



April 19, 2018

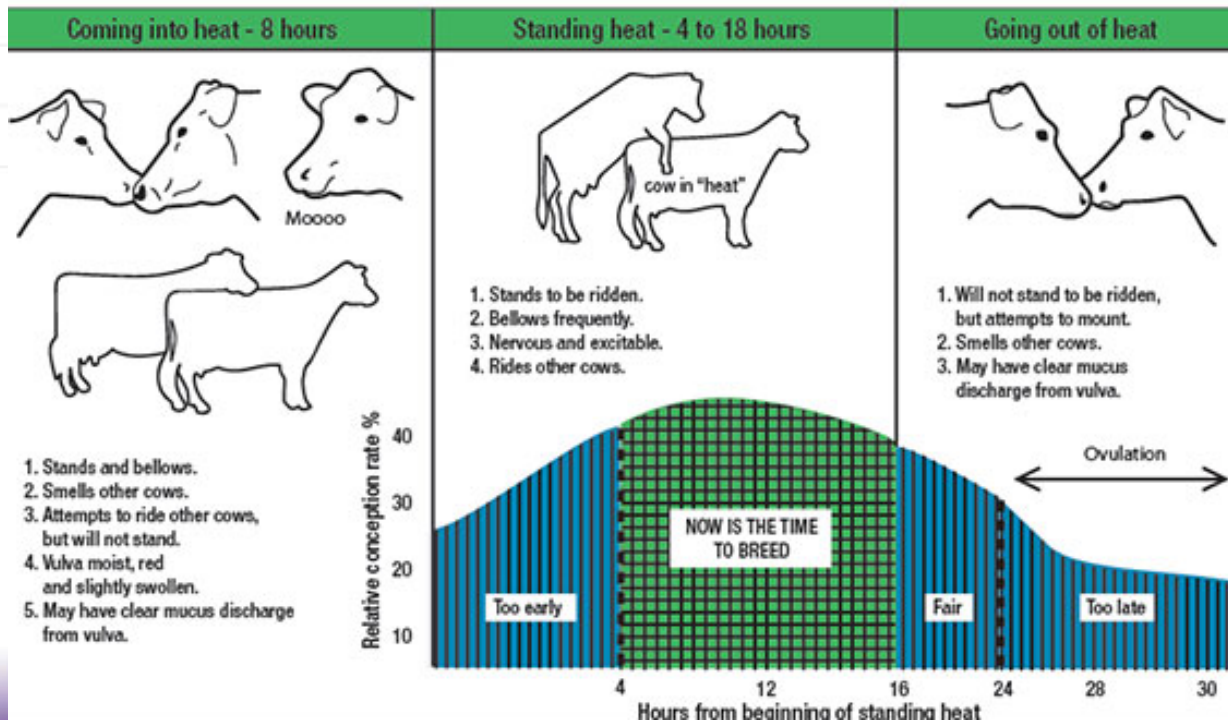
Split-time artificial insemination programs for beef cows

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Western Kansas Agricultural Research Center - Hays

Estrous Synchronization

- Enhance the use of artificial insemination
- Decrease / eliminate the time required for heat detection
- Maximize the number of cows conceiving to artificial insemination



Resources for estrous synchronization

- Many estrous synchronization protocols to choose from
- Many different company brand name hormones available for estrous synchronization
- Beef Reproduction Task Force – Applied Reproductive Strategies in Beef Cattle
 - <https://beefrepro.unl.edu/>

Applied Reproductive Strategies in Beef Cattle (ARSBC)

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Beef Reproduction Task Force

Applied Reproductive Strategies in Beef Cattle



Institute of Agriculture and Natural Resources

APPLIED REPRODUCTIVE STRATEGIES IN BEEF CATTLE

Nebraska

IANR

Nebraska Extension

Applied Reproductive Strategies in Beef Cattle



HOME

RESOURCES

PROCEEDINGS



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Visit our **RESOURCES** page for
2018 synchronization protocols, AI Cowculator, past proceedings and more.

Applied Reproductive Strategies in Beef Cattle

Nebraska IANR Nebraska Extension Applied Reproductive Strategies in Beef Cattle Resources

☰ HOME RESOURCES PROCEEDINGS

RESOURCES

- **Download FREE Estrus Synchronization Planner**
- **AI Cowculator**
- **NEW! 2018 Estrus Synchronization Protocols for HEIFERS and COWS (Chart)**
- **2017 Protocols for Synchronization of Estrus and Ovulation**
- **The Bovine Estrous Cycle**
- **Detection of Standing Estrus in Cattle**
- **Estrus Synchronization--Planning for Success**
- **Tips for a Successful Synchronization Program**

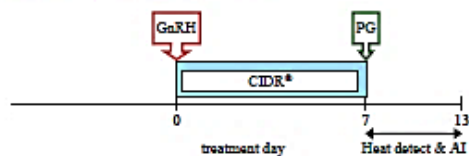
BEEF COW PROTOCOLS - 2018

HEAT DETECTION

Select Synch

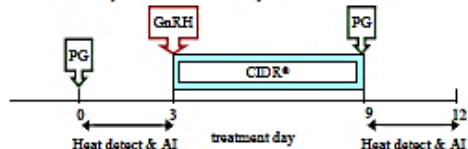


Select Synch + CIDR®



PG 6-day CIDR®

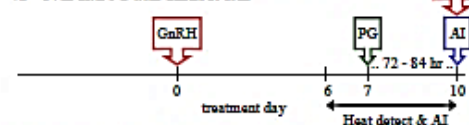
Heat detect and AI days 0 to 3. Administer CIDR to non-responders and heat detect and AI days 9 to 12. Protocol may be used in heifers.



