Implementing Effective Reproductive Programs to Maximize Profitability

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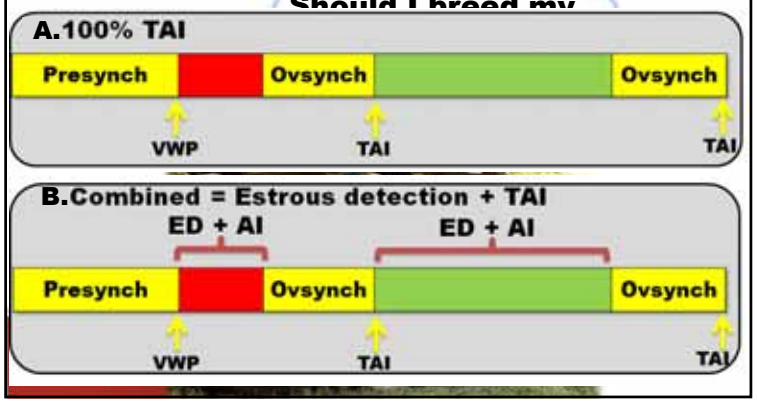
Selection of Reproductive Program



Daily-Markov Chain Model

First AI Service

30-70% cows
25-30-35% P/AI

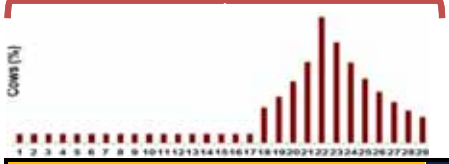
Presynch | Ovsynch

VWP
50 DIM

TAI
71 DIM

2+ AI Services

30-70% cows
25-30-35% P/AI



ED + AI | Resynch-D32

TAI

TAI
42 DSLH

Program	1st AI			2nd and subsequent AI		
	ED before 1st TAI	2CR ED	CR TAI	ED before TAI	CR ED	CR TAI
TAI 1	0	-	42	0	-	30
TAI + ED 2	30	25	40	30	25	30
TAI + ED 3	40	25	38	40	25	30
TAI + ED 4	50	25	36	50	25	30
TAI + ED 5	60	25	34	60	25	28
TAI + ED 6	70	25	32	70	25	28
TAI + ED 8	30	30	40	30	30	30
TAI + ED 9	40	30	38	40	30	30
TAI + ED 10	50	30	36	50	30	30
TAI + ED 11	60	30	34	60	30	28
TAI + ED 12	70	30	32	70	30	28
TAI + ED 14	30	35	40	30	35	30
TAI + ED 15	40	35	38	40	35	30
TAI + ED 16	50	35	36	50	35	30
TAI + ED 17	60	35	34	60	35	28
TAI + ED 18	70	35	32	70	35	28

Economic Parameters

Item	Unit	Value
Milk Price	($/cwt)	18.5
Feed Cost Lactating	($/lb DM)	0.13
Female Calf Value	($/calf)	125
Male Calf Value	($/calf)	25
Heifer Replacement	($/heifer)	1,150
Salvage Value	($/lb)	0.60

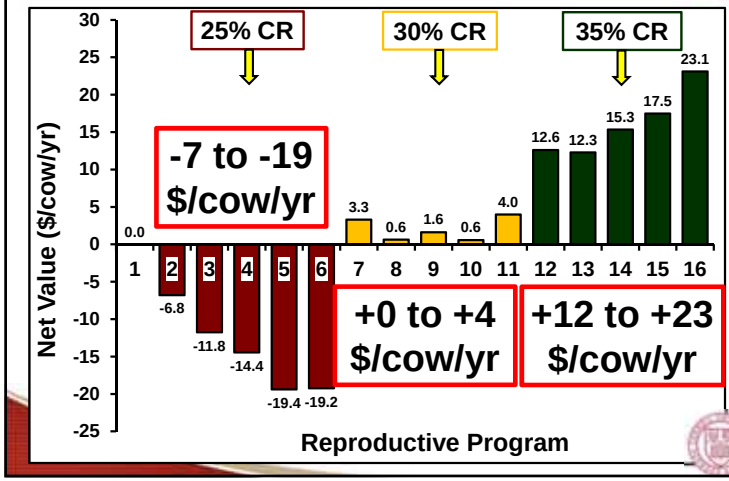
*Based on values observed in Upstate New York in the fall of 2012

