

# **Fall Lambing: Overcoming Seasonality of the Ewe**

**by**

**Erin Windorski**

# Questions for Today

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- 1) Why do we see seasonal reproductive activity in the ewe?**
- 3) What are the advantages of overcoming seasonal reproduction in the ewe?**
- 5) What methods can be used to overcome seasonal reproduction in the ewe?**

# Questions for Today

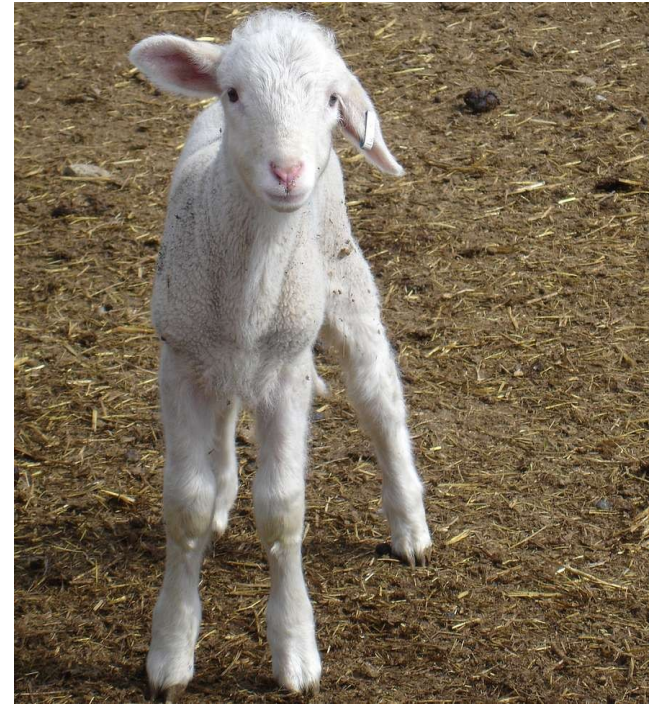
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- 1) Why do we see seasonal reproductive activity in the ewe?**
  - What are the advantages of overcoming seasonal reproduction in the ewe?**
  - What methods can be used to overcome seasonal reproduction in the ewe?**

# Why do we see seasonal reproductive activity in the ewe?

**Two main factors:**

**2) Climate**

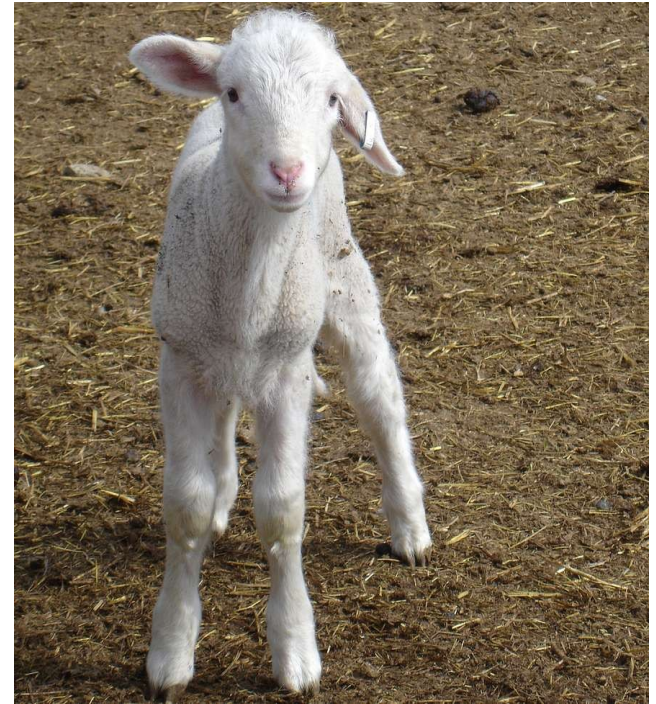


# Why do we see seasonal reproductive activity in the ewe?

**Two main factors:**

## **2) Climate**

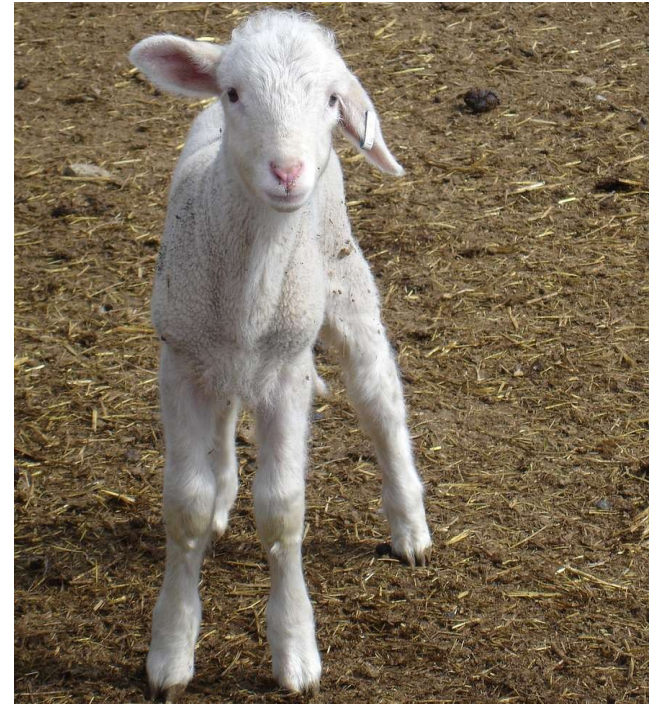
- **Sheep in a temperate climate with cold winter and warm summer tend to be more seasonal. It is natural for the sheep to lamb when the food is plentiful in the spring.**



# Why do we see seasonal reproductive activity in the ewe?

## Two main factors:

- **Climate**
- **Day Length**



# Seasonal Breeding Cycle in Sheep



Summer

Decreasing Day Length



Fall



Winter

Increasing Day Length



Spring



Summer



Anovulatory



Breeding



Pregnancy



Lambing



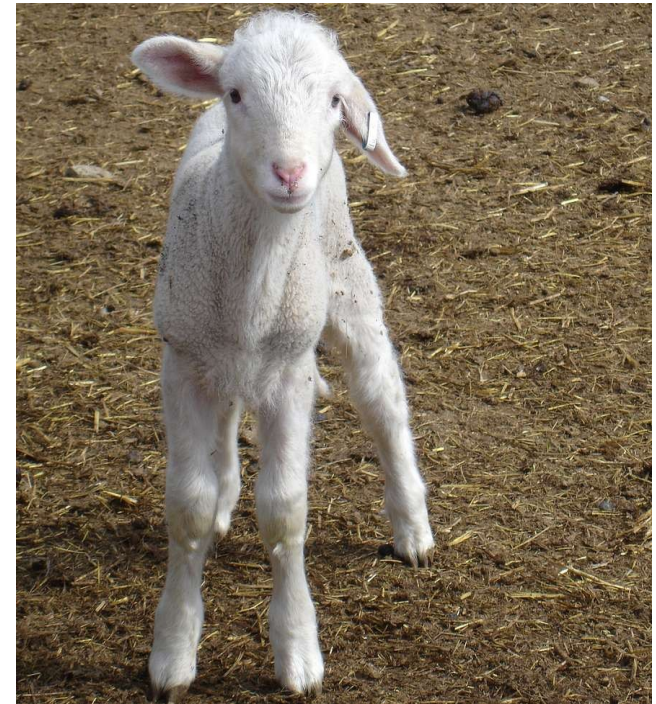
Anovulatory

Geisert, 1999

# Why are sheep seasonal breeders?

## Two main factors:

- **Climate**
- **Day Length**
  - **The reaction between the amount of light and the amount of melatonin produced**

