 mg at 9 to 11 day interval
  - Estrumate (Cloprostenol) 125-150 µg at 9 to 11 day interval. (12 day interval for doe)
- The mechanism of action of PGFα is to induce regression of CL found in cycling and pregnant ewes; therefore, it is completely ineffective in ewes without CL, such as anestruos and prepuberal ewes.

Prostaglandin method (PGF2α)

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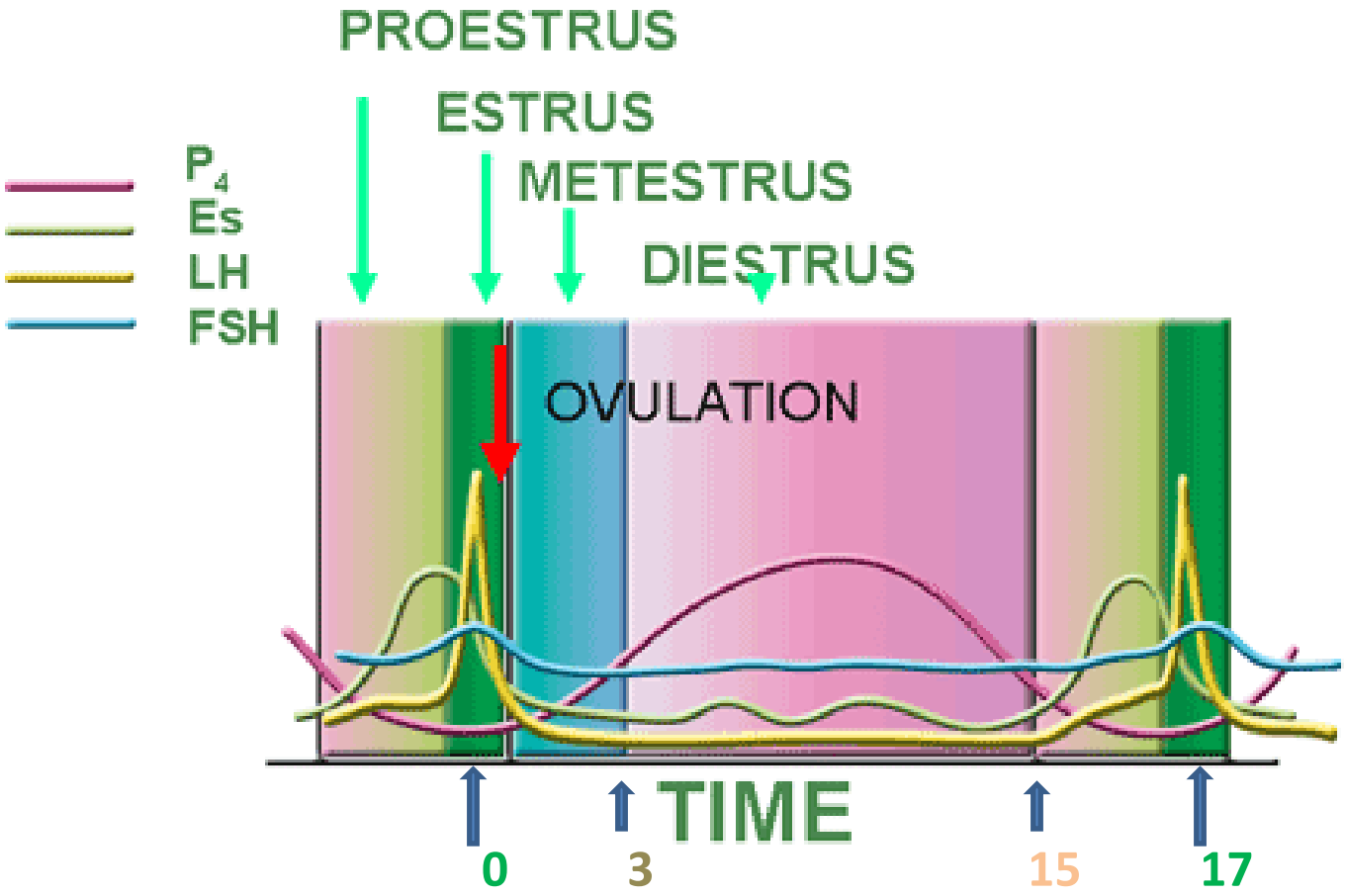
PHYSIOLOGICAL STAGES OF THE ESTROUS CYCLE