HEAT DETECT & TIME AI (TAI)

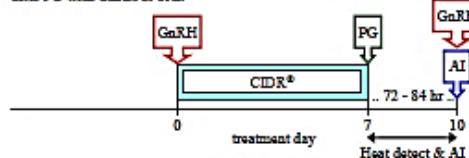
Select Synch & TAI

Heat detect and AI day 6 to 10 and TAI all non-responders 72 - 84 hr after PG with GnRH at TAI



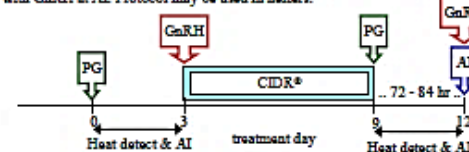
Select Synch + CIDR® & TAI

Heat detect and AI day 7 to 10 and TAI all non-responders 72 - 84 hr after PG with GnRH at TAI



PG 6-day CIDR® & TAI

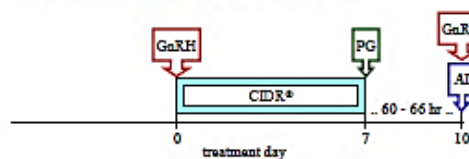
Heat detect & AI days 0 to 3. Administer CIDR to non-responders & heat detect and AI days 9 to 12. TAI non-responders 72 - 84 hr after CIDR removal with GnRH at AI. Protocol may be used in heifers.



FIXED-TIME AI (TAI)*

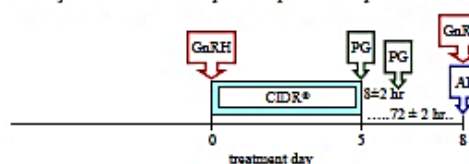
7-day CO-Synch + CIDR®

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



5-day CO-Synch + CIDR®

Perform TAI at 72 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.

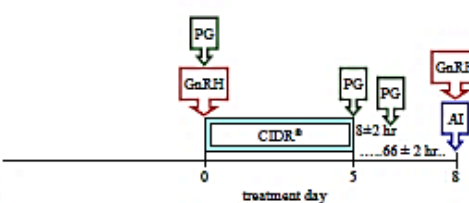


FIXED-TIME AI (TAI)*

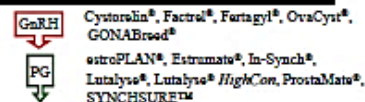
for *Bos Indicus* cows only

PG 5-day CO-Synch + CIDR®

Perform TAI at 66 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



* The time listed for "Fixed-time AI" should be considered as the approximate average time of insemination. This should be based on the number of cows to inseminate, labor, and facilities.

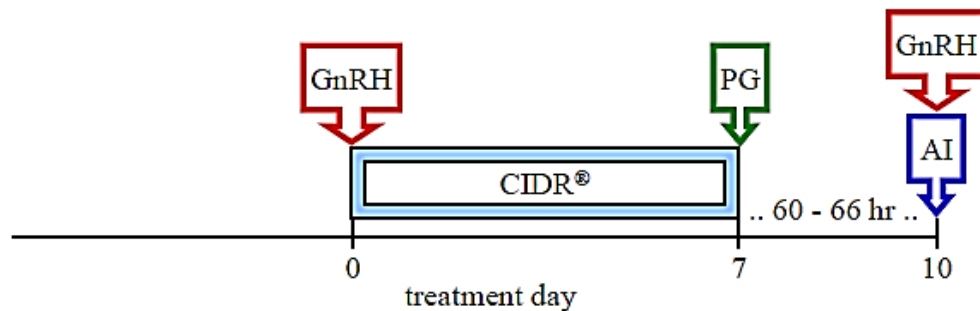


BEEF COW PROTOCOLS - 2018

FIXED-TIME AI (TAI)*

7-day CO-Synch + CIDR®

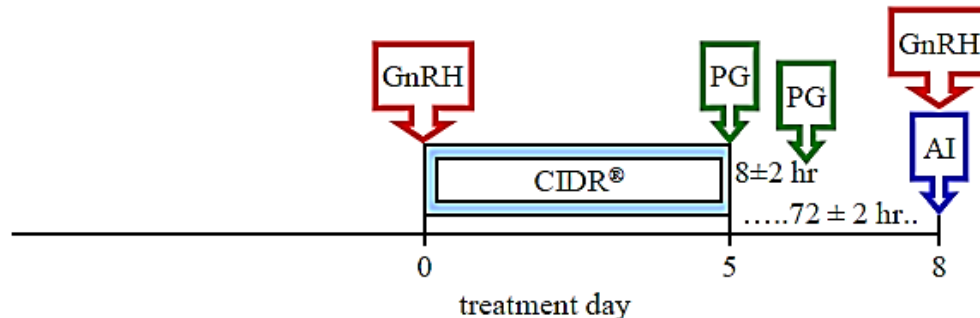
Perform TAI at 60 to 66 hr after PG with GnRH at TAI.



5-day CO-Synch + CIDR®

Perform TAI at 72 ± 2 hr after CIDR removal with GnRH at TAI.

Two injections of PG 8 ± 2 hr apart are required for this protocol.



Estrus Synchronization Hormones

CIDR[®]