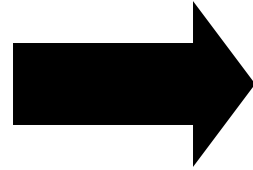




# Day Length



**Decreasing  
Daylight**

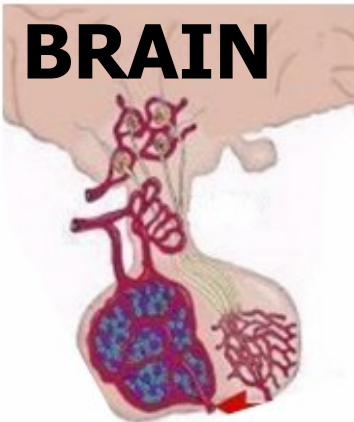


**Melatonin  
Production**

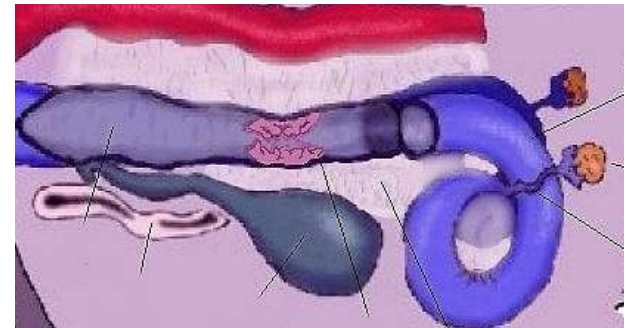


**STIMUALTION**

**BRAIN**



**COMMUNICATION  
VIA HORMONES**



**REPRODUCTIVE TRACT**

# Day Length

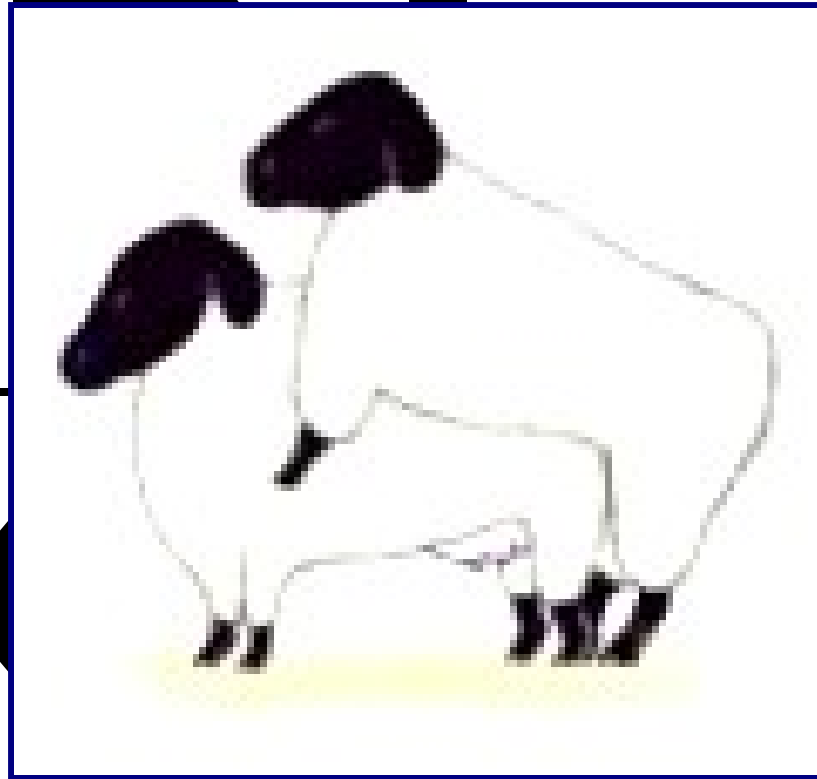


Decreasing  
Daylight

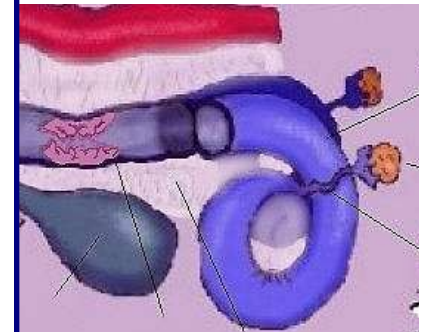
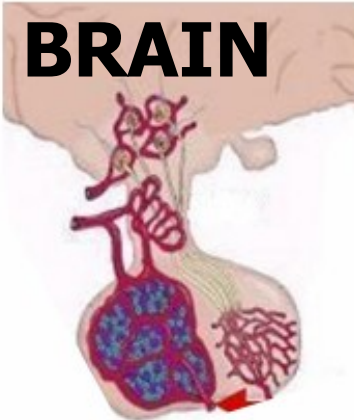
Melatonin

tion

MUALTION



BRAIN

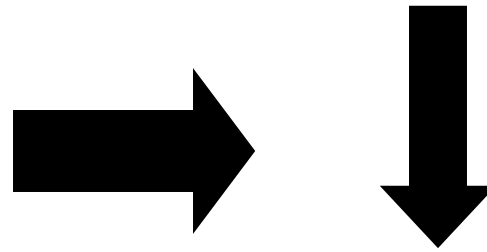


REPRODUCTIVE TRACT

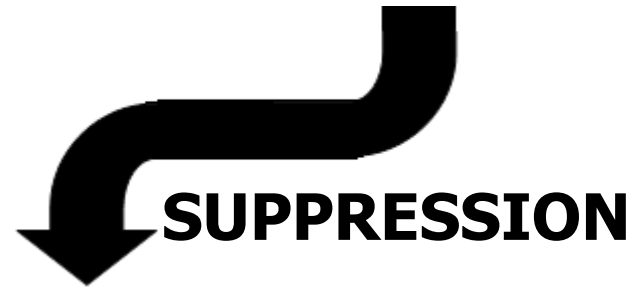
# Day Length



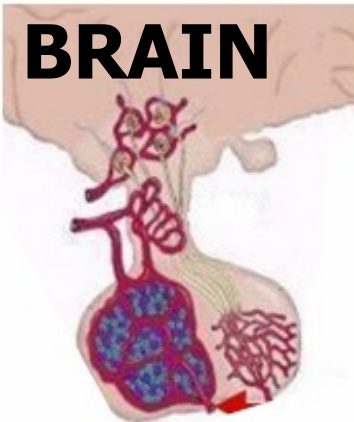
**Increasing  
Daylight**



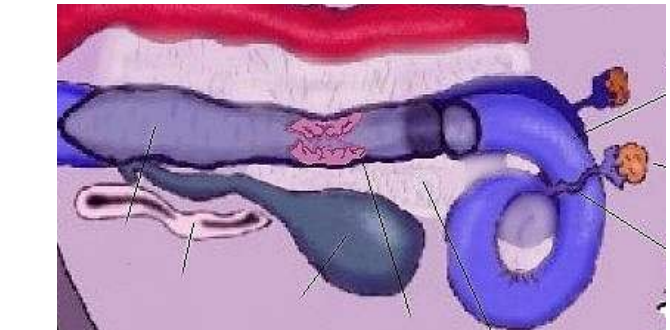
**Melatonin  
Production**



**BRAIN**



**COMMUNICATION  
VIA HORMONES**



**REPRODUCTIVE TRACT**

# Day Length

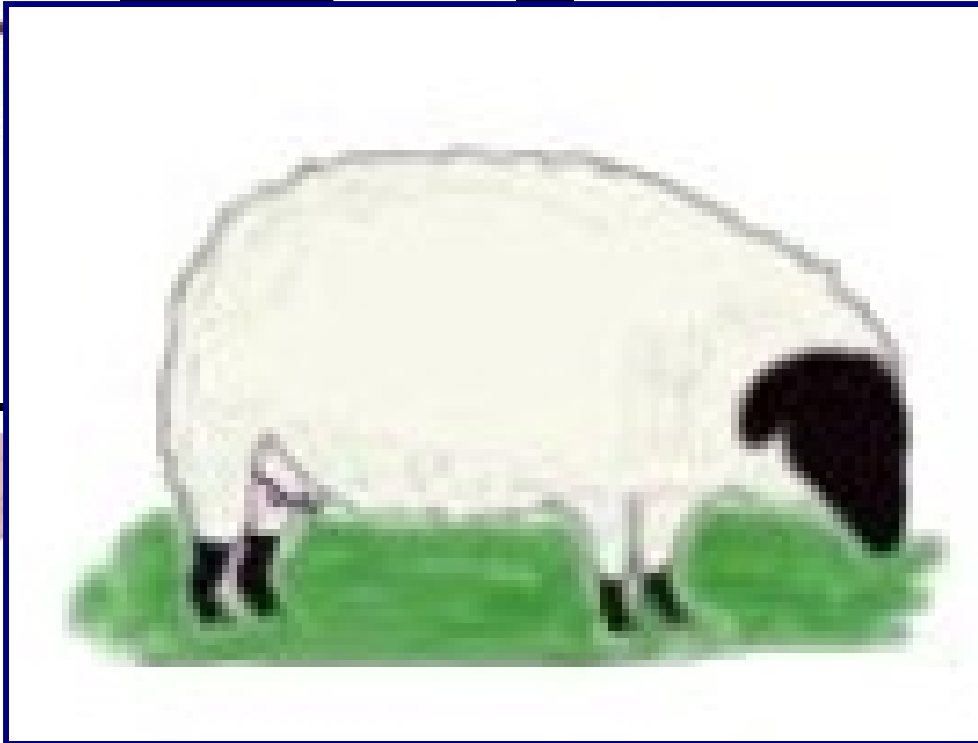


**Increasing Daylight**

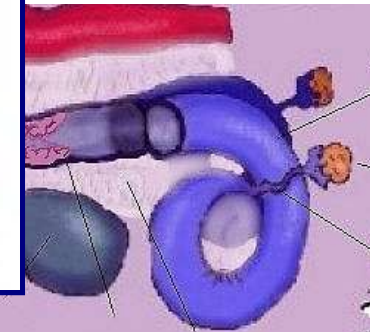
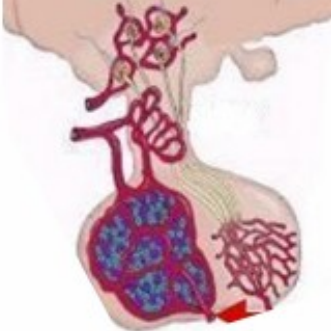
**Melatonin**

