



What's new with synchrony programs in pasture based dairy herds?



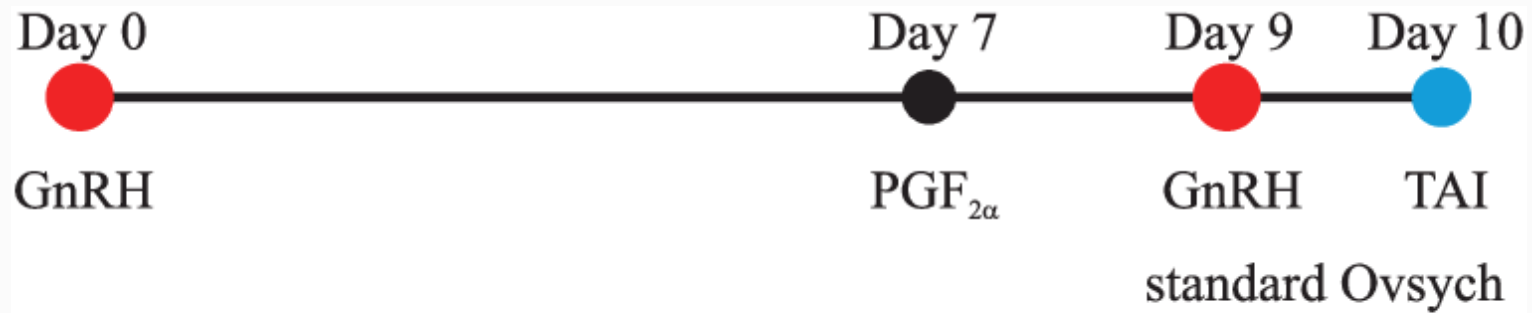
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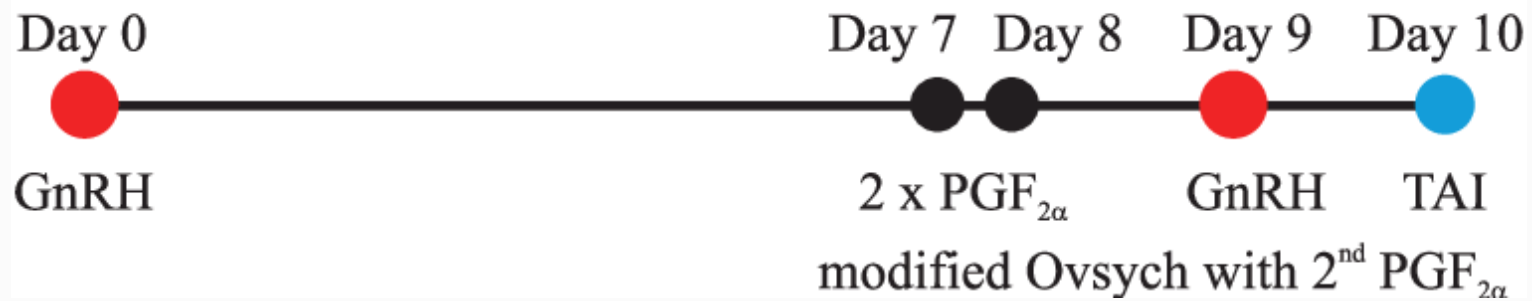
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An extra PG injection on day 8 ↑ P / AI



Sync Program



Fertility program

Nowicki *et al* (2019) Polish Journal of Veterinary Sciences. 22. 157-161.

Induced Ovulators



Spontaneous Ovulators



Back to the beginning... in 1995



SYNCHRONIZATION OF OVULATION IN DAIRY COWS USING PGF_{2α} AND GnRH

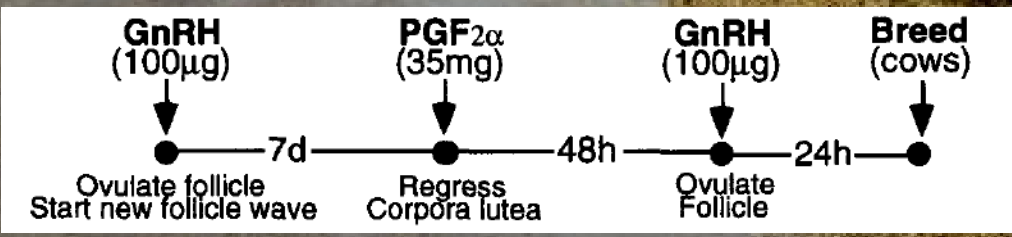
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Improving fertility (P / AI)



