Ovarian cysts in the cow

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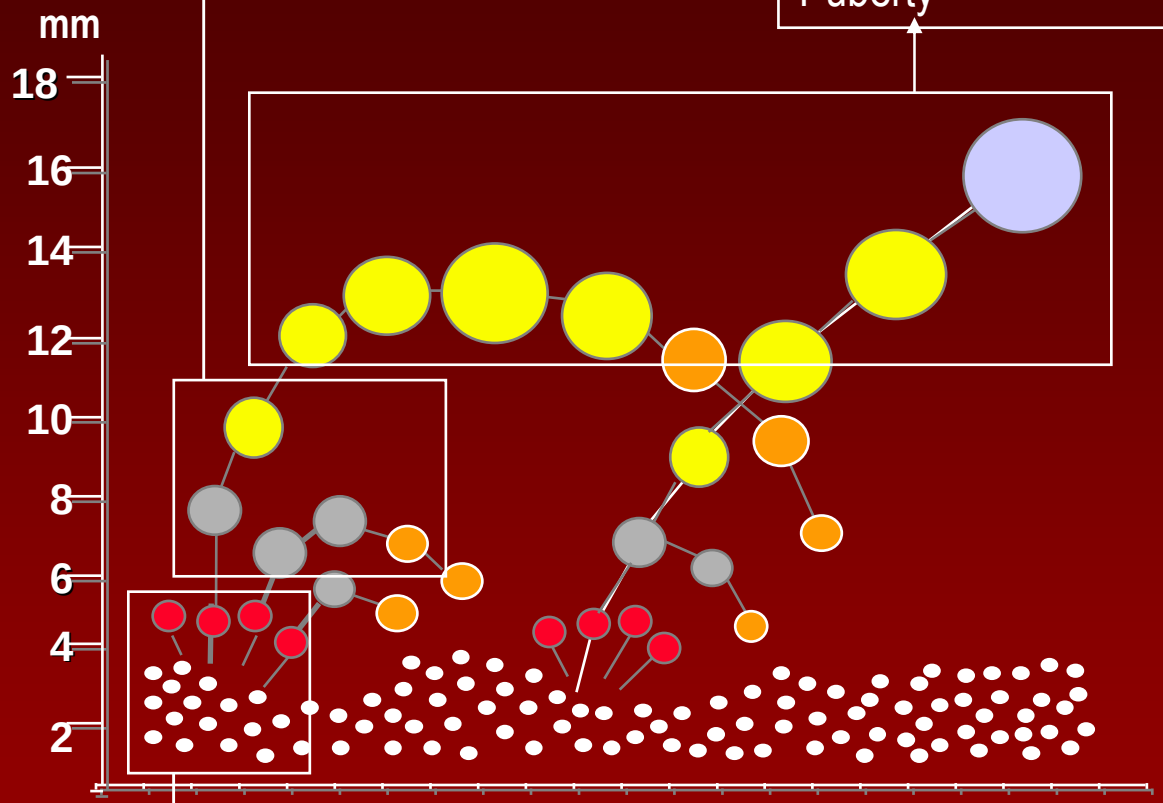
- Frequency
- Diagnosis
- Etio-pathogeny
- Treatment
- Conclusions

Definition

Reproduction periods and anovulation

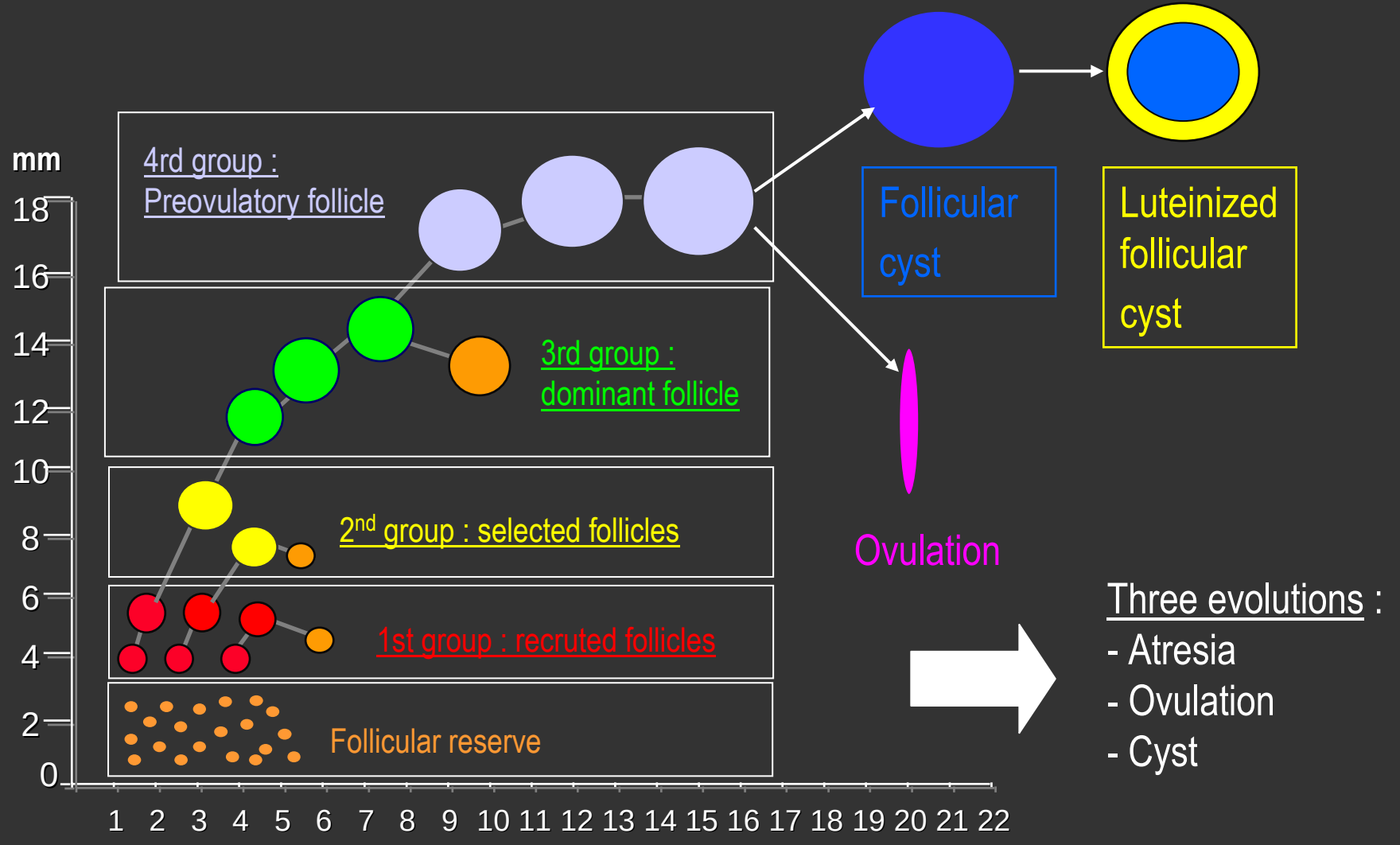
Growth phase :
puberty, pregnancy, postpartum