**on**

**PRESSION**



**BRAIN**



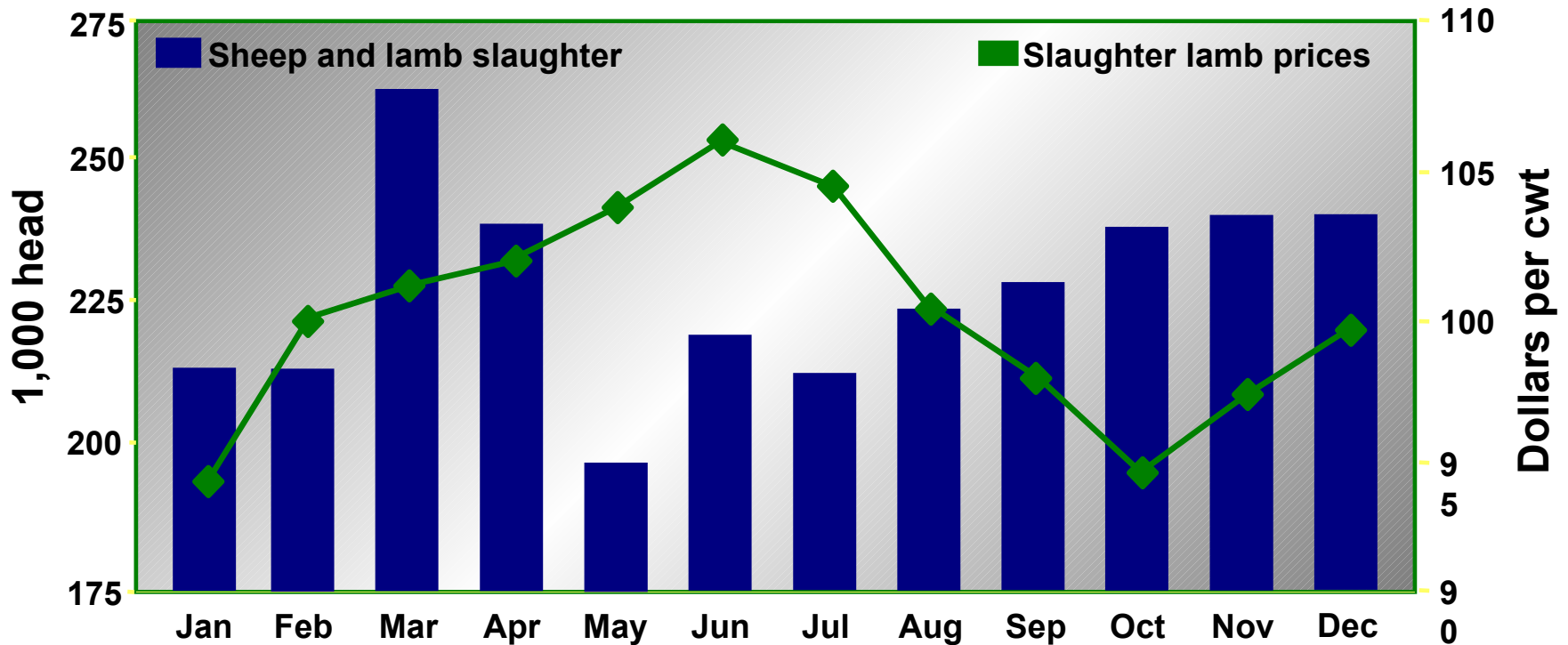
**REPRODUCTIVE TRACT**

# What does seasonal reproduction do to the supply of lamb throughout the year?

- **Supply and Demand**
  - **Creates peaks and valleys on the price curve of lamb.**
- **↑ Supply = ↓ Demand = ↓ Price**

# How does seasonality effect the supply of lamb?

## U.S. Monthly Lamb Slaughter in 2004 and 2005



Source: USDA/NASS

# Questions for Today

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- 1) Why do we see seasonal reproductive activity in the ewe?**
  - What are the advantages of overcoming seasonal reproduction in the ewe?**
  - What methods can be used to overcome seasonal reproduction in the ewe?**

# What are the benefits of overcoming seasonality?

- **Better use of facilities and resources**
- **Having lambs available for market all year long**





# What are the benefits of overcoming seasonality?



- **Instead of having empty barns 9 months out of the year.**

- **Use your barns more by having a fall and spring lambing.**

# What are the benefits of overcoming seasonality?

- **Fall lambing allows for taking advantage of fall forage during late gestation and early lactation**
- **Better weather conditions**
- **More time to get lambs to a high market weight for the higher market prices during the spring**

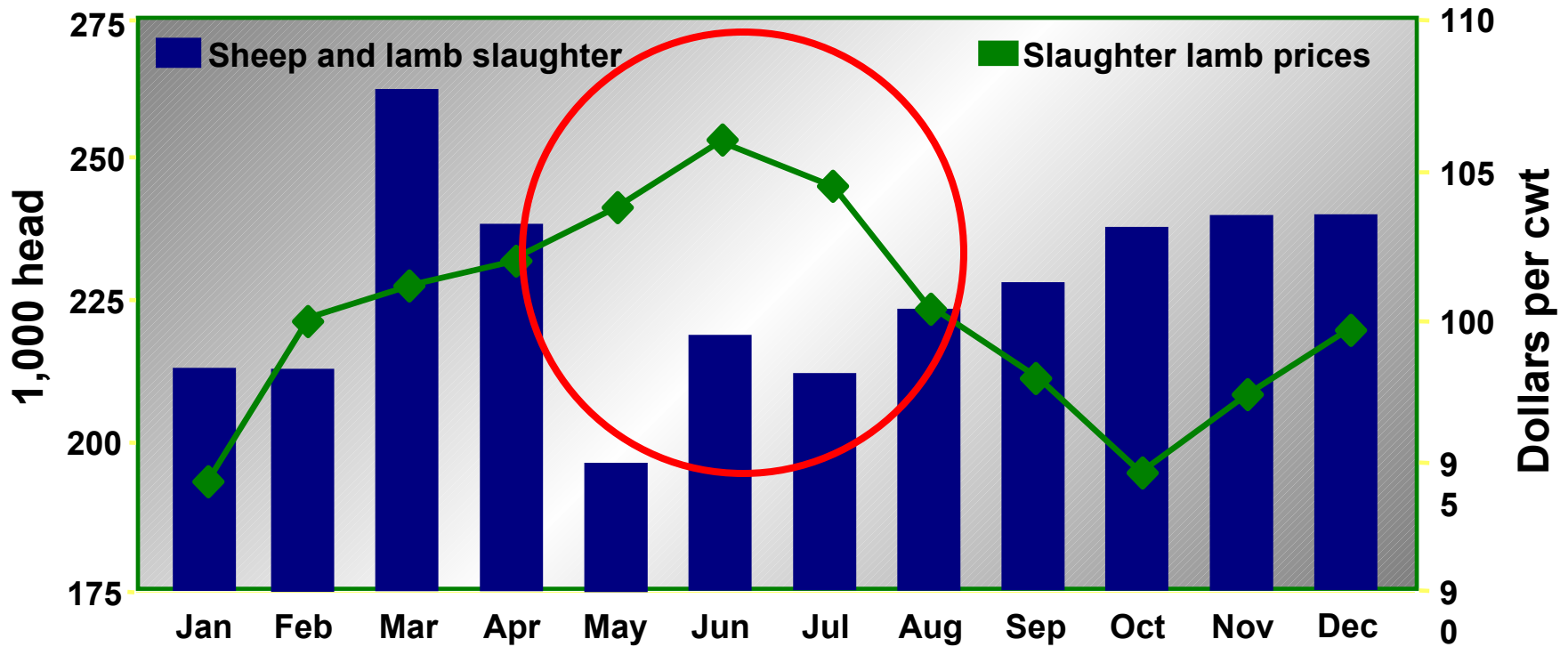
# What are the benefits of overcoming seasonality?

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- **Taking advantage of the price increases during low supply of lamb.**

# What are the benefits of overcoming seasonality?

## U.S. Monthly Lamb Slaughter in 2004 and 2005



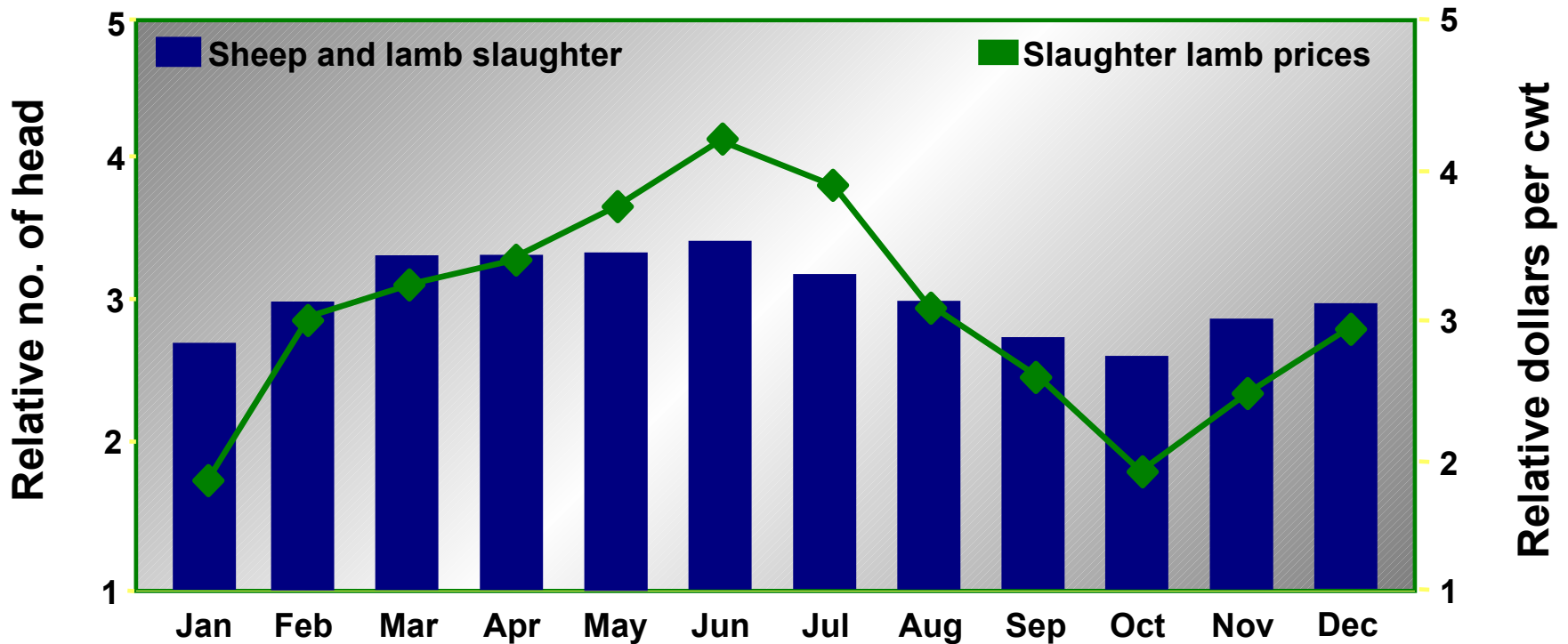
Source: USDA/NASS

# What are the benefits of overcoming seasonality?

- **Taking advantage of the price increases during low supply of lamb.**
- **Change North Dakota's Monthly Supply of lamb by using out of season lambing techniques.**

