Applied Reproductive Strategies in Beef Cattle Workshop - 2017

Physiology of the Estrous Cycle: The Why's and How's of Controlling Estrus and Ovulation

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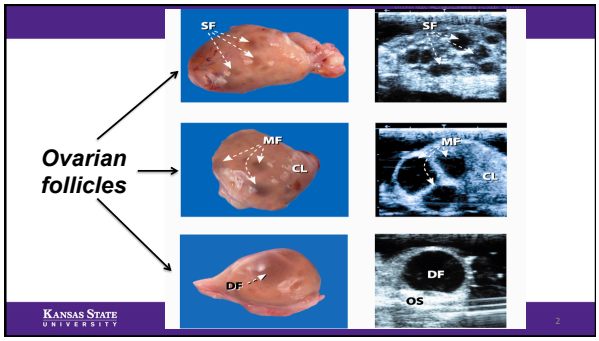
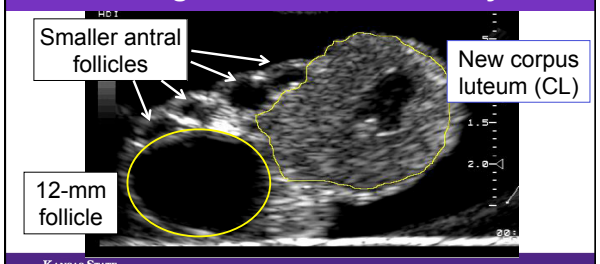
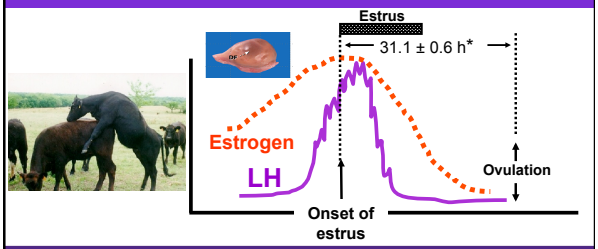


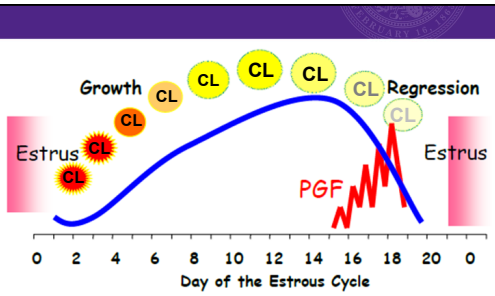
Sonogram of a Bovine Ovary

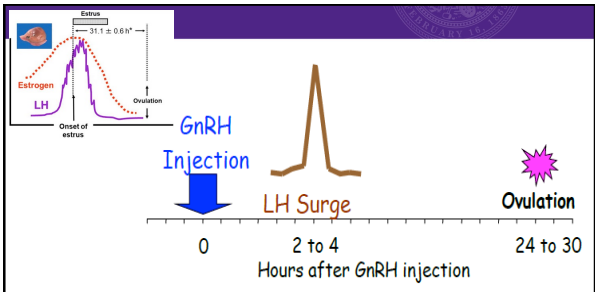


Timing of Ovulation

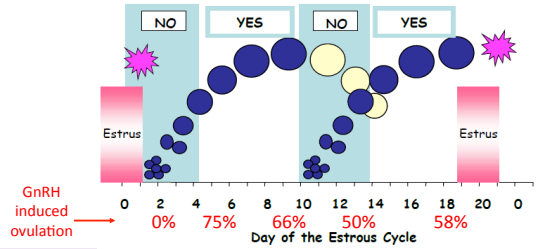


*White et al. (2002)





GnRH-Induced ovulation is follicle-size dependent



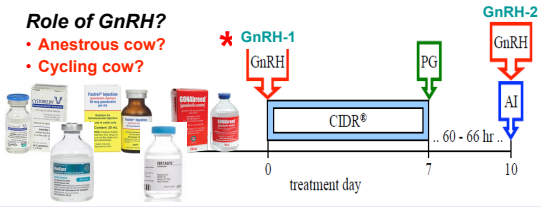
Atkins et al. (2010)

7-day CO-Synch + CIDR®

Perform TAI at 60 to 66 hr after PG with GnRH at TAI.

Role of GnRH?