Controlled internal drug release impregnated with progesterone

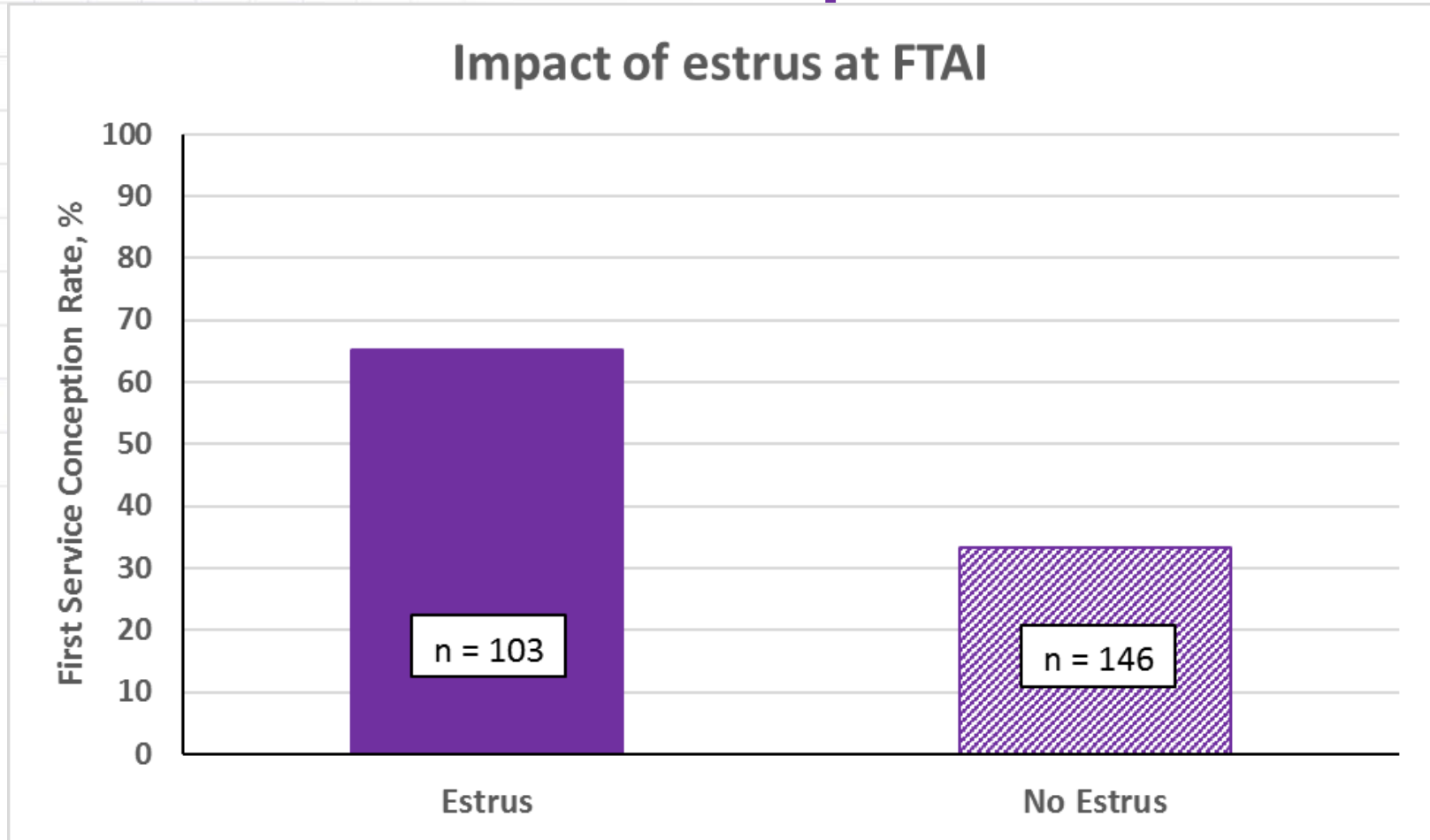


Cystorelin[®], Factrel[®], Fertagyl[®], OvaCyst[®],
GONABreed[®]



estroPLAN[®], Estrumate[®], In-Synch[®],
Lutalyse[®], Lutalyse[®] *HighCon*,
ProstaMate[®], SYNCHSURE[™]

Why add split-time breeding to a fixed-time protocol?



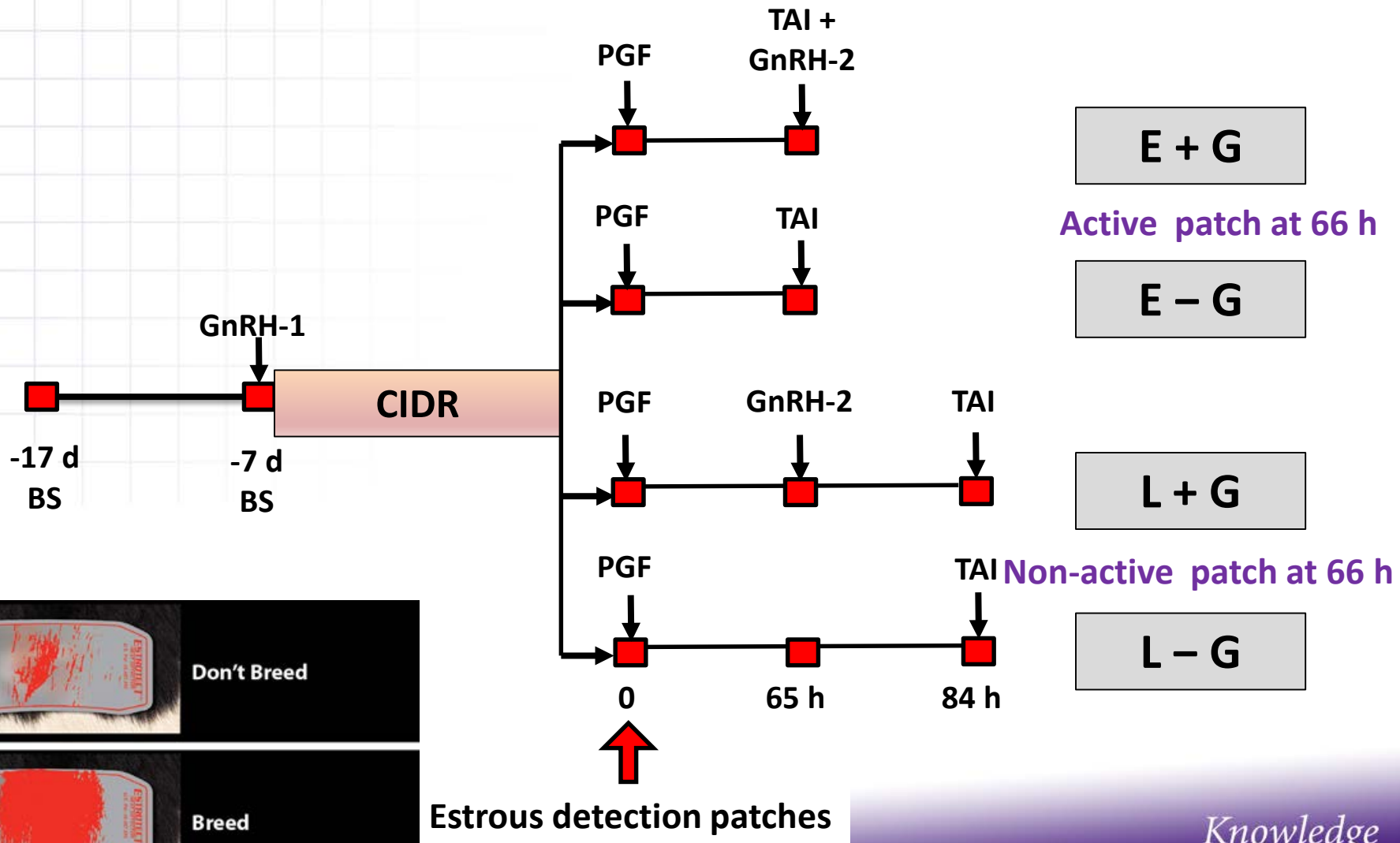
Hill et al., 2016

Why add split-time breeding to a fixed-time protocol?

