Optimizing first service management and performance with fertility programs and targeted management strategies

Julio Giordano, DVM, MS, PhD
Dairy Cattle Biology and Management Laboratory
Department of Animal Science

Vermont Veterinary Medical Association, Vermont
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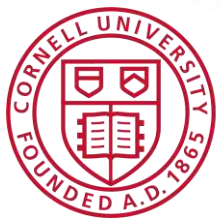

Cornell CALS
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Designing a first AI program

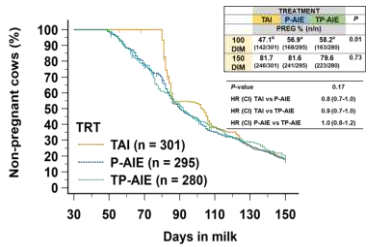
Increased reliance on timed AI (TAI)

Combining AIE and TAI

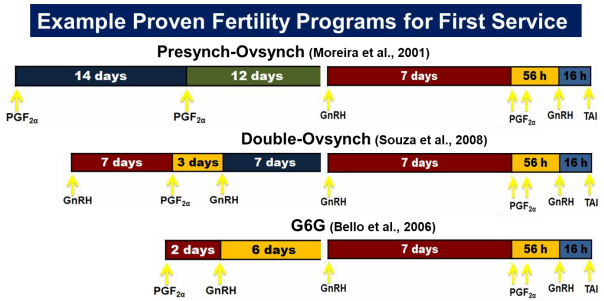
What do we do?

Defining drivers of success

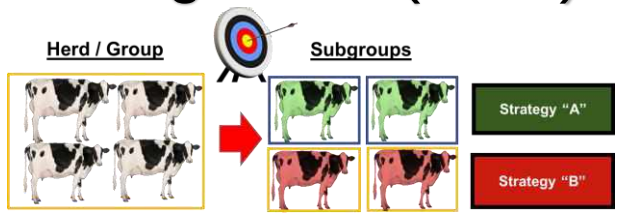
Bred Number	95% CI	%Conc	#Preg	#Open	Other	Abort	Total	%Tot	SPC
1	39-42	40	1031	1515	46	50	2592	43	2.5



Fertility programs for TAI



Targeted and Non-Targeted Reproductive Management (TRM)

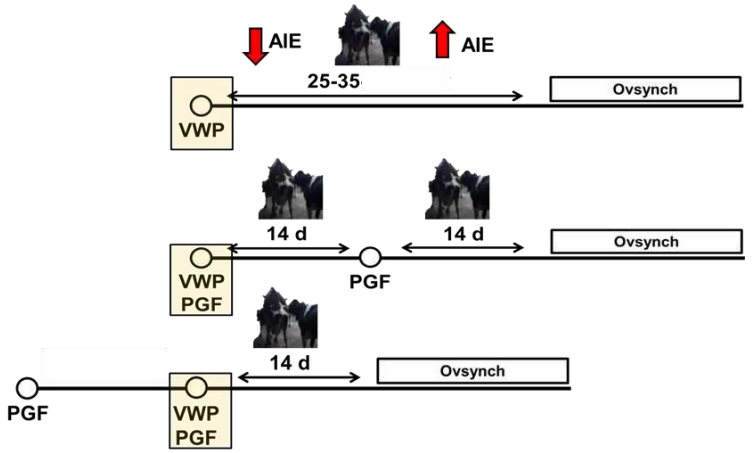


Picking the program that works best

Considerations about first breeding programs

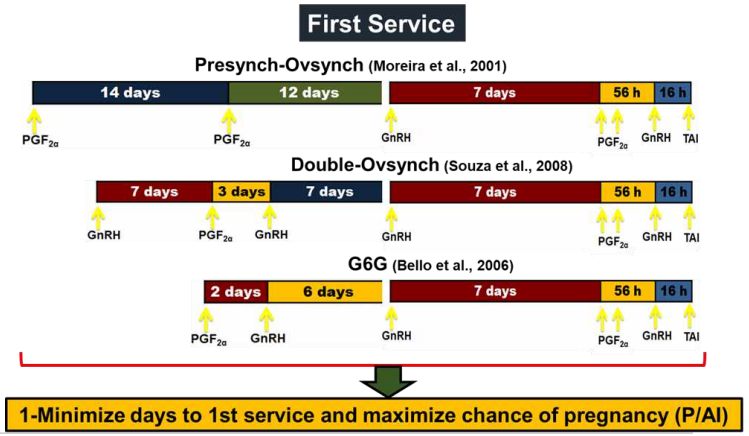
First breeding program should be designed to:

- **Minimize days to AI after end of VWP**
- **Maximize fertility of AI services**
- **Control timing of pregnancy during lactation**



Define most relevant outcome(s) of interest

- **Performance (e.g., P/AI, 21 d-PR, % AIE vs % TAI)**
- **Economics (e.g., reduce cost, maximize profits)**
- **Herd management (e.g., maximize/minimize AIE/TAI, spread labor, concentrate labor)**
- **All or specific combinations**



Timed AI is a great tool to increase P/AI

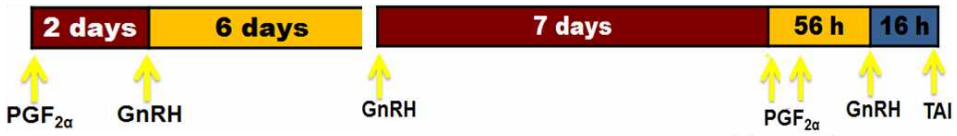
All-TAI with fertility programs is effective for controlling days to first AI and maximize fertility

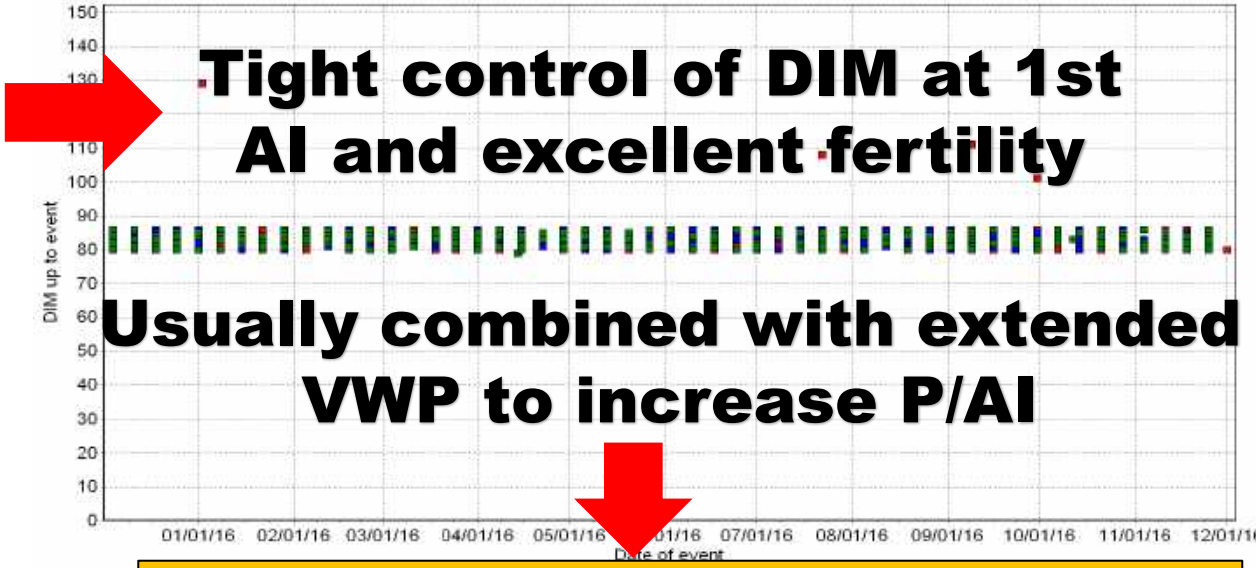
Example Proven Fertility Programs for First Service

Presynch-Ovsynch (Moreira et al., 2001)

Double-Ovsynch (Souza et al., 2008)

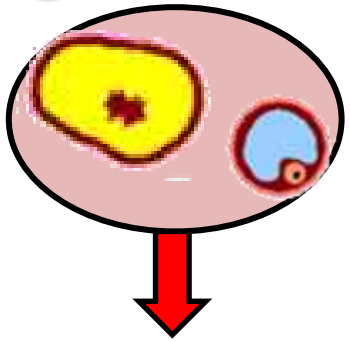
G6G (Bello et al., 2006)



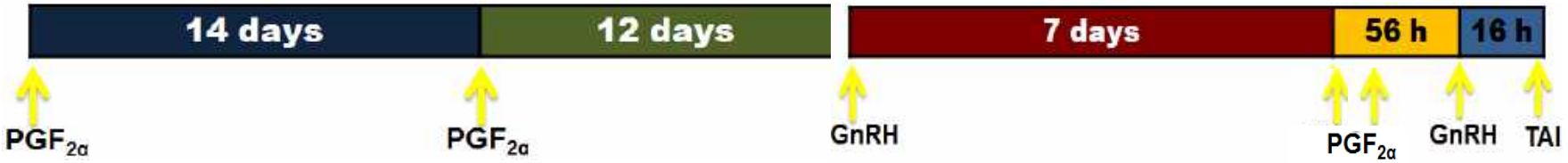


Pregnancy per AI ~40-60%

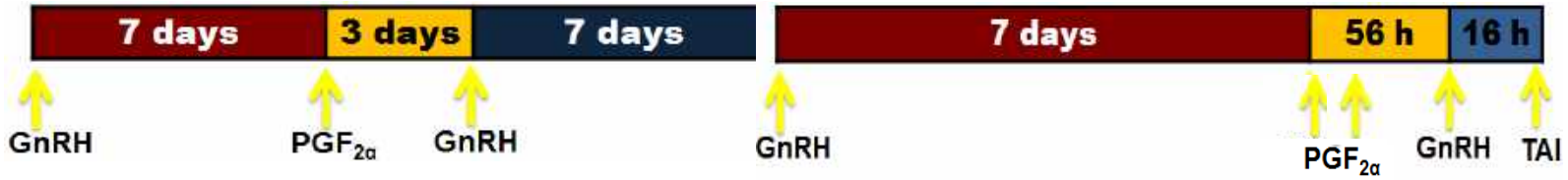
Fertility programs include presynchronization of the estrous cycle to optimize P/AI



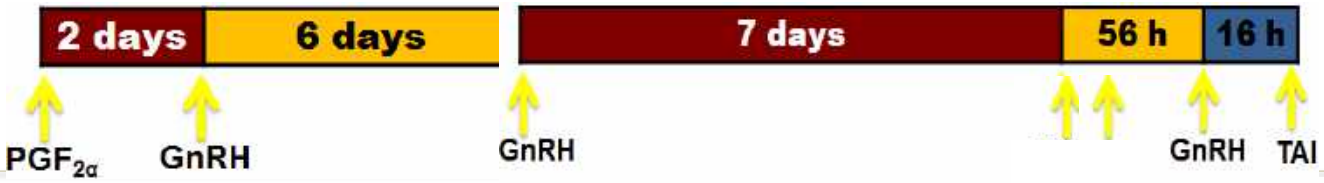
Presynch-Ovsynch (Moreira et al., 2001)



Double-Ovsynch (Souza et al., 2008)



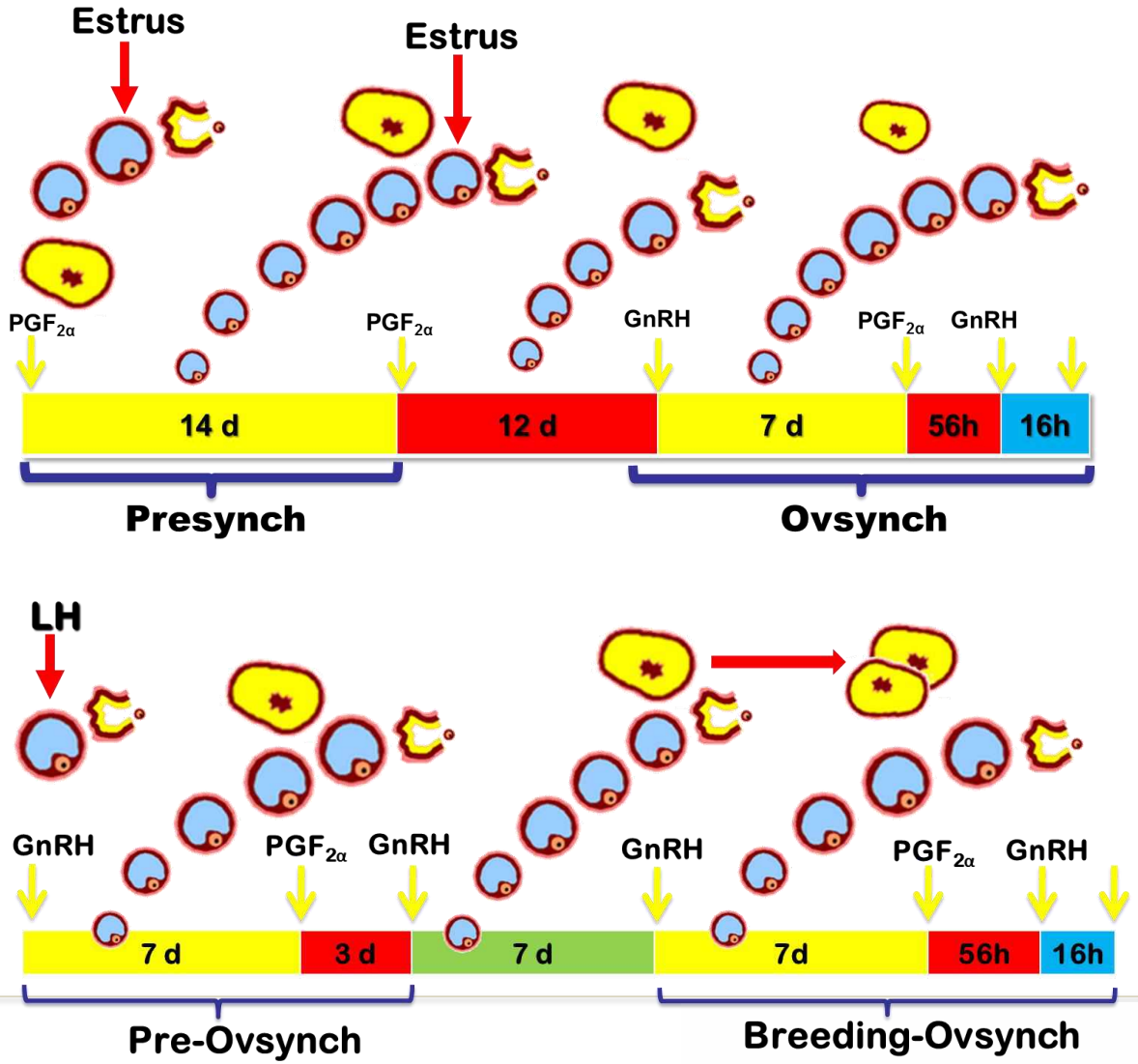
G6G (Bello et al., 2006)



Designed to control days to AI and maximize chance of pregnancy (i.e., P/AI)