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Two injection method of PGFα for ewes

Cycle Days	First inj. 1/Jan.	3-4-5/Jan	Second inj. 10/Jan	12-14-16/ Jan
0-3	No response to hormone	No estrus	Day 10-13 of the cycle	Estrus & insemination
4-14	Responsive to hormone	Estrus & Ovulation	Day 6-7 of the cycle	Estrus & insemination
15-17	No response to hormone	No estrus	Day 7-10 of the cycle	Estrus & insemination

all will responsive to hormone treatment and will show estrus

Melatonin implants

- **DOSAGE AND ADMINISTRATION**
- Use by subcutaneous implantation only. Administer one implant to each ewe 30 to 40 Days before joining rams with the ewes.

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Use the ram effect

- Pre-requisites:
- Target a breed with females during the transition period
- Ewes/goats need to be away from the rams/bucks for at least a month
- The rams/bucks need to be prepared (light treatment/melatonin)

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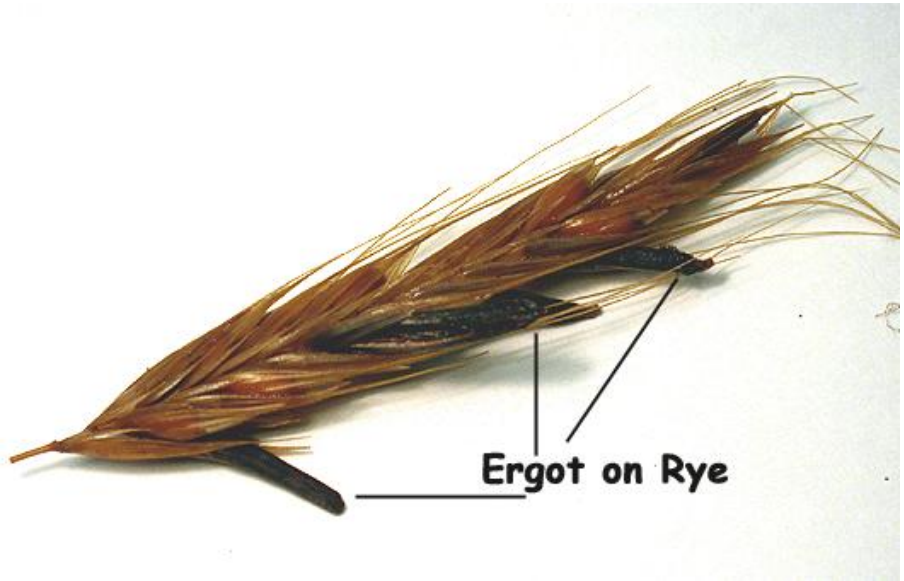
Nutritional abnormalities

- **1. Plant toxicity**: Ergot alkaloids and ergot.
  - The consumption of grains infected with the fungus *(Netyphodium coenophialum) is associated with decreased reproductive efficiency.*



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Nutritional abnormalities

- **2. Estrogen-producing plants**: How?
  - Sheep appear to be sensitive to the effects of phytoestrogen from plants such as subterranean clover and white clover.
  - Clinical signs associated with phytoestrogen consumption include
    - infertility,
    - irregular and prolonged heat cycles,
    - lowered conception rates,
    - early embryonic death,
    - vaginal prolapse,
    - cystic glandular hyperplasia of the cervix and the uterus,
    - dystocia and
    - uterine inertia also are observed.