- Numerous studies have shown that ~30% of cows do not show estrus by 66 h post-CIDR.
 - First service conception rate is ↓
- Delaying fixed-time insemination for those cows not displaying estrus by 66 h may improve conception rate among those cows.



Treatment protocol to establish the importance of injecting GnRH

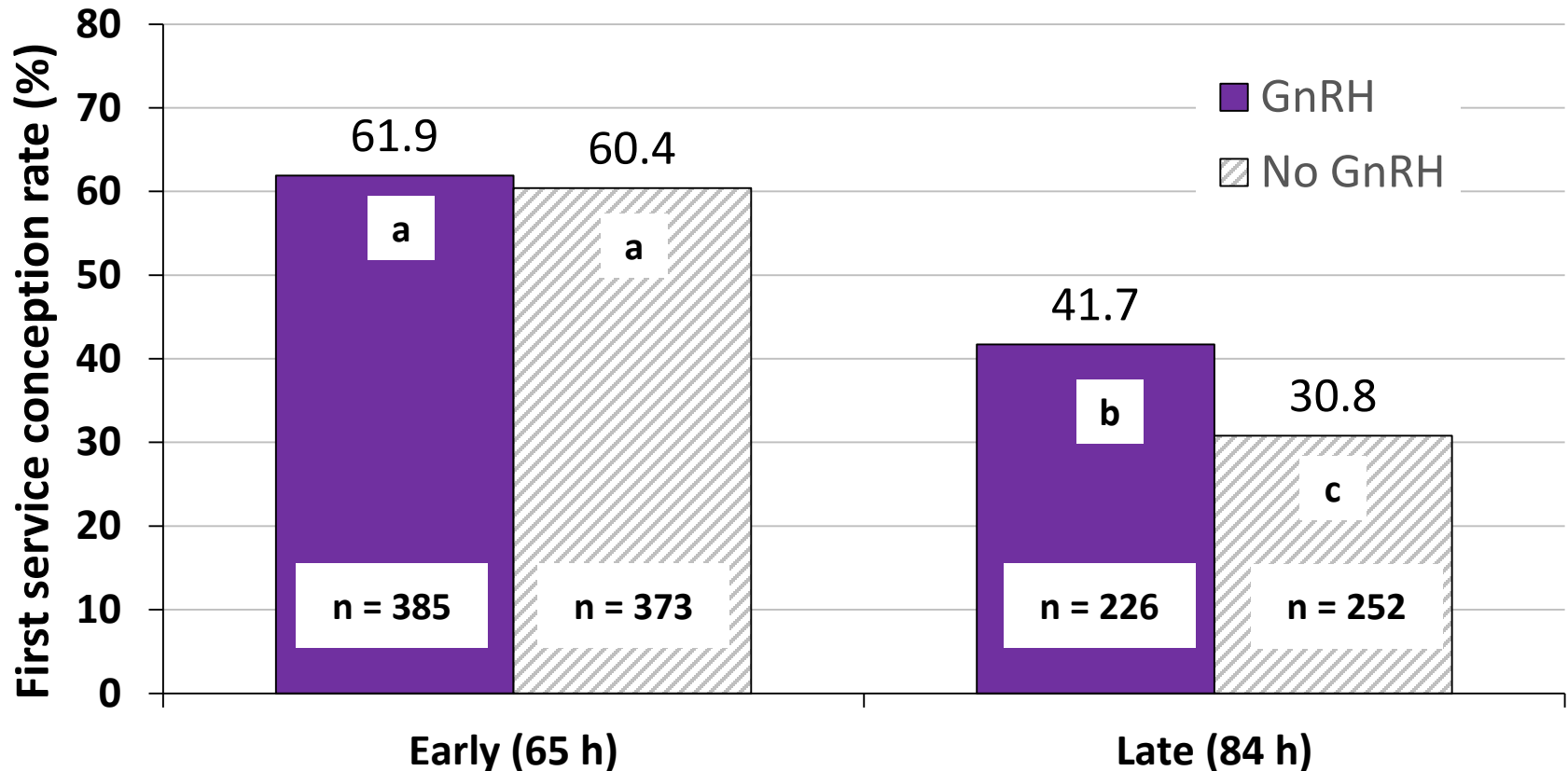


Treatment protocol to establish the importance of injecting GnRH

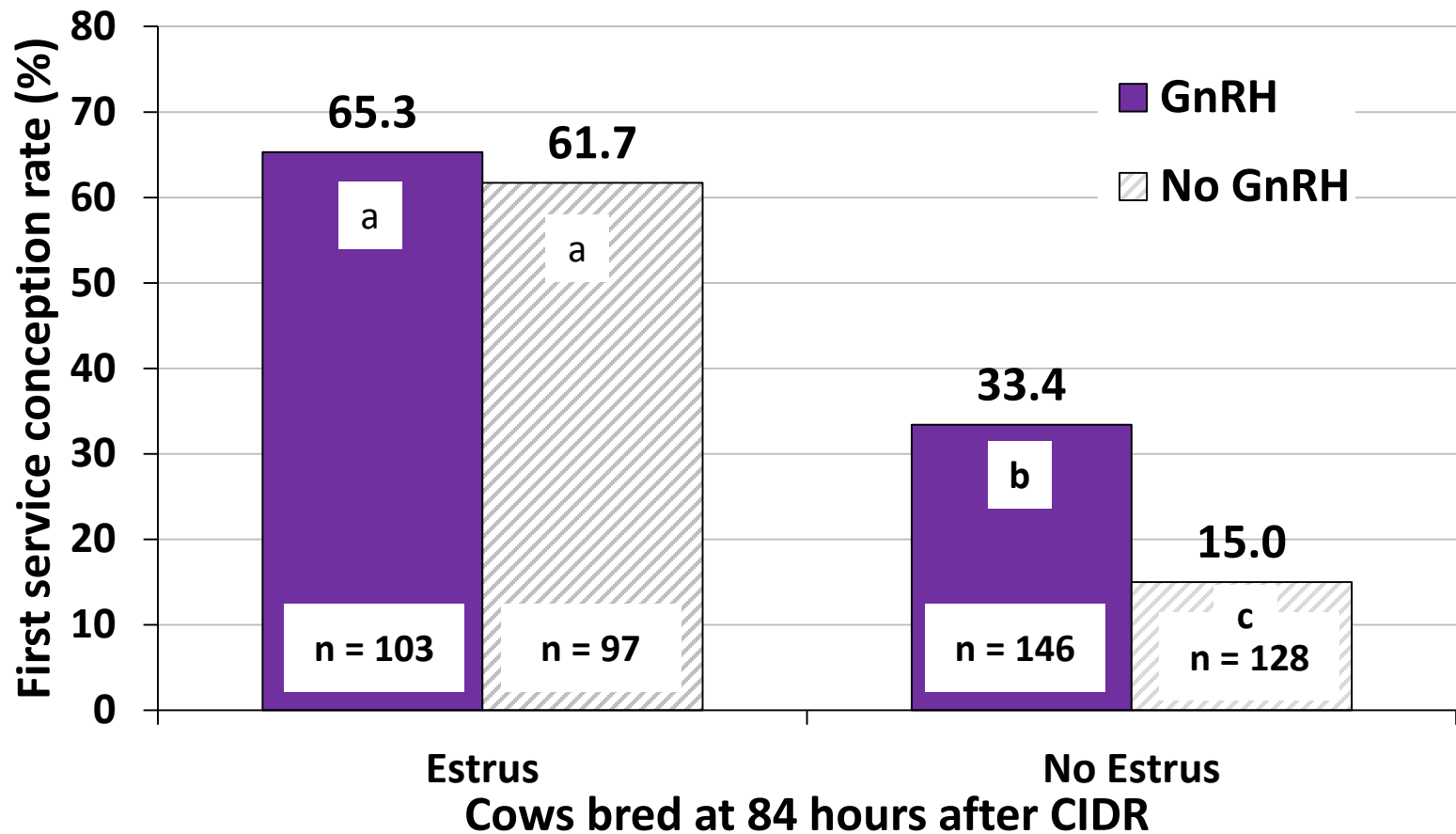
- **E + G**: Cows displayed estrus by 65 h, received GnRH and AI
- **E – G**: Cows displayed estrus by 65 h, received **no** GnRH and AI
- **L + G**: Cows did not display estrus by 65 h, received GnRH and inseminated at 84 h
- **L – G**: Cows did not display estrus by 65 h, received **no** GnRH and inseminated at 84 h



First service conception rate to fixed-time AI at 65 or 84 h after CIDR removal



Effect of estrus and GnRH on FSCR to fixed-time AI at 84 h after CIDR removal



Discussion

- GnRH is not essential to achieve acceptable FSCR (>60%) when cows express estrus before AI at 65 h.