GnRH-based fertility programs are more effective than PGF-based protocols

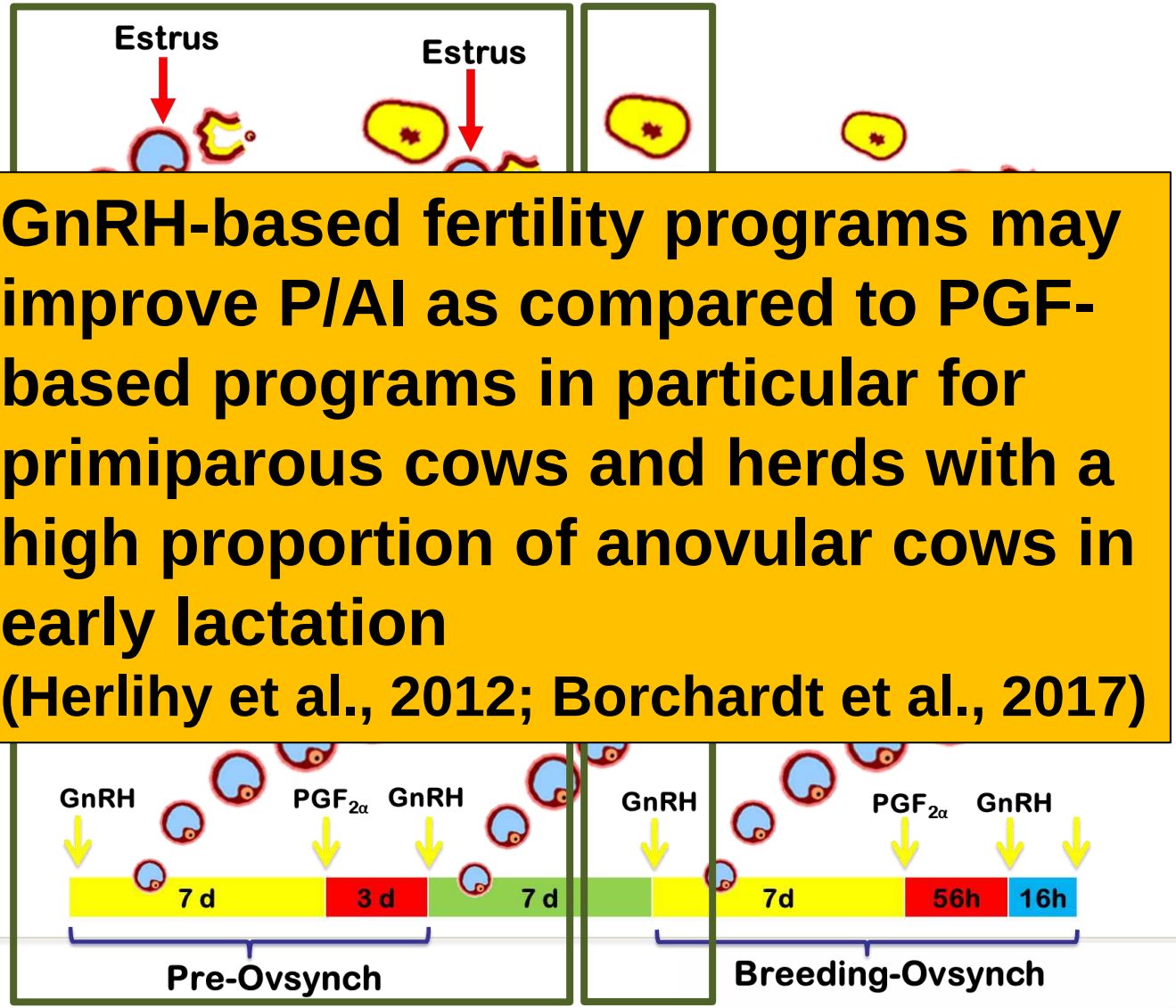
PGF-based versus GnRH-based protocols



GnRH-based fertility programs are more effective than PGF-based protocols

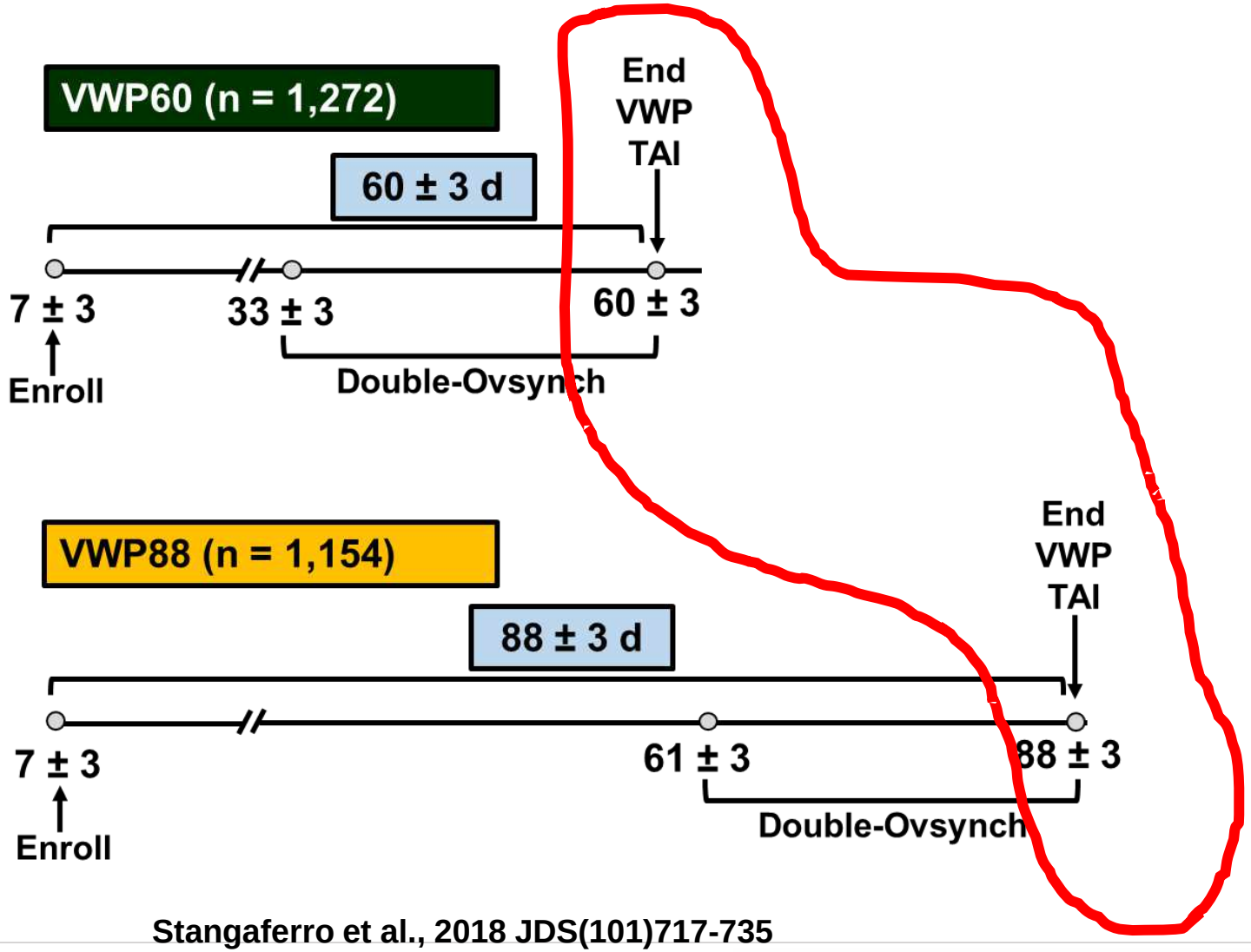
PGF-based versus GnRH-based protocols

GnRH-based fertility programs may improve P/AI as compared to PGF-based programs in particular for primiparous cows and herds with a high proportion of anovular cows in early lactation
(Herlihy et al., 2012; Borchardt et al., 2017)



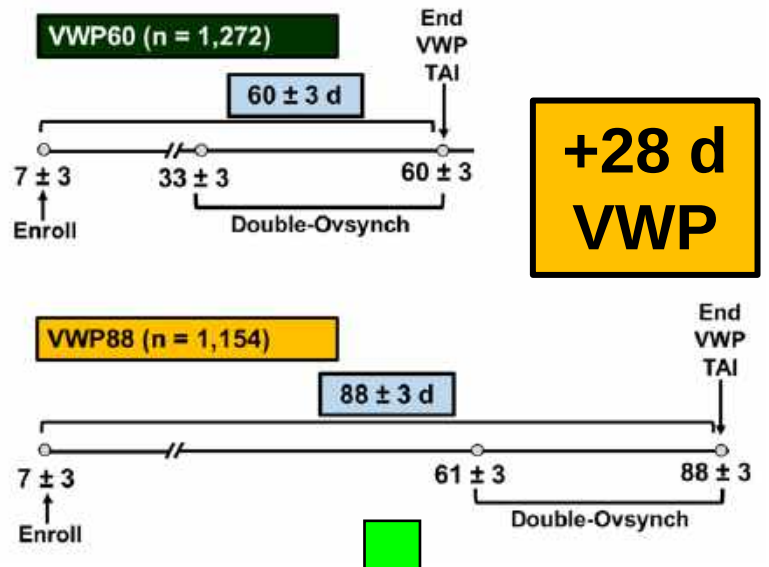
VWP duration can affect performance of fertility programs

- Cows bred for first time with TAI after Double-Ovsynch at 60 or 88 DIM
- Same management after first breeding

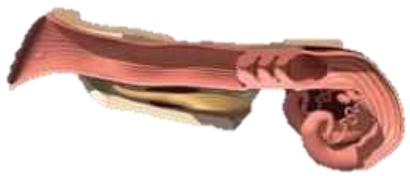


Stangaferro et al., 2018 JDS(101)717-735

Extending VWP from 60 to 88 DIM resulted in physiological conditions more favorable for pregnancy



Return to ovulation



Recovery uterine health

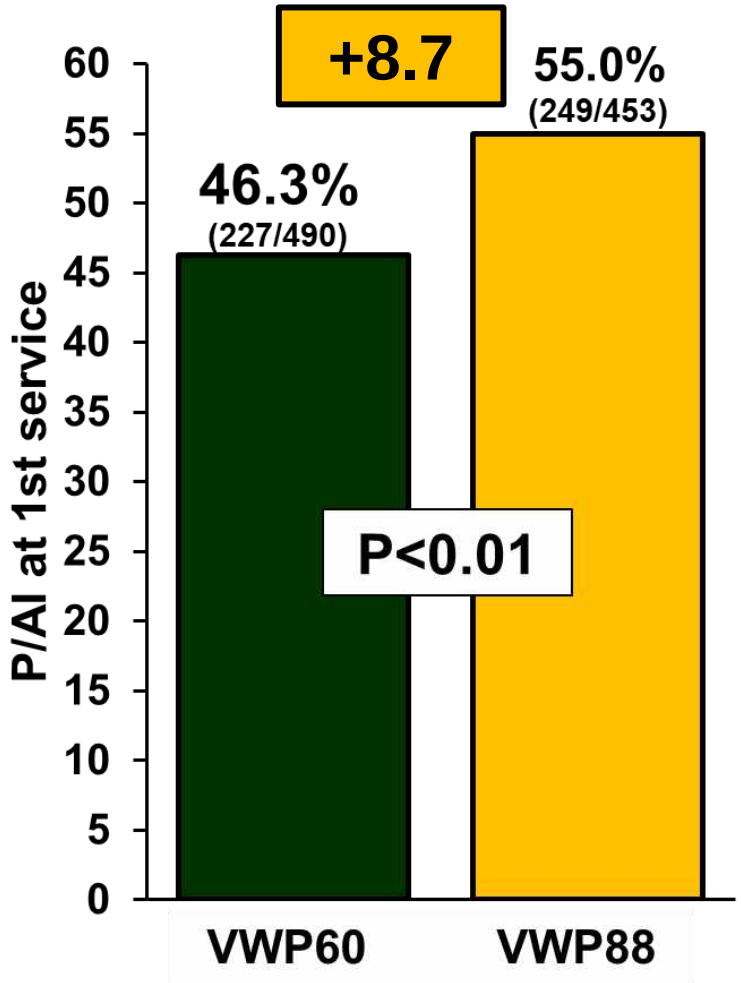
BCS recovery

- Increased % cyclic before synch protocol
  - Primi = 17 p.p.
  - Multi = 20 p.p.
- Reduced PVD (clinical endometritis) and SCE (subclinical endometritis)
  - Primi = PVD 25 p.p.
  - Multi = PVD 11 p.p.
- Increased % with BCS ≥2.75 before TAI
  - Primi = 5 p.p.
  - Multi = 12 p.p.

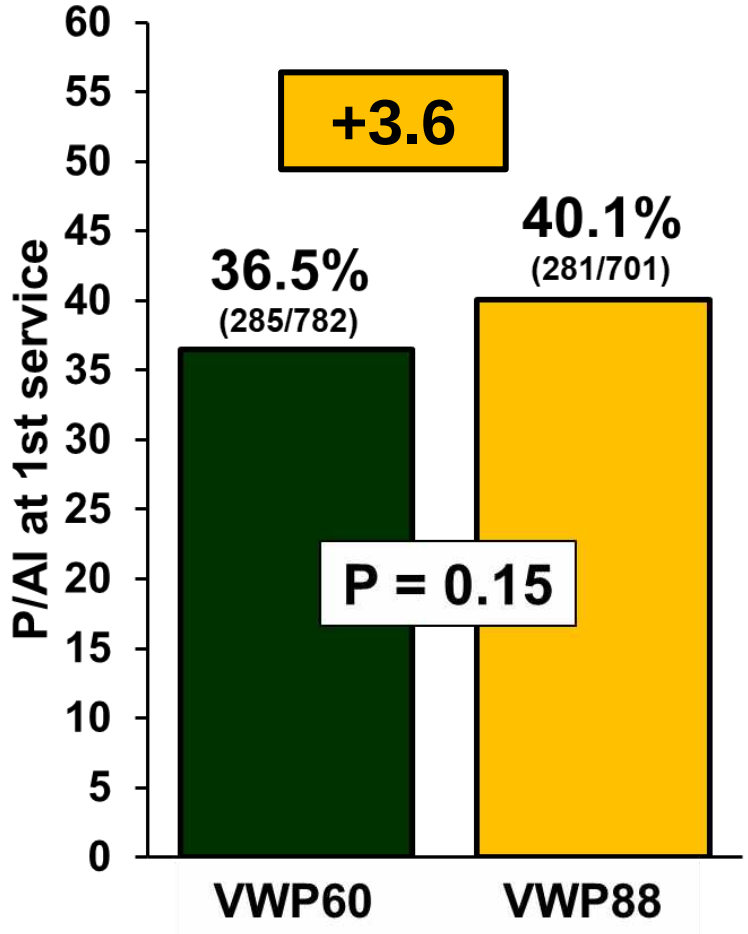
Stangaferro et al., 2018 JDS(101)717-735

Effect of extending VWP on fertility depended on parity group

PRIMIPAROUS (i.e., first lactation)



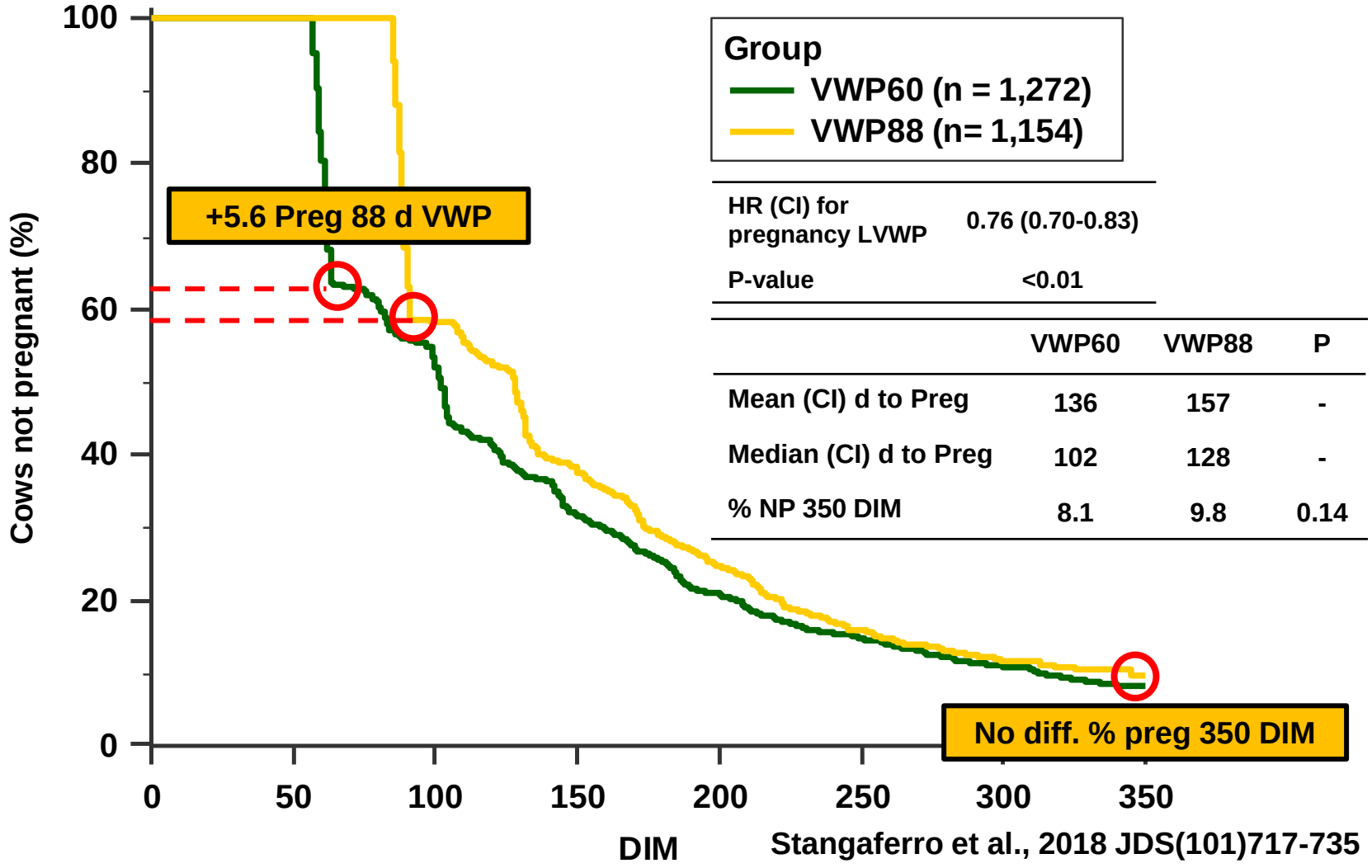
MULTIPAROUS (i.e., >1 lactation)