Repro Program Costs

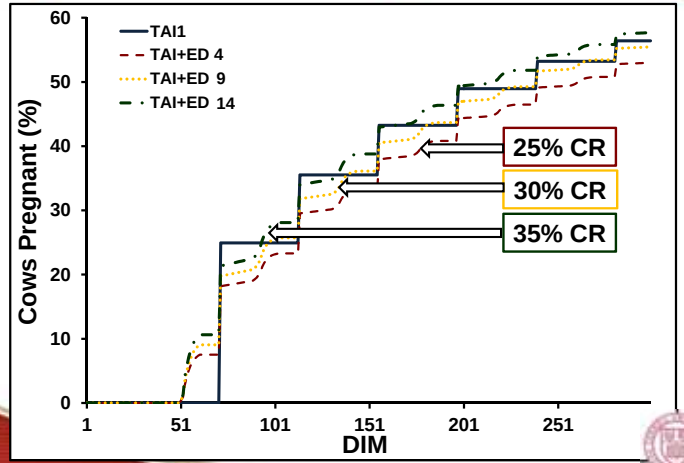
Item	Unit	Value
GnRH	($/dose)	2.6
PGF	($/dose)	2.3
AI (semen + labor)	($/AI)	16.0
Labor estrus detection*	($/h)	15.0
Non-preg. diagnosis	($/h)	105.0

*Estrus detection was performed 4 h per day 7 d a week

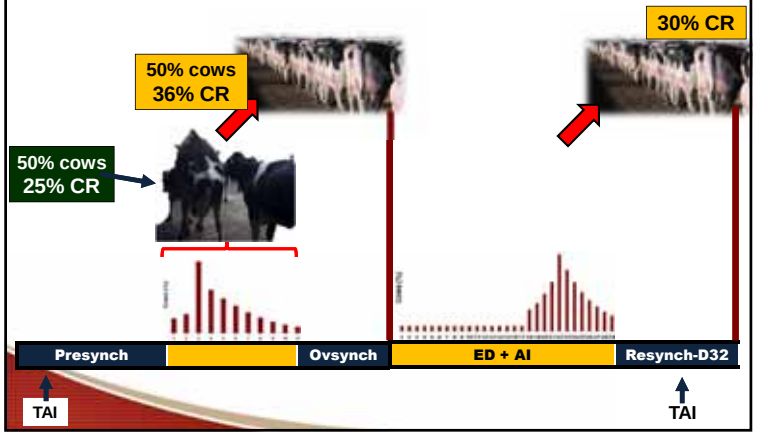
Difference with 100% TAI



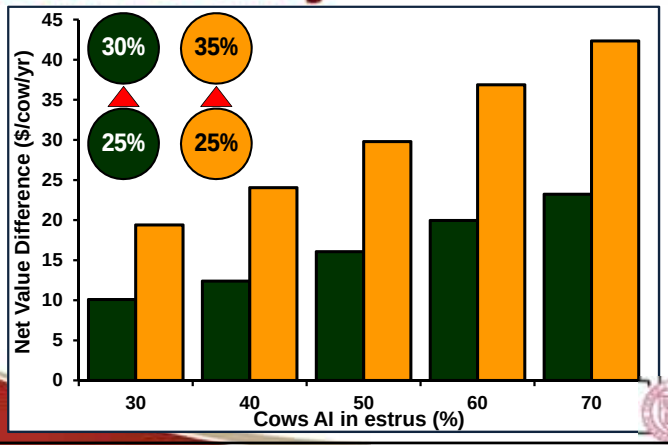
Reproductive Dynamics



Reduced Performance



Impact of Improving EDAI Fertility



Impact of Improving EDAI Fertility

Improving P/AI by 5-10 % when initial P/AI was 25% increased NV ~ $10-42/cow/yr

Greatest impact of increasing fertility of ED breedings when high % of cows AI in estrus