- For cows not in estrus by 65 h – GnRH was only effective in improving FSCR for cows not displaying estrus by 84 h.
 - GnRH treatment of non-estrus cows increased FSCR of those cows by 2×

Conclusions

- GnRH injection at AI improved FSCR only in those cows that were not detected in estrus before AI.
- Cows that displayed estrus, regardless of GnRH treatment, had better FSCR than cows that did not display estrus.
- The split-time AI program serves as a compromise between conventional AI after detecting estrus and a standard one fixed-time AI program.

Two split-time artificial insemination programs

- Two split-time treatment groups
 1. Cows in estrus bred at 55 h, non-estrus cows received GnRH and bred at 75 h. **(55 – 75 h)**
 2. Cows in estrus bred at 65 h, non-estrus cows received GnRH and bred at 85 h. **(65 – 85 h)**



Two split-time artificial insemination programs

- Four treatment response groups

55 – 75 h

1a. Cows in estrus at 55 h & AI (no GnRH)

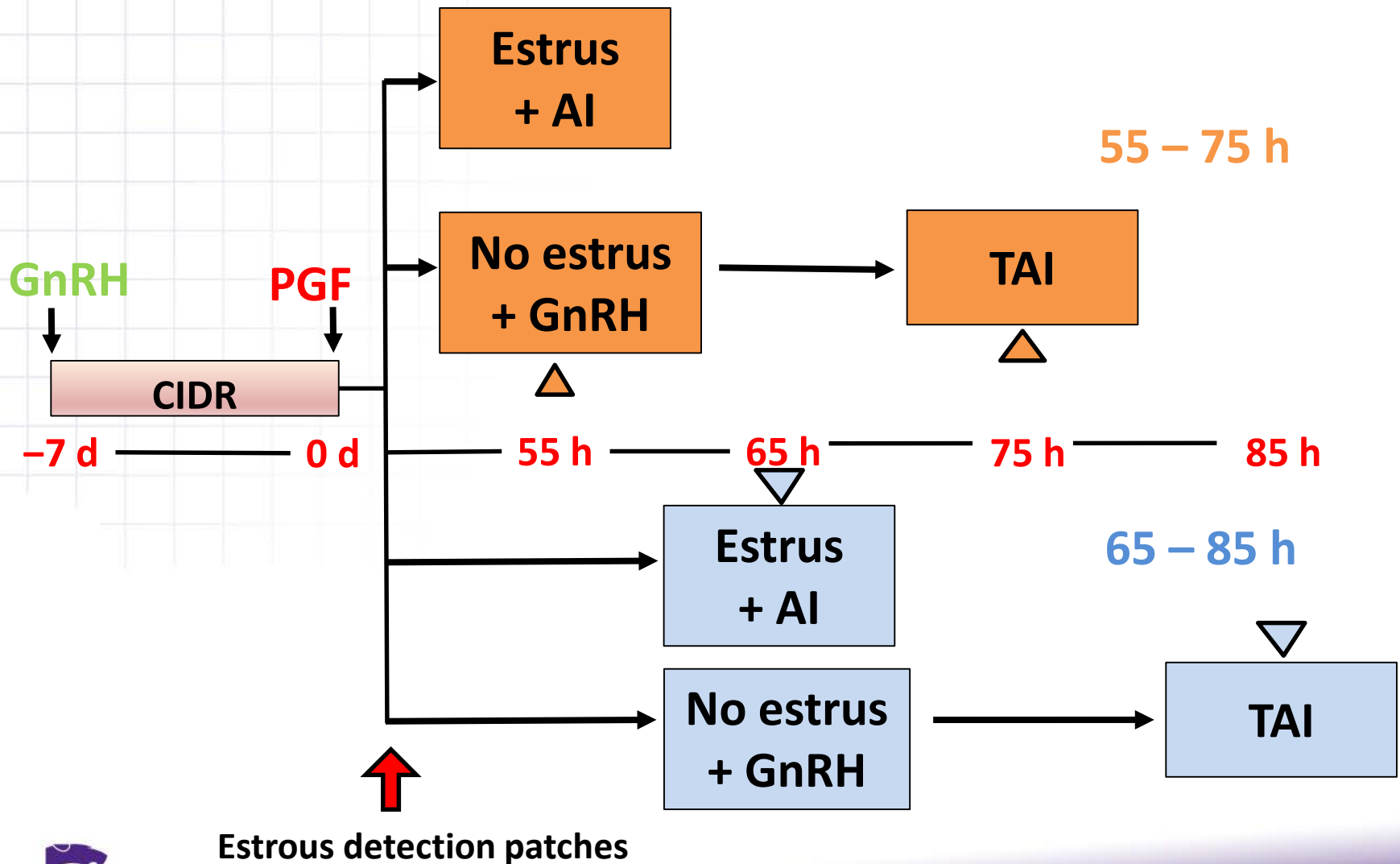
1b. Cows not in estrus at 55 h, received GnRH & AI at 75 h.