Preovulatory phase
Post-partum
Reproduction period
Puberty



Recruitment phase :
prepuberty, postpartum

Cyst = abnormal follicular growth



So, the cyst is an abnormal ovarian structure …

- In 30 to 40 % of cases : cyst coexists with a CL

1. Absence of corpus luteum

- Duration of dominance : 5 to 6 days

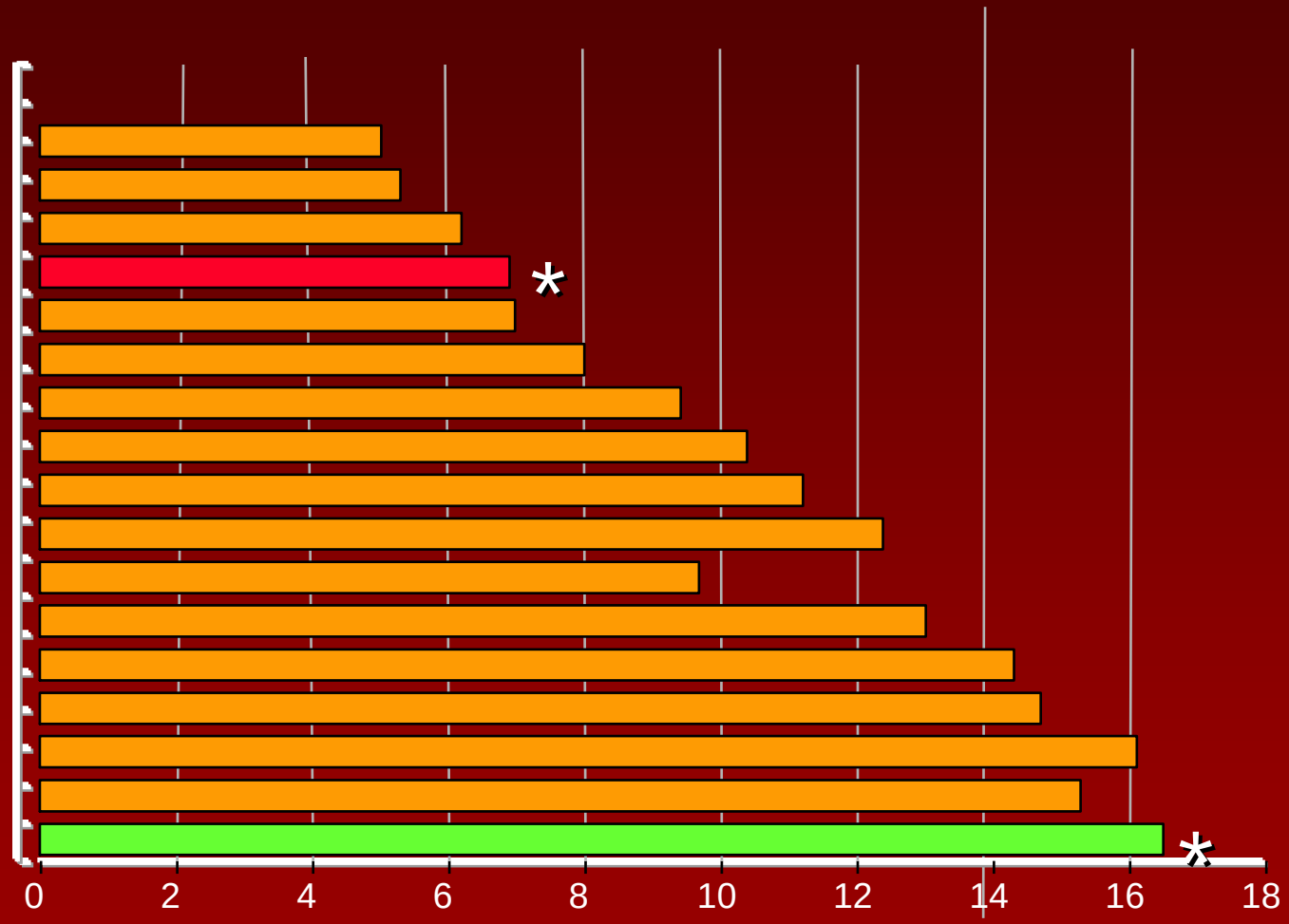
2. More than 1 week

- In the cow, ovulation between 13 to 19 mm

3. Diameter more than 20 to 24 mm

Frequency

Frequency of ovarian cysts amongst different studies (1974 to 1994)



Frequency of ovarian cysts

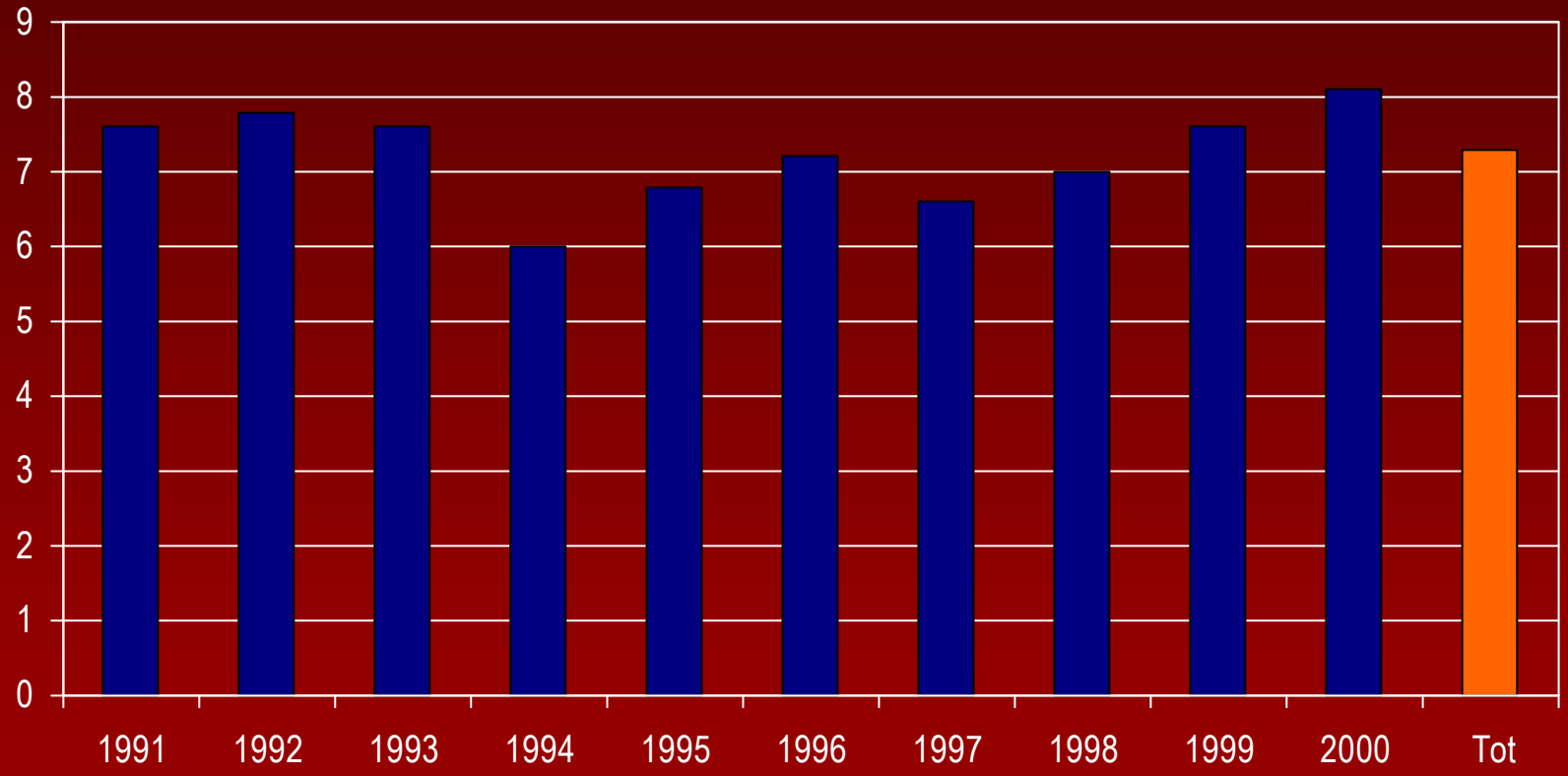
- Fourichon et al., 2000 : meta-analysis (20.000 cows in 196 dairy herds) : 12 % (3 to 29 %)
- Lubbers 1998 (Holland) : 12.626 lactations during 10 years in 39 herds 7,2 % (1,9 to 11,3 % amongst herds)
- Erb et Martin, 1980 and Kinsel et Etherington, 1998 (Canada) 24.356 lactations : 9,3 %

→ More than 10 % : herd problem

Evolution with time

Lopez-Gatius et al. Is fertility declining in dairy cattle ? A retrospective study in northeastern Spain *Theriogenology*, 2003, **60**, 89-99.

4 dairy farms



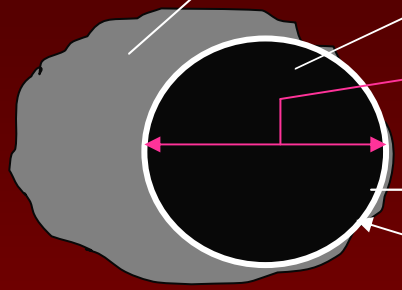
Diagnosis

- Manual palpation
- Ultrasonography
- Hormones
- Ethology

Manual / US diagnosis

Ovary

Follicular cyst



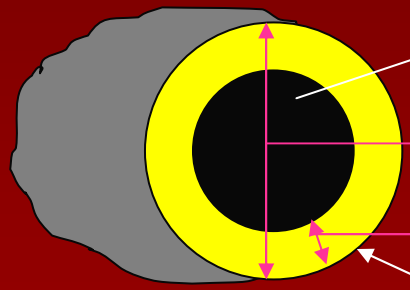
Cavity anechogenous

Diameter : 31 ± 4 mm to 33 ± 7 mm
(if > 24 mm : Hanzen and Bascon 2007)

Thin wall (< 3 mm)

Easily depressed

Luteinized cyst



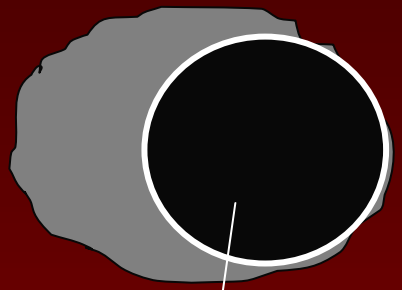
Cavity less large (24 to 49 mm)
and anechogenous

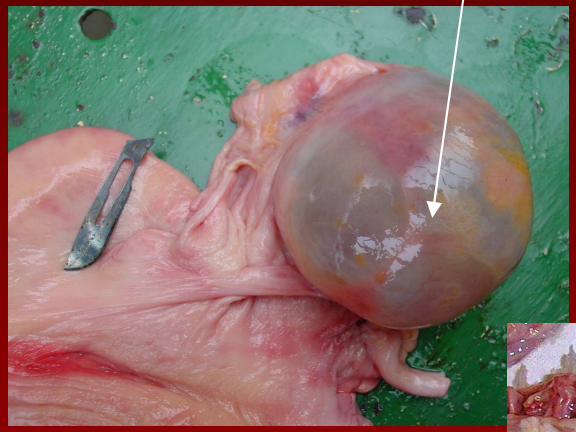
Diameter : 35 ± 7 mm to 39 ± 9 mm
(if > 24 mm : Hanzen and Bascon 2007

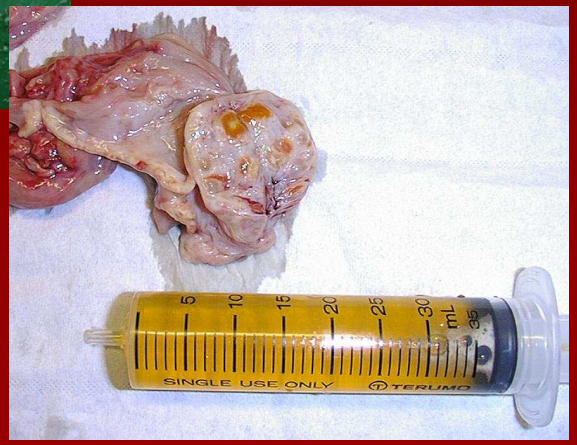
Thick wall (3 to 9 mm)