Heat detection



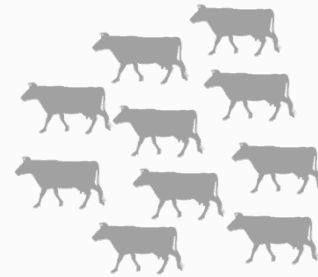
50% showing heat, getting **submitted** for insemination



CR 50% →



= **25% PR**



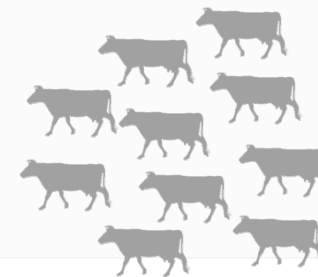
Increasing the submission to **80%**



CR 50% →



= **40% PR**



FTAI



Increasing the submission to **100%**



CR 50% →

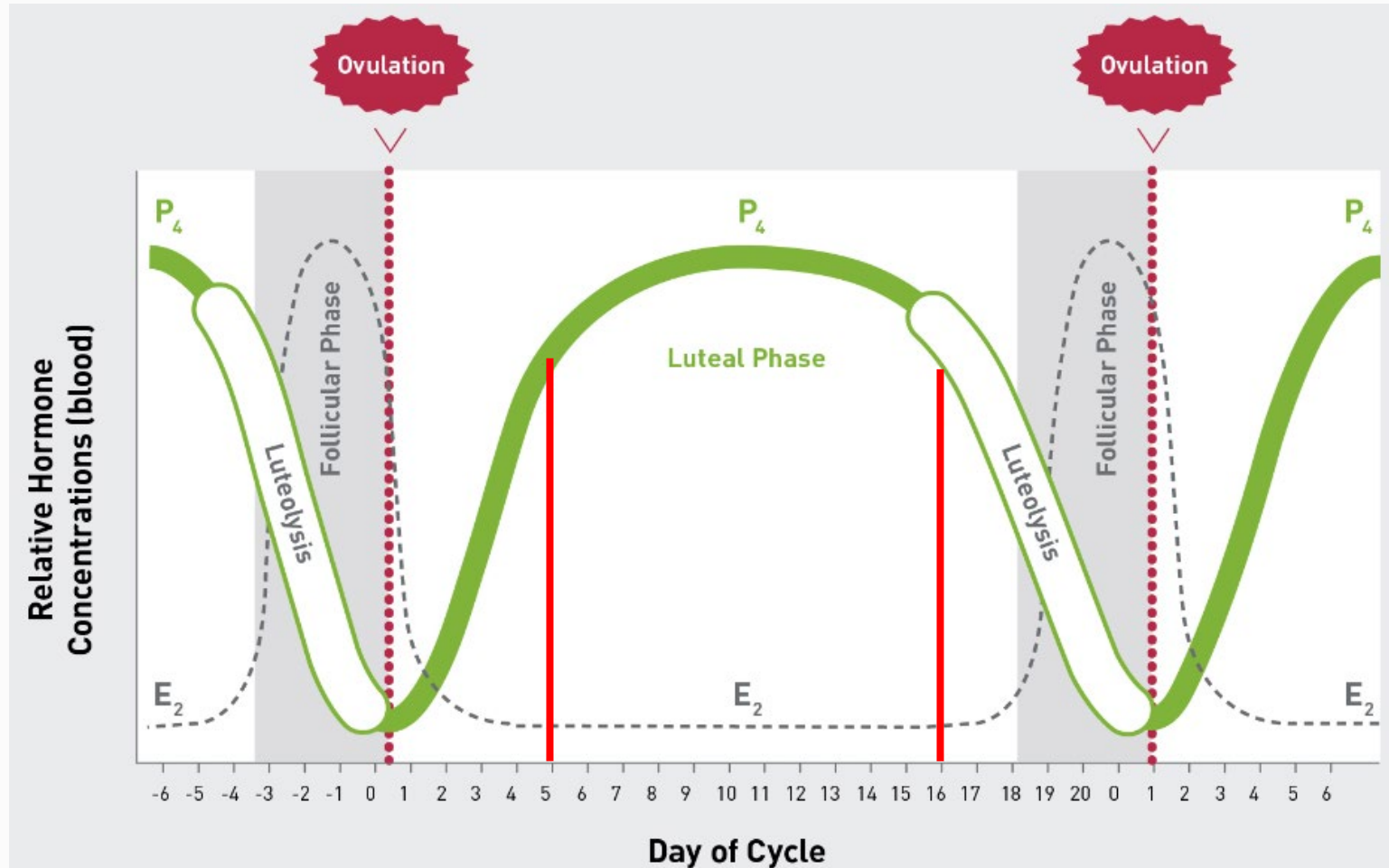


= **50% PR**

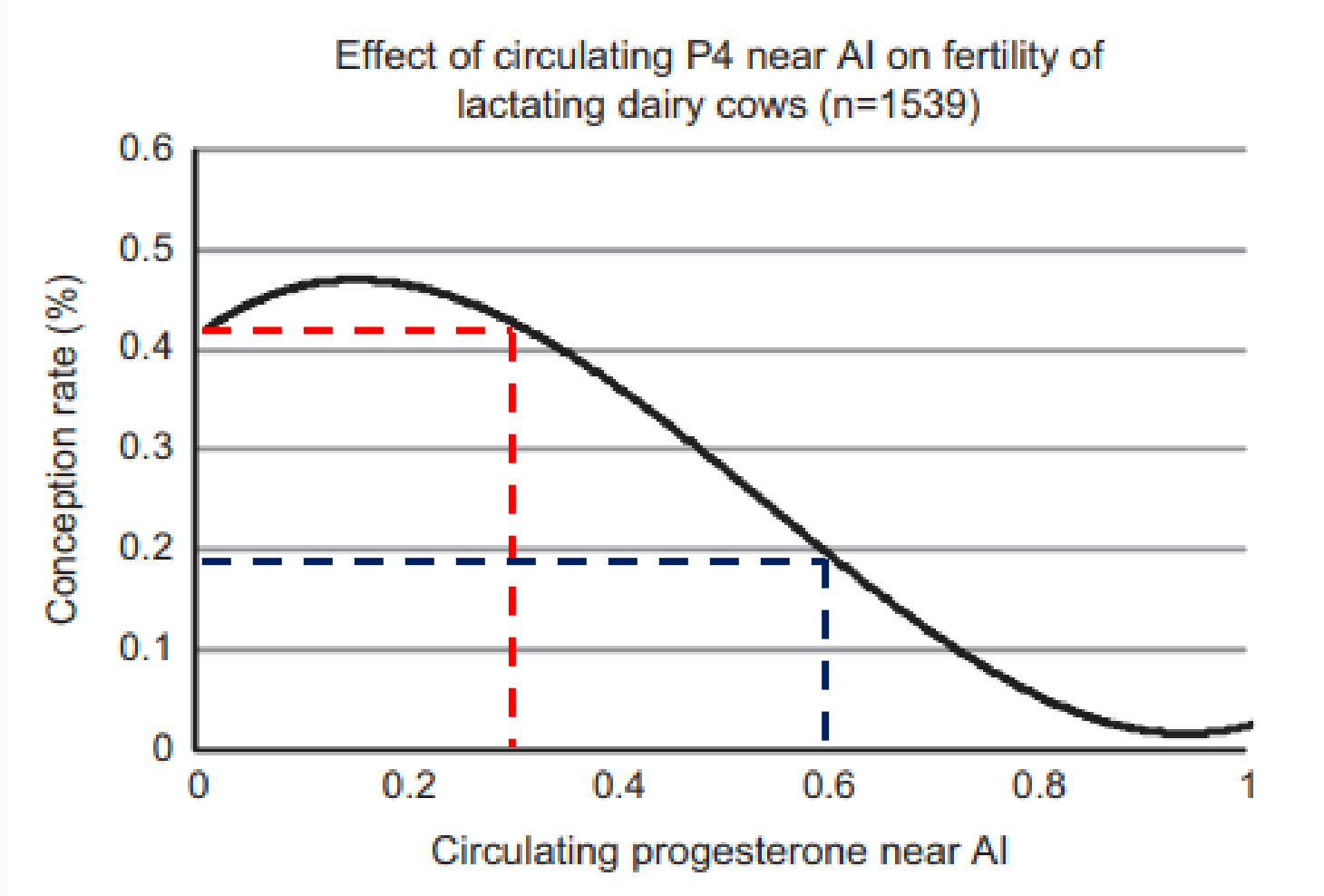
Oestrous cycle of the cow



Luteolytic treatment with PGF2 α is only effective when a functional CL exists from **days 5 to 16** of a normal oestrous