65 – 85 h

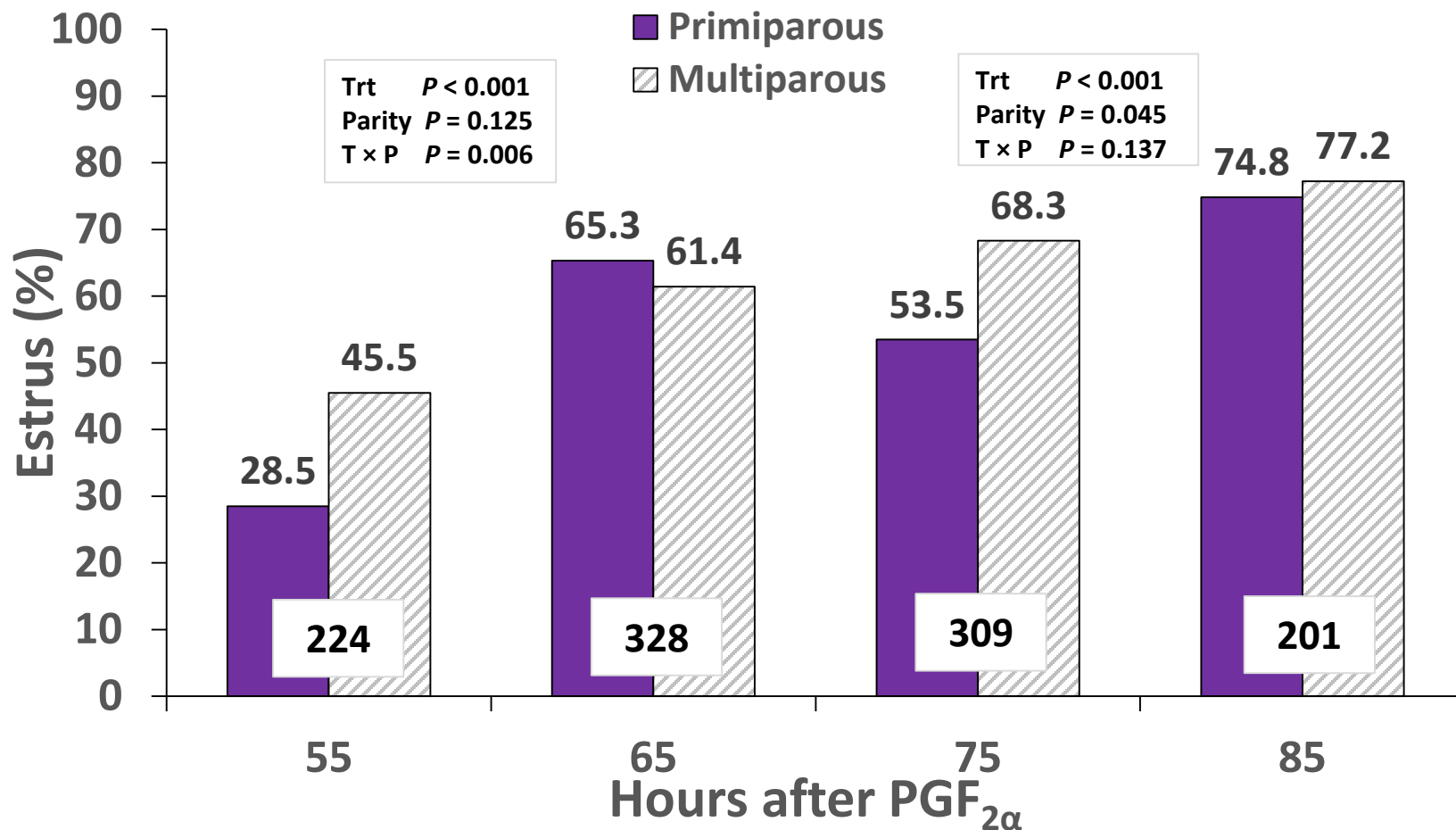
2a. Cows in estrus at 65 h & AI (no GnRH)

2b. Cows not in estrus at 65 h, received GnRH & AI at 85 h.