Summary

- **Adding ED to an effective 100% TAI program may be beneficial depending on the % of cows AI after estrus and the resulting CR**
- **Attempts to maximize profits by reducing breeding costs may in fact reduce profitability**

Service Number and Fertility

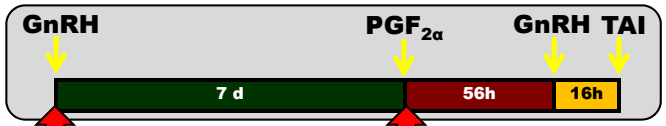
Bred #	%Conc	#Preg	#Open	Other	Abort	%Tot
1	47	211	237	181	19	36
2	30	81	187	84	9	20
		8	159	62	9	16
		4	104	59	2	12
		5	63	42	2	7
6	32	12	25	18	0	3
OTHERS	33	8	16	9	0	2
TOTALS	35	445	821	474	42	1

~30%

Resynch Limitations

Cows with a CL at the 1st GnRH of Resynch have better P/AI than cows lacking CL's (Fricke et al., 2003; Silva et al., 2007; Giordano et al., 2012)

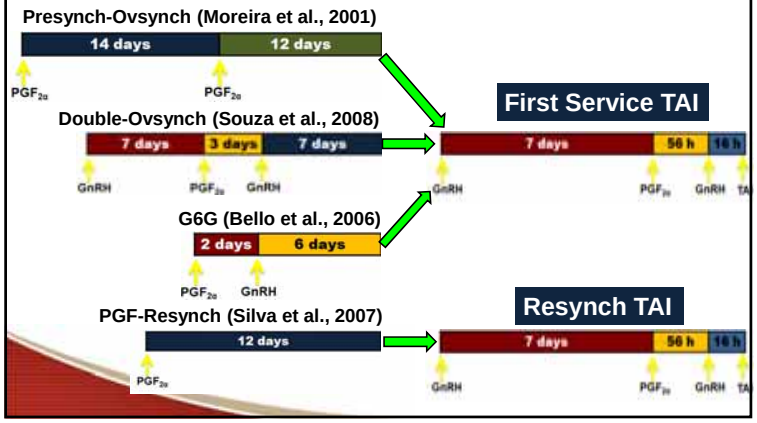
~15-40% of cows lack a CL or have low P4 at 1st GnRH of Resynch (Fricke et al., 2003; Sterry et al., 2006, Silva et al., 2007; Giordano et al., 2012)



Low ovulatory response

Lack of luteal regression

Presynchronization for Resynchronization

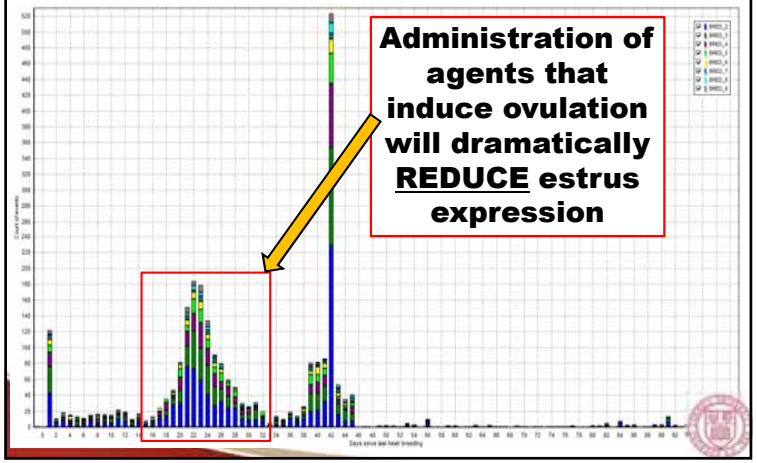


Resynchronization

100% TAI Resynch programs may be suitable under certain conditions:

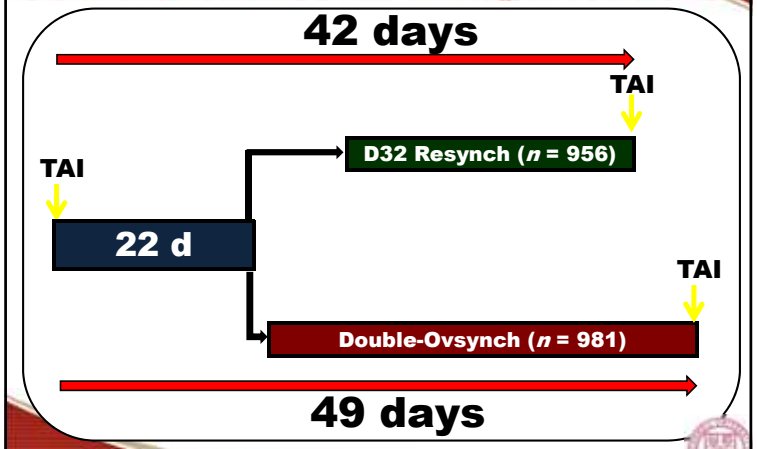
- **Inability to perform adequate estrus detection (e.g., lack of adequate training or lack of personnel)**
- **Reduced expression and duration of estrus in lactating dairy cows (e.g., high milk production, flooring, tie-stall)**
- **Poor results for AI after estrus detection**

Resynchronization



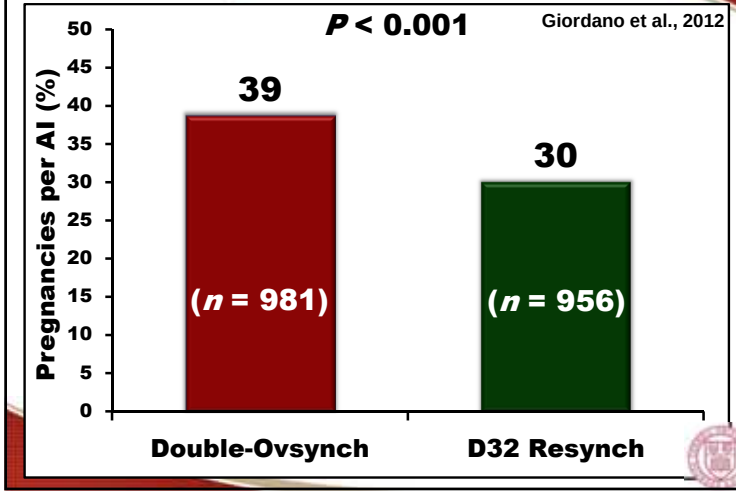
Administration of agents that induce ovulation will dramatically <u>REDUCE</u> estrus expression

Treatment Assignment

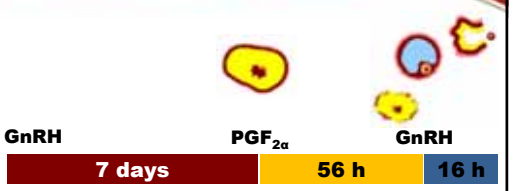


Giordano et al., 2012

Fertility to TAI



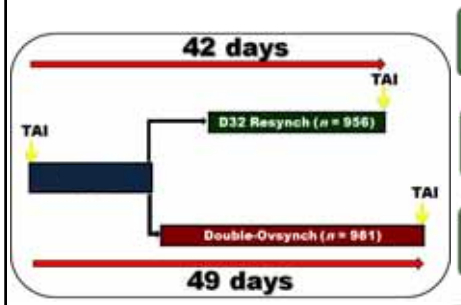
Synchronized Cows



Item	D32	DO	P
Synch Cows	51 (106/210)	72 (160/223)	< 0.01
P/AI Not Synch	10 (10/104)	5 (3/63)	0.97
P/AI Synch	43 (46/106)	43 (69/160)	0.27