# What are the benefits of overcoming seasonality?

## Potential North Dakota Monthly Lamb Slaughter



Source: USDA/NASS

# Questions for Today

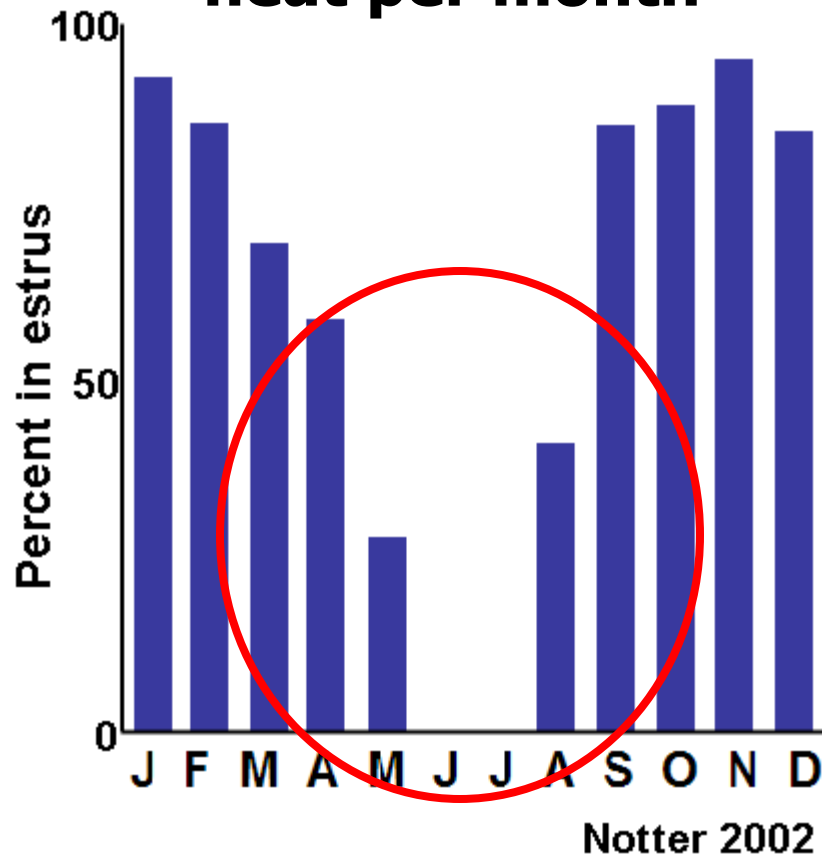
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- 3) What are the advantages of overcoming seasonal reproduction in the ewe?**

  - What methods can be used to overcome seasonal reproduction in the ewe?**

# How can we overcome seasonality in ewes?

## Normal percentage of ewes in heat per month





# What methods can be used to overcome seasonal reproduction in the ewe?

## NATURAL

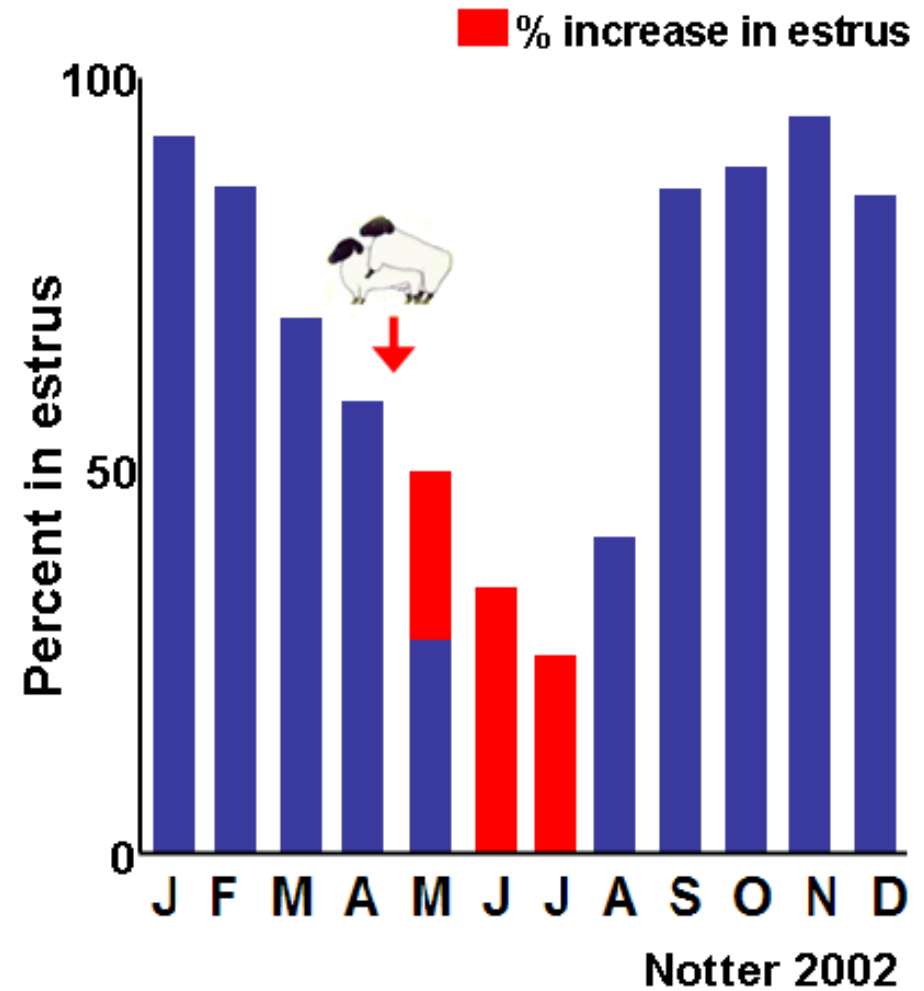
- **Getting ewe to produce hormones naturally**
  - Ram Effect
  - Selection

## ARTIFICIAL

- **Treating ewes with hormones that are normally seen during her reproductive cycle**
  - Progestins
  - Gonadotropins

# Ram introduction

- The ewe needs to be completely isolated from the ram for 60 days.
- The introduction of a viable ram will induce estrus in the ewe which is caused by release of gonadotropins.

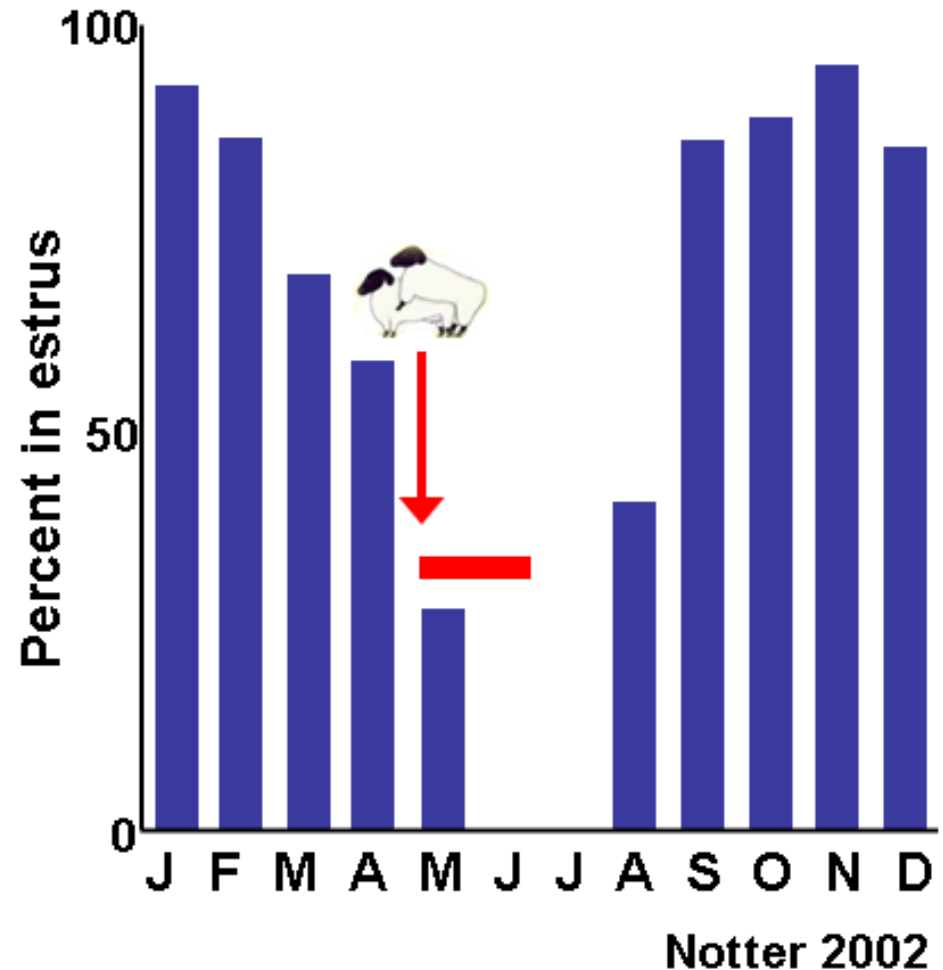


# Ewe lamb selection

- **Ewe lamb selection is based on the idea that being seasonal is partially genetic.**
- **Therefore, any ewes bred out of season are more likely to have ewe lambs that will do the same.**
- **This is done in two phases: challenge phase and clean-up phase.**