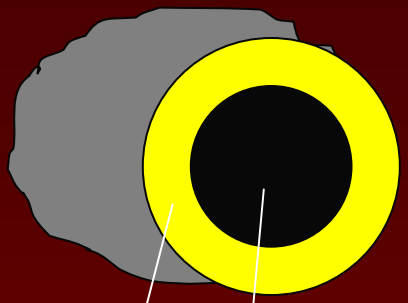
Less easily depressed

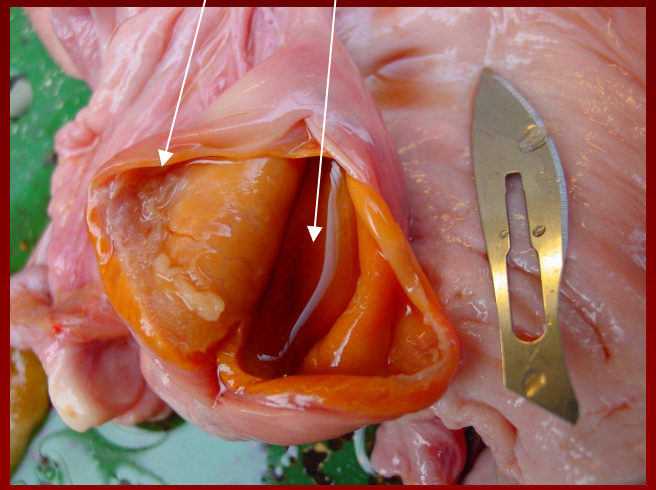
Caracteristics of cysts



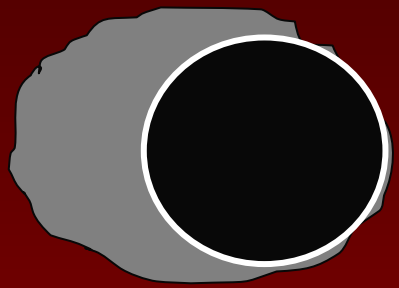


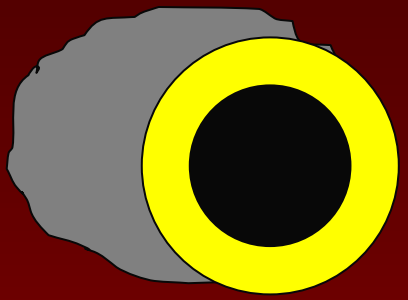


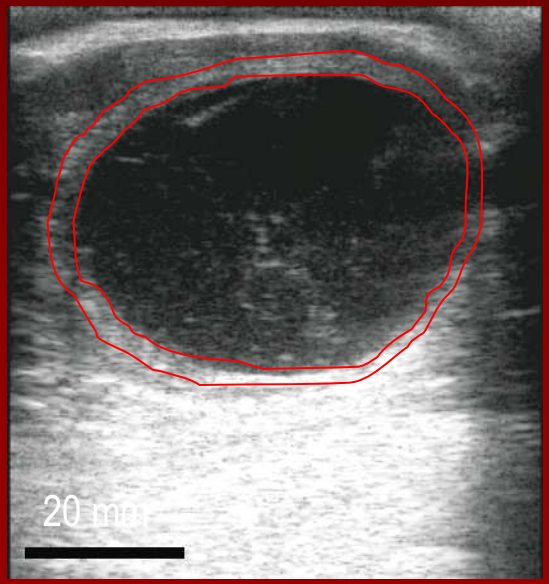


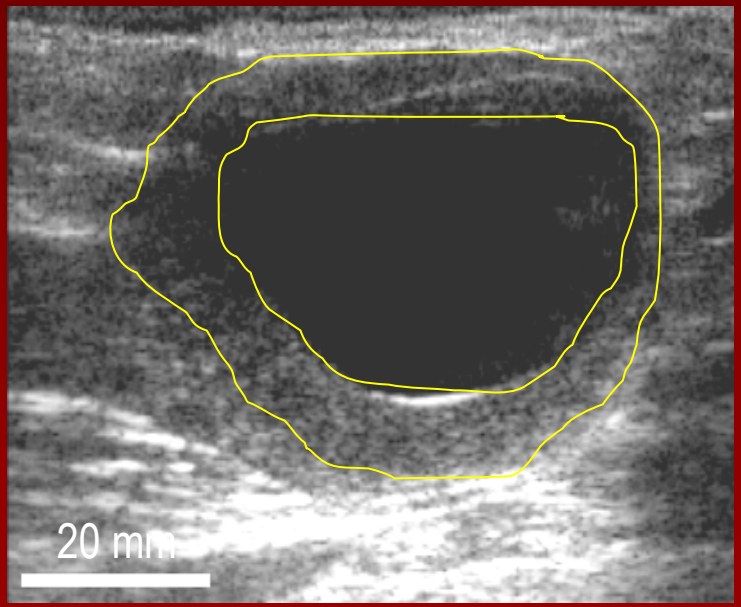


Caracteristics of cysts (ultrasonography)

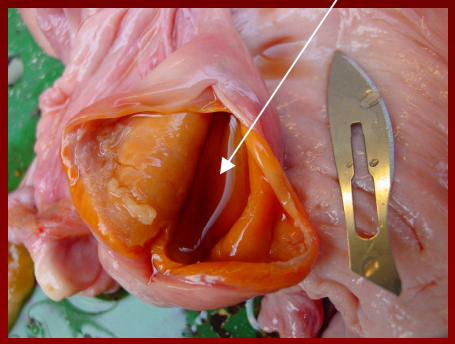


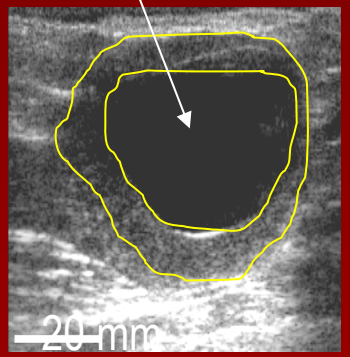


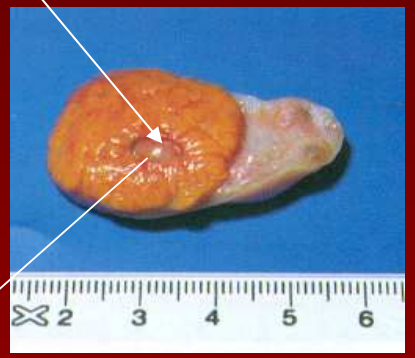


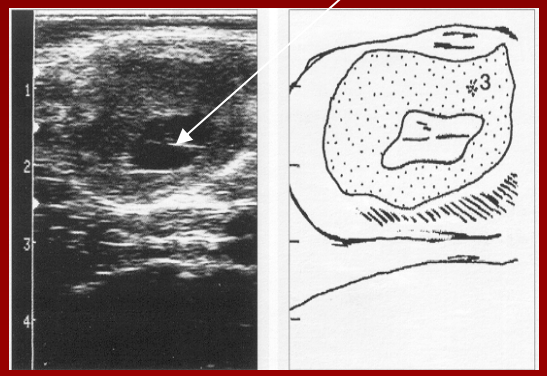


Luteinized cyst an corpus luteum with cavity



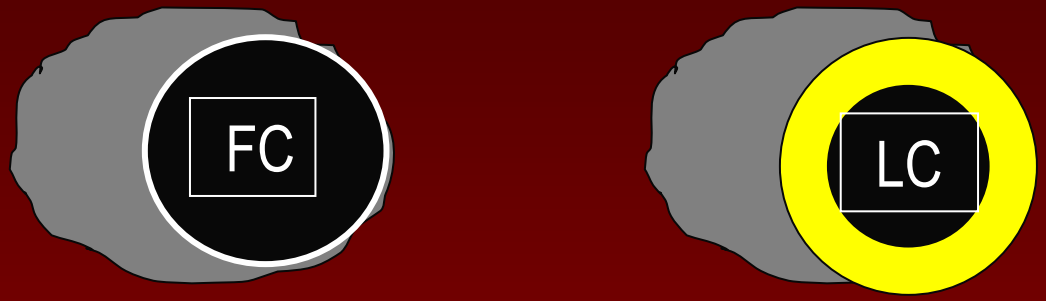






Diagnosis (hormones)