Giordano et al., 2012

Interbreeding Interval & Pregnancy Rate



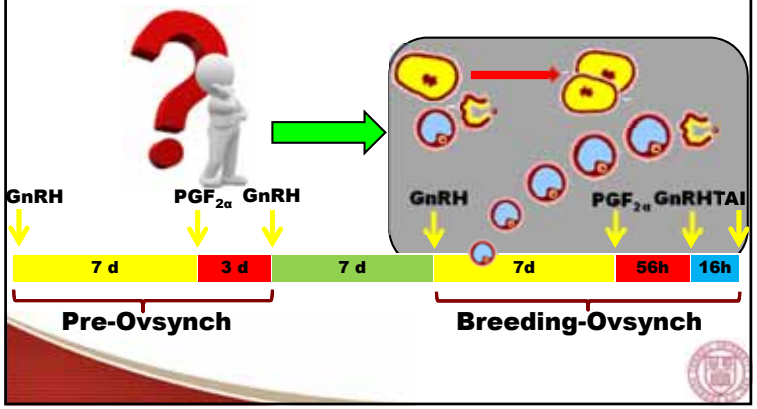
Interval > 21d

Eligible Cows

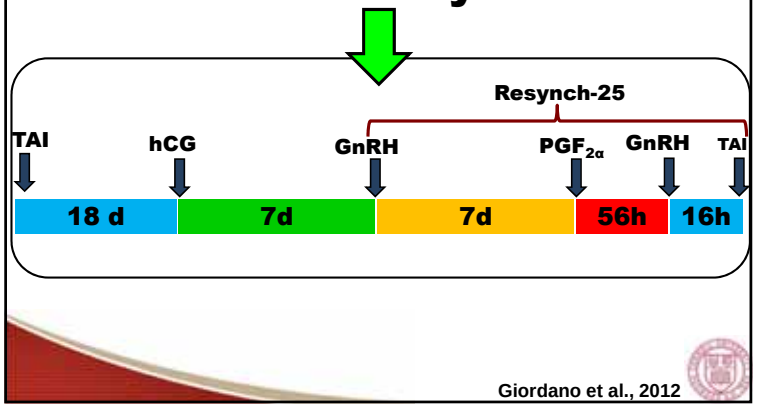
↓ SR

↓21d-PR

Physiology of Double-Ovsynch

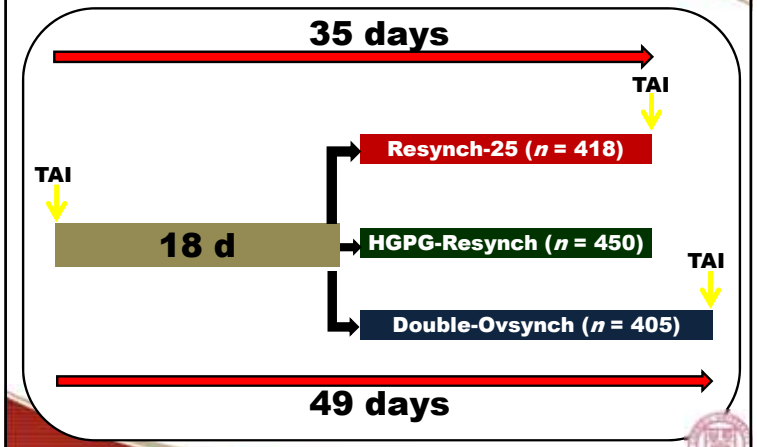


HGPG Resynch



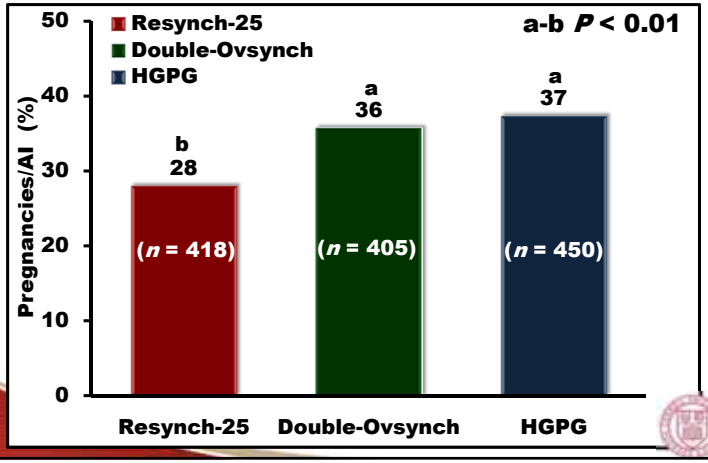