- **Anestrous cow?**
- **Cycling cow?**



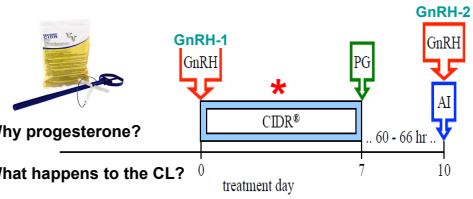
Ovulation Response to GnRH

	GnRH-1	GnRH-2	Ovulation after GnRH-1	Ovulation after GnRH-2
Cycling cows	50%	77%	Yes (+)	83%
			No (☒)	67%

Atkins et al. (2010a,b)

7-day CO-Synch + CIDR®

Perform TAI at 60 to 66 hr after PG with GnRH at TAI.

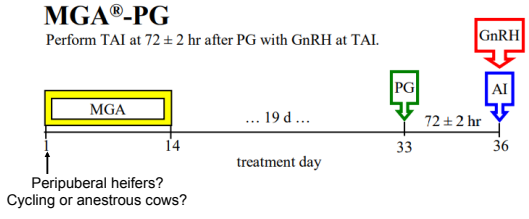


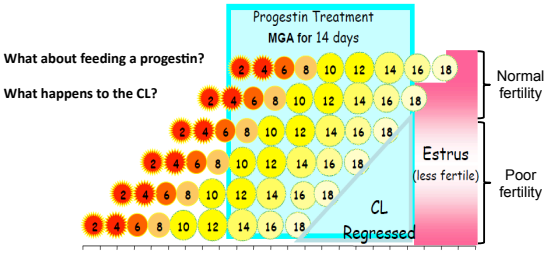
Why progesterone?

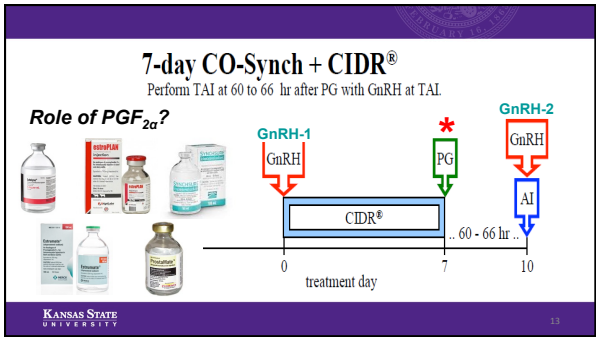
What happens to the CL?

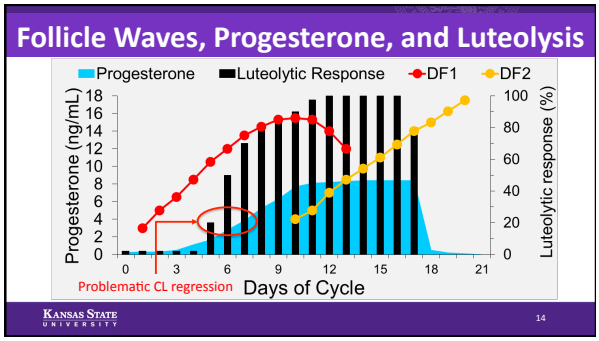
MGA®-PG

Perform TAI at 72 ± 2 hr after PG with GnRH at TAI.









Age and number of CL at $PGF_{2\alpha}$ treatment 7 days after GnRH-1	Proportion of cows with CL regression after $PGF_{2\alpha}$
New CL formed after GnRH-1	64%
Original CL before GnRH-1	97%
Original CL + new CL	92%

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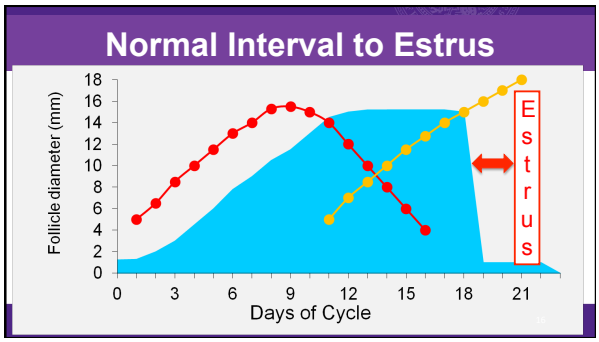