Stangaferro et al., 2018 JDS(101)717-735

Pregnancy was Delayed for VWP88 but Percent Pregnant at 350 DIM was the Same

- On average cows in 88 d VWP became pregnant later than cows in 60 d VWP group
- No difference in % pregnant at end of lactation



HR (CI) for pregnancy LVWP	0.76 (0.70-0.83)
P-value	<0.01

	VWP60	VWP88	P
Mean (CI) d to Preg	136	157	-
Median (CI) d to Preg	102	128	-
% NP 350 DIM	8.1	9.8	0.14

Stangaferro et al., 2018 JDS(101)717-735

Greater Cash Flow for PRIMIPAROUS Cows Bred at 88 than 60 DIM

	Primiparous			
	VWP60	VWP88	Diff	*P-val*
Number of cows	480	471	-	-
	$/slot per 18 mo			
Cash flow ($/slot)	1,756 ± 148	1,824 ± 148	68	0.32
	+$68 X VWP88			

- **Replacement cost** greatest contributor to cash flow difference
- Effect was on replacement cost in **subsequent lact** (i.e., 2nd lactation)

Stangaferro et al., 2018 JDS(101)7500-7516

Greater Cash Flow for MULTIPAROUS Cows Bred at 60 than 88 DIM

	Primiparous			
	VWP60	VWP88	Diff	*P-val*
Number of cows	785	789	-	-
	$/slot per 18 mo			
Cash flow ($/slot)	2,006 ± 124	1,921 ± 124	-85	0.19
	-$85 X Long VWP			

- **Income over feed cost (IOFC)** explained half of the difference – later pregnancy reduces efficiency in multiparous cows

- **Replacement cost** in extended VWP lactation – more culling pressure on open cows in later lactation

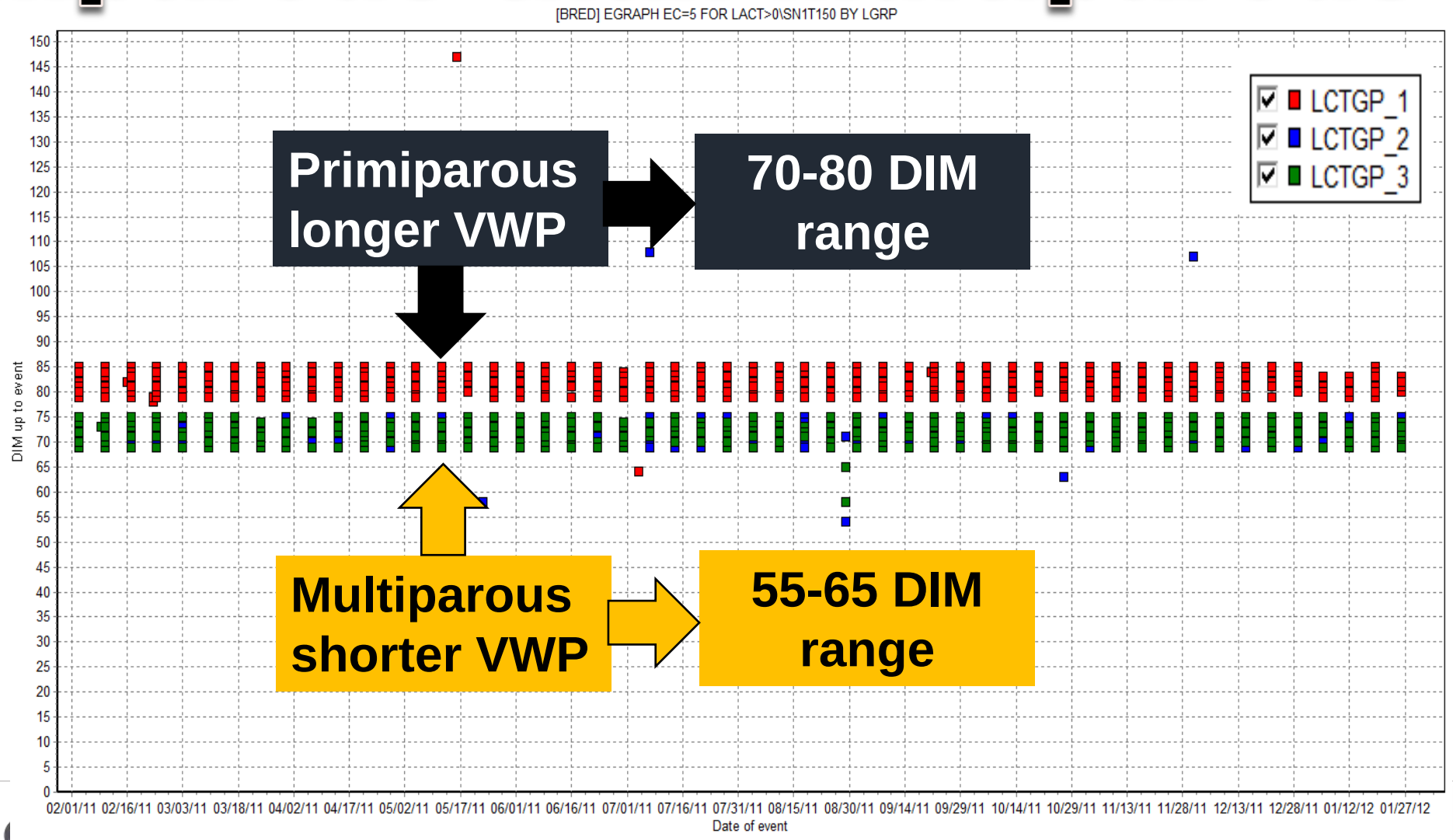
Stangaferro et al., 2018 JDS(101)7500-7516

VWP duration effects - highlights

- **Effect of VWP duration** on cash flow depended on parity
  - **Primiparous** cows benefited by **88 d VWP**
  - **Multiparous** cows benefited by **60 d VWP**

- **Direction and magnitude** of economic differences were **consistent** under conditions of **10 yr** of simulated **market variation**
  - Under conditions of typical variation in inputs and outputs prices primiparous benefited by 88 d and multiparous by 60 d VWP

VWP based on Parity – Longer for Primiparous than Multiparous



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All-TAI with fertility programs is effective for controlling days to first AI and maximize fertility

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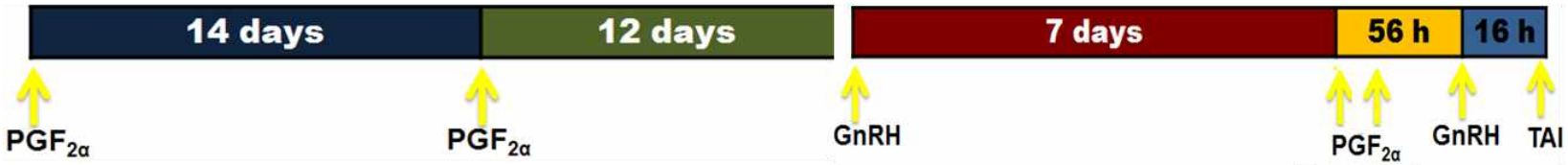
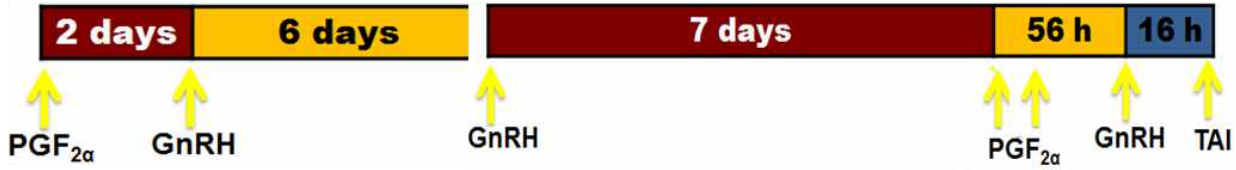


Double-Ovsynch (Souza et al., 2008)

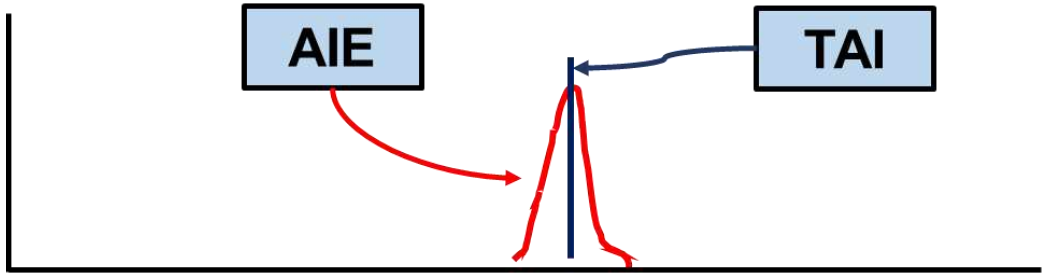
G6G (Bello et al., 2006)

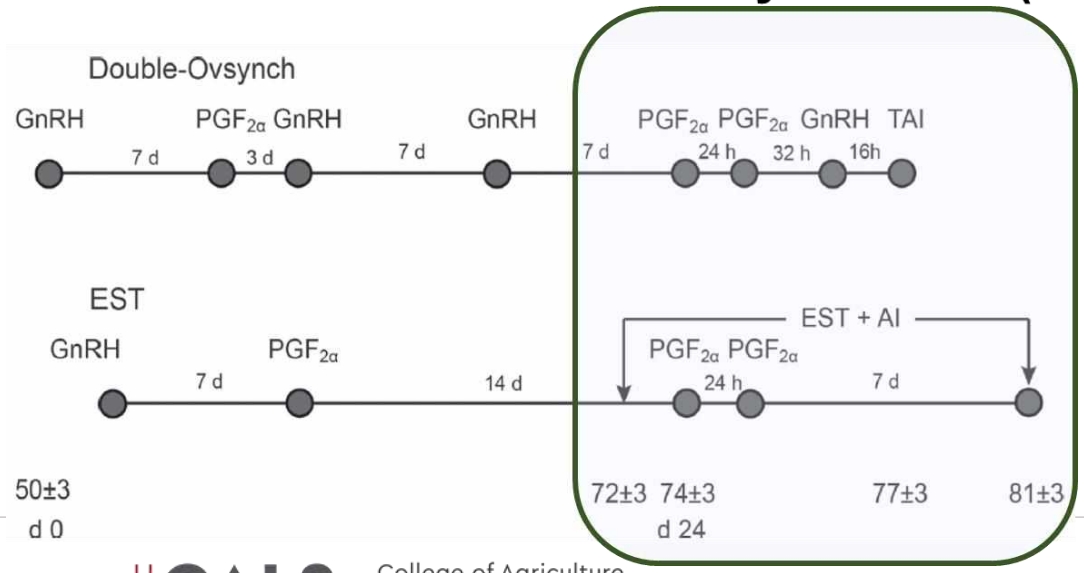


J. Dairy Sci. 100:8507–8517
https://doi.org/10.3168/jds.2017-13210

Fertility of lactating Holstein cows submitted to a Double-Ovsynch protocol and timed artificial insemination versus artificial insemination after synchronization of estrus at a similar day in milk range

V. G. Santos,* P. D. Carvalho,* C. Maia,† B. Carneiro,† A. Valenza,‡ and P. M. Fricke*[1]
*Department of Dairy Science, University of Wisconsin, Madison 53706
†Diessen Serviços Veterinários Lda, 7001 Évora, Portugal
‡Ceva Santé Animale, 10 Avenue de la Ballastiere, 33500 Libourne, France





TAI

vs.

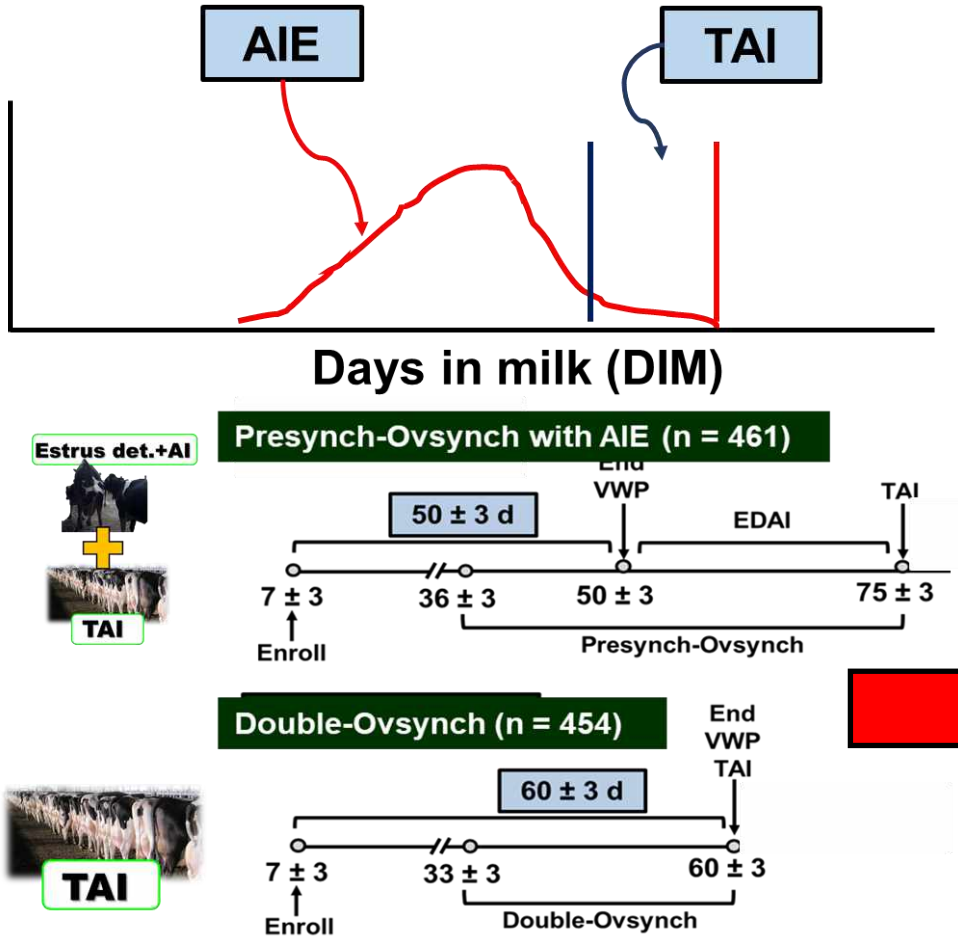
AIE

Cows TAI (Double-Ovsynch) compared with AIE at ~77 DIM had 10.4 p. p. greater (*P*=0.02) P/AI

