

PUBERTY AND ANESTRUS: DEALING WITH NON-CYCLING FEMALES

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Anestrus?

- Anestrus can be defined as the lack or absence of the expression of estrus.
- Anestrus occurs annually; heifers are anestrus prior to puberty and anestrus occurs in cows after each calving.
- The occurrence of anestrus does not limit reproductive efficiency but rather the length of the anestrus period.

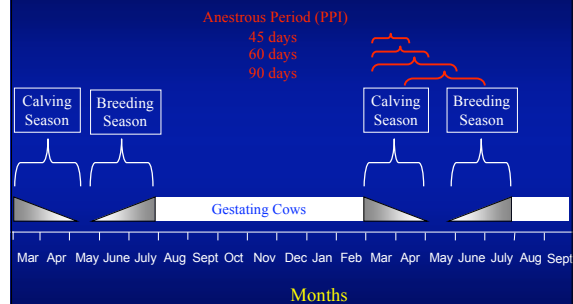
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Anestrus?

- The anestrus period in postpartum cows ranges from 14-180 days in length.
 - For mature cows, 30-90 days is normal.
 - For young cows (2 year olds), 60-120 is normal.

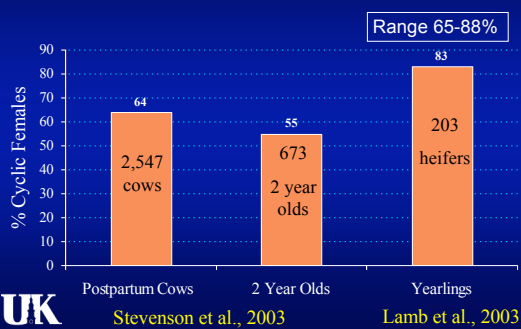
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Reproductive Cycle – 60 d Breeding Season



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Incidence of Anestrus in US Beef Cattle



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Management of Anestrus in Cattle

Since females are likely to be anestrus, it is necessary that estrus synchronization systems induce onset of estrous cycles in females that are anestrus at the start of the program.

1. What is anestrus, and what are the stimuli necessary to induce anestrus cows to ovulate?
2. What factors influence the incidence and duration of anestrus?
3. How does anestrus influence the choice of estrus control system?

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“Cycling Cow”

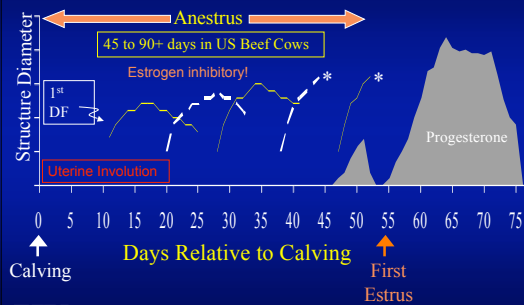


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What Is Anestrus?

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Postpartum Anestrus in Beef Cows



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Factors Regulating the Length of Anestrus

- Presence of the calf
- Body Condition Score (BCS)
- Parity
- Days Since Calving
- Others effectors include dystocia, health, and calving season

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Presence of the Calf

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Presence of the Calf

- Presence of the calf initiates anestrus
 - Establishes the negative feedback of estrogen on the hypothalamus.
 - Results in low LH pulse frequency
 - Mechanism unknown but both the physical contact of the calf (nursing) and the mere presence of the calf at side are involved.
- Short-term calf removal (48 h) has been shown to be an effective method to induce estrus.

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Response of Anestrous Postpartum Cows to Early Weaning

Reference	n	Days Postpartum	Reproductive Response		
			Weaning to estrus (d)	% Short Estrous Cycles	Length of Short Estrous Cycles
Odde et al., 1990	25	44 (19-68 d)	< 10 d (80%)	81.3%	7 - 10 d
Smith et al., 1986	17	29.5 (26-33 d)	5 ± 1.5 d (100%)	88.8%	7 - 12 d

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Body Condition

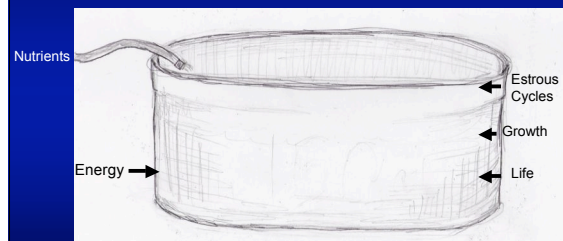
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Body Condition Score (BCS)

- Body Condition Score is an estimate of the degree of fatness of an animal
 - 1 = emaciated
 - 9 = extremely obese
- Estimate of available energy stores

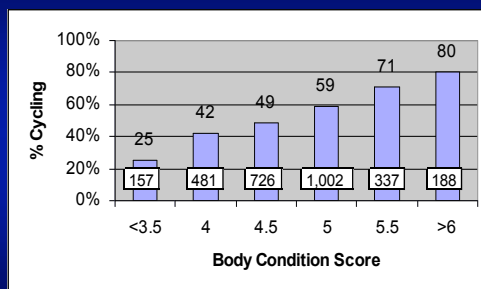
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Postpartum Cow = Water tank



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Influence of BCS on Anestrus



Source: Stevenson et al., 2003

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Parity

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Parity

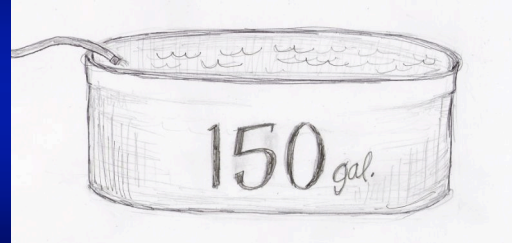
- Young cows (2 year old suckled cows) simply require 20-30 more days resume estrous cycles.
- Recommendation has always been to calve first parity cows 20-30 days before the mature cow herd.