Inadequate luteolysis \Rightarrow High P4 @ AI \Rightarrow poor fertility



Effect of a second treatment with PGF₂α during the Ovsynch protocol on luteolysis and pregnancy in dairy cows

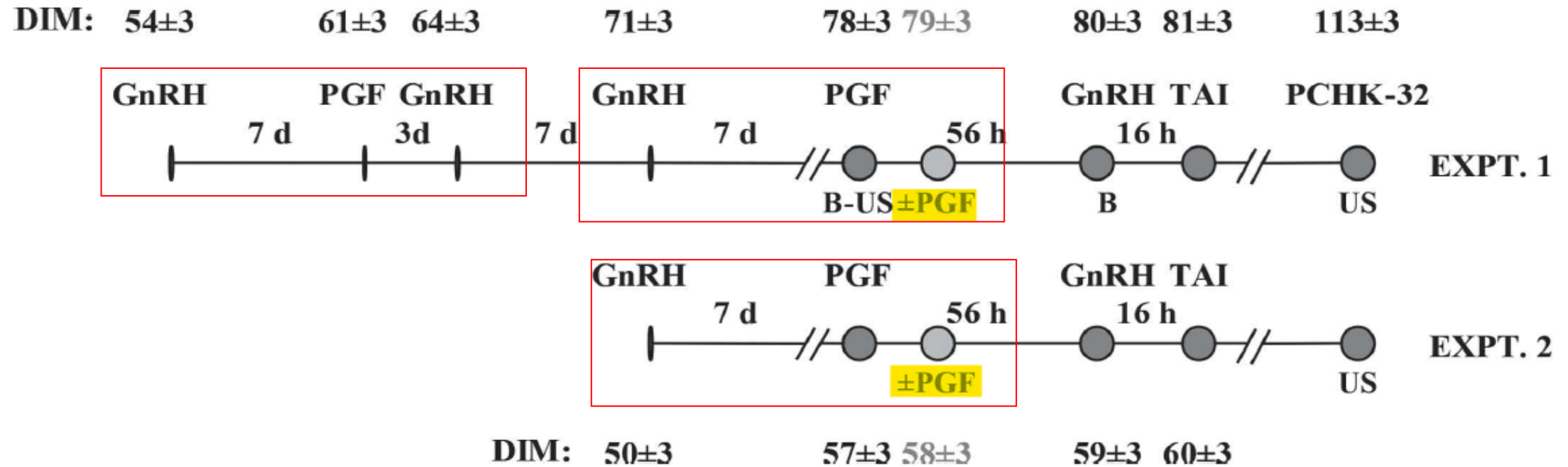


Figure 1. Schematic diagram of the experimental protocols used for experiments (EXPT.) 1 and 2. In EXPT. 1, cows began Double-Ovsynch at 54 ± 3 DIM with timed AI at 81 ± 3 DIM. In EXPT. 2, cows began Ovsynch at 50 ± 3 DIM with timed AI at 60 ± 3 DIM. PGF = prostaglandin F_{2α}.

Effect of a second treatment with PGF₂α during the Ovsynch protocol on luteolysis and pregnancy in dairy cows



Table 6. Effect of treatment with a second prostaglandin F_{2α} (PGF) on P/AI during the Ovsynch (experiment 2) or Double-Ovsynch (experiment 1) protocols¹

Parity	1 PGF, % (no./no.)	2 PGF, % (no./no.)	Effect of PGF difference, % (<i>P</i> -value)
Primiparous	39.3 (140/356)	40.6 (139/342)	+ 3.31% (0.39)
Multiparous	32.5 (296/910)	36.5 (333/913)	+12.31% (0.043)
<i>P</i> -value	0.04	0.17	
Overall	34.4 (436/1266)	37.6 (471/1251)	+9.45% (0.049)

¹Results from experiments 1 and 2 were combined for the analysis with all cows assigned to the experiments included in the analysis.