J. Dairy Sci. 101:1–14
https://doi.org/10.3168/jds.2017-13425

Reproductive performance and herd exit dynamics of lactating dairy cows managed for first service with the Presynch-Ovsynch or Double-Ovsynch protocol and different duration of the voluntary waiting period

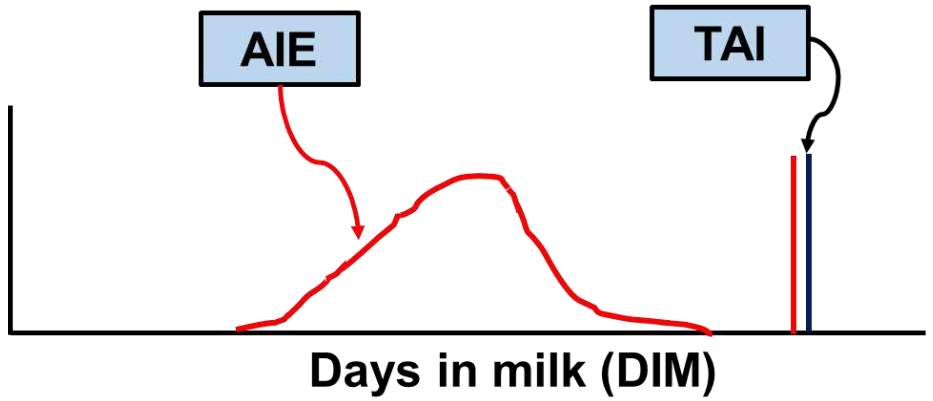
M. L. Stangaferro, R. Wijma, M. Masello, and J. O. Giordano[1]
Department of Animal Science, Cornell University, Ithaca, NY 14853

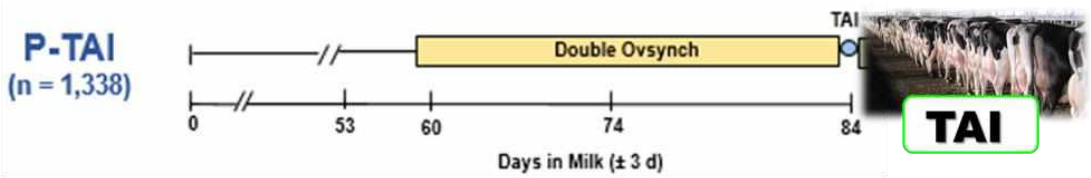


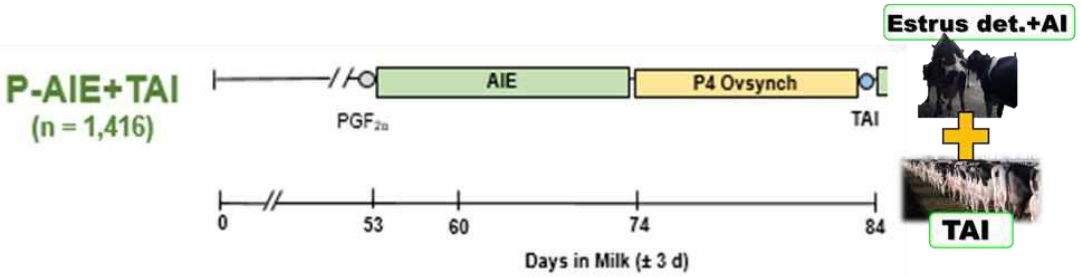
Variable	Group		P
	DO60 (n = 416)	PSOv (n = 415)	Group
AI in estrus (%)	0[b]	65[a]	<0.01
DIM 1st TAI	60	62	>0.10
P/AI 1st AI, % (n/n)	42	37	0.12

Cows TAI (Double-Ovsynch) vs AIE + TAI (Presynch-Ovsynch) at ~60 DIM on avg. 5 p. p. greater P/AI (*P* = 0.12)

Fertility program plus extended VWP increased first service P/AI compared with AIE+TAI







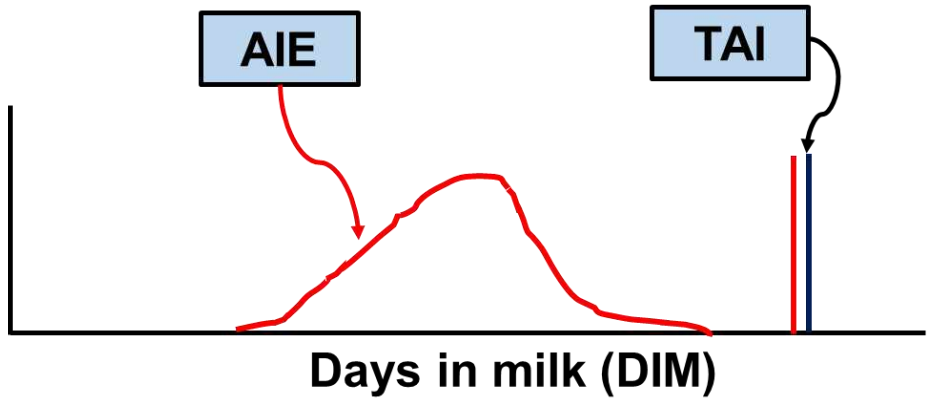
	Group		
Item	TAI	AIE+TAI	P-value
	%, (n)		
Avg (AIE+TAI)	58.6^{A} (1,230)	48.4^{B} (1,330)	<0.0001
AIE	NA	47.0* (954)	NA
TAI	58.1 (1230)	52.5* (376)	0.03†

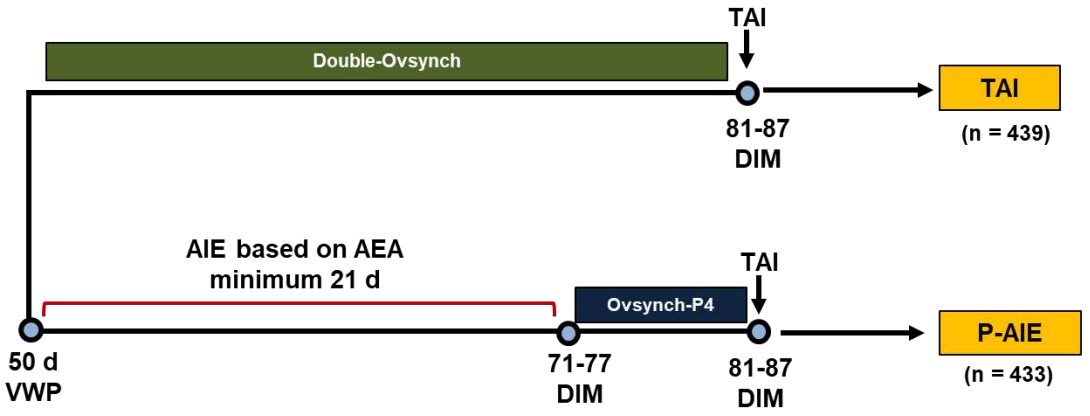
*AIE vs TAI with Double-Ovsynch P<0.05

1st Lact cows TAI (Double-Ovsynch) at 84 DIM had greater P/AI than cows in combined program that received AIE + TAI or when compared AIE vs TAI

Sitko et al. 2019 (JDS; Abstract)

Fertility program plus extended VWP increased first service P/AI compared with AIE+TAI





	Treatment		
	TAI	P-AIE	
	P/AI % (n/n)		*P*-value
Overall	49.1 (210/427)	43.3 (183/422)	0.08
AIE	N/A	43.8 (131/299)	0.93
TAI	49.2 (210/427)	42.3 (52/123)	0.03

Cows TAI (Double-Ovsynch) at 84 DIM had greater P/AI than cows in combined program that received AIE after 50 d VWP + TAI at 84 DIM

Sitko et al. 2019 (JDS; Abstract)

Fertility programs used for 100% TAI lead to greater first service P/AI than combined programs

First service P/AI was always greater for TAI than AIE+TAI programs when:

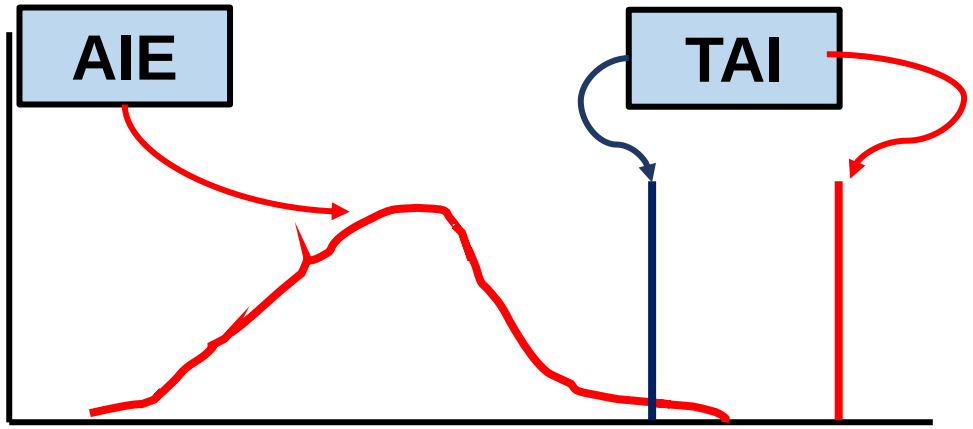
-When AIE and TAI services occurred at the same range of DIM than 100% TAI

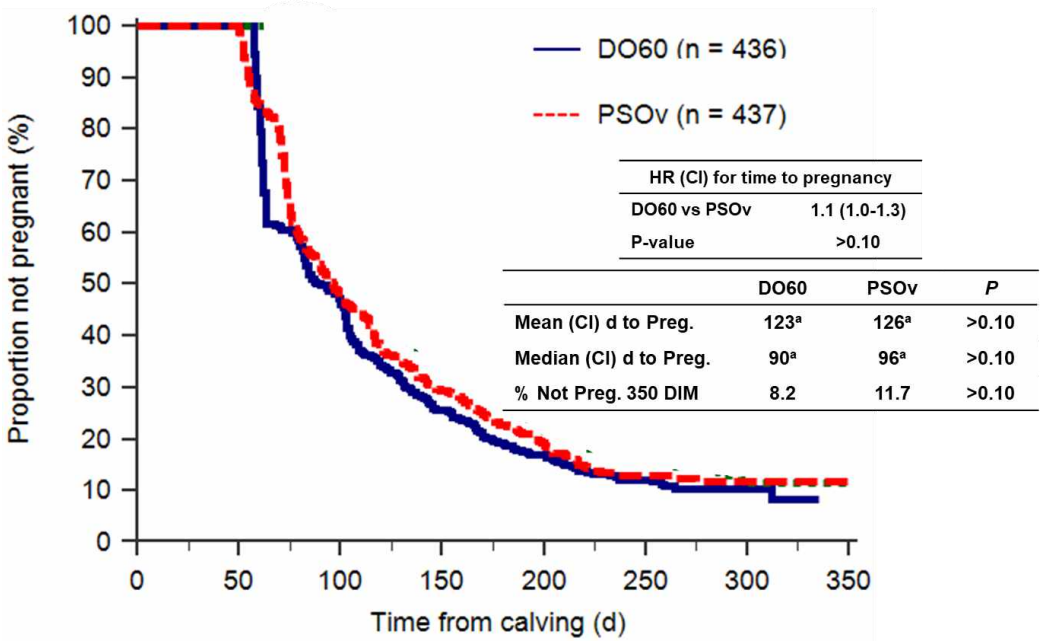
-Average DIM at first service where the same for AIE+TAI than 100% TAI

-AIE for AIE + TAI program occurred earlier than for 100% TAI program

Greater P/AI at first services does not mean that 100% TAI is best alternative to increase pregnancy rate during lactation!

Programs that combine AIE + TAI can be as effective as 100% TAI at same range of DIM



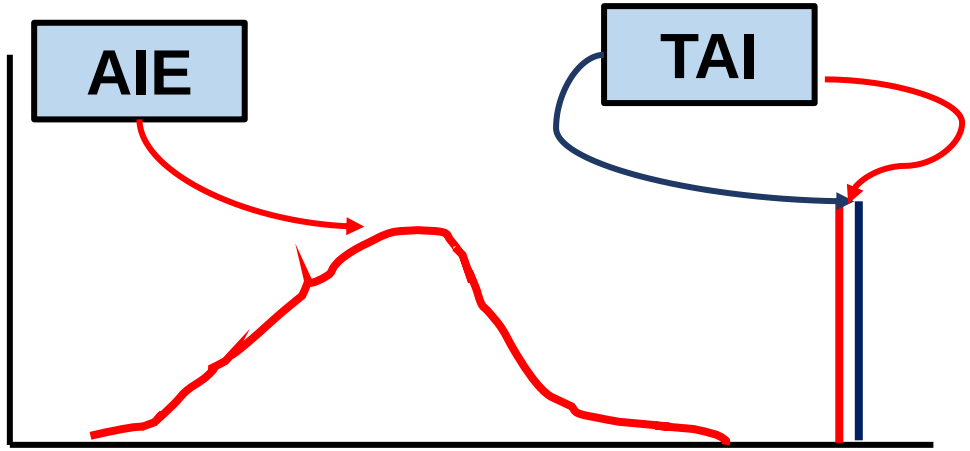


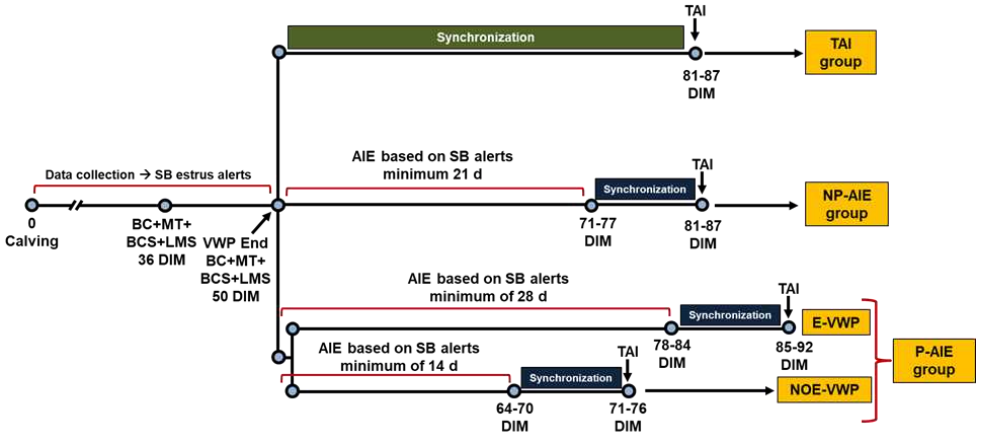
HR (CI) for time to pregnancy	
DO60 vs PSOv	1.1 (1.0-1.3)
P-value	>0.10

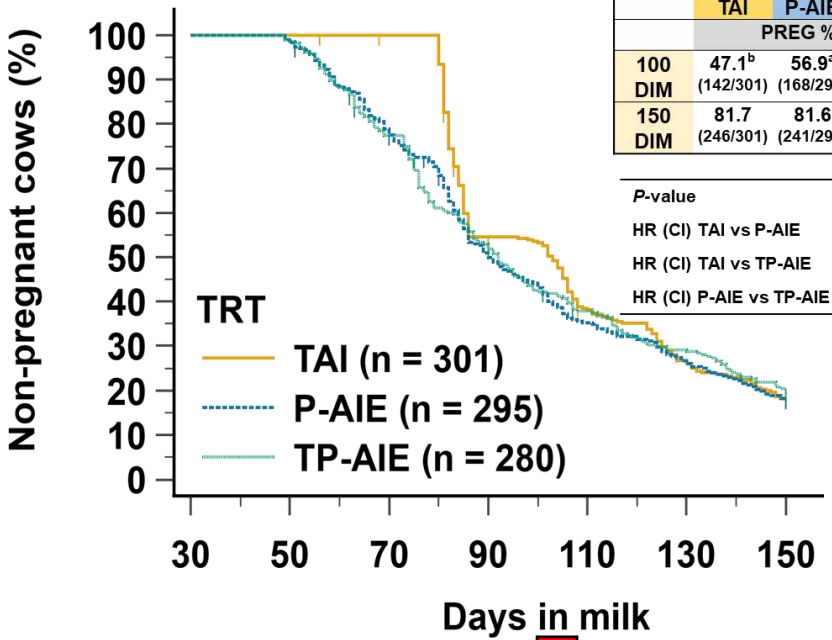
	DO60	PSOv	*P*
Mean (CI) d to Preg.	123[a]	126[a]	>0.10
Median (CI) d to Preg.	90[a]	96[a]	>0.10
% Not Preg. 350 DIM	8.2	11.7	>0.10