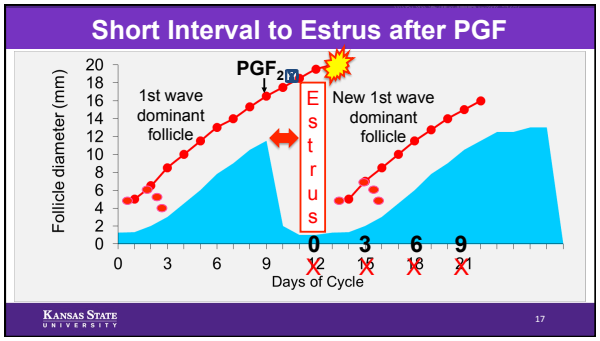

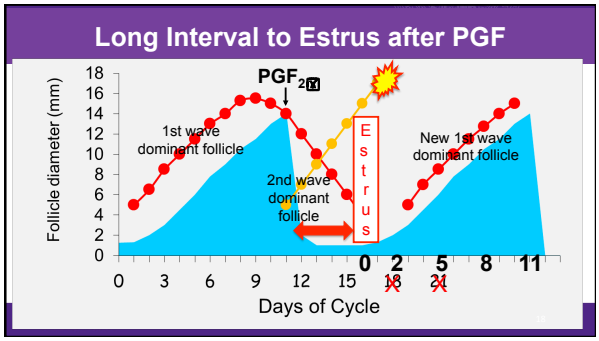

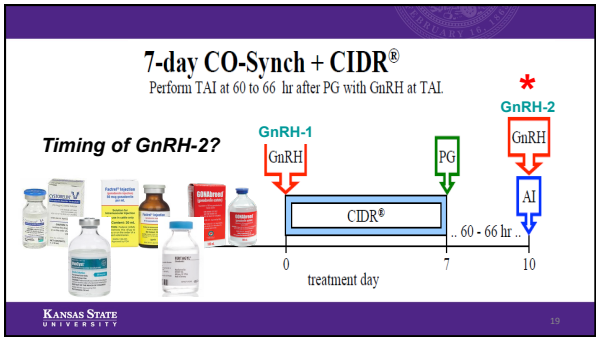

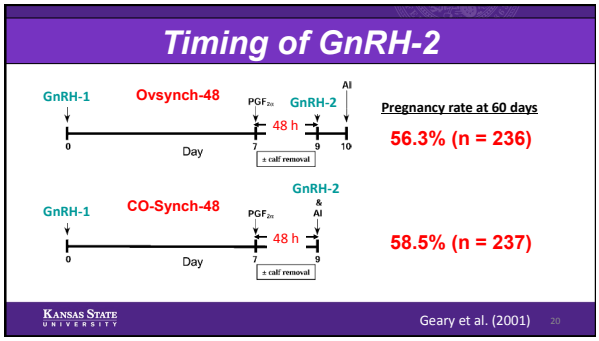

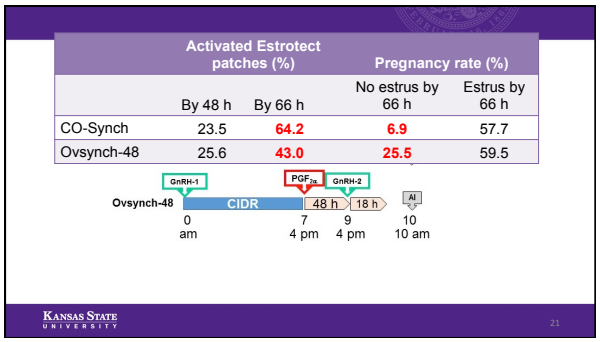

	Activated Estrotect patches (%)		Pregnancy rate (%)	
	By 48 h	By 66 h	No estrus by 66 h	Estrus by 66 h
CO-Synch	23.5	64.2	6.9	57.7
Ovsynch-48	25.6	43.0	25.5	59.5

Summary

- Progesterone is required to "regulate" the postpartum uterus to prevent short cycles.
- GnRH induces ovulation 50 to 75% in cycling cows across the estrous cycle and 36% in anestrous cows.
- Complete regression of the corpus luteum is age-dependent.
- Presence and maturity of a dominant follicle determines timing of estrus after CL regression.

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