Giordano et al., 2012

Experimental Design



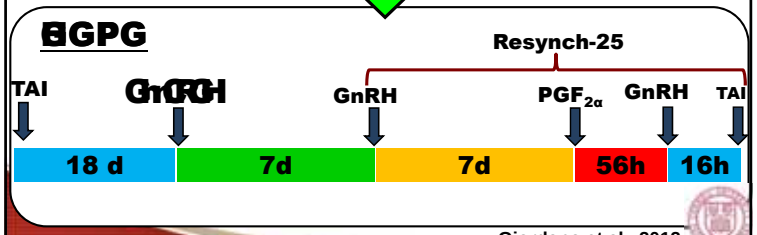
Giordano et al., 2012

Effect of Presynchronization on P/AI



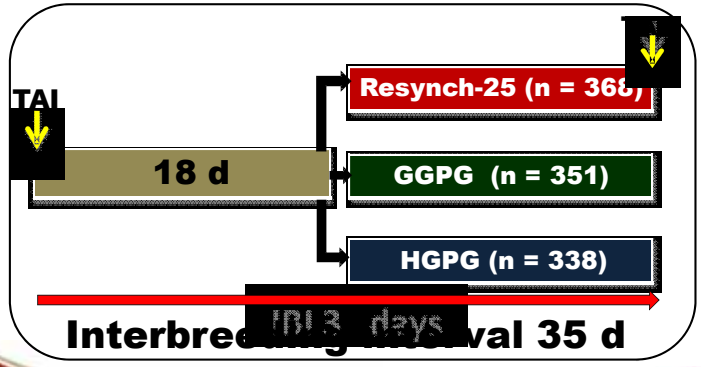
Exp. 2: Hypothesis

Replacing hCG by GnRH on Day 18 will result in similar P/AI for HGPG than GGPG and greater fertility than Resynch-D25