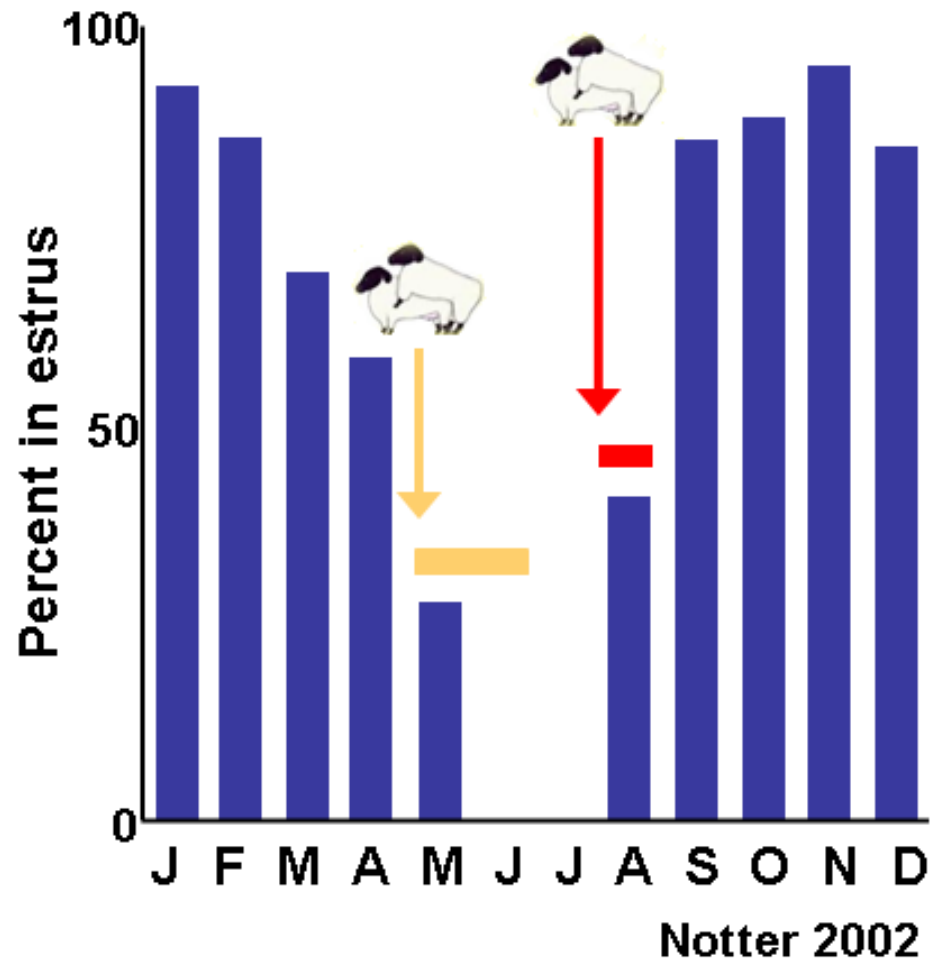
# Ewe lamb selection

- **Challenge phase**
  - **October and November lambing**
  - **Keep replacement ewe lambs**



# Ewe lamb selection

- **Challenge phase**
  - October and November lambing
  - Keep replacement ewe lambs
- **Clean-up Phase**
  - January lambing
  - No Replacements



# Natural Techniques

- **Ram Effect**

- **Advantages:**

- **Cost effective**

- **Disadvantages:**

- **Not always effective on all ewes**

- **Ewe lamb Selection**

- **Advantages:**

- **Cost effective**

- **Disadvantages:**

- **Takes many breeding seasons to build up a flock**

# What methods can be used to overcome seasonal reproduction in the ewe?

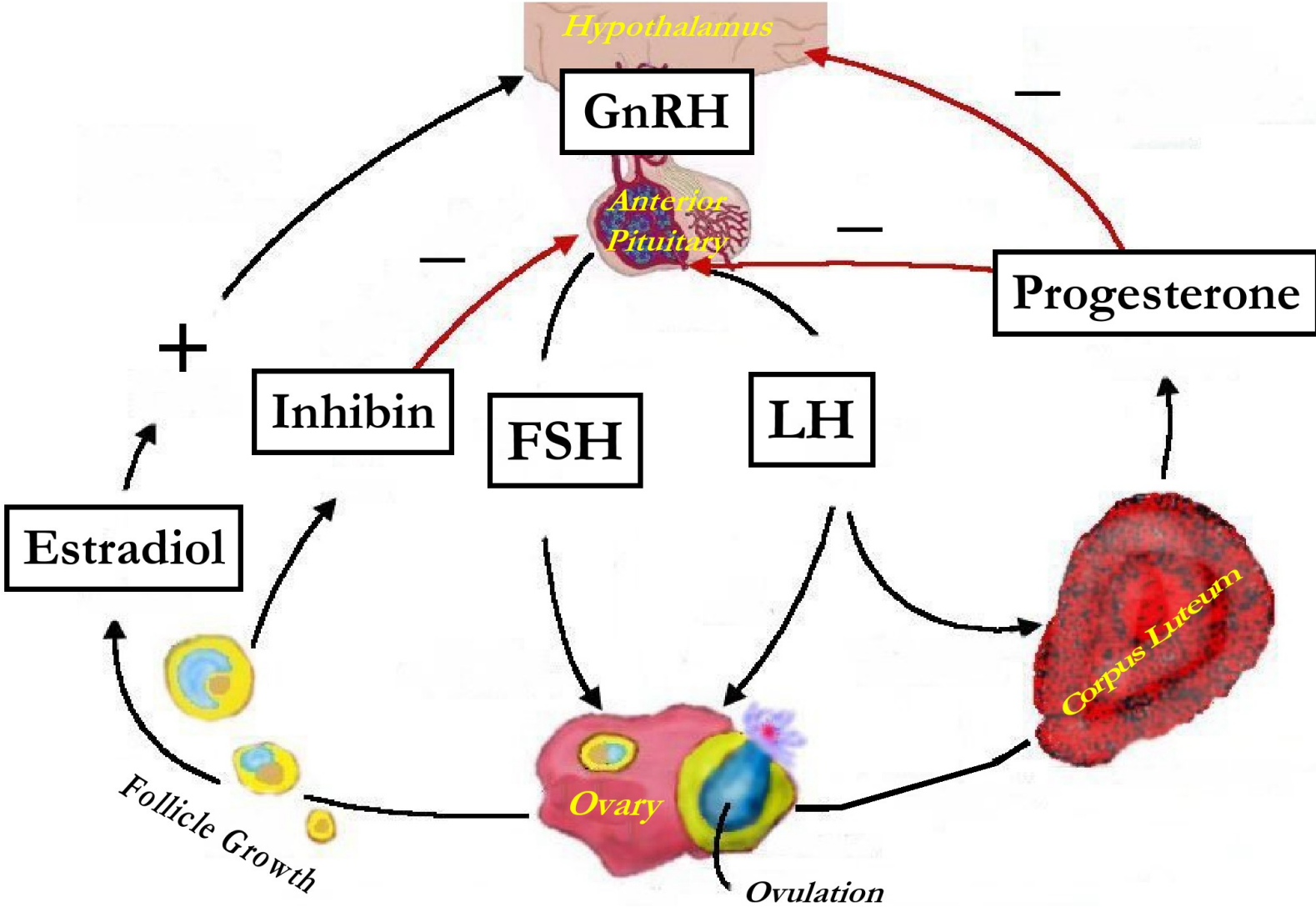
## NATURAL

- **Getting ewe to produce hormones naturally**
  - **Ram Effect**
  - **Selection**

## ARTIFICIAL

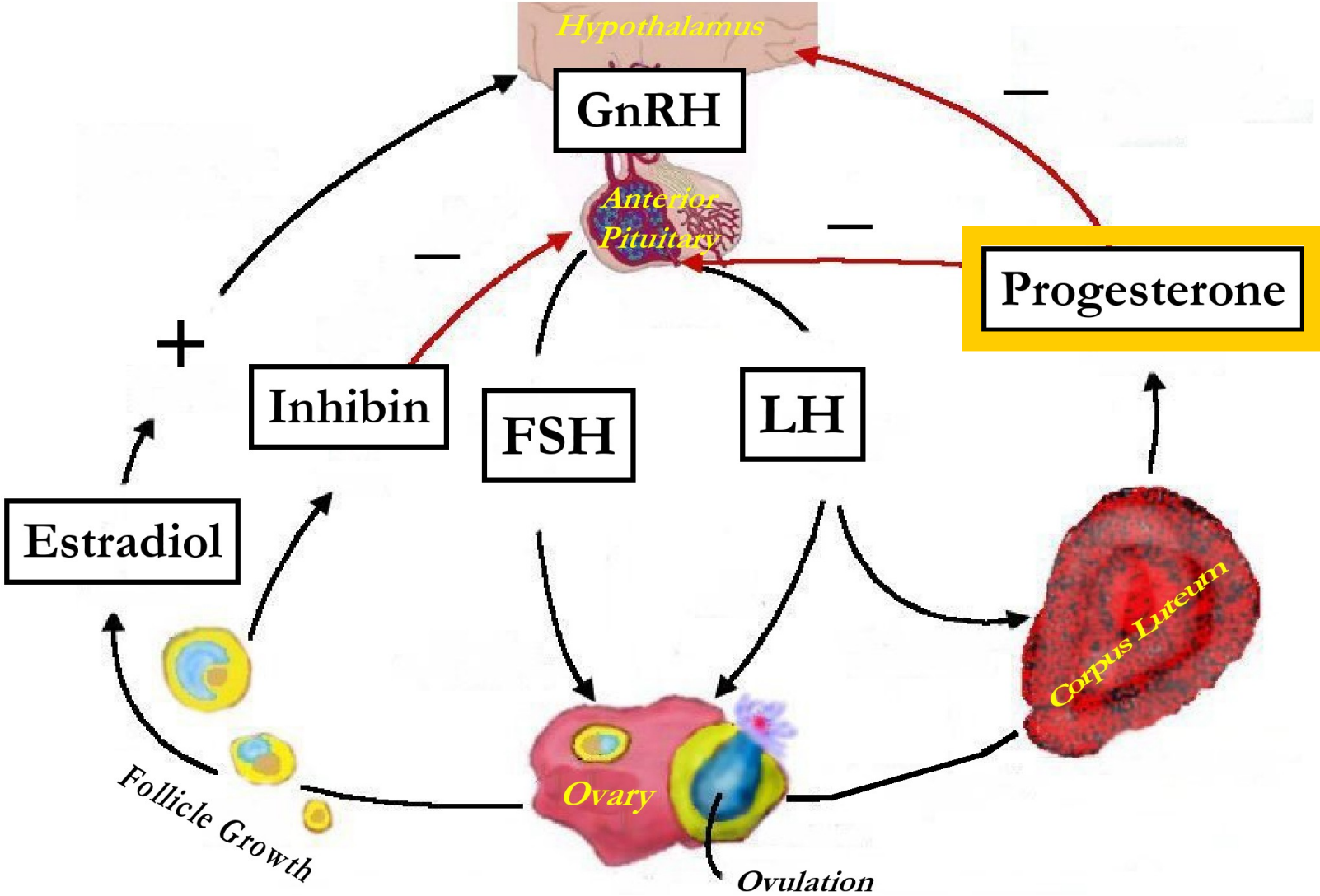
- **Treating a ewe with hormones that are normally seen during her reproductive cycle**