– Stevenson et al., 2003

Parity	Days PP	Percent Cyclic
1	86	55
2	68	64

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Two Year Olds

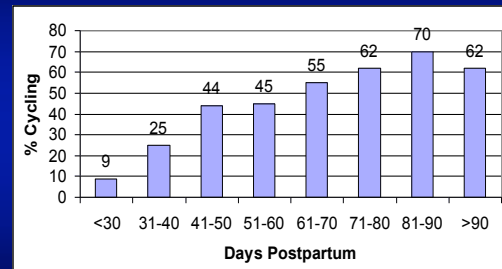


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Influence of Days Since Calving

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Influence of Days Since Calving on Anestrus



Source: Stevenson et al., 2003

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Regulation of Anestrus

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How do we mimic the transition?

- Mimic the short cycle
 - Administer progesterone
 - 5-9 days of a progestin will induce an LH surge and usually estrus within 72 hours
 - CL is typically normal
 - Fertility can be acceptable; 45-70%
- Progesterone Products
 - MGA[®]
 - EAZI-BREED CIDR[®] Cattle Inserts
 - GnRH

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MGA (melengestrol acetate)

- Synthetic hormone that is orally active
- **NOT A GREAT PROGESTIN!**
 - Induction rate ranges from 0-80% (Stevenson et al., 2003; Perry et al., 2004).
 - “shallow” peri-estrous but not “deep” anestrus??

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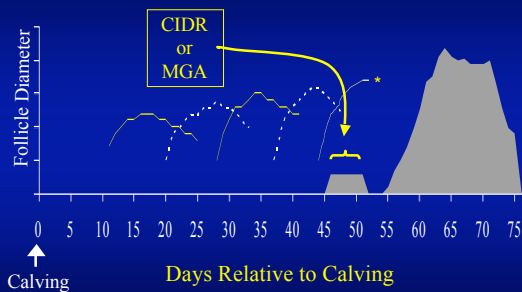
Induction of Estrus Using a CIDR

THE BEST PROGESTIN AVAILABLE!

Induces estrus/ovulation in females that are both anestrus and peri-estrus (Fike et al., 1997; Chenault et al., 2003, Stevenson et al., 2003).

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Induction of Estrus Using a CIDR or MGA



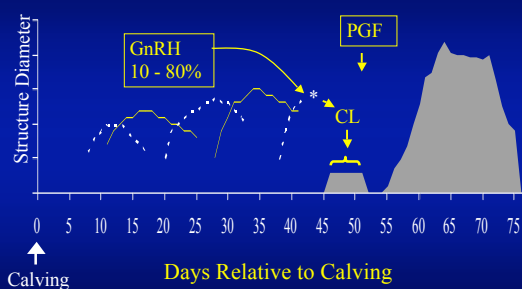
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GnRH (Gonadotropin-releasing Hormone)

- Injection
- Recommended level = 100 µg/hd
- Product names = Cystorelin, Fertagyl, Factrel, Ova Cyst
- **NOT A GREAT PROGESTIN!**
 - Has been shown to induce CL formation in 10-80% of anestrus cows
 - “shallow” peri-estrous but not “deep” anestrus??
 - Also likely dependent upon stage of follicle growth

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Induction of Estrus Using GnRH

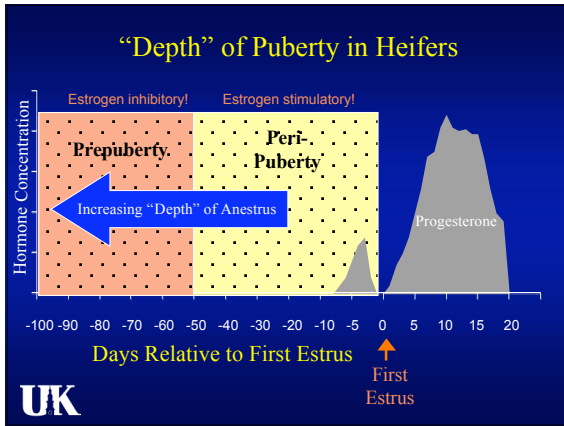


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Puberty

- Puberty is the occurrence of estrus and ovulation followed by the formation of a CL that leads to an estrous cycle of normal length.
- To MAXIMIZE fertility, heifers need to reach puberty by 12-13 months of age.

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- ### Summary
- Anestrus is the major factor regulating reproductive efficiency.
 - Induction of estrus in anestrus females is essential to maintaining a high reproductive rate.
 - Estrous synchronization protocols for anestrus females **MUST** include a progestin (CIDR, MGA, or GnRH).
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