Same pregnancy rate and % pregnant at 350 DIM for AIE w/50 d VWP+TAI (Presynch-Ovsynch) vs 100% TAI (Double-Ovsynch) with TAI at 60 DIM

Programs that combine AIE + TAI can be as effective as 100% TAI programs + extended VWP







	TREATMENT			
	TAI	P-AIE	TP-AIE	*P*
	PREG % (n/n)			
100 DIM	47.1[b] (142/301)	56.9[a] (168/295)	58.2[a] (163/280)	0.01
150 DIM	81.7 (246/301)	81.6 (241/295)	79.6 (223/280)	0.73

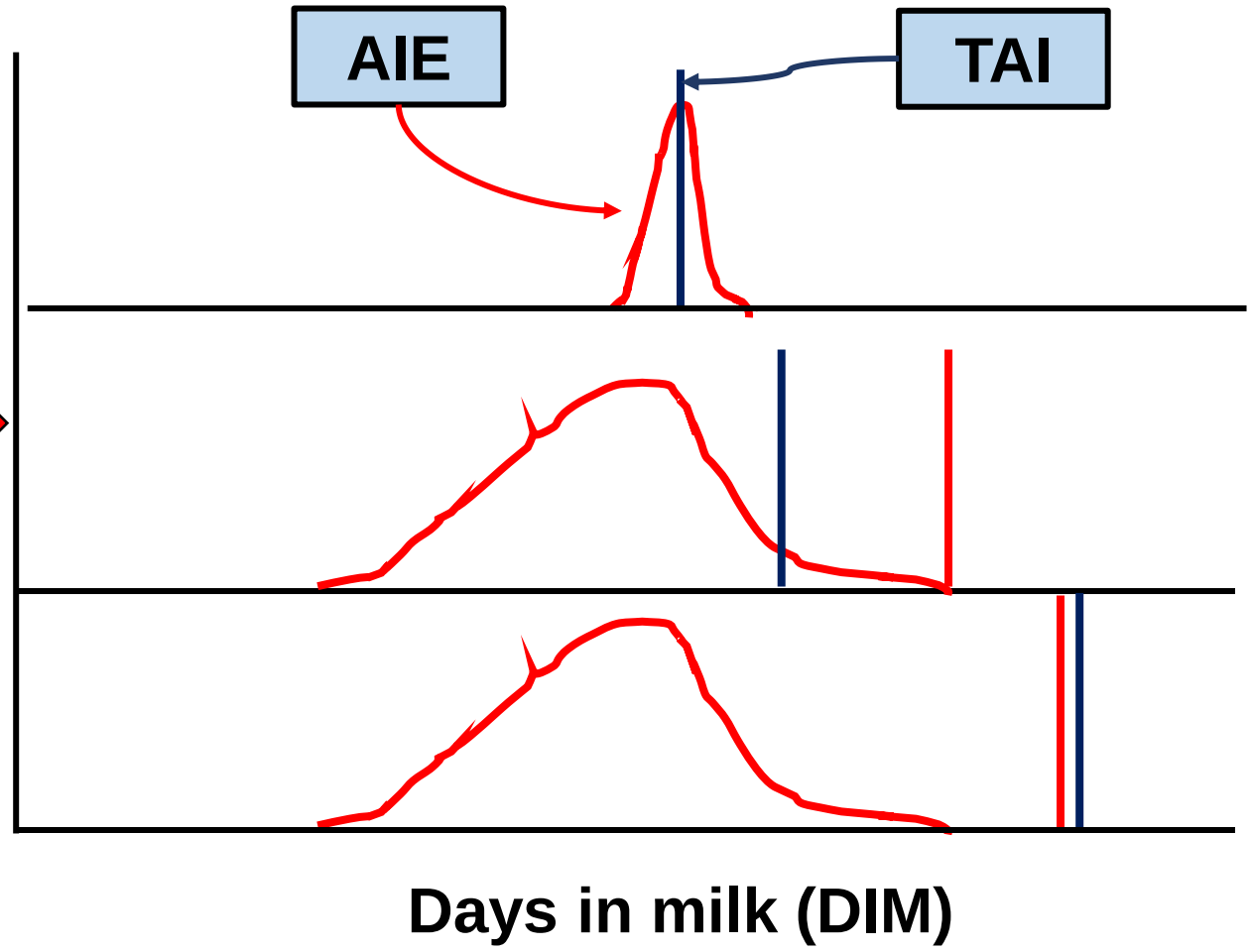
P-value	0.17
HR (CI) TAI vs P-AIE	0.8 (0.7-1.0)
HR (CI) TAI vs TP-AIE	0.9 (0.7-1.0)
HR (CI) P-AIE vs TP-AIE	1.0 (0.8-1.2)

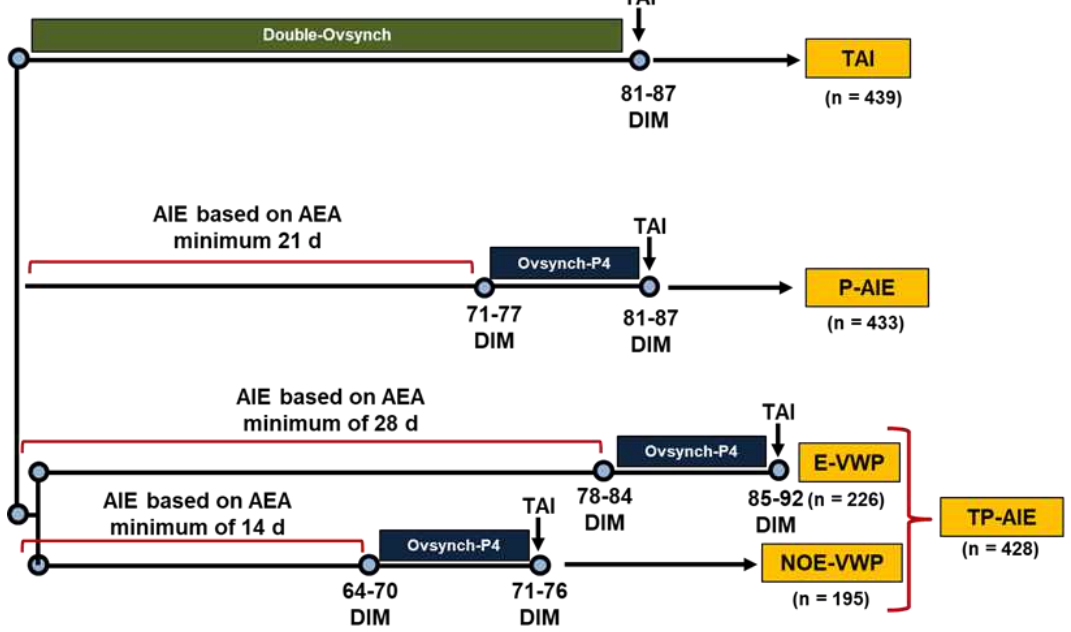
Same pregnancy rate and % pregnant at 150 DIM for AIE w/50 d VWP+TAI (P4-Ovsynch) vs 100% TAI (Double-Ovsynch) at 84 DIM

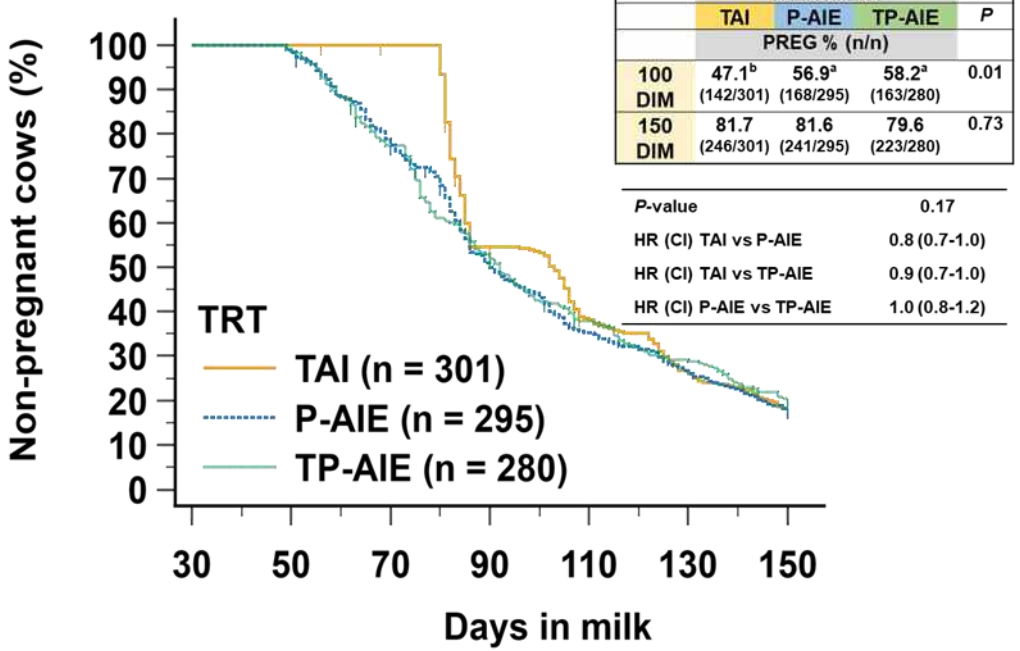
Fertility programs used for 100% TAI lead to greater first service P/AI than combined programs

Combined programs may need a shorter VWP to compensate for lower P/AI as compared to effective 100% TAI programs +/- extended VWP

Design program to have at least the same average DIM for combined than TAI program and maximize P/AI for AIE and TAI services







	TAI	P-AIE	TP-AIE	P
	PREG % (n/n)			
100 DIM	47.1[b] (142/301)	56.9[a] (168/295)	58.2[a] (163/280)	0.01
150 DIM	81.7 (246/301)	81.6 (241/295)	79.6 (223/280)	0.73

P-value	0.17
HR (CI) TAI vs P-AIE	0.8 (0.7-1.0)
HR (CI) TAI vs TP-AIE	0.9 (0.7-1.0)
HR (CI) P-AIE vs TP-AIE	1.0 (0.8-1.2)

All-TAI

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/24/20	13	13	100	13	7	54	0
7/15/20	31	30	97	31	11	35	3
8/05/20	49	43	88	49	26	53	0
8/26/20	38	28	74	38	13	34	1
9/16/20	43	36	84	42	18	43	0
10/07/20	52	46	88	52	21	40	2
10/28/20	57	46	81	54	22	41	1
11/18/20	58	45	78	55	25	45	1
12/09/20	56	46	82	54	20	37	1
12/30/20	64	49	77	64	27	42	0
1/20/21	59	52	88	56	26	46	0
2/10/21	59	47	80	0	0	0	0
3/03/21	59	57	97	0	0	0	0
Total	520	434	83	508	216	43	9

Wait Period 80

P-AIE

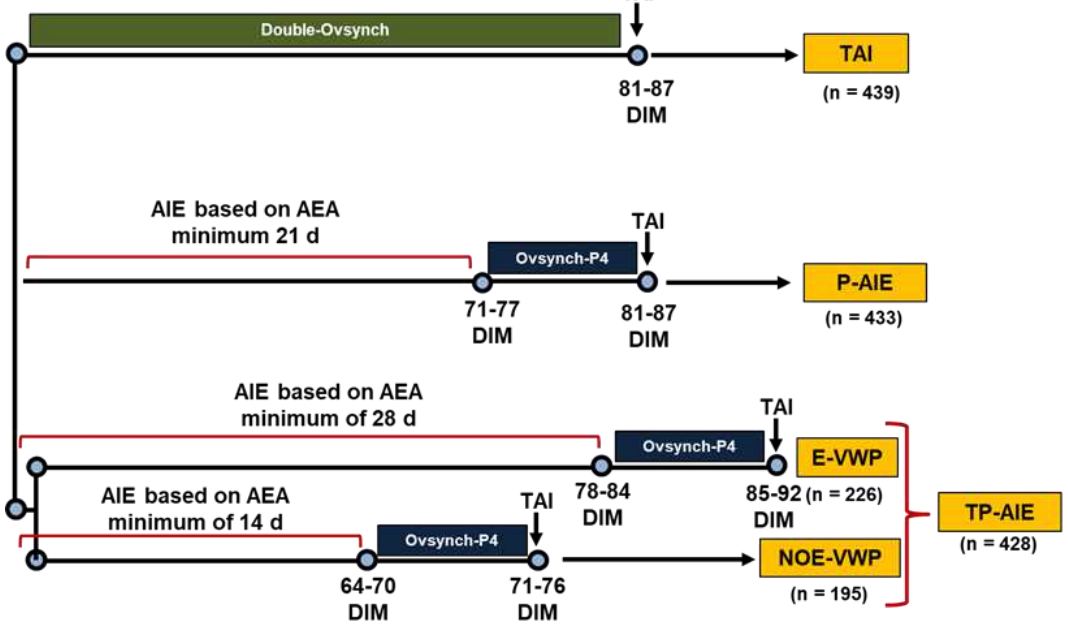
Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	19	5	26	19	3	16	0
6/24/20	48	25	52	47	5	11	2
7/15/20	63	40	63	62	18	29	2
8/05/20	68	52	76	66	25	38	4
8/26/20	63	36	57	63	21	33	1
9/16/20	66	51	77	65	15	23	2
10/07/20	79	50	63	78	24	31	0
10/28/20	81	57	70	77	22	29	0
11/18/20	77	47	61	76	27	36	3
12/09/20	80	55	69	80	21	26	1
12/30/20	84	60	71	83	28	34	2
1/20/21	88	49	56	85	21	25	0
2/10/21	102	74	73	0	0	0	0
3/03/21	92	71	77	0	0	0	0
Total	816	527	65	801	230	29	17

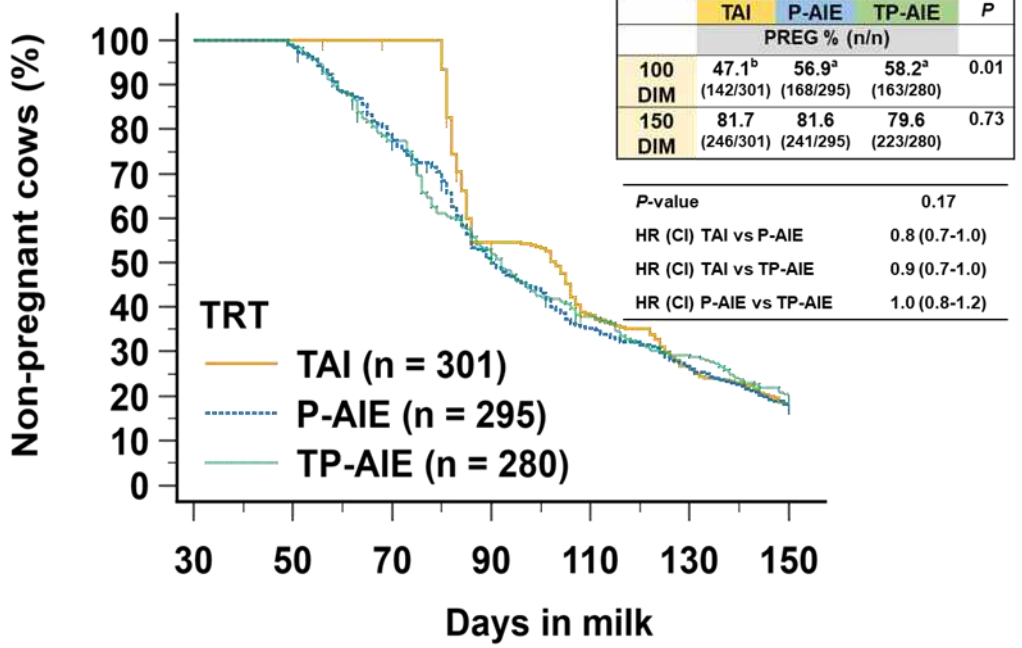
Wait Period 50

TP-AIE

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	21	4	19	21	1	5	0
6/24/20	47	26	55	46	8	17	0
7/15/20	64	46	72	64	21	33	0
8/05/20	65	39	60	65	14	22	2
8/26/20	75	50	67	75	21	28	0
9/16/20	79	61	77	76	18	24	1
10/07/20	87	61	70	84	23	27	1
10/28/20	84	62	74	82	33	40	2
11/18/20	79	52	66	75	13	17	3
12/09/20	93	61	66	91	29	32	0
12/30/20	85	62	73	83	25	30	1
1/20/21	88	57	65	85	25	29	1
2/10/21	94	67	71	0	0	0	0
3/03/21	89	65	73	0	0	0	0
Total	867	581	67	847	231	27	11