Conclusion:

- ▶ 2nd PGF₂α ⇒ reduced the percentage of cows with inadequate regression of the CL at the time of the final GnRH
- ▶ An increase in fertility with about **10% more pregnancies produced in cows treated with the second PGF**
- ▶ Likely to be a **practical treatment** for many dairy farms

A meta-analysis: Effect of adding a 2nd PGF_{2α} injection during the Ovsynch protocol on luteal regression and fertility in lactating dairy cows



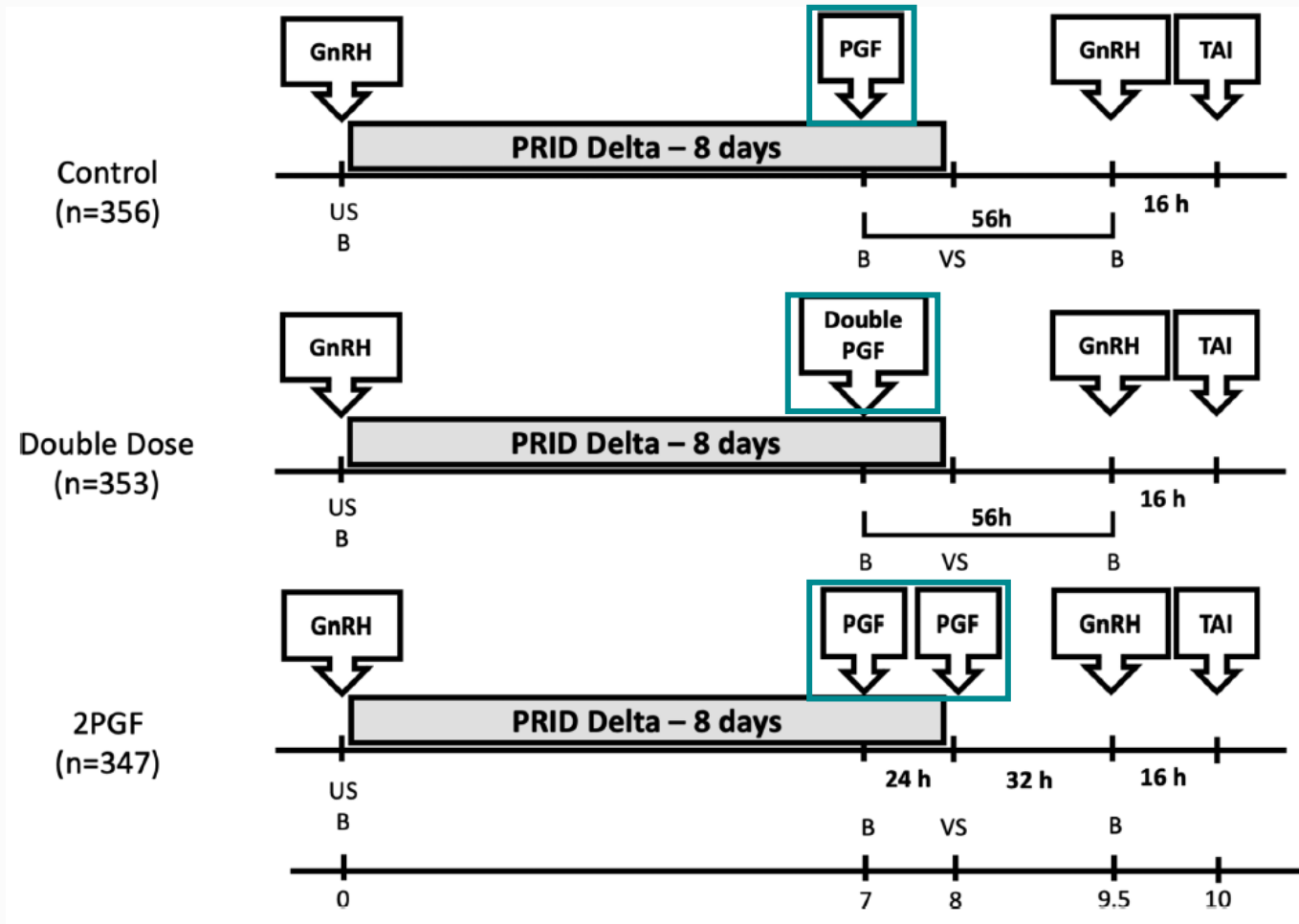
Table 2. Effect of an additional treatment with PGF_{2α} during the Ovsynch protocol (n = 1,856) on luteal regression at the end of the protocol considering 6 manuscripts with a randomized controlled study design