- SUBTERRANEAN CLOVERS

ويمكن الحصول على الاستروجينات النباتية الفيتواستروجين (Phyto Estrogen)من بعض الخضار والفواكه والأعشاب مثل :
البروكلي وبذور الكتان والحمص والفول السوداني والعنب والتمر وعرق السوس والشومر واليانسون

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Nutritional abnormalities

- **3. Decreased Energy, mineral and vitamin intake:**
  - These include poor body condition, depressed energy intake and decreased mineral and vitamin intake, all suppress reproductive activity in ewes' results in
    - poor or weak signs of estrus,
    - depressed ovulation,
    - abnormal estrous cycle length,
    - delayed puberty and
    - irregular estrous cycle

ENVIRONMENTAL CAUSES:

- **Heat stress:**
  - depresses reproductive ability and
  - causes fetal wastage.
- **Clinical signs:** include
  - decreased fertility,
  - depressed signs of estrus,
  - high embryonic mortality during first 3 to 6 weeks of pregnancy.
- Other clinical signs include dullness, depression, rapid respiration, increase heart rate, hyperthermia, acid-base alterations and dehydration.
- **Treatment**:
  - Lowering body temperature with cold water submersion, ice application.
  - IV fluids should be administered and
  - place affected animals in shade.

II- STRUCTURAL CAUSES:

- Structural defects of the genital organs are **uncommon** in sheep theses include:
- 1. **Freemartin** condition is unlikely but incidences of 2.3 - 1.1 % have been recorded.
- 2**. Intersexuality is seen;** they are male pseudohermaphrodites.
- 3. **Occlusion of oviducts and hydrosalpinx** causes ovine infertility and sterility.
- 4. **Vaginitis**: Whenever either non parturient or parturient vaginitis is encountered in sheep
- **5. Ovarian tumors** are rarely reported in sheep. A granulosa cell tumor is the most common type of ovarian tumors occurring in ewes.
  - **Animals may exhibit nymphomania.**
  - **Ultrasonography reveals an enlarged ovary.**
  - **Treatment of such case is by ovariectomy**

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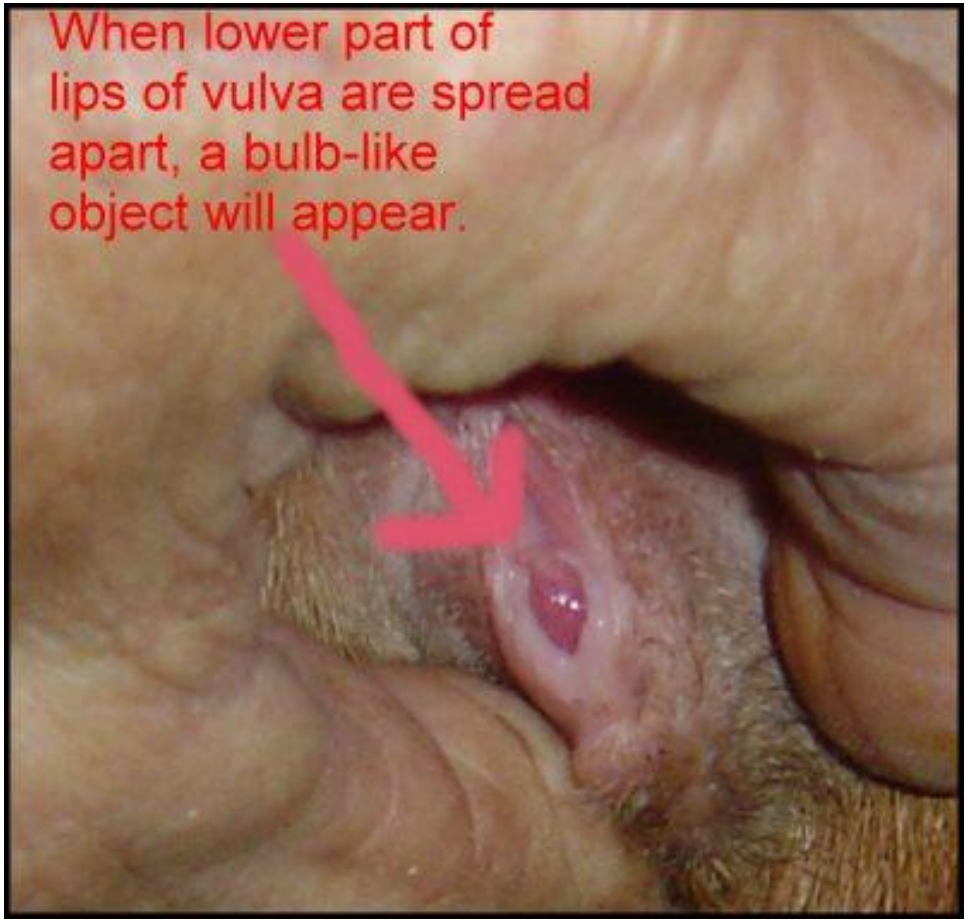

Intersexuality
Hermaphroditism

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Intersex Goat.