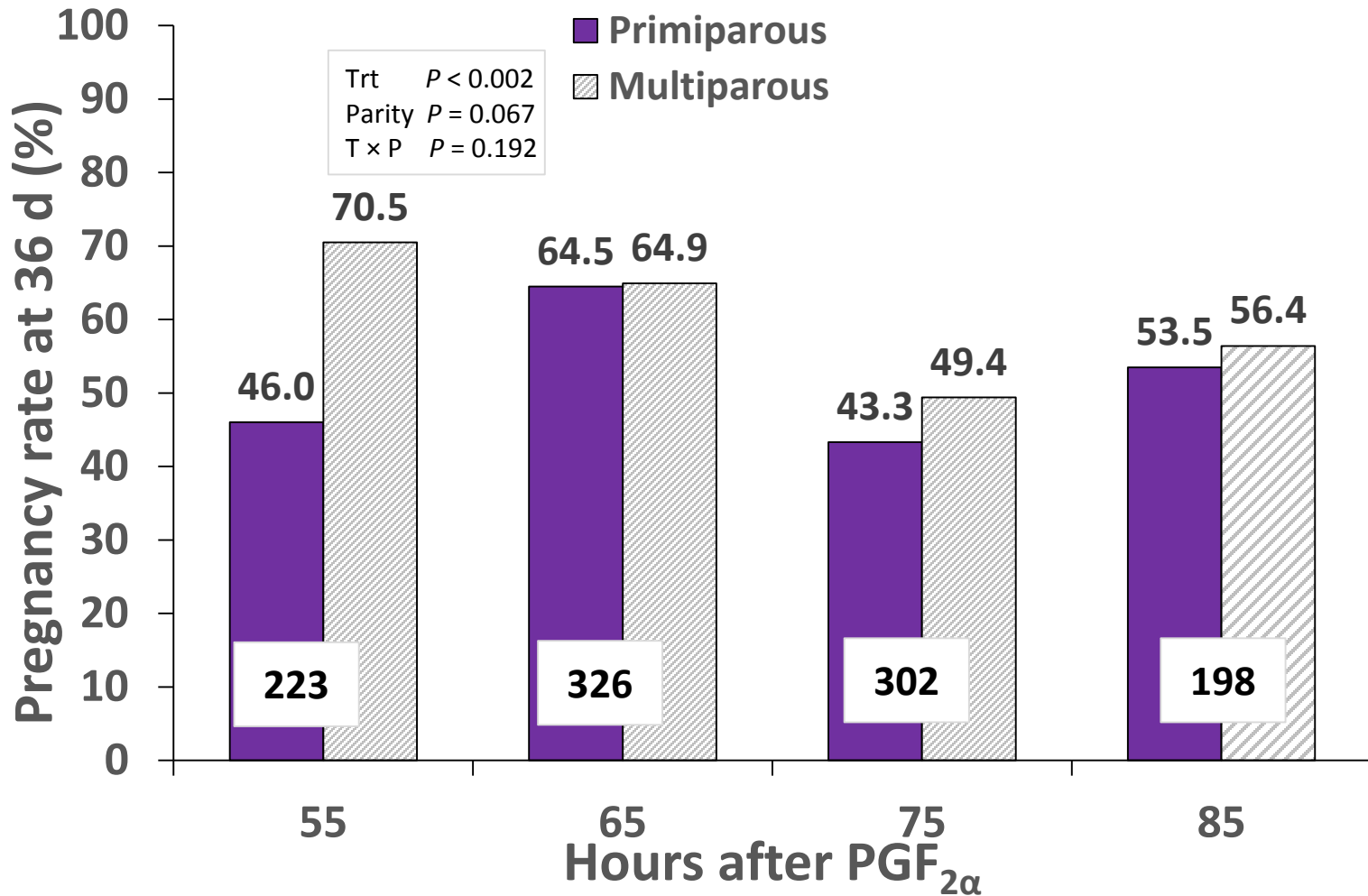
Two split-time artificial insemination programs



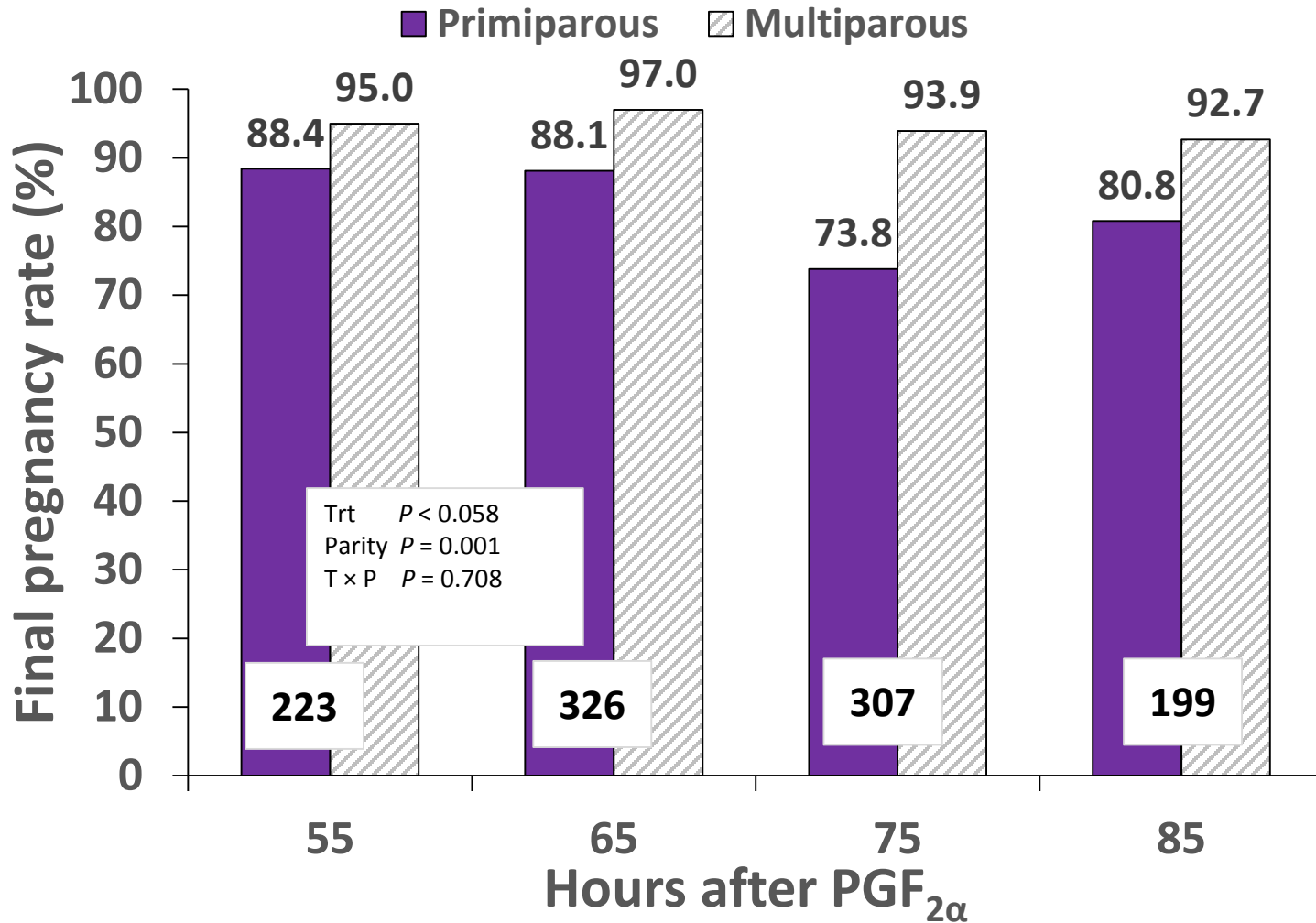
Proportion of cows in estrus by 55, 65, 75 or 85 h after removal of CIDR and injection of PGF_{2α}