Manuscript ¹	Luteal regression		Relative risk ²	95% CI	P-value
	1PGF	2PGF			
Barletta et al. (2018)	112/128	133/142	1.07	0.99–1.16	
Brusveen et al. (2009)	151/178	155/162	1.13	1.05–1.21	
Carvalho et al. (2015a)	262/312	281/288	1.16	1.10–1.22	
Heidari et al. (2017)	28/50	35/50	1.25	0.92–1.70	
Santos et al. (2016)	89/100	100/102	1.10	1.02–1.19	
Wiltbank et al. (2015)	146/176	163/168	1.17	1.09–1.26	
$I^2 = 0.00\%$ ($P = 0.450$)					
Total (fixed effects)	788/944	867/912	1.14	1.10–1.17	0.001
Total (random effects)	788/944	867/912	1.13	1.10–1.17	0.001
Pooled proportion (%)	83.5	95.1			

¹ I^2 = proportion of total variation of effect size estimates that is due to heterogeneity.

²Relative risk for having a blood progesterone concentration below a certain threshold at the end of the Ovsynch protocol using a single PGF_{2α} treatment (1PGF) compared with 2 PGF_{2α} treatments (2PGF) during the Ovsynch protocol.

Effect of dose and frequency of PGF2 α treatments during a 7-day Ovsynch protocol with an intravaginal progesterone releasing device on luteal regression and pregnancy outcomes in lactating Holstein cows



- 2nd PGF treatment ⇒ **increased luteal regression and decreased mean P4** at G2
- At 35 ± 3 days P/AI: **46.5%** vs **37.7%** (P = 0.045)
- At 80 ± 7 days P/AI: **44.1%** vs **35.6%** (P = 0.055)

But what about in cows on pasture?



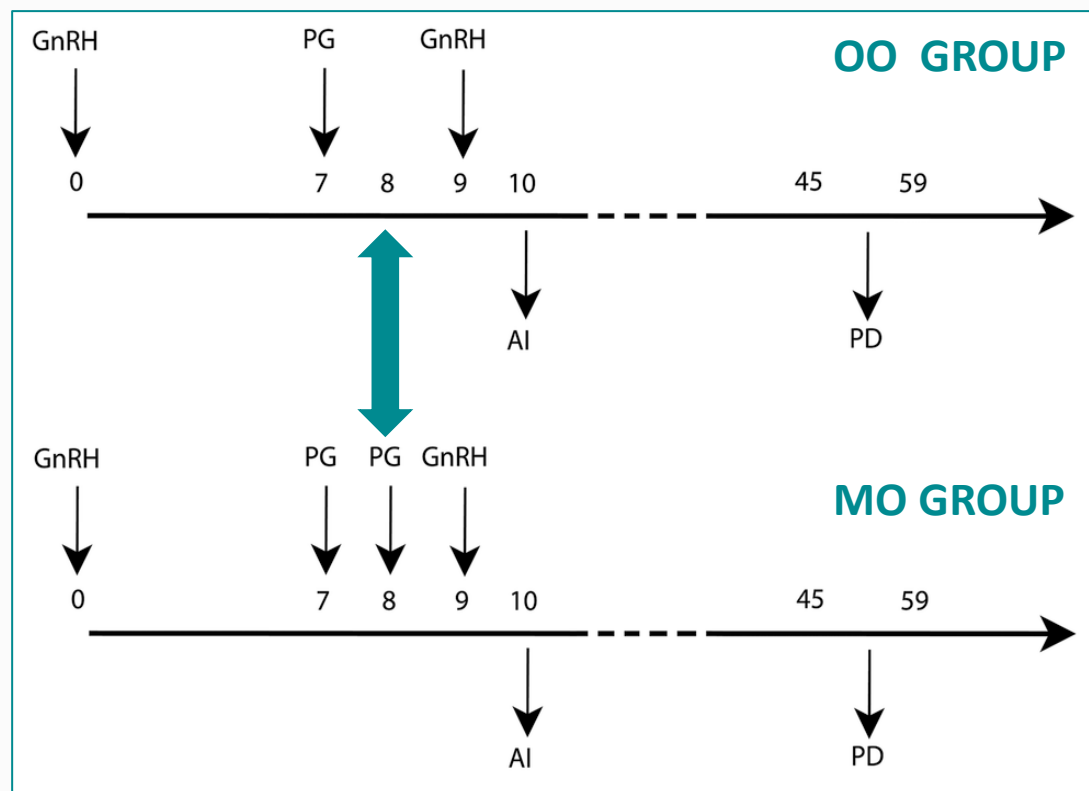
Effect of a 2nd PGF2 α during the Ovsynch program on FTAI conception rates and luteolysis in split calving, pasture-fed dairy cows