> 0,5 or 1 ng/ml



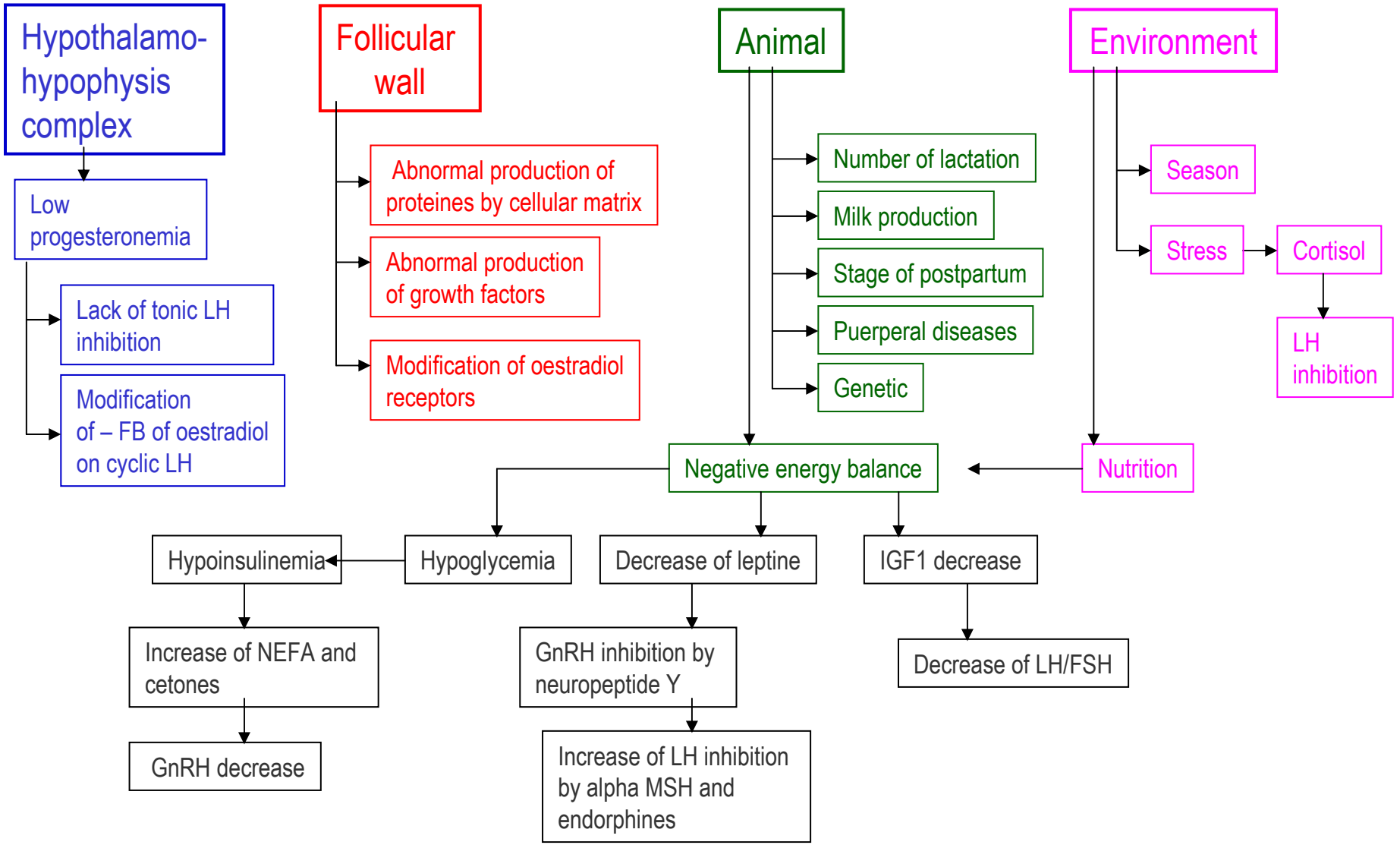
Progestérone	low : 0,13 et 2,1 ng/ml	« high » : 1,08 et 10,4 ng/ml
Oestradiol	low or high	low

→ Anoestrus or nymphomania

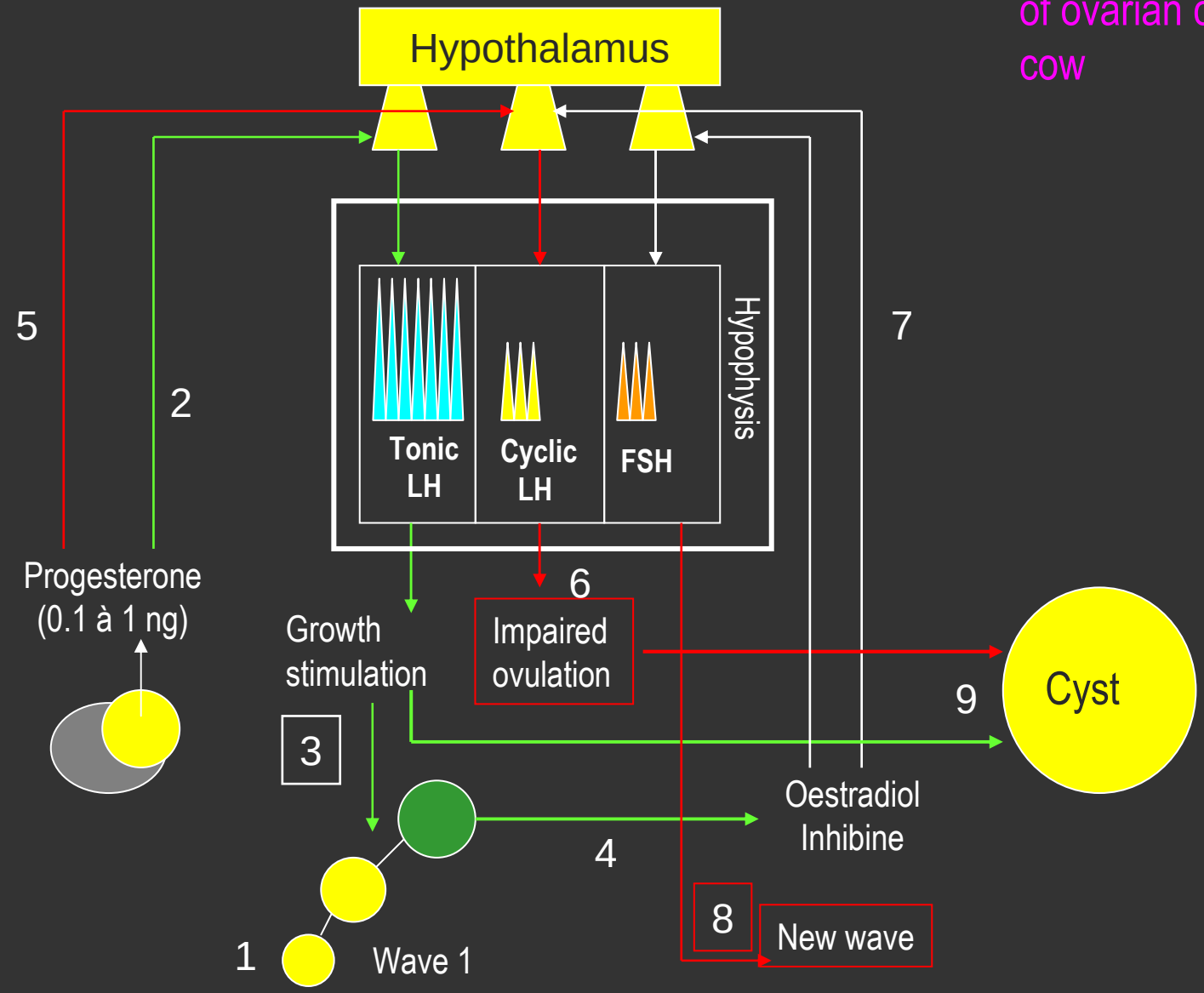
Courtesy Prof Badinand ENV Lyon

Etio-pathogeny

Risks factors of ovarian cysts and their interrelationships in the cow

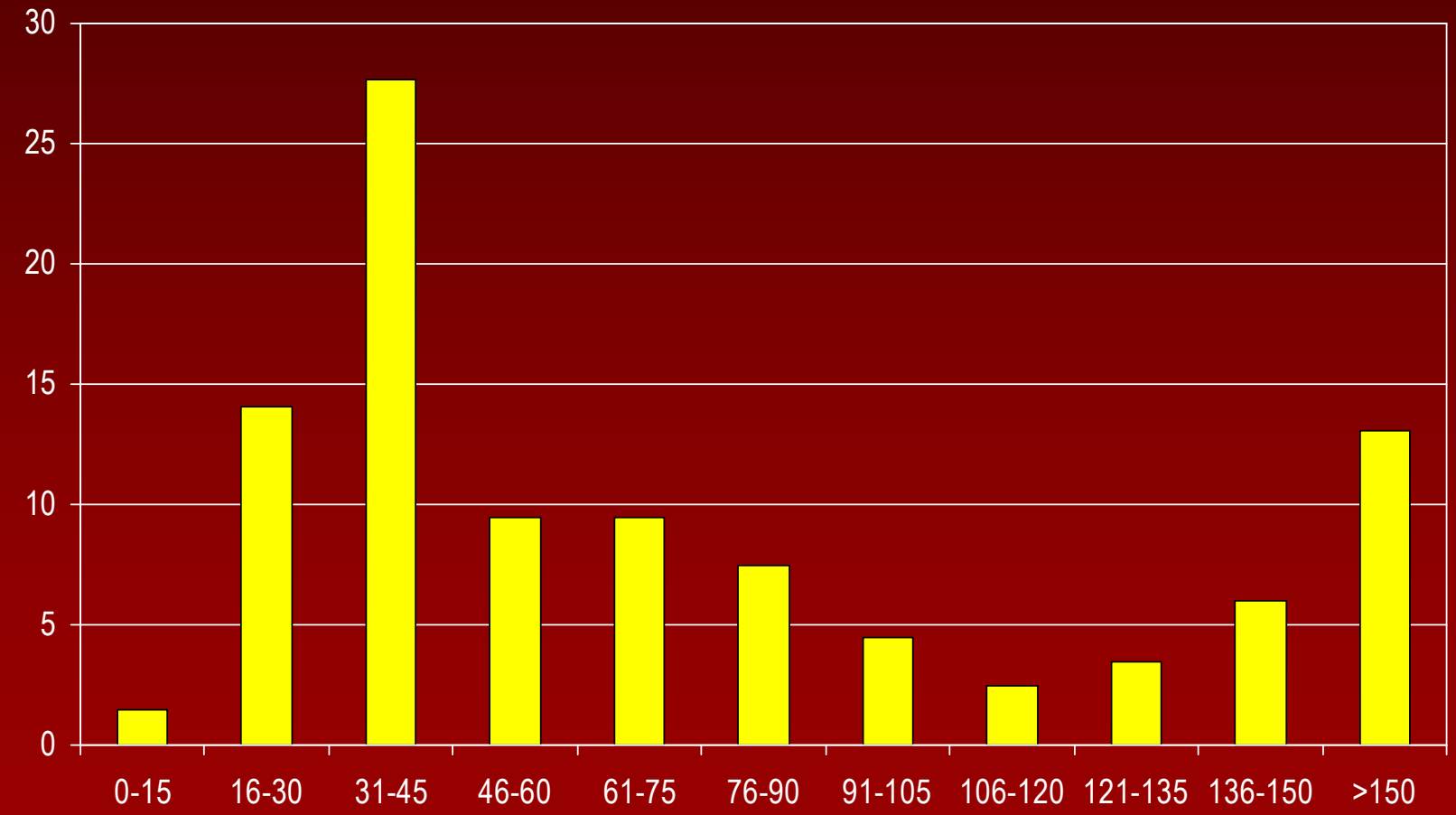


Hormonal pathogeny of ovarian cyst in the cow



Frequency (%) of cysts according to stage of postpartum (days)