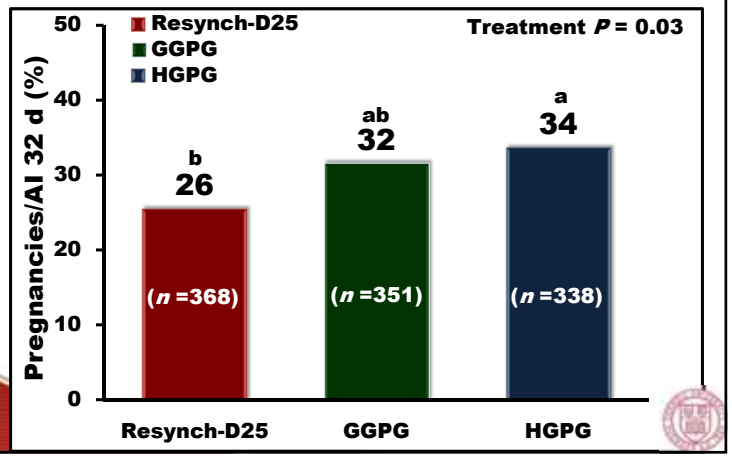
Giordano et al., 2012

Exp. 2: Experimental Design

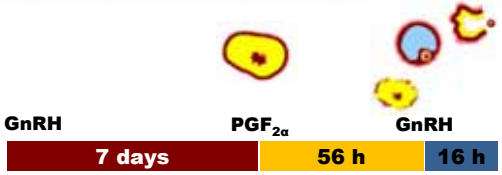


Giordano et al., 2012

Effect of Presynchronization with GnRH and hCG on P/AI



Response to Protocol



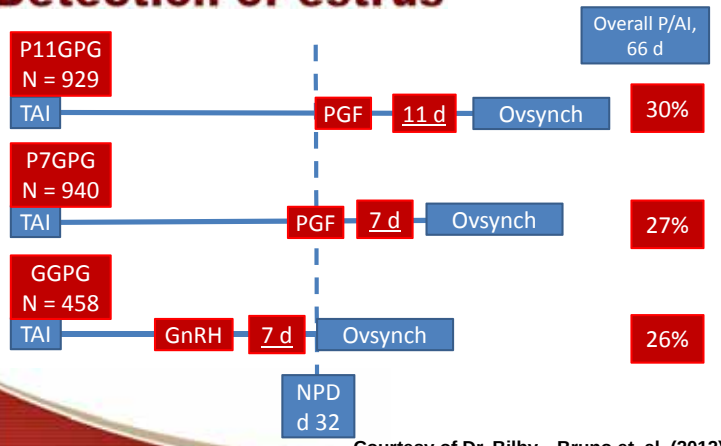
Item	D25	GGPG	HGPG	P
Cows Synch	54[b] (98/183)	70[a] (128/184)	64[a] (114/178)	<0.01
P/AI Not Synch	12 (10/85)	14 (8/56)	8 (5/64)	0.56
P/AI Synch	41 (48/98)	41 (52/128)	41 (47/114)	0.99

Giordano et al., 2012

Overall Conclusions

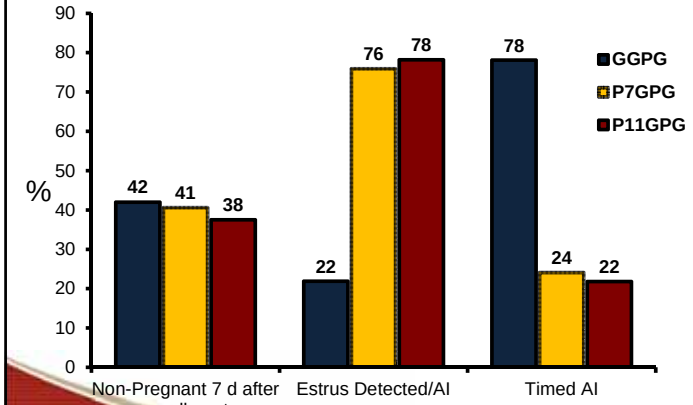
- **Presynchronization of the estrous cycle before initiating a Resynch program is likely to improve the fertility of Resynchronized TAI services**
- **Improvement in fertility may vary from 4 to 9% depending on the agent used to presynchronize ovulation**
- **Consider the potential reduction in estrus expression in cows induced to ovulate if goal is to AI cows in estrus**

Maximizing AI after Detection of estrus



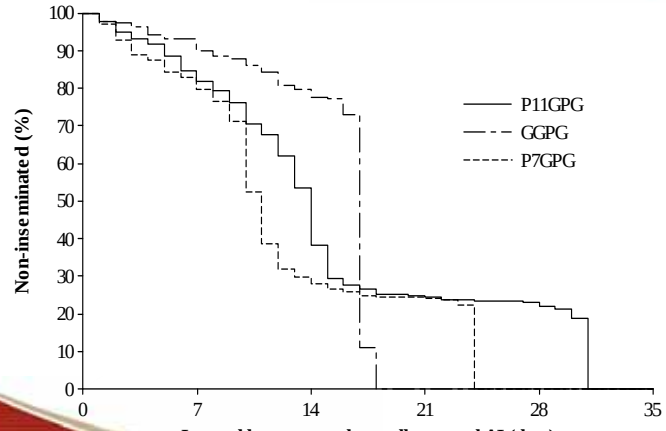
Courtesy of Dr. Bilby Bruno et. al. (2012)

GnRH reduced number of cows detected in estrus & increased number TAI



Bruno et. al. (2012)