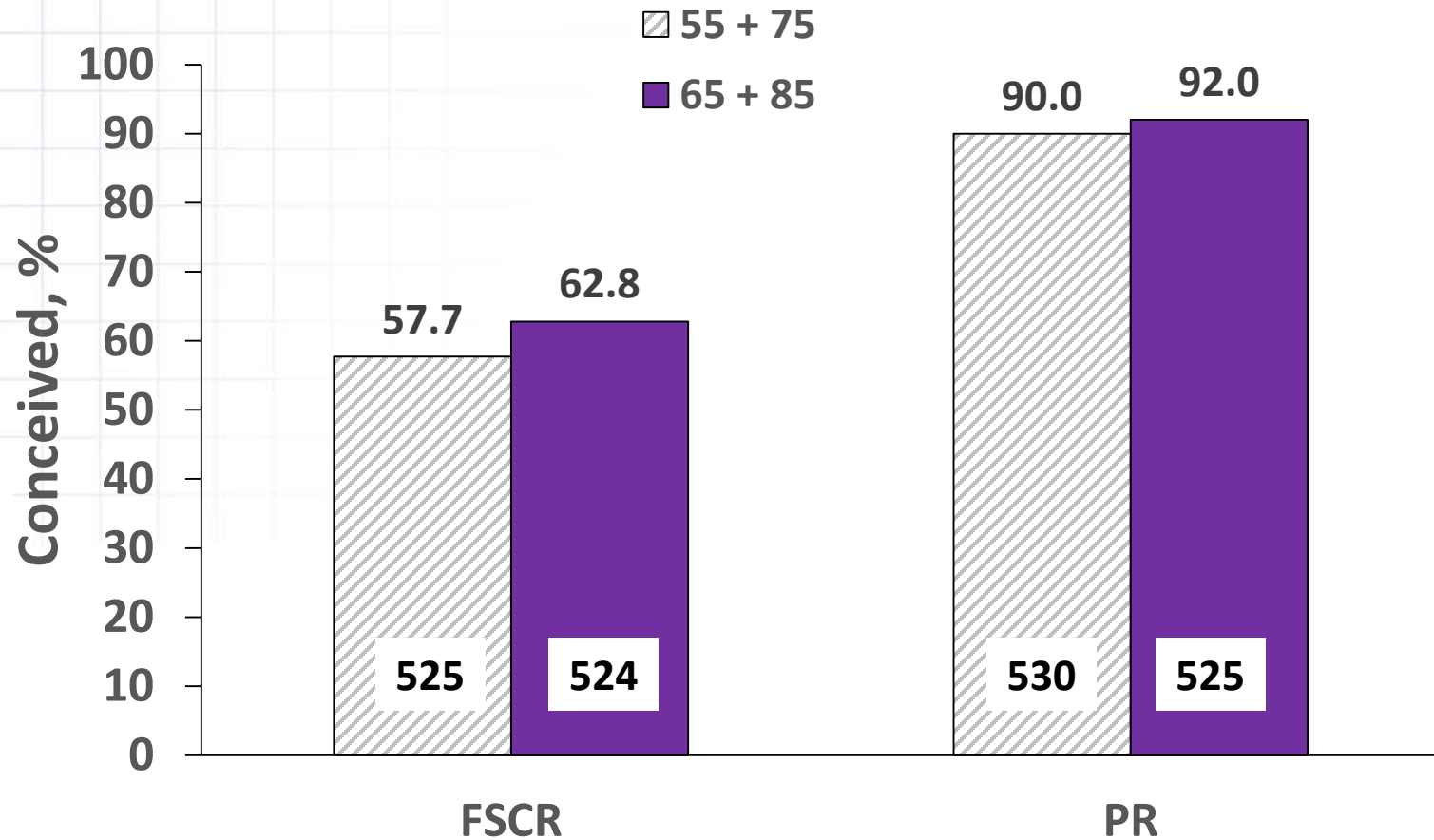
First service conception rate



Final (end of breeding) pregnancy rate



First service conception and final pregnancy rate by treatment (55 + 75 vs. 65 + 85 h)



Summary

- **For cows in estrus by 55 or 65 h**, pregnancy rate was greater compared to cows not in estrus and bred at 75 or 85 h.
- **For cows not in estrus by 55 or 65 h**, but showed estrus by 75 or 85 h, pregnancy rate was greater for cows displaying estrus than for cows not showing estrus.
- **Overall**, (regardless of when estrus occurred) FSCR rate was greater for cows displaying estrus than for those not showing estrus (67.3 vs. 42.7%).

Summary

- FSCR was greater for cows assigned to the 65 + 85 h treatment compared to cows assigned to the 55 + 75 h treatment (62.8 vs. 57.7%, respectively).
- Final pregnancy rate was not different between the 55 + 75 h and 65 + 85 h treatments (90.0 vs. 92.0 %, respectively).



Summary – “Cowboy math” (100 cows)

FSCR: At 65/85 h Estrus – 67%; No estrus – 43%

FTAI at 65 h

63 % in estrus at 65 h

37 % not in estrus at 65 h

63 estrus cows × 67% FSCR = 42 cows

37 no estrus cows × 43% FSCR

= 16 cows

FSCR = 58 cows

Split time AI at 65 + 85 h

63 % in estrus at 65 h

37 % not in estrus at 65 h

63 estrus cows × 67% FSCR = 42 cows

37 cows × 76% estrus @ 85 h

= 28 cows

28 cows × 67% FSCR = 19 cows

9 no estrus cows × 43% FSCR @ 85 h

= 4 cows

FSCR = 65 cows

7% increase for FSCR

Implications

- It is more economical to use estrus detection patches and reduce the number of GnRH injections required.
- Allows for choice of semen and sire selection (cost) for cows detected in estrus (greater PR)
 - Cows not detected in estrus are placed in a split-time program and less expensive semen is utilized.
- Split-time insemination programs should result in a greater number of bred cows and recapture costs associated with estrus synchronization.

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