(Whitmore et al. 1974, Wiltbank et al. 1953, Whitmore et al. 1979, Erb et White 1981, Kirk et al. 1982)



Treatments

- To treat or not to treat ?
- Preventive treatments
- Non hormonal curative treatments
- Hormonal curative treatments
    - individual approach
    - hormonal associations

To treat or not to treat : that' the question

- Stage of the postpartum period
  - Lenght of the waiting period decided
  - Diagnosis during the reproduction period
- Spontaneous regression of cysts
  - 28 to 80 % before d60 of postpartum
- Accuracy level of the diagnosis : follicular vs luteinized
- Efficacy of the treatment : different parameters
  - Interval treatment-pregnancy
  - Fertility index after treatment
- Cost of the treatment
- Preventive or curative treatment

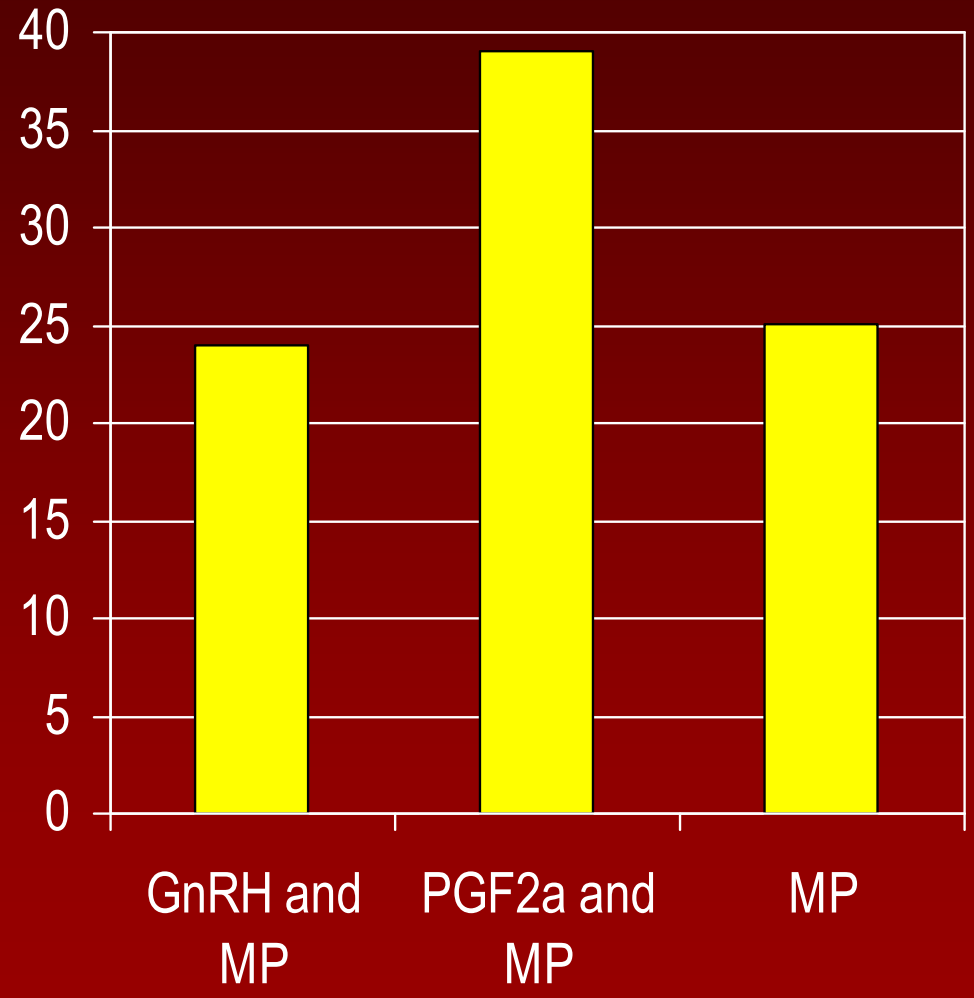
Preventive treatments

- Association of GnRH and PGF2a (10d apart) at d15 postcalving
- Decrease the frequence of placental retention, endometritis, lameness
- Regular control of the BCS to prevent a NEB
- Genetic selection ?

Non hormonal curative treatments : manual rupture

Lopez-Gatius personal communication

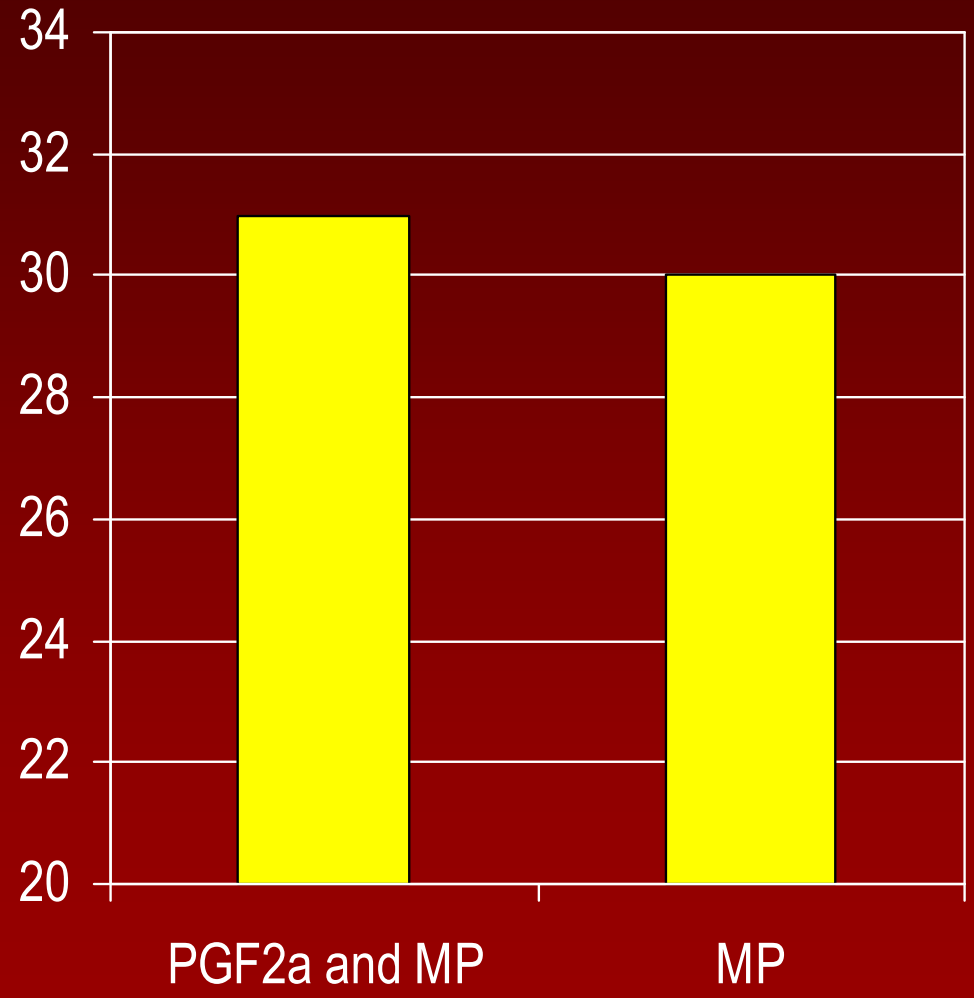
Effect of manual rupture of a cyst on the oestrus return rate in the 14 days after treatment (388 dairy cows)