Close examination of the external genitalia showed this goat to be a hermaphrodite. It behaved like a buck, mounting does, and the hair on its neck stood up. Notice the absence of a prepuce.

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Intersex Genitalia.
Small vulva and a prominent, protruding, rudimentary penis. Intersexuality is more common in polled breeds.

Milking Buck Syndrome.
Lactation was triggered in this male goat (buck) as a result of a pituitary tumor leading to excessive production of prolactin. Not an intersex.

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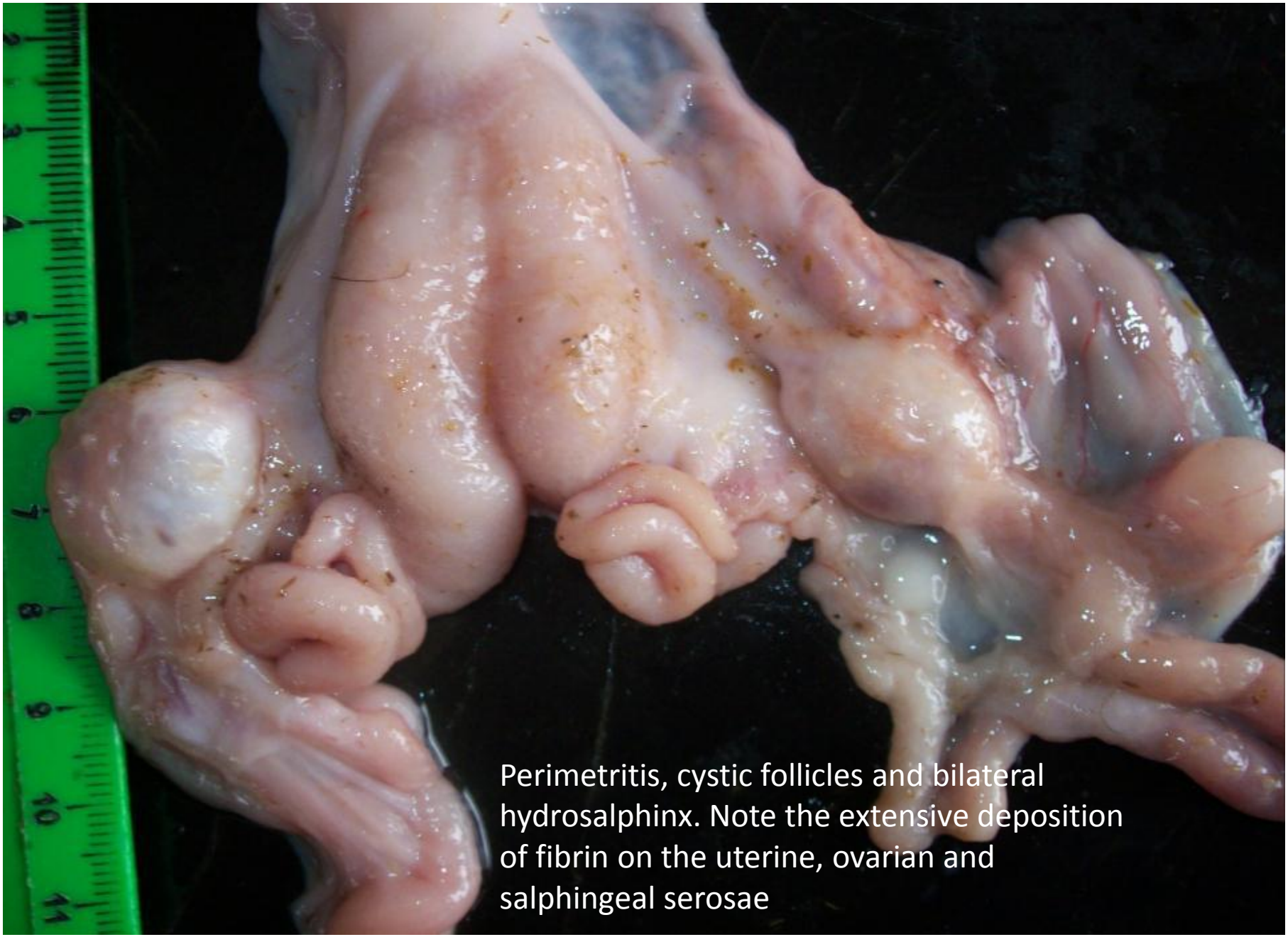
III- FUNCTIONAL CAUSES:

- 1. Anestrus and subestrus are uncommon in sheep
- 2. **Cystic ovarian disease**: cystic ovaries appear to be more common in goats than in sheep.
- The use of some super-ovulation protocols (PMSG),
  - possible phosphorus deficiency and
  - feeding of estrogenic compounds may be associated with the formation of cystic ovaries.
- Treatment with LH (750 to 1000 IU) or GnRH (50 to 100 µg) may be effective.



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Bilateral bursal cyst: There is bilateral accumulation of fluid in the ovarian bursa

Cystic ovarian disease: Cystic graffian follicle and uterine wall thickening. Inset is the close up of the incised ovarian cyst. The uterine mucosa had numerous pin point cysts

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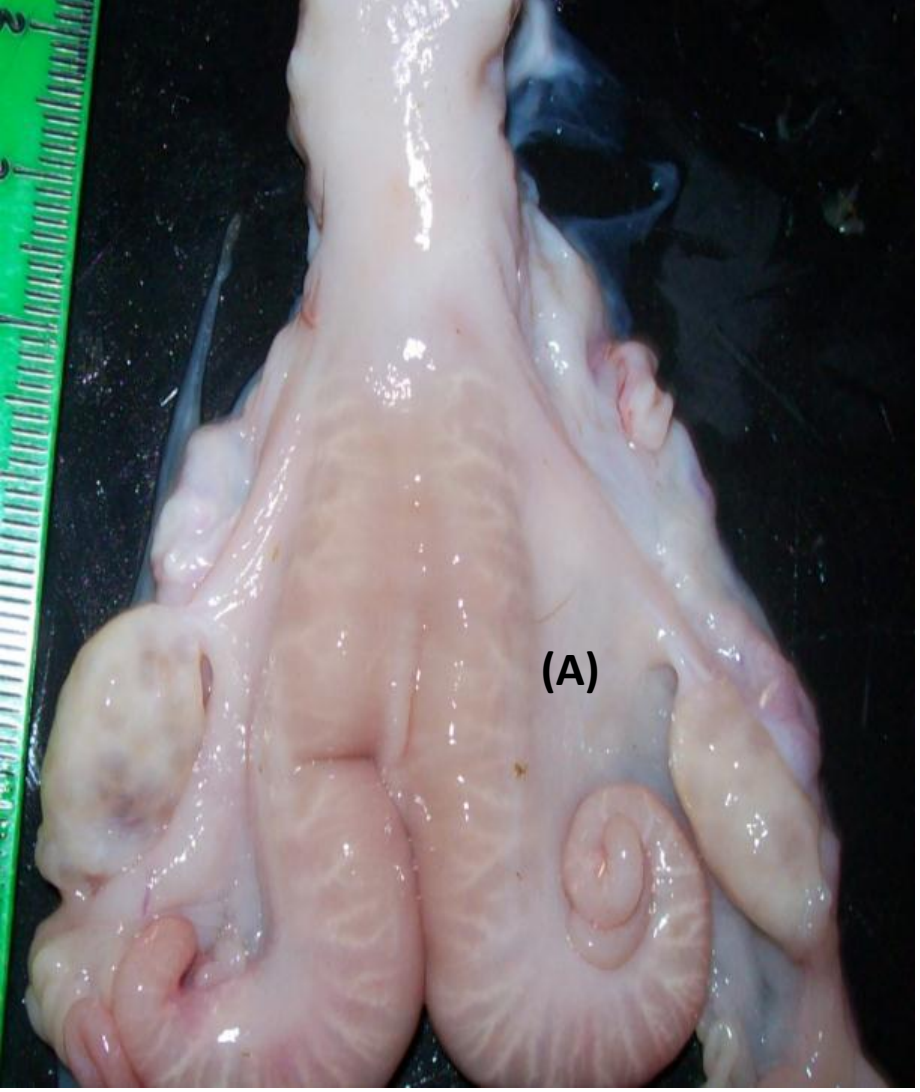