# Endocrine Control of Estrous Cycle in the Ewe



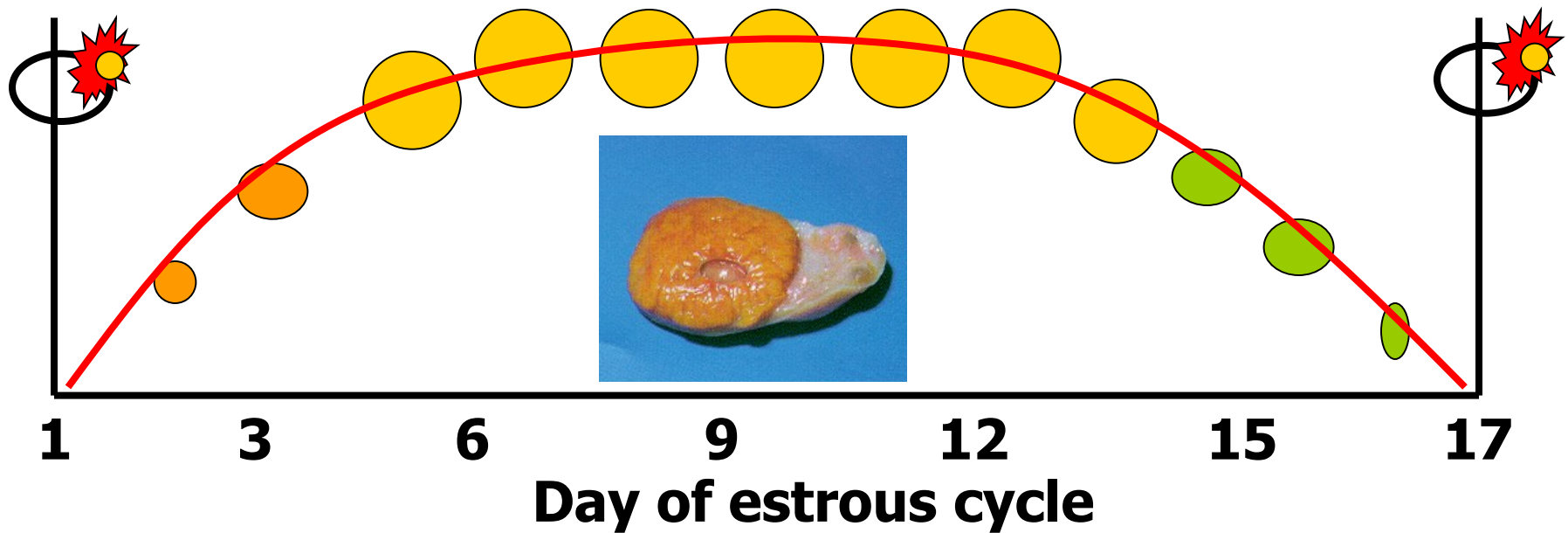


# Endocrine Control of Estrous Cycle in the Ewe



# Progestins: How they work

- Progesterone is produced by the Corpus Luteum (CL)
- CL grows and shrinks producing more and less Progesterone
- Decreasing levels of Progesterone stimulate ovulation

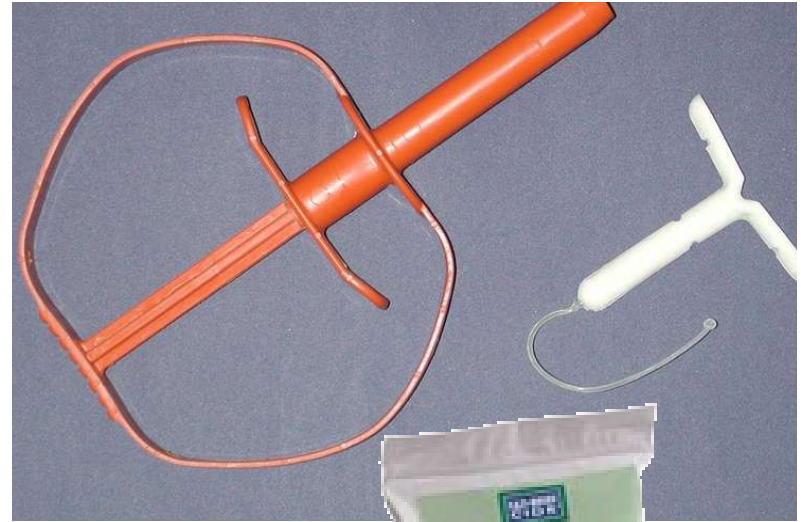


# Artificial Techniques

- **Progestins (active ingredient: P4 or synthetic P4)**
  - **Controlled Internal Drug Release (CIDR™) – Vaginal insert**
  - **Melengestrol Acetate (MGA™) – Oral (Feed additive)**

# Progestins

- **CIDRS:**
  - **Inserted Vaginally**
  - **Contains 300mg of  $P_4$**
  - **Cost of \$7.50/ewe**
  - **Pregnancy Rate of 75% - 95%**



**CIDR™**

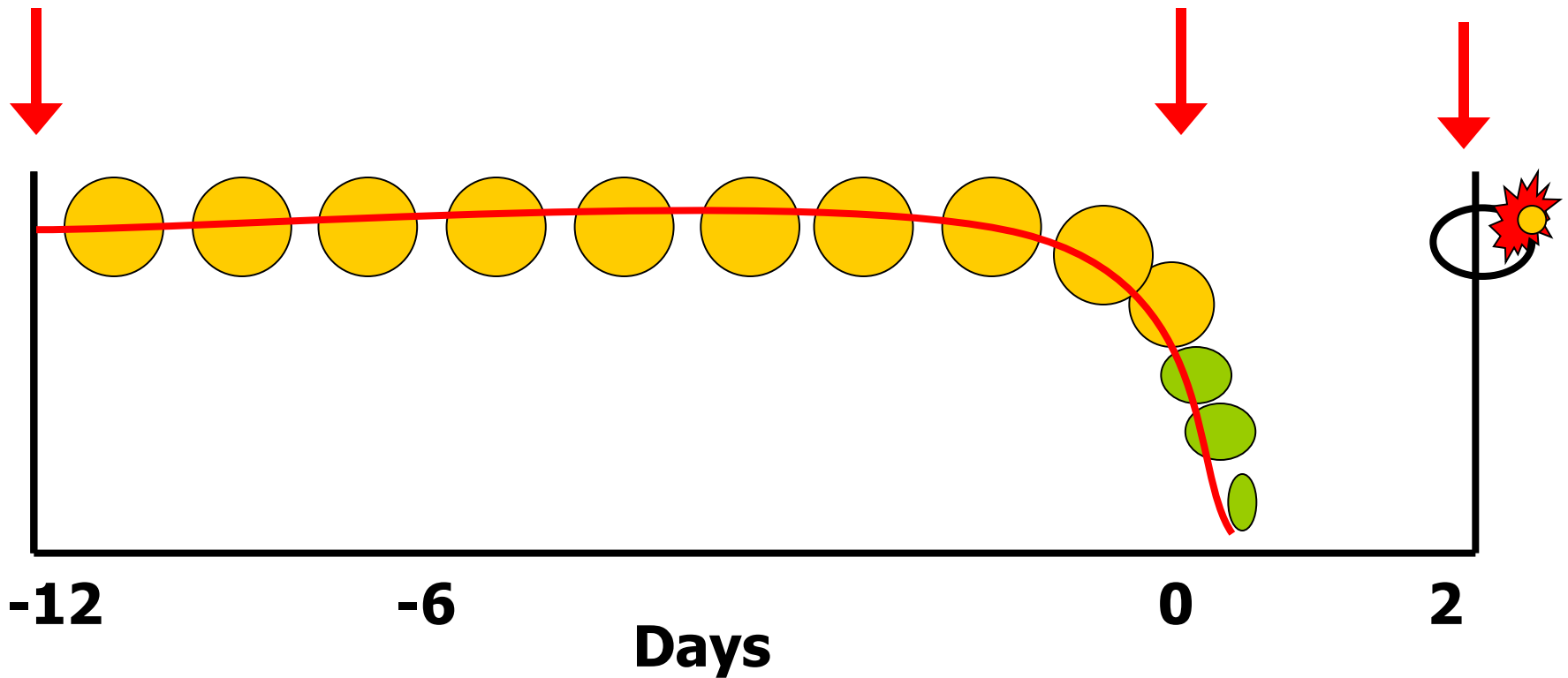


# Progestins: CIDR

Insert CIDR  
on day -12

Remove CIDR  
on day 0

Heat in  
1-2 days



# Progestins

- **MGA**
  - Feed to ewe twice a day
  - Total of **0.3mg/ewe/day**
  - Cost very inexpensive/ewe/day
  - Pregnancy Rate of **40% - 60%**