Non hormonal curative treatments : manual rupture

Lopez-Gatius personnal communication

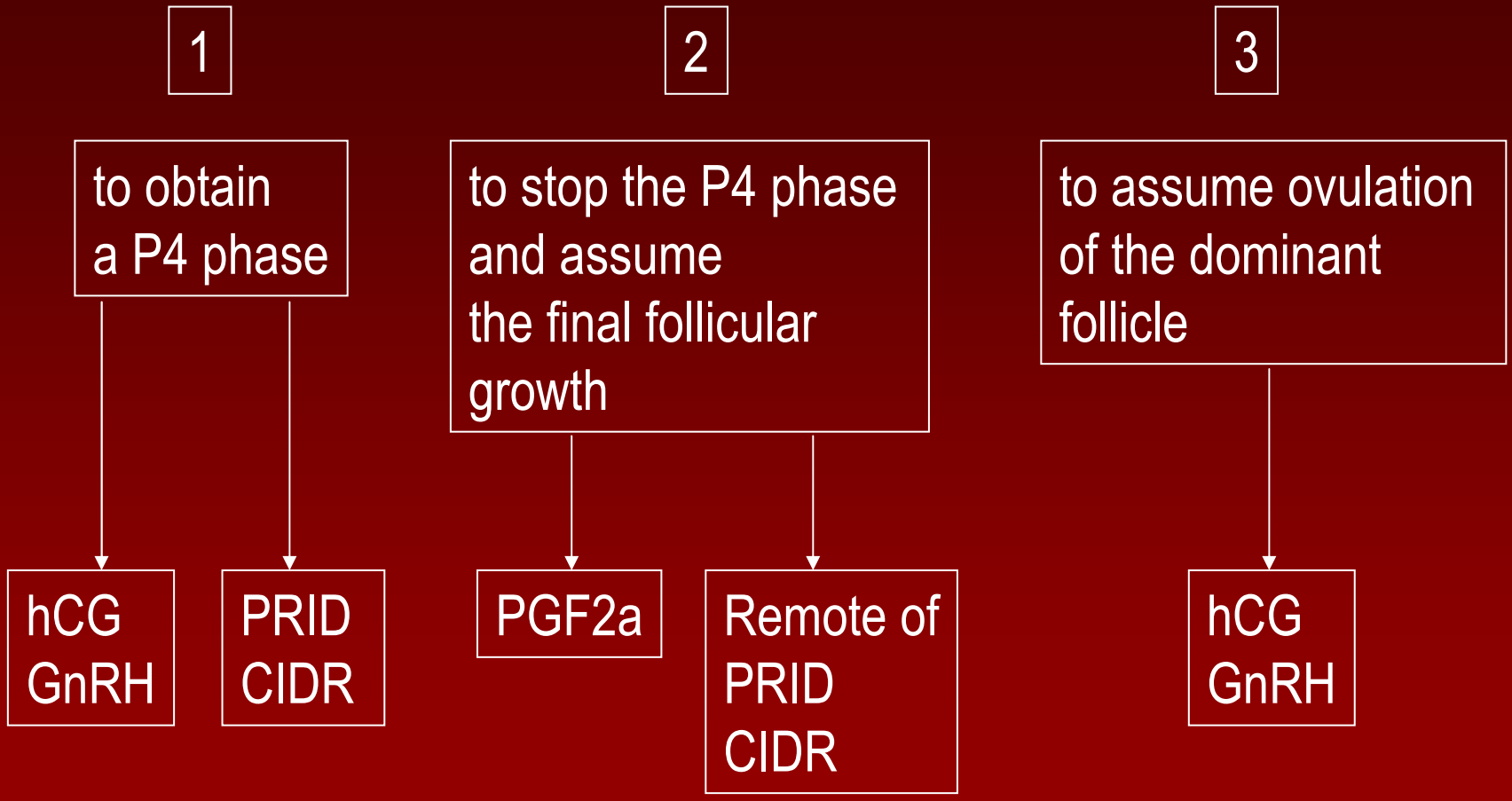
- Effect of manual rupture of a cyst on the pregnancy rate at first AI after treatment (10.634 lactations)
- Oestrus observed 6,8 days after treatment in 36 % of cows



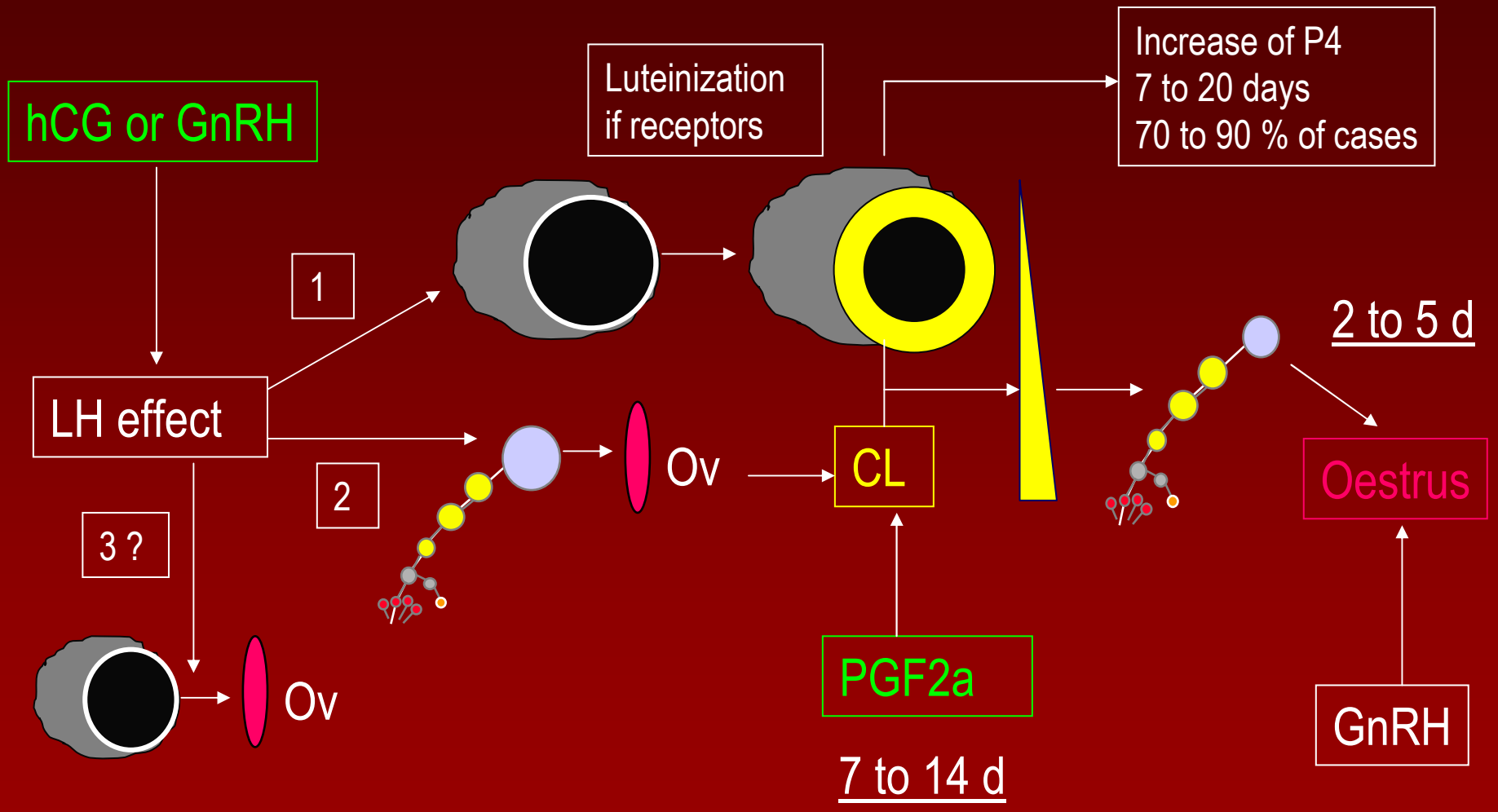
Hormonal curative treatments : general objective

To obtain as soon as possible a new follicular growth with expulsion of a mature oocyte

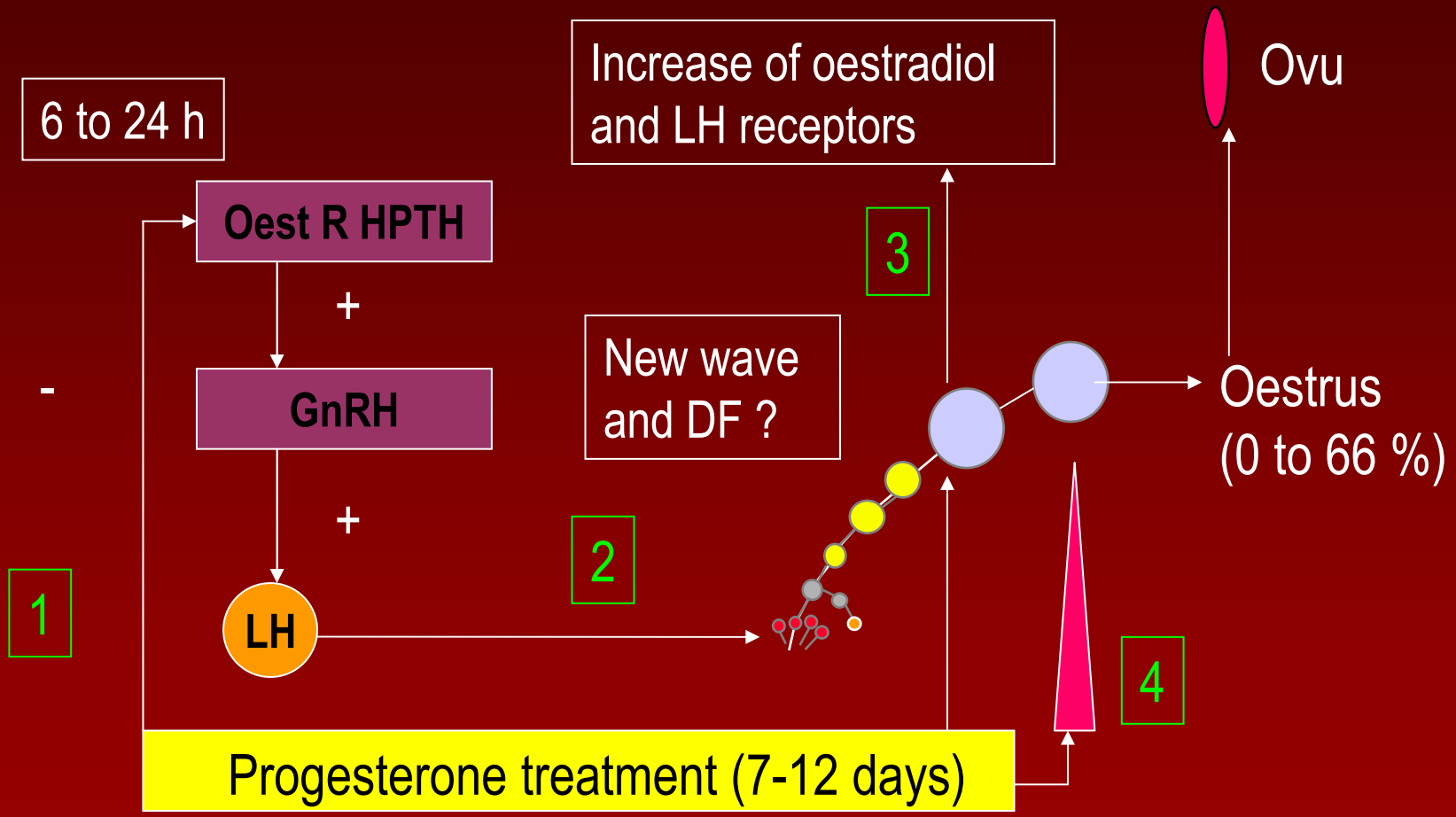
Hormonal curative treatments : three steps