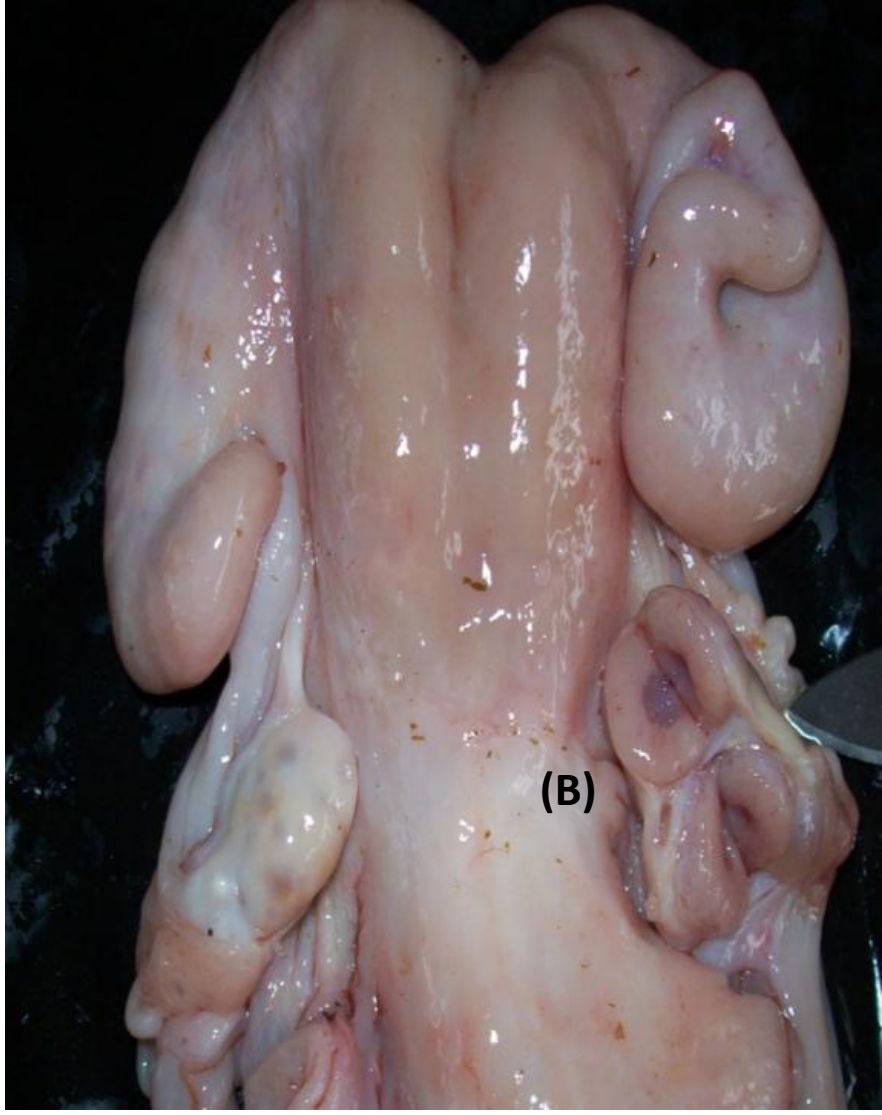

Inactive ovaries (A) and cystic corpora lutea (B)

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Granulosa thecal cell tumour of the left ovary and a cystic round structure attached on to the tumour (arrow). Note the general atrophy of the uterine horns.

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- **Ultrasonogram of Hydrometra.**
  Cloud burst or pseudo pregnancy. The ultrasonogram shows large fluid-filled compartments which are separated by thin tissue walls (trabeculae). There are no fetuses, nor placentomes. The compartments undulate when the doe moves, or when the abdomen is succussed.

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- Pyometra: Corpora lutea (arrows) are evident in the right ovary

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- **Mummy.**
  Totally inspissated, sterile mummy. The fetus died between three and four months of gestation

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