Wait Period 50





	TAI	P-AIE	TP-AIE	*P*
	PREG % (n/n)			
100 DIM	47.1[b] (142/301)	56.9[a] (168/295)	58.2[a] (163/280)	0.01
150 DIM	81.7 (246/301)	81.6 (241/295)	79.6 (223/280)	0.73

P-value	0.17
HR (CI) TAI vs P-AIE	0.8 (0.7-1.0)
HR (CI) TAI vs TP-AIE	0.9 (0.7-1.0)
HR (CI) P-AIE vs TP-AIE	1.0 (0.8-1.2)

All-TAI

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	21	0	0	21	0	0	0
6/24/20	52	17	33	52	9	17	1
7/15/20	73	37	51	73	13	18	3
8/05/20	82	47	57	82	28	34	0
8/26/20	72	39	54	70	17	24	2
9/16/20	80	41	51	79	18	23	0
10/07/20	95	53	56	95	24	25	2
10/28/20	94	54	57	91	23	25	1
11/18/20	100	51	51	97	28	29	2
12/09/20	102	53	52	100	21	21	1
12/30/20	102	57	56	102	31	30	0
1/20/21	106	59	56	103	29	28	0
2/10/21	116	55	47	0	0	0	0
3/03/21	104	67	64	0	0	0	0
Total	979	508	52	965	241	25	12

Wait Period 50

P-AIE

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	19	5	26	19	3	16	0
6/24/20	48	25	52	47	5	11	2
7/15/20	63	40	63	62	18	29	2
8/05/20	68	52	76	66	25	38	4
8/26/20	63	36	57	63	21	33	1
9/16/20	66	51	77	65	15	23	2
10/07/20	79	50	63	78	24	31	0
10/28/20	81	57	70	77	22	29	0
11/18/20	77	47	61	76	27	36	3
12/09/20	80	55	69	80	21	26	1
12/30/20	84	60	71	83	28	34	2
1/20/21	88	49	56	85	21	25	0
2/10/21	102	74	73	0	0	0	0
3/03/21	92	71	77	0	0	0	0
Total	816	527	65	801	230	29	17

Wait Period 50

TP-AIE

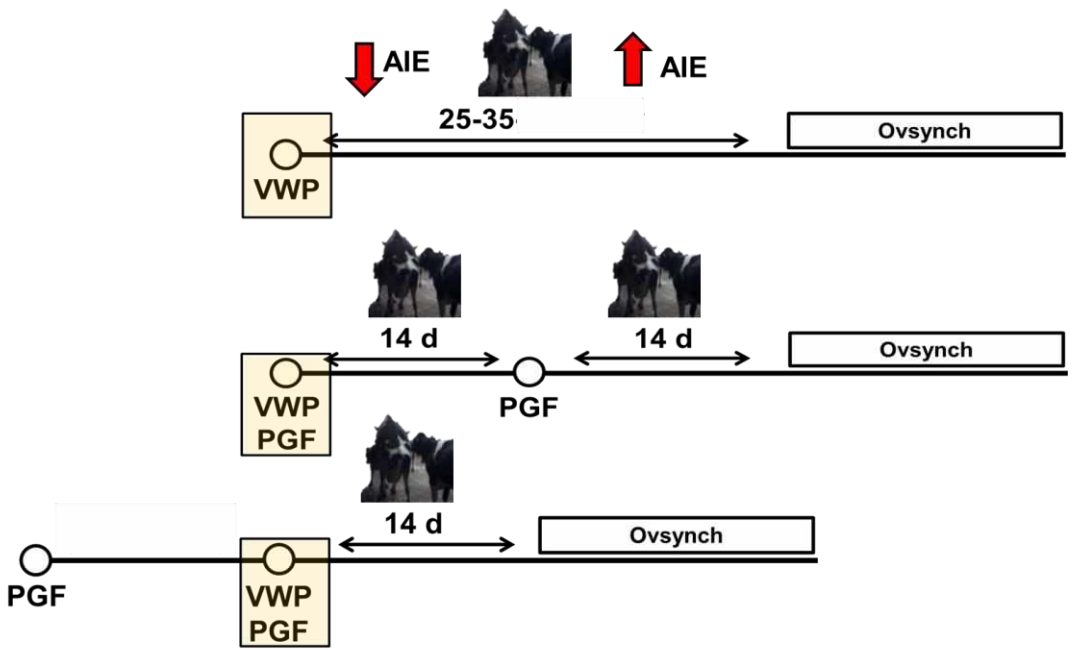
Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	21	4	19	21	1	5	0
6/24/20	47	26	55	46	8	17	0
7/15/20	64	46	72	64	21	33	0
8/05/20	65	39	60	65	14	22	2
8/26/20	75	50	67	75	21	28	0
9/16/20	79	61	77	76	18	24	1
10/07/20	87	61	70	84	23	27	1
10/28/20	84	62	74	82	33	40	2
11/18/20	79	52	66	75	13	17	3
12/09/20	93	61	66	91	29	32	0
12/30/20	85	62	73	83	25	30	1
1/20/21	88	57	65	85	25	29	1
2/10/21	94	67	71	0	0	0	0
3/03/21	89	65	73	0	0	0	0
Total	867	581	67	847	231	27	11

Wait Period 50

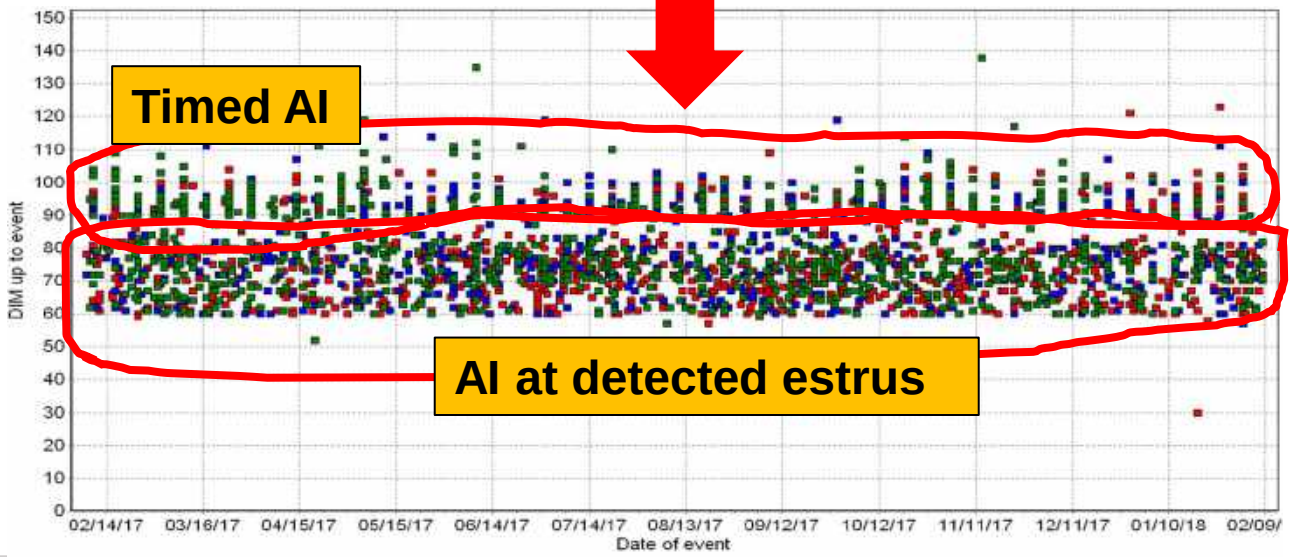
Pros and cons of use of all-TAI with fertility programs

- Great tool to **maximize P/AI of individual services** but may not always maximize the pregnancy rate compared to other programs
- Can be **difficult** and **expensive** to implement for some farms
- Growing interest on **reducing cow disruption by some farms**

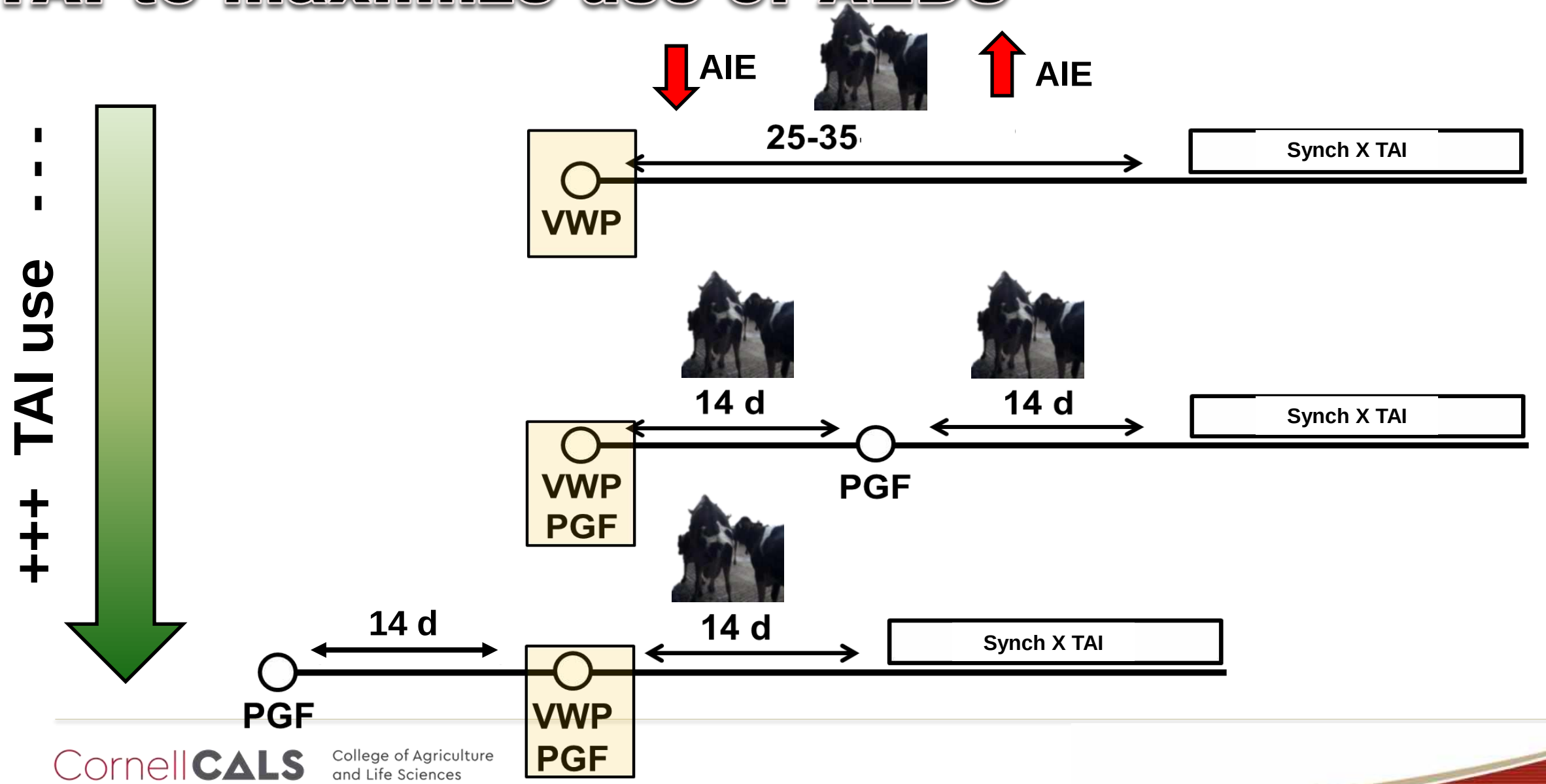
Programs that combine AIE and TAI can be effective



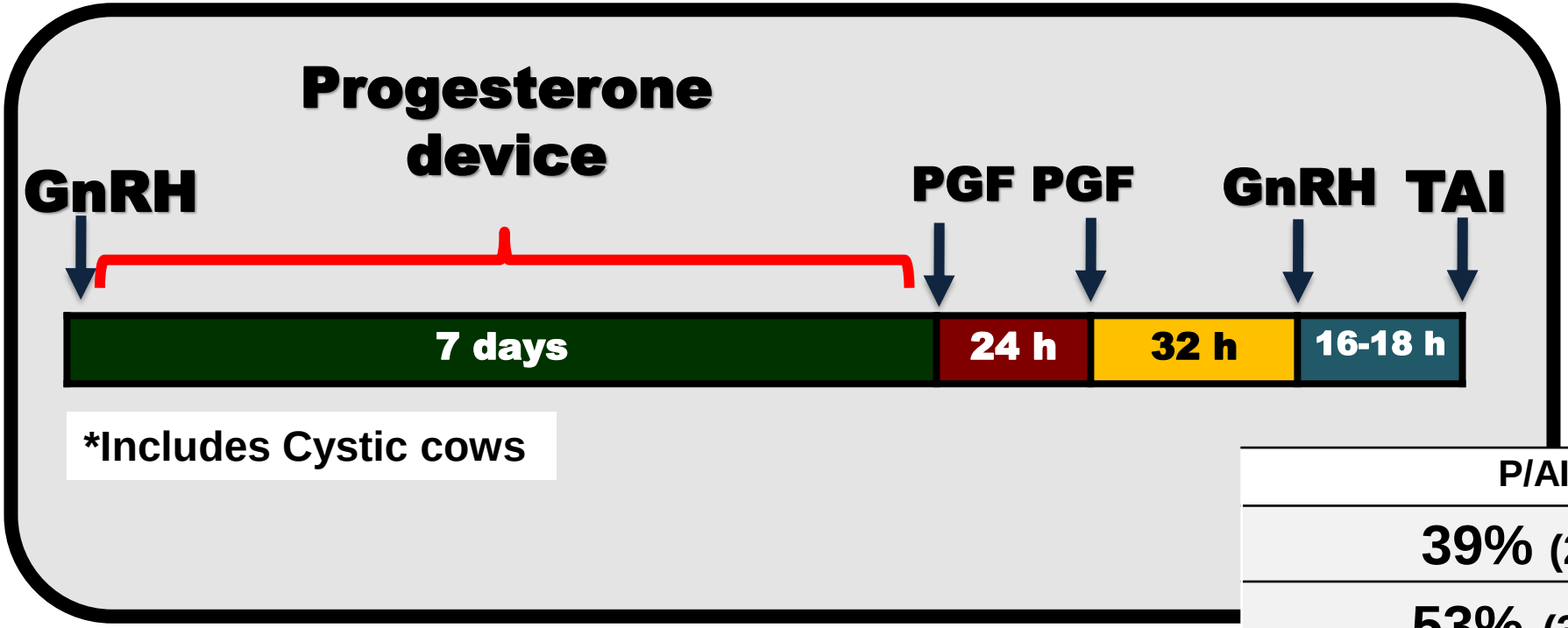
Good control of days in milk at first service – TAI as safety net



Use programs that prioritize AIE rather than TAI to maximize use of AEDS



P4-Ovsynch with two PGF is a good protocol to use in combined programs



*Includes Cystic cows

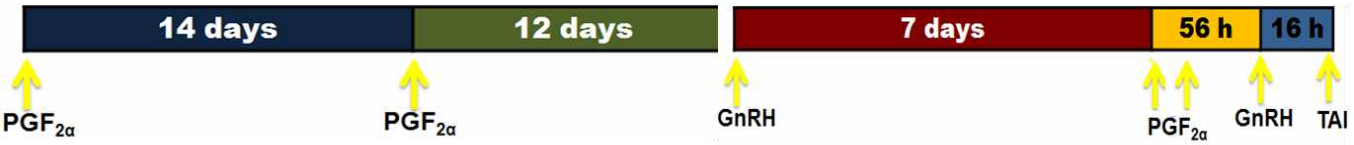
P/AI	Ref
39% (255)	Rial et al., 2021
53% (376)*	Sitko et al., 2019
47% (296/631)	Total

*First lactation only

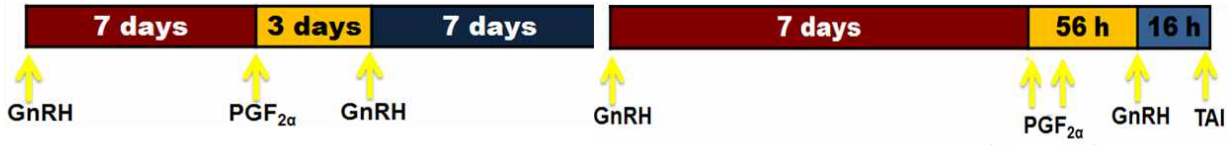
How can we make the best use of both technologies?