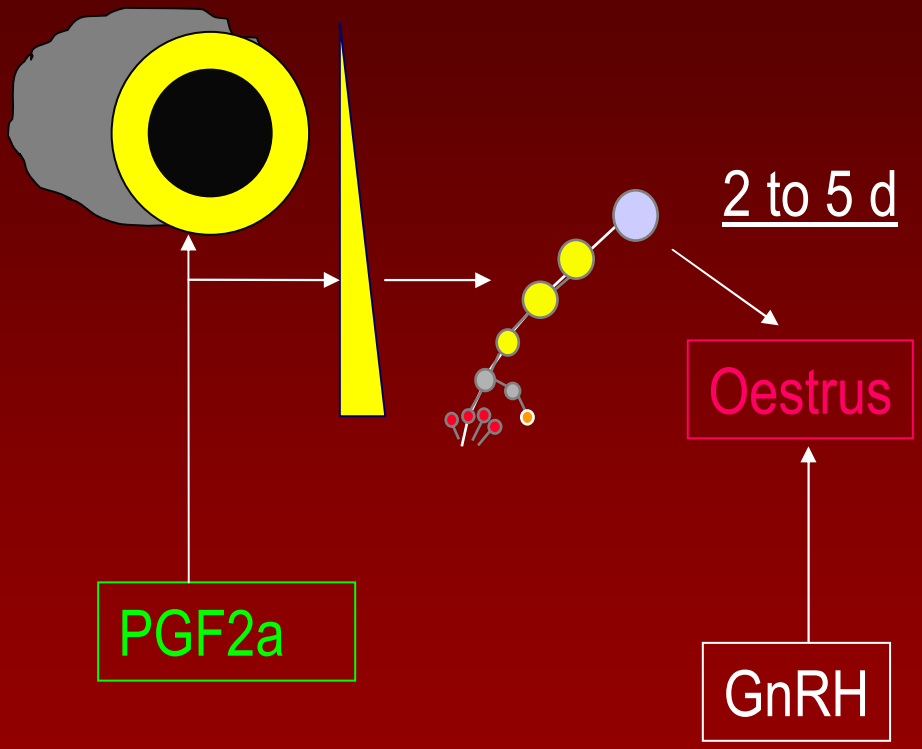
Hormonal treatment steps of a follicular cyst
Endogenous synthesis of P4



Hormonal treatment steps of a follicular cyst
Effect of an exogenous administration of P4



Hormonal treatment steps of a luteinized cyst



Hormonal associations

Justifications :

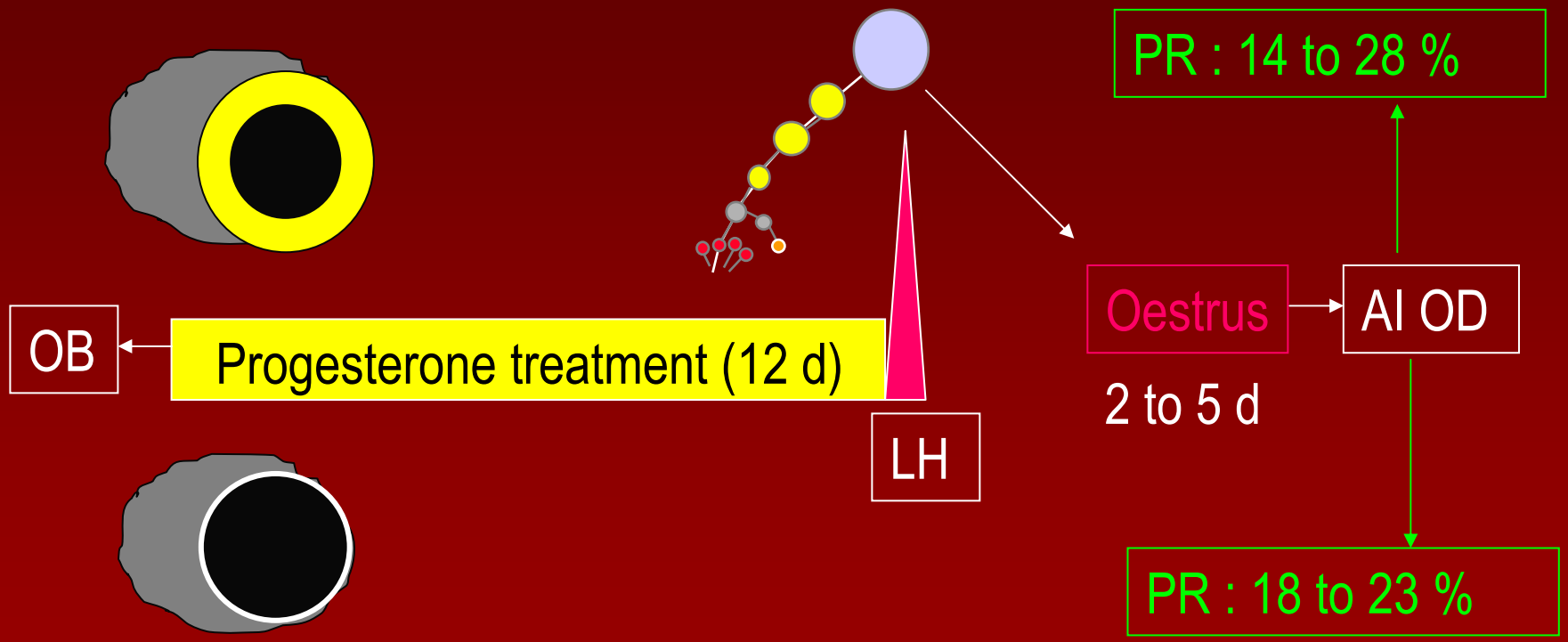
- difficulty to make a differential diagnosis between cysts ?
- decrease time between treatment and pregnancy ?

Some hormonal associations

1. hCG or GnRH (d0) – PGF2a (d7 or d14)
2. GnRH and PGF2a (d0) – PGF2a (d14)
3. hCG (d0) – PGF2a (d7 to d12) – GnRH (d9 to d14)
4. hCG or GnRH(d0) – Progesterone (d7 to d14 or d16) – PGF2a (d14 or d16) – GnRH (d16 or d18)
5. Ovsynch : GnRH (d0) – PGF (d7) – GnRH (d9)

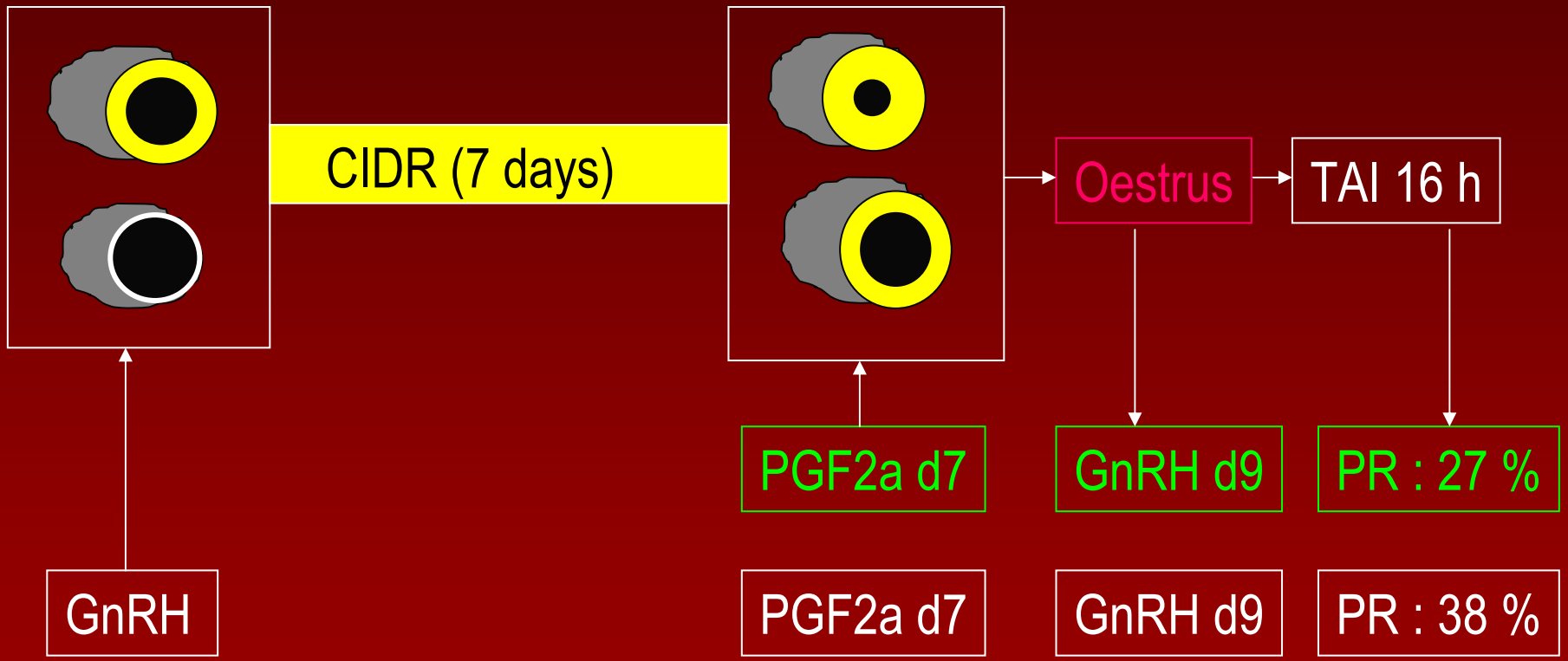
Hormonal association : Progesterone with OB