Five split-calving, pasture-based dairy herds in SW VIC (Spring 2015 / Autumn 2016)

Original Ovsynch (OO)

Modified Ovsynch (MO)



Effect of a 2nd PGF2 α during the Ovsynch program on FTAI conception rates and luteolysis in split calving, pasture-fed dairy cows

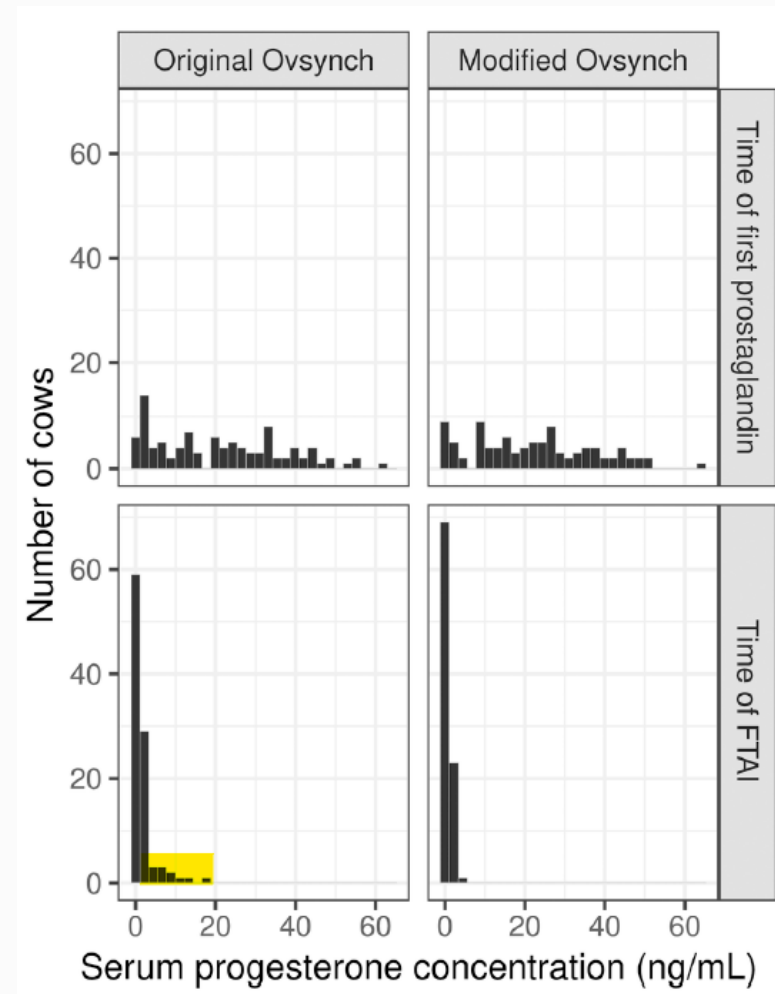


RESULTS:

1. MO FTAI conception rates **7%** (95% CI 2%-12%) > OO
2. Odds of conception to FTAI was **1.36** (95% CI 1.12-1.66) times greater for MO than OO*
3. Variability of serum progesterone concentrations at the time of FTAI was **significantly less** for MO than OO

CONCLUSION:

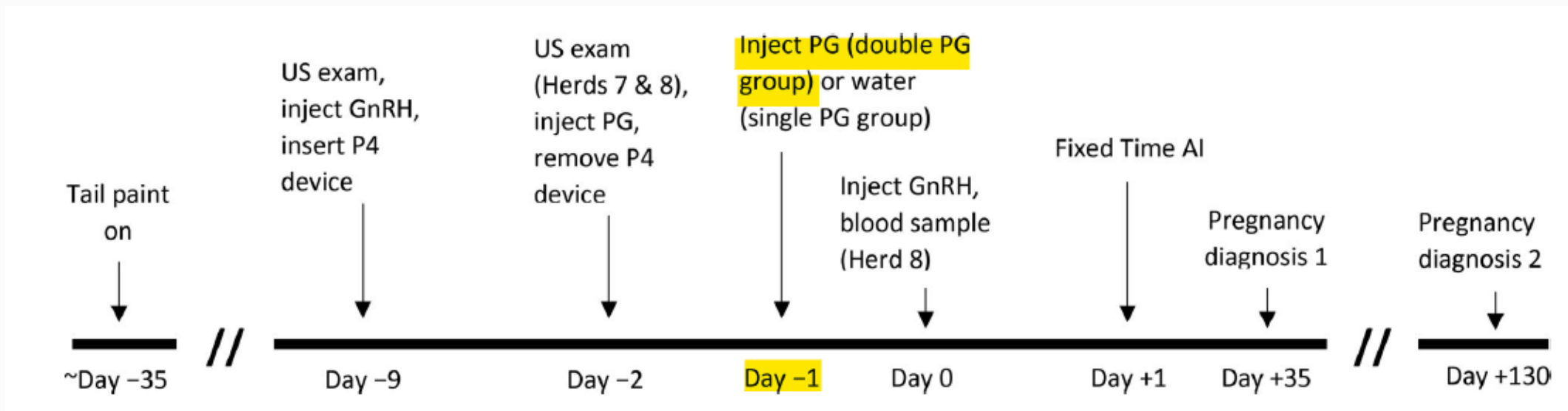
For HF and HF-X cows managed in pasture based dairy herds in southern Australia, the use of a **modified Ovsynch protocol including a second injection of PGF on day 8, increased FTAI conception rates**



Increasing conception rate by addition of a 2nd PGF2 α injection in an Ovsynch and progesterone treatment programme for dairy cows not detected in oestrus before the start of the seasonal mating period



Anoestrous cows (n = 1,411) from **nine** spring-calving dairy herds in the Waikato region of NZ (2018/2019)



Increasing conception rate by addition of a 2nd PGF2 α injection in an Ovsynch and progesterone treatment programme for dairy cows not detected in oestrus before the start of the seasonal mating period



RESULTS:

	Original Ovsynch (PG D7)	Modified Ovsynch (PG D7&8)	p
Conception rate (1 st AI)	41.1 (95% CI = 41.0-41.3)%	45.3 (95% CI = 45.1-45.4)%	p < 0.001
3-week-in-calf rate	49.2 (95% CI = 49.0-49.4)%	53.4 (95% CI = 53.6-54.0)%	p < 0.001
6-week-in-calf rate	63.5 (95% CI = 62.0-65.0)%	67.2 (95% CI = 65.7-68.8)%	p = 0.014

CONCLUSIONS:

Addition of a second PG injection 24 hours after the first

1. increased conception rate to first service
2. and the proportion of cows pregnant by 3 and 6 weeks after commencement of the mating period

Cow Synchrony Trial @ Matamata Vet Services



- ▶ Effect of 2nd PGF2a on day 8 in 461 Autumn-calving cows on 2 Waikato farms (2022)





Treatment	PR	Lower 95%CI	Upper 95%CI	p-value
1 x PG d7	34.2%	28.3%	40.8%	
2 x PG d7 & d8	47.1%	40.2%	54.0%	
Difference	12.8%	3.2%	17.1%	0.006

Conclusions:

- ⇒ double PG injection performed **significantly better**
- ⇒ increasing pregnancy rates on average by **12.8%**

Summary



- Improving fertility requires:
 - Increasing **submission rates** (FTAI)
 - Increasing **conception rates**
- Including a **second PGF2a** 24hrs after the first **improves conception rates**