TAI

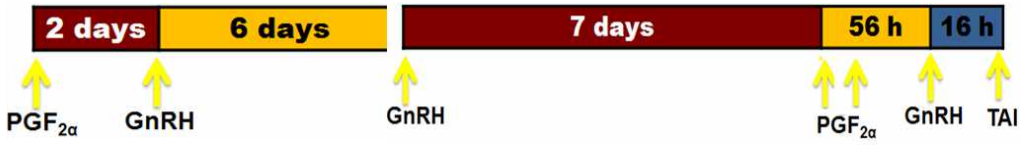
Presynch-Ovsynch (Moreira et al., 2001)



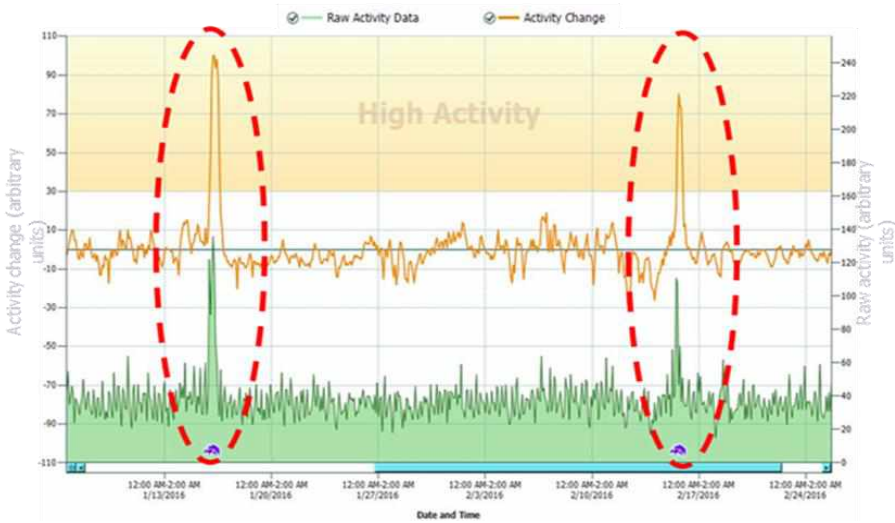
Double-Ovsynch (Souza et al., 2008)



G6G (Bello et al., 2006)



AED

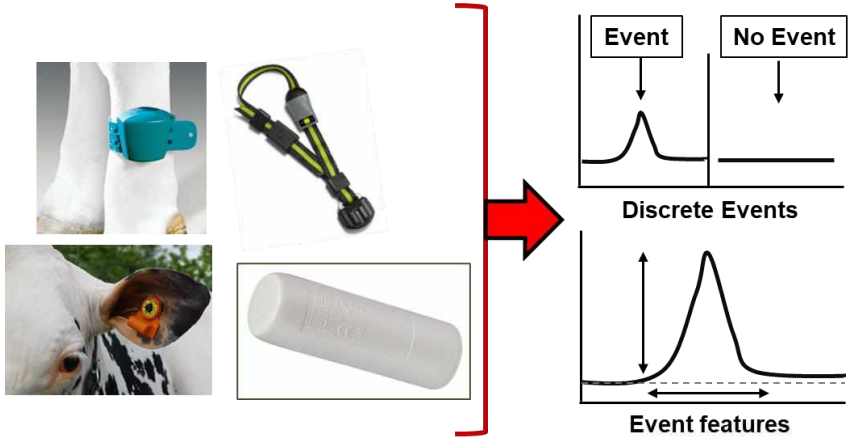


Automated detection of estrus is a great tool to optimize reproduction

- Using AED systems is an effective but imperfect strategy for submission to AI
  - Not all cows express estrus or are detected
  - P/AI is typically not maximized with AI at detected estrus
- Many herds increasing estrous detection efficiency and fertility after AI at detected estrus (AIE) – role of AED systems
- Data generated by AED systems can be used to improve reproductive management

Item	Visual Observation[2]	AED system[1]
Estrus	84.7%	84.3%
Ovulation	83.3%	83.3%

No difference (P > 0.10) between AEDS and VO for % of cows detected in estrus



Targeted reproductive management strategies (TRMS)

Subgroups of cows that share biological features and expected performance are managed with programs designed to optimize reproductive performance, management, and profitability.

Herd / Group → **Subgroups**

Strategy "A"

Strategy "B"

Optimize outcomes for group "A"

Optimize outcomes for group "B"

Greater gains in herd performance than when managed as single group

Giordano et al., 2022 (JDS; 105:4669-4678)

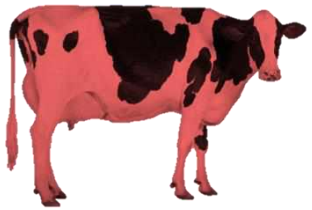
Evaluated effect of TRMS based on automated estrus alert (AEA) occurrence during the VWP

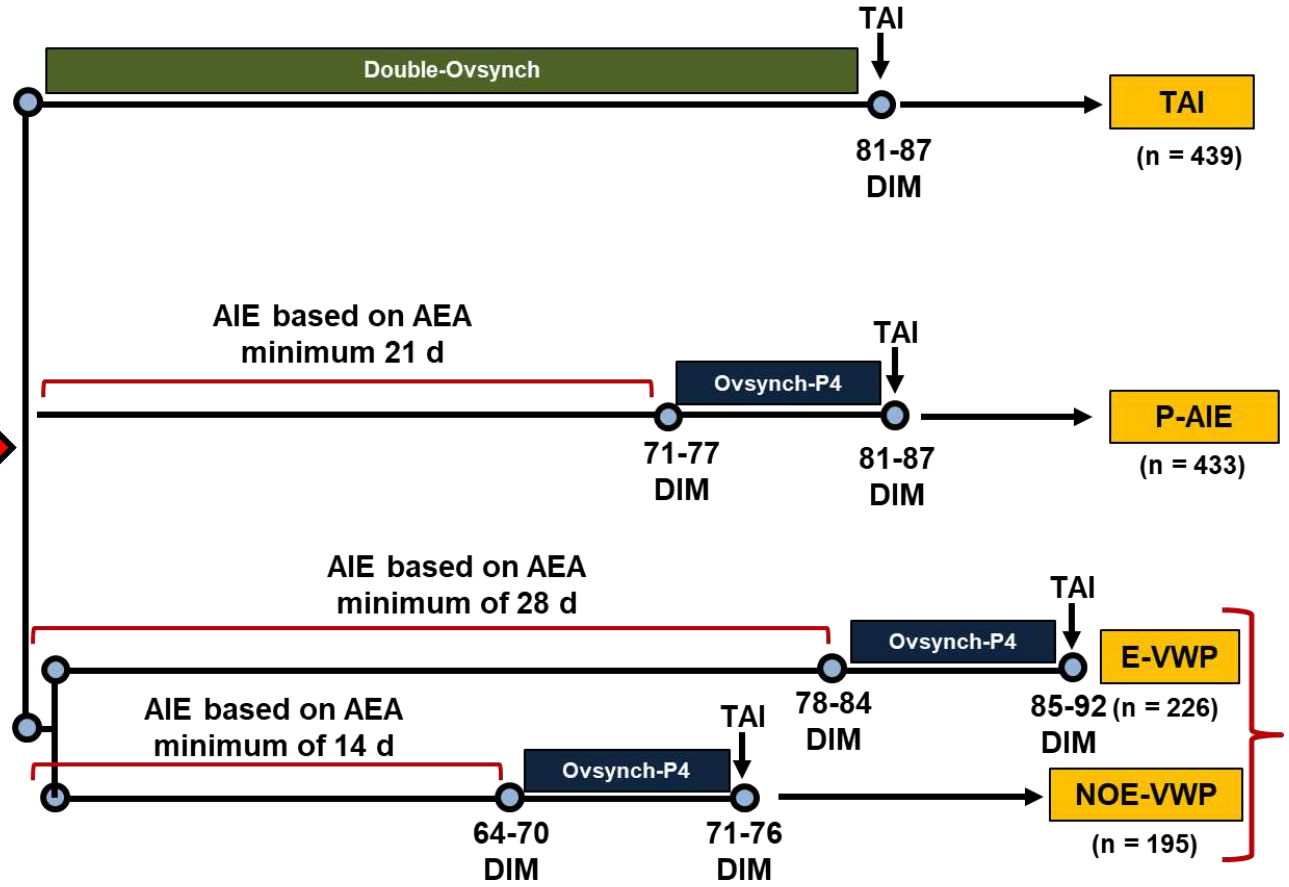
AEA = automated estrus alert

21 DIM — 49 DIM

ESTRUS before 50 DIM (VWP)
54.2% (705/1,300)

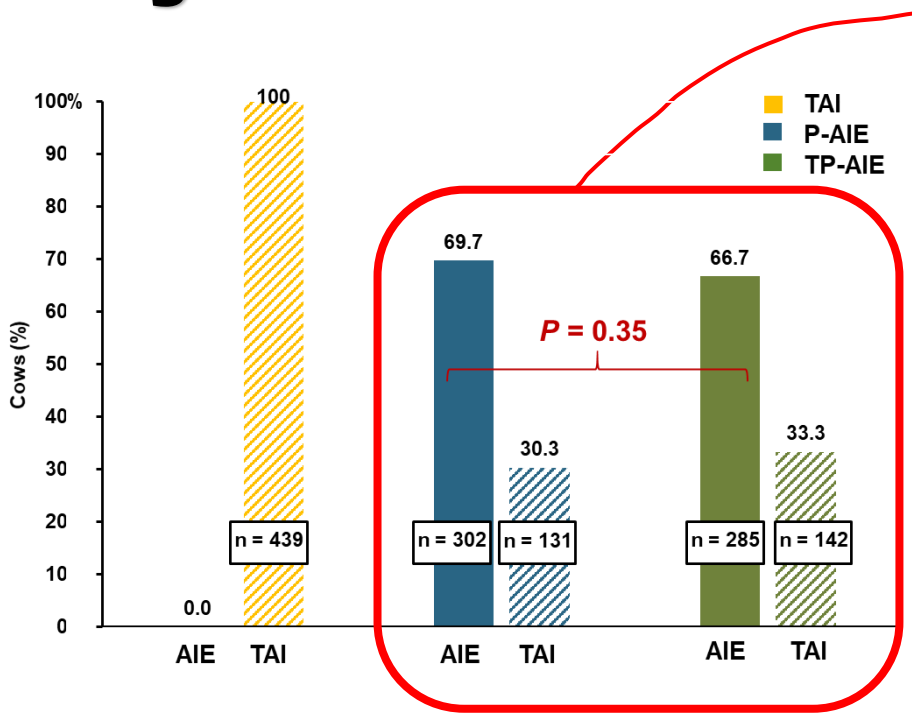
NO ESTRUS before 50 DIM (VWP)
45.7% (595/1,300)

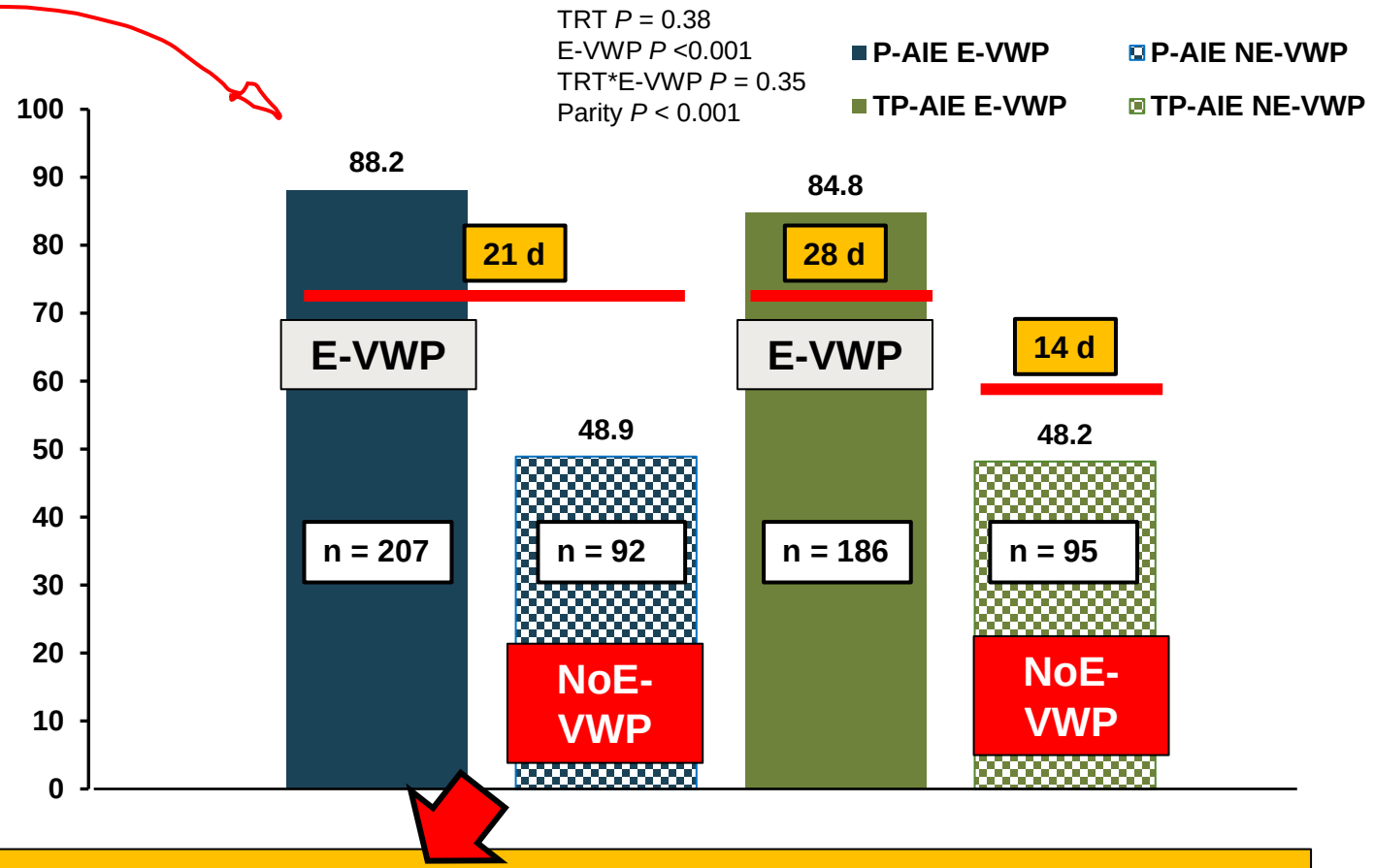




Rial et al., 2021 J. Dairy Sci. Volume 104, E-Supplement 1

Cows with AEA during the VWP were more likely to be inseminated in estrus





Providing cows more or less time to receive AIE based on AEA:

- **Did not increase or reduced the proportion of cows AIE**
- **Reduced DIM at first service by 4 d for cows with no AEA during the VWP**

Rial et al., 2021 J. Dairy Sci. Volume 104, E-Supplement 1

First service P/AI good for cows AI in estrus but greater for the ALL-TAI treatment

	Treatment			
	TAI	P-AIE	TP-AIE	
	P/AI % (n/n)			*P*-value
Overall	49 (210/427)	43 (183/422)	42 (174/413)	0.08
AIE				
TAI				