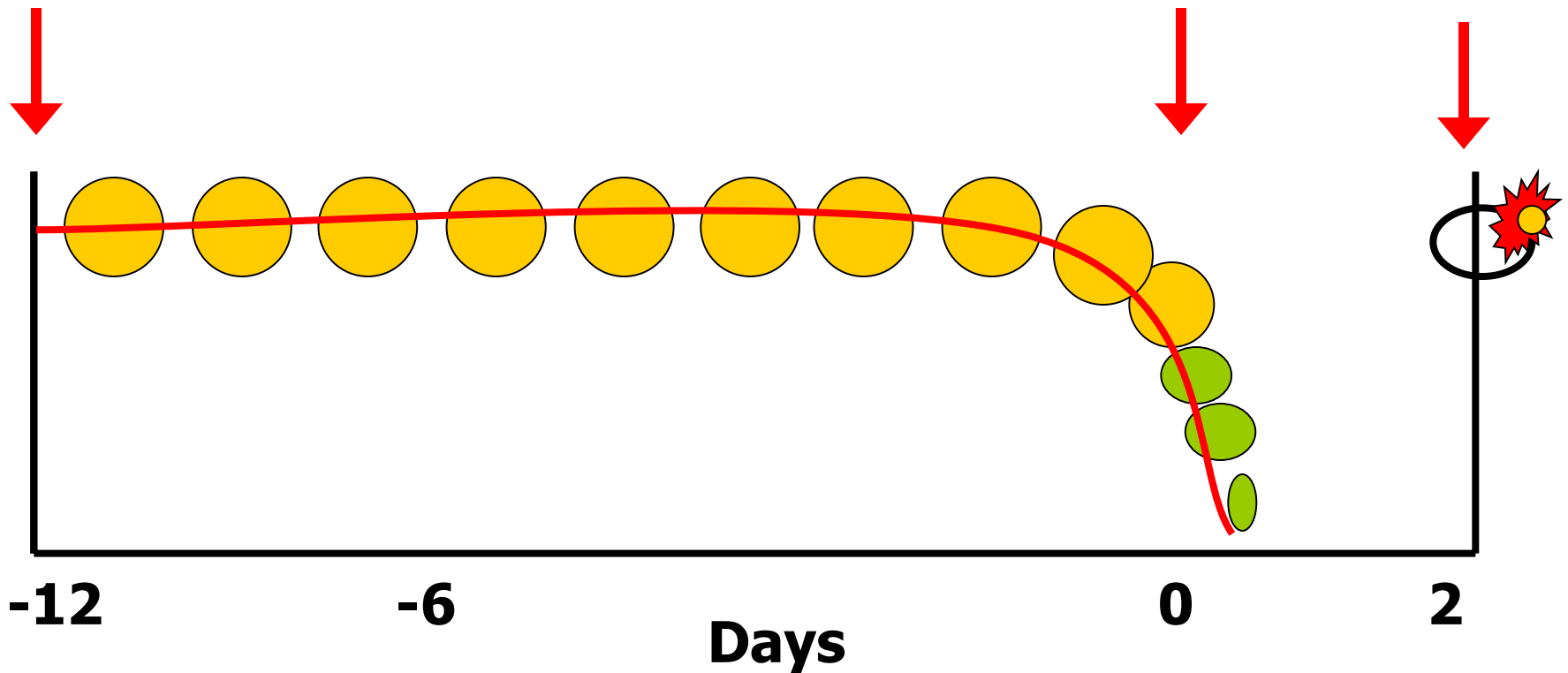


# Progestins: MGA

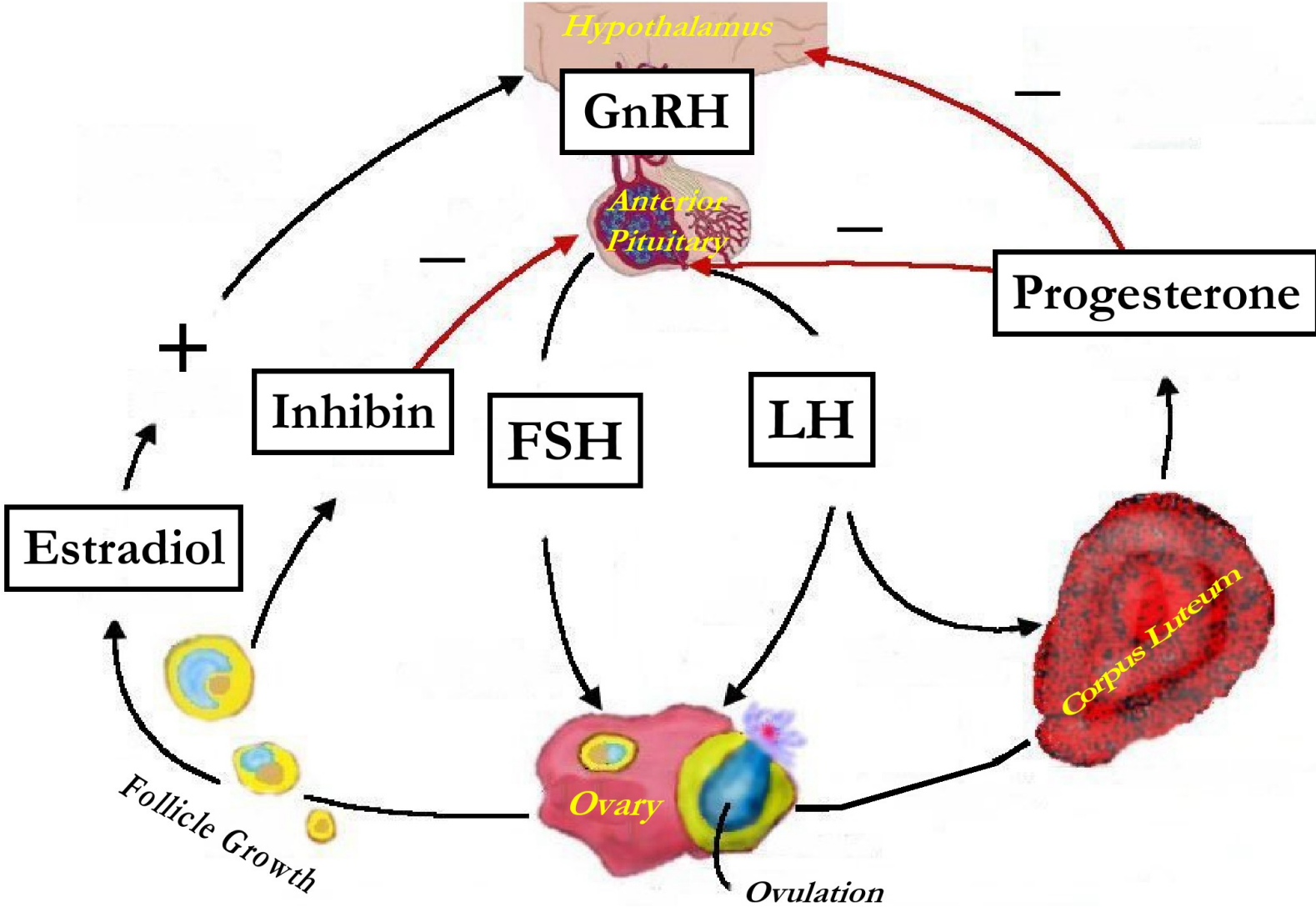
Start feeding  
MGA on day -12

Stop feeding  
MGA on day 0

Heat in  
1-2 days

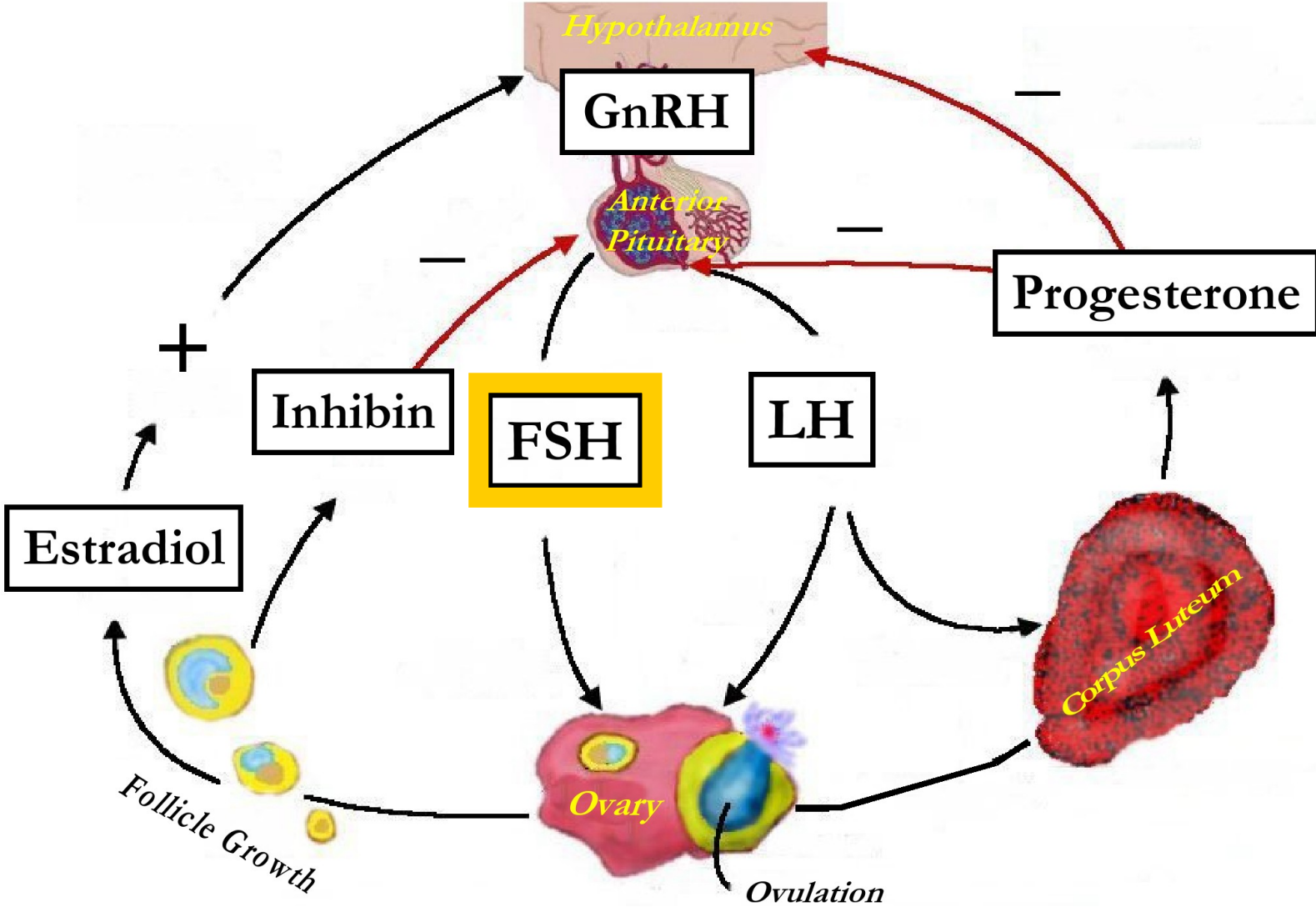


# Endocrine Control of Estrous Cycle in the Ewe



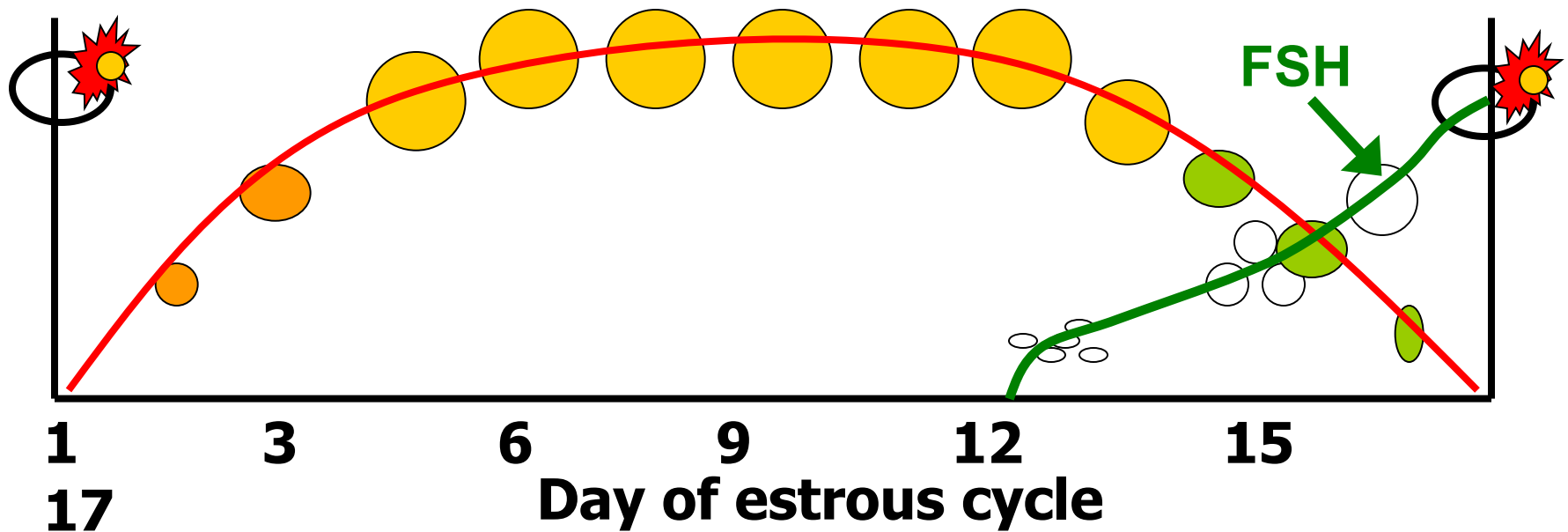


# Endocrine Control of Estrous Cycle in the Ewe



# Gonadotropins: How they work

- Follicle stimulating hormone (FSH) stimulates the growth of follicles so eggs can be shed during ovulation.



# Artificial Techniques

- **Gonadotropins:**
  - **Increase # lambs born/ewe by stimulating follicle development to release more eggs at ovulation**
  - **Increase synchronization of ovulation, which helps to shorten duration of the lambing season**

# Gonadotropins

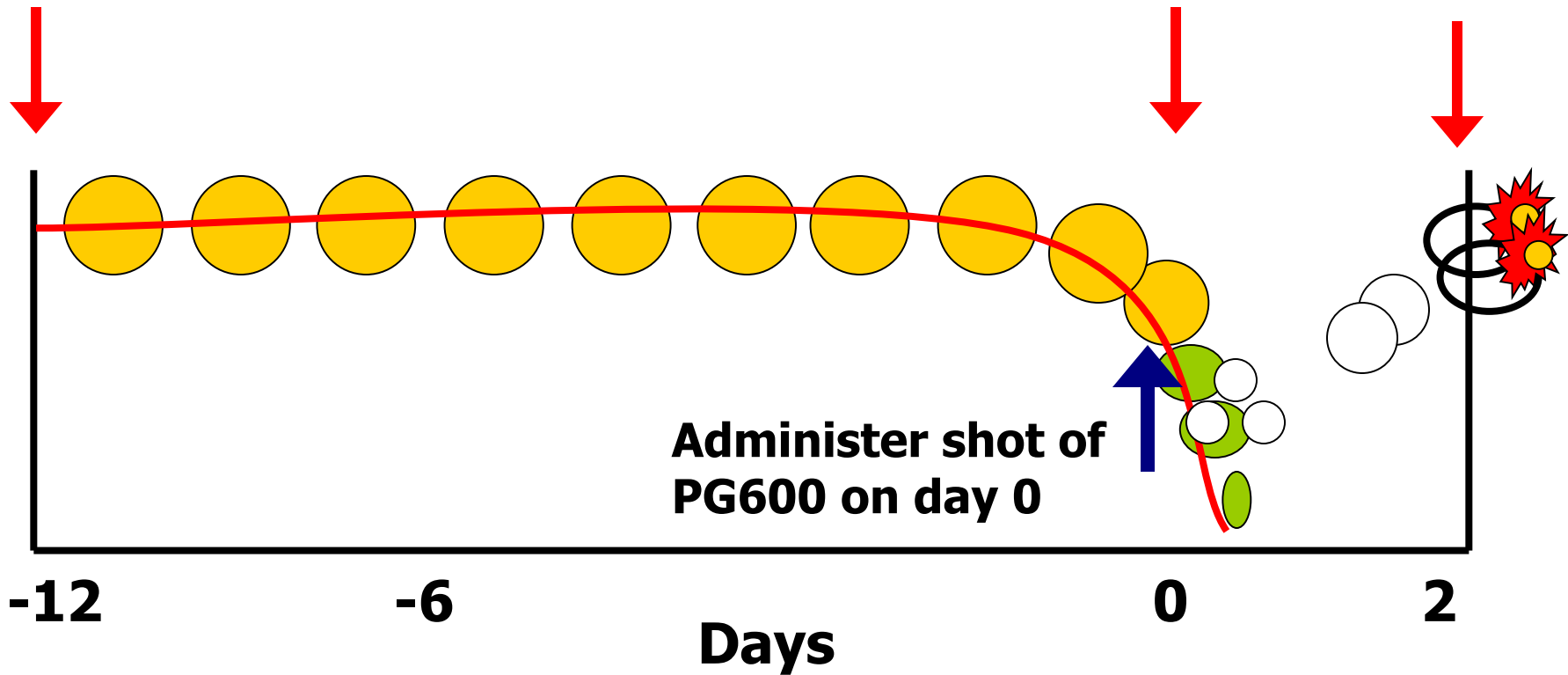
- **PG600**
  - Mimics the actions of FSH
  - Administer one shot at time of removal of CIDRs or MGA
  - 5ml dose (400IU PMSG)
  - \$5/dose
  - Pregnancy rate when used with CIDRs of 85% - 95% out of season

# Gonadotropin: PG600 (with CIDRs)

Insert CIDR  
on day -12

Remove CIDR  
on day 0

Heat in  
1-2 days



# Artificial Techniques

- **Advantages**

- **Effective at increasing pregnancy rates out of season**
- **MGA is cost efficient**
- **PG600 is efficient at increasing the # of lambs/ewe**
- **Ability to synchronize lambing for better management of time**

- **Disadvantages**

- **More costs than natural methods**
- **Time consuming –**
  - **feeding MGA twice daily**
  - **inserting CIDRs**
  - **injecting PG600**
- **CIDRs have limited availability, FDA is working on approval**

# Summary

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- **Overcoming seasonality of the ewe:**
  - can enhance profitability of the producer
  - but it does require time, strict management and some initial costs