Maximizing AI after Detection of estrus



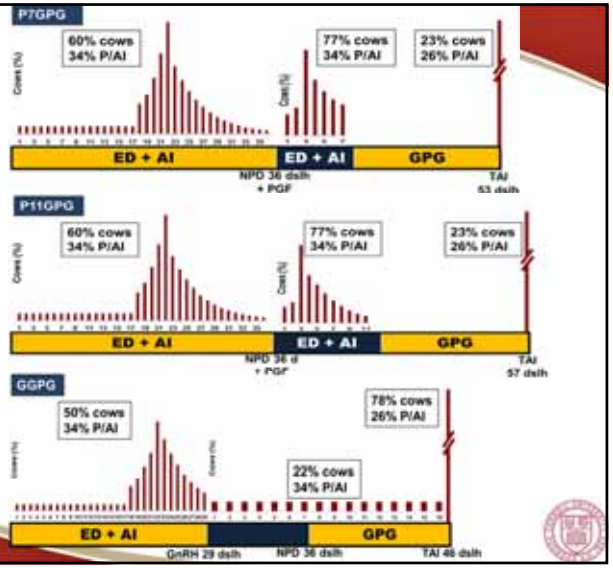
Bruno et. al. (2012)

Pregnancy per AI at 66 d

Item, % (n/n)	GGPG	P7GPG	P11GPG	P - value
Enrollment, n	458	940	929	
P/AI, 66 d (%, n/n)				
Estrus Detected (%)	26 (11/42)[b]	28 (82/289)[a]	34 (91/271)[a]	0.31
Timed AI (%)	26 (38/148)	20 (19/91)	18 (14/76)	0.41
Overall (%)	26 (49/190)	27 (101/380)	30 (105/347)	0.38

Bruno et. al. (2012)

Resynchronization



Economic Parameters

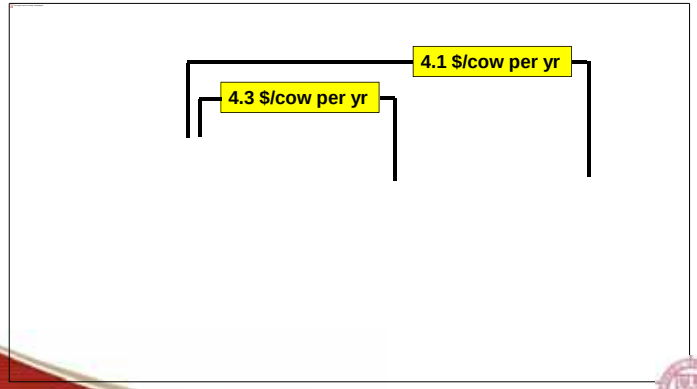
Item	Units	Value
Milk Price	($/cwt)	18.0
Feed Cost Lactating	($/lb DM)	0.13
Female Calf Value	($/calf)	150
Male Calf Value	($/calf)	50
Heifer Replacement	($/heifer)	1,250
Salvage Value	($/lb)	0.60

Economic Parameters

Item	Units	Value
GnRH	($/dose)	2.0
PGF	($/dose)	1.8
Labor injections	($/cow)	0.33
Labor estrus detection*	($/h)	10.0
Non-preg. diagnosis	($/cow)	2.5

*Estrus detection was performed 4 h per day

Economic Differences



Summary

- Results for PGF given 7 or 11 d before Ovsynch reflect the balance between the improvement in performance by AI on estrus detection and the extended interbreeding interval for TAI
- GnRH based programs that suppress estrus and force cows into TAI needs to increase P/AI to be a viable alternative

Take Home Messages

1) Presynchronization before Resynch improves fertility

2) GnRH/hCG will reduce estrus and PGF will promote.

   a) Don't use protocols that are going to reduce estrus if your trying to detect estrus!

3) Must take into account BOTH estrus detection and TAI fertility

4) Economics is a balance between:

   a) Interbreeding AI interval

   b) Proportion of cows re-inseminated after estrus detection

   c) Fertility of both estrus detection and TAI

Thank you!

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