Parity $P < 0.001$	Primiparous had greater P/AI than multiparous
Season $P = 0.04$	Cold season greater P/AI than warm season

Rial et al., 2021 J. Dairy Sci. Volume 104, E-Supplement 1

First service P/AI good for cows AI in estrus but greater for the ALL-TAI treatment

	Treatment			
	TAI	P-AIE	TP-AIE	
	P/AI % (n/n)			*P*-value
Overall	49 (210/427)	43 (183/422)	42 (174/413)	0.08
AIE	N/A	44 (131/299)	45 (127/281)	0.93
TAI				

Parity $P < 0.001$ Primiparous had greater P/AI than multiparous
Season $P = 0.04$ Cold season greater P/AI than warm season

Rial et al., 2021 J. Dairy Sci. Volume 104, E-Supplement 1

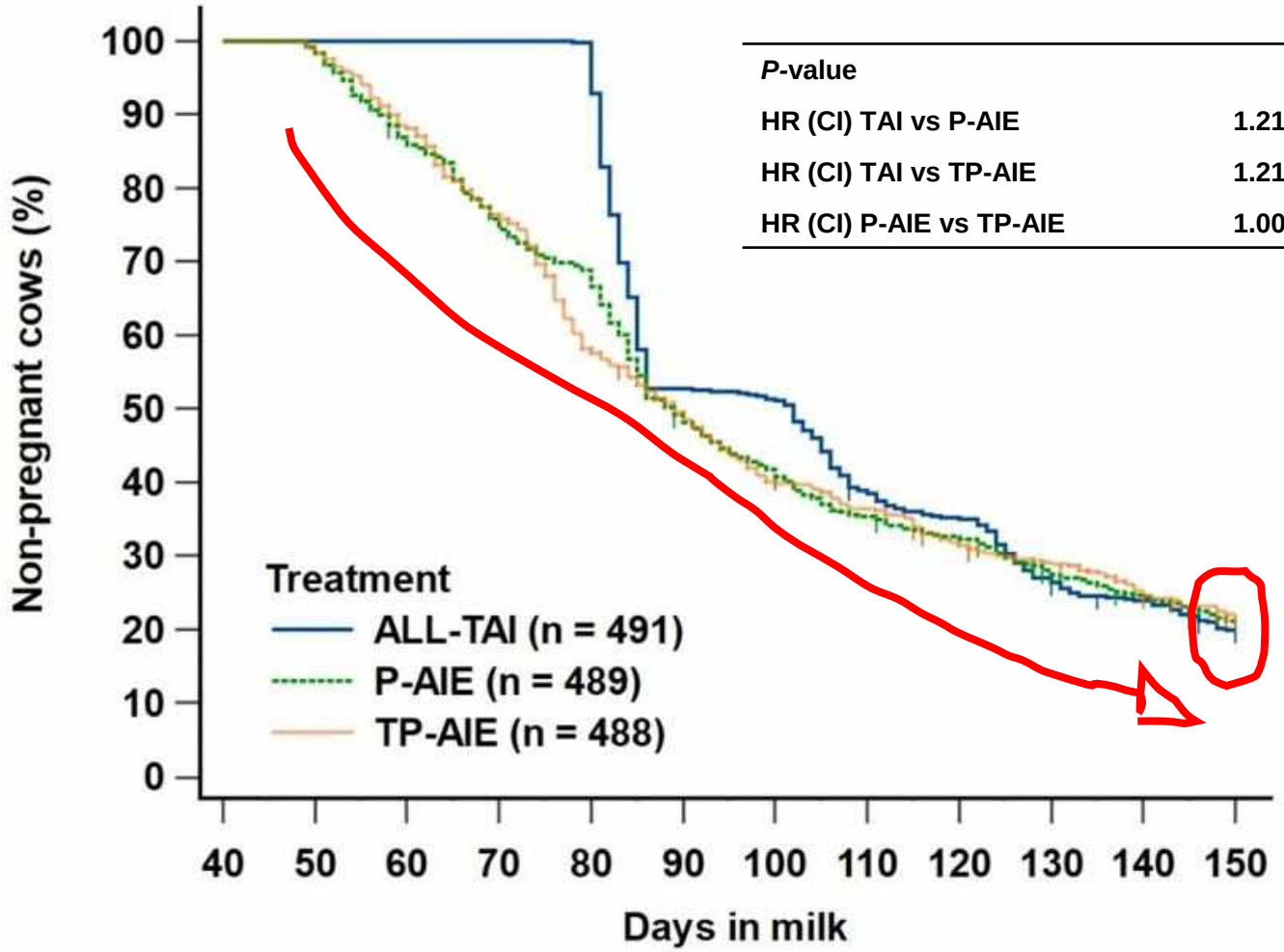
First service P/AI good for cows AI in estrus but greater for the ALL-TAI treatment

	Treatment			
	TAI	P-AIE	TP-AIE	
	P/AI % (n/n)			*P*-value
Overall	49 (210/427)	43 (183/422)	42 (174/413)	0.08
AIE	N/A	44 (131/299)	45 (127/281)	0.93
TAI	49^{a} (210/427)	42^{ab} (52/123)	36^{b} (47/132)	0.03

Parity $P < 0.001$	Primiparous had greater P/AI than multiparous
Season $P = 0.04$	Cold season greater P/AI than warm season

Rial et al., 2021 J. Dairy Sci. Volume 104, E-Supplement 1

Greater preg. rate for TRMS based on AEA and Non-TRM that prioritized AIE than ALL-TAI



P-value	0.008
HR (CI) TAI vs P-AIE	1.21 (1.05-1.40)
HR (CI) TAI vs TP-AIE	1.21 (1.05-1.39)
HR (CI) P-AIE vs TP-AIE	1.00 (0.87-1.15)

Mean days to pregnancy

ALL-TAI	110.3 ± 1.6 d
P-AIE	102.2 ± 1.6 d
TP-AIE	101.1 ± 1.6 d

Rial et al., 2021 J. Dairy Sci. Volume 104, E-Supplement 1

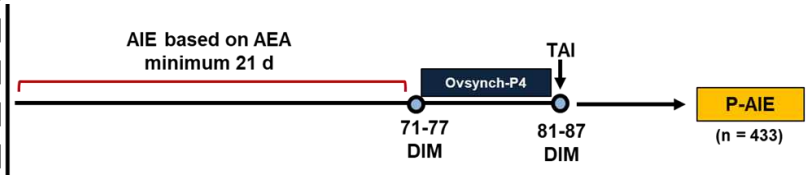
All-TAI

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	21	0	0	21	0	0	0
6/24/20	52	17	33	52	9	17	1
7/15/20	73	37	51	73	13	18	3
8/05/20	82	47	57	82	28	34	0
8/26/20	72	39	54	70	17	24	2
9/16/20	80	41	51	79	18	23	0
10/07/20	95	53	56	95	24	25	2
10/28/20	94	54	57	91	23	25	1
11/18/20	100	51	51	97	28	29	2
12/09/20	102	53	52	100	21	21	1
12/30/20	102	57	56	102	31	30	0
1/20/21	106	59	56	103	29	28	0
2/10/21	116	55	47	0	0	0	0
3/03/21	104	67	64	0	0	0	0
Total	979	508	52	965	241	25	12

Wait Period 50

21d –PR 25%

Predominant AIE+TAI

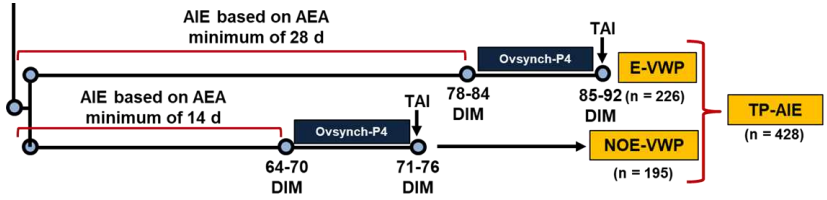


Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	19	5	26	19	3	16	0
6/24/20	48	25	52	47	5	11	2
7/15/20	63	40	63	62	18	29	2
8/05/20	68	52	76	66	25	38	4
8/26/20	63	36	57	63	21	33	1
9/16/20	66	51	77	65	15	23	2
10/07/20	79	50	63	78	24	31	0
10/28/20	81	57	70	77	22	29	0
11/18/20	77	47	61	76	27	36	3
12/09/20	80	55	69	80	21	26	1
12/30/20	84	60	71	83	28	34	2
1/20/21	88	49	56	85	21	25	0
2/10/21	102	74	73	0	0	0	0
3/03/21	92	71	77	0	0	0	0
Total	816	527	65	801	230	29	17

Wait Period 50

21d –PR 29%

Targeted Predom AIE+TAI



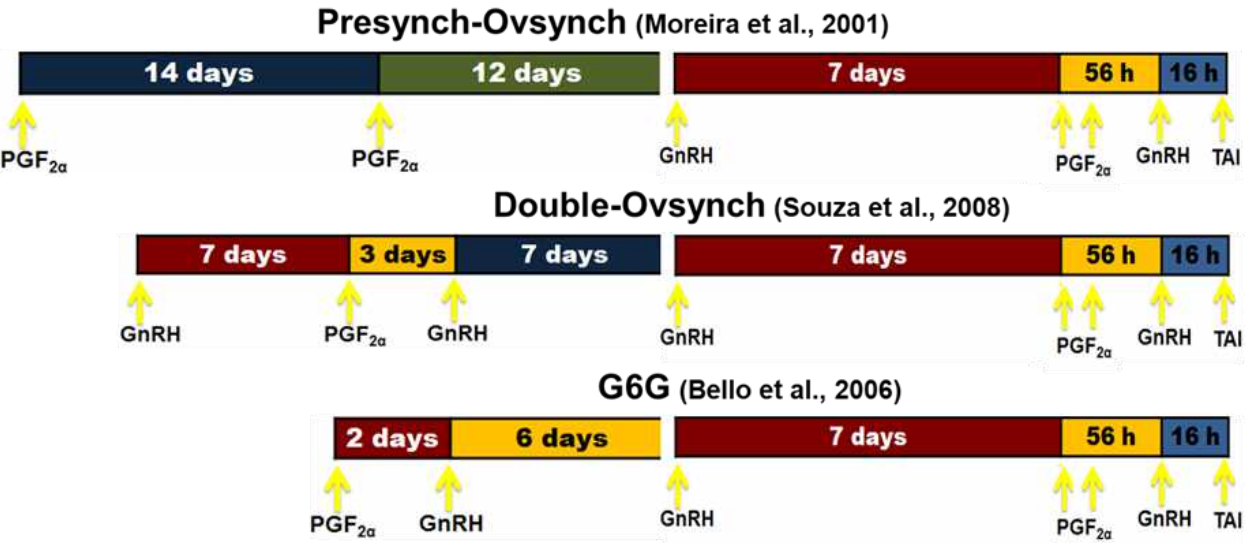
Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
6/03/20	21	4	19	21	1	5	0
6/24/20	47	26	55	46	8	17	0
7/15/20	64	46	72	64	21	33	0
8/05/20	65	39	60	65	14	22	2
8/26/20	75	50	67	75	21	28	0
9/16/20	79	61	77	76	18	24	1
10/07/20	87	61	70	84	23	27	1
10/28/20	84	62	74	82	33	40	2
11/18/20	79	52	66	75	13	17	3
12/09/20	93	61	66	91	29	32	0
12/30/20	85	62	73	83	25	30	1
1/20/21	88	57	65	85	25	29	1
2/10/21	94	67	71	0	0	0	0
3/03/21	89	65	73	0	0	0	0
Total	867	581	67	847	231	27	11

Wait Period 50

21d –PR 27%

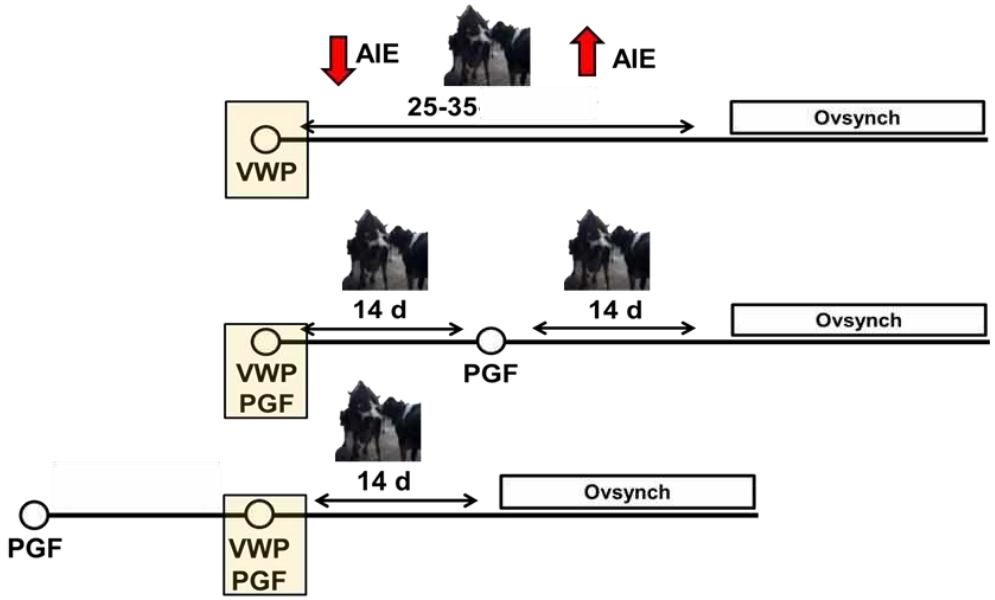
Choosing a program that works to reach goals

All-TAI

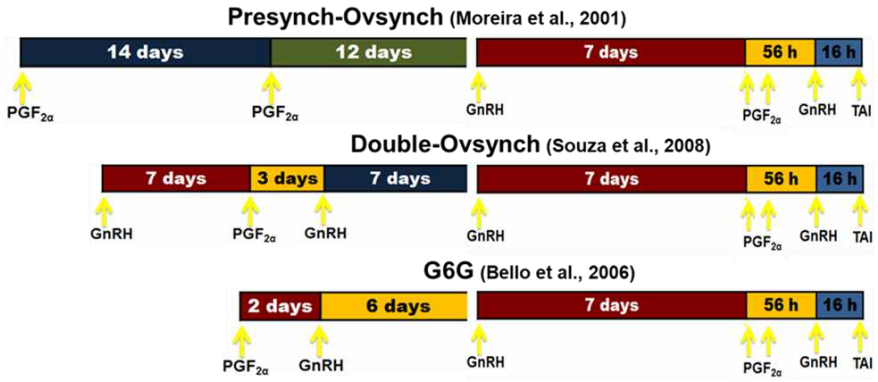


or

Combined AIE+TAI

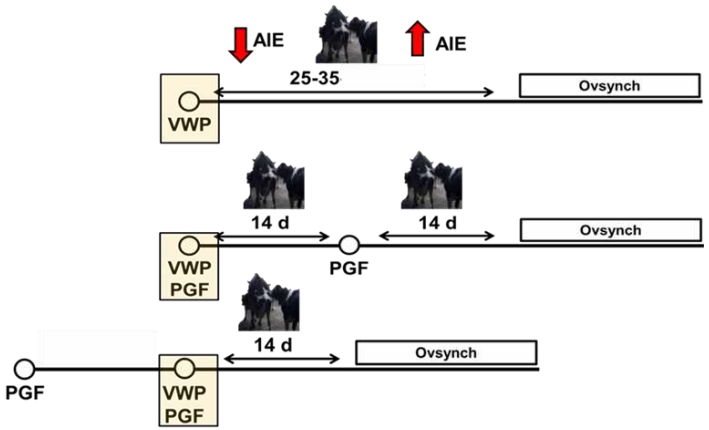


All-TAI



- Likely to maximize P/AI and lead to excellent 21d-PR measured after end of VWP
- Combined with extended VWP can safely shift timing of pregnancy to later lactation
- More dependent on compliance and setup than cow biology

Combined AIE+TAI



- Unlikely to maximize overall P/AI
- Combined with shortened VWP can lead to excellent preg rate after calving
- Highly dependent of estrous detection efficiency and P/AI of AIE services

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Thank You! Questions?