Zulu et al. *J. Vet. Med. Sci.*, 2003, 65, 57.
Douthwaite et Dobson *Vet Rec.* 2000, 147, 355

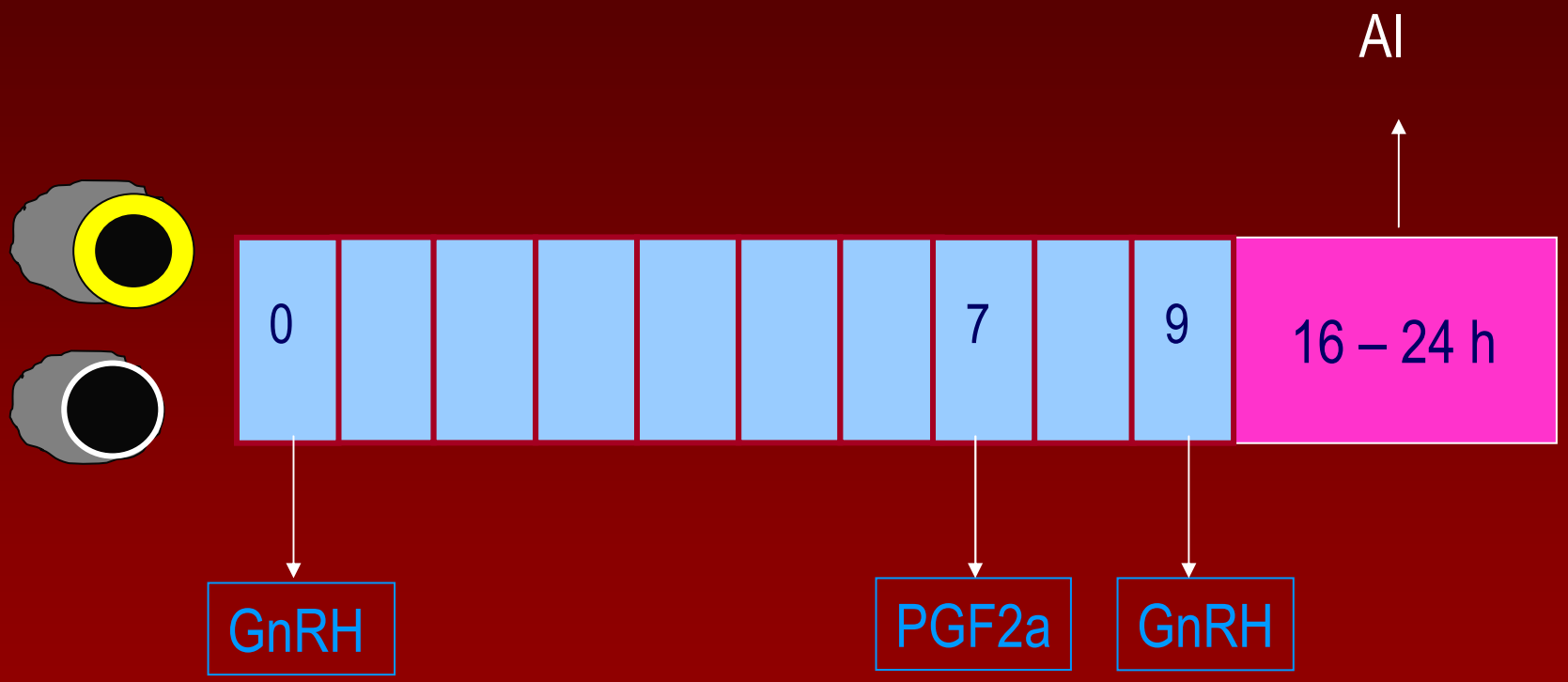


Hormonal association : GnRH-progesterone-PGF-GnRH

Bartolome *et al*. *Theriogenology,* 2005,63,1643-1658.



Hormonal association : GnRH-PGF-GnRH (Ovsynch)



Bibliography : Ovsynch and treatment of ovarian cysts

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2. Lopez-Gatius et Lopez-Bejar. Theriogenology, 2002, 58, 1337-1348
3. Bartolome et al. Theriogenology, 2003, 59, 1991-1997
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6. Crane et al. Theriogenology, 2006, 65, 1563-1574
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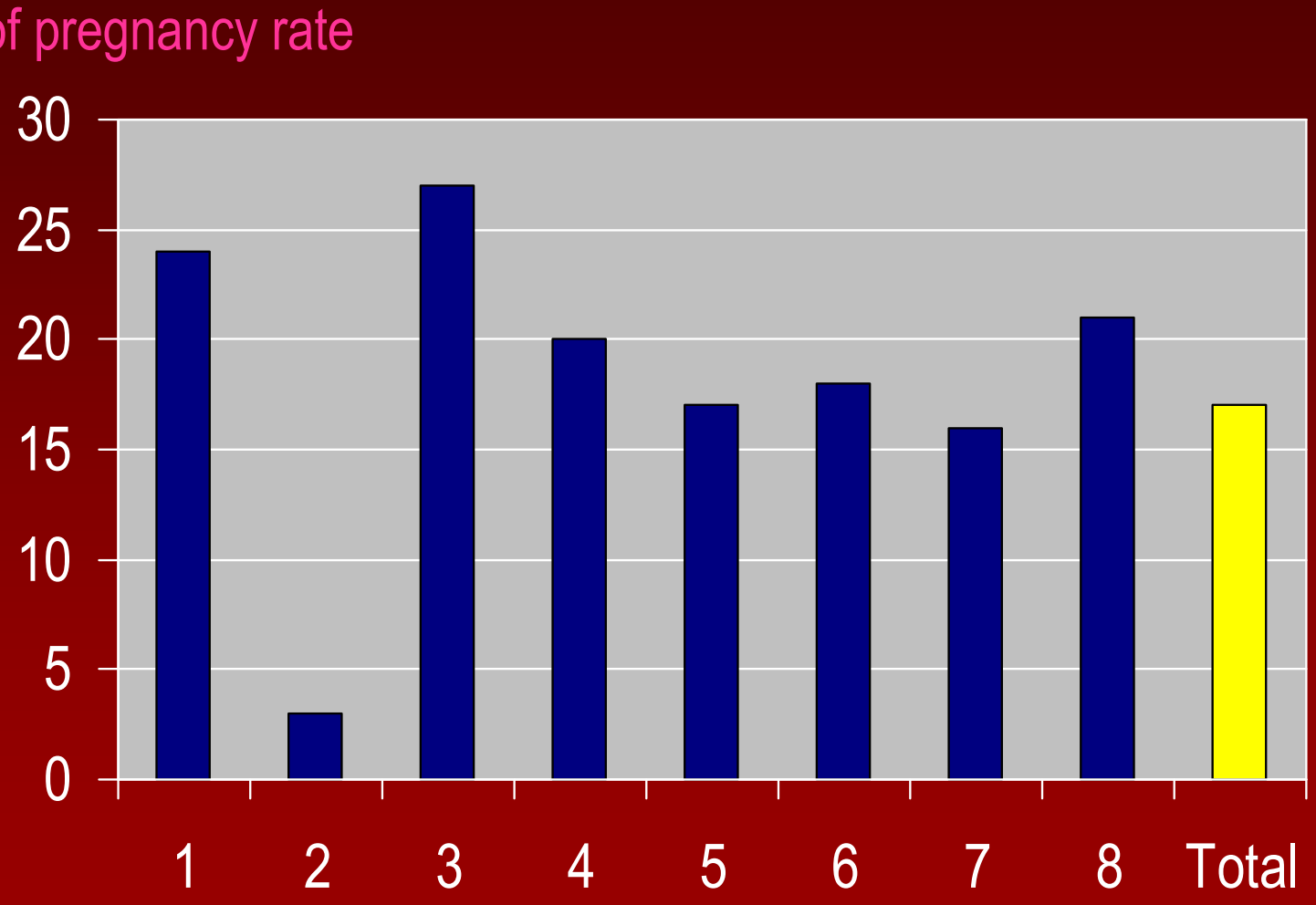
8. De Rensis et al. Theriogenology, 2008, 69: 481-484.

Ovsynch and treatment of ovarian cysts (8 studies and 792 cases of cysts between year 2000 and 2008)



Comparison of hormonal treatments of cysts (Hanzen et al. 2008)

Treatment	N	PR (%)
PRID (12d) + OB	63	14 to 28
GnRH (J0)-PGF(J14)	62	8 to 16
GnRH-PGF (J0)-PGF(J14)	65	22 to 36
OVSYNCH	791	17
GnRH(J0)-Ovsynch(J8)	89	30

Comparison of hormonal treatments of cysts (Hanzen et al. 2008)

Treatment	N	PR/CR (%)
PRID (12d) + OB	63	14 to 28
GnRH (J0)-PGF(J14)	62	8 to 16
GnRH-PGF (J0)-PGF(J14)	65	22 to 36
OVSYNCH	791	17
CIDR 7J-PGFJ7	82	23 (CR)
CIDR(J0-J7)-PGF(J7)-GnRH(J9)	11	27

Conclusions : to take home

1. Accuracy of ultrasonography diagnosis (> 24 mm)
   → Importance of correct diagnosis for quantification
2. Herd problem if > 10 %
   → Importance of HHM system
3. Impact of NEB in dairy cows and postpartum diseases
   → Importance of preventive approach
4. Poor results of hormonal therapy
   → Importance of quality and time of diagnosis