Strategies for a Successful Reproductive Management and AI Program

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What is success?

- *Success is not final, failure is not fatal: it is the courage to continue that counts.---Winston Churchill*
- Operation dependent
  - Money returned?
  - Winning shows?
  - Replacement females?
  - More pounds?
  - Better carcass?
- Sustainability: you are not likely to repeat failure

Identify goals

- Have reasonable goals and expectations for what you input
- Pregnancy percentage = A x B x C x D
  - A = % of Herd Detected in Heat/Effectiveness of Synchronization and Fixed Time A.I. Program
  - B = Inseminator Efficiency %
  - C = Herd's Fertility Level %
  - D = Semen Fertility Level %
  - 90% x 90% x 90% x 90% = **66%**

With respect to reproduction, what you do incorrectly can negate everything you do correctly!

Is perfection required?

- A = % of Herd Detected in Heat/Effectiveness of Synchronization and Fixed Time A.I. Program ?
- B = Inseminator Efficiency % ?
- C = Herd's Fertility Level % ?
- D = Semen Fertility Level % ?

Inseminator efficiency

- Not just "can I pass a rod?"
- First question: "Who is going to do the work?"
- If you hire…
  - Have good communication with Technician/Veterinarian and follow their guidelines
  - Realize what works for them, WORKS for them
- If you are going to do yourself…

Do it yourself approach

- Plan well and well in advance
- Assemble all supplies well in advance
  - Consider a "dry run"
- Have a backup plan
- Keep very good records
- Pay attention to every detail

Do it yourself approach

- Know your limitations
  - New to AI or been a while since AI, arm fatigue can be an issue
  - Keep in mind when synchronizing

Herd fertility level

Not just managing hormones at breeding

Management of nutrition

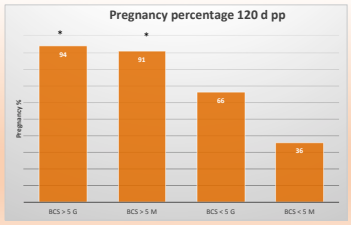
- Ascending plane of nutrition
- BCS of 5 to 6
  - Spring calving cows should calf with a BCS of 5.
  - Spring calving heifers should calf with a BCS of 6.
  - Fall calving cows should calf with a BCS of 5.5.
    - Dr. R.P. Wettemann, personal communication
- Maintain nutrition after calving
- Heifers should be 55%-65% of mature weight

Photo compliments of Dr. R. P. Wettemann

Change in BCS and PPI (Lalman et al., 1997)

	Change in condition score to 90 days after parturition						
BCS at Calving	-1	-0.5	0	0.5	1	1.5	2
3	189	173	160	150	143	139	139
4	161	145	131	121	115	111	111
5	133	116	103	93	86	83	82
5.5	118	102	89	79	72	69	66

BCS influences PP pregnancy rates (Bell et al., 1990)



Conception rates with BCS 6+ (Cushman et al., 2007)

Age, Yr	Records	PPIE	BCS	Conception rate
2	215	55.3 ± 1.2[a]	6.1 ± 0.1[a]	82.8 ± 4.1
3	356	65.4 ± 1.3[b]	6.3 ± 0.1[b]	78.8 ± 3.9
4	190	62.4 ± 2.2[b]	6.5 ± 0.1[c]	72.8 ± 5.1

Collectively: BCS at AND after calving matter

Management at and after breeding

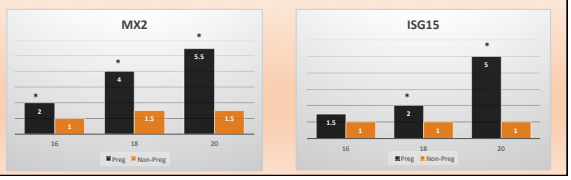
Key days of early pregnancy

Event	Day
Estrus	0
Ovulation/Fertilization	1
Enters Uterus	5-6 ←
Blastocyst	7-8
Pregnancy Recognition	15-17
Definitive attachment	42 ←

Adapted from Senger, 2003 and Perry et al., 2011

Immune response to pregnancy (Gifford et al., 2007)

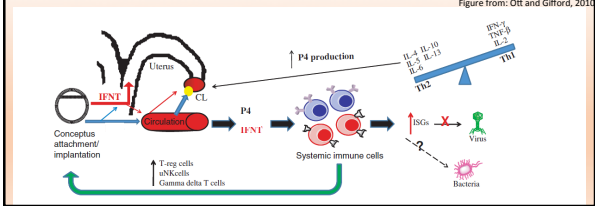
- Pregnancy is immune modulation not immune suppression
- Cow's immune system adapts to pregnancy



Management of immune system

- Conceptus is allogeneic or semi-allogeneic
  - i.e. has different DNA than mother

Figure from: Ott and Gifford, 2010

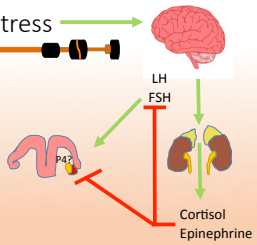


Managing immune system take home

- Discuss vaccinations and timing with your Veterinarian
- Just because you have them in the chute to breed does not mean it is a good time to vaccinate
- Make sure you are following a good herd health program

Management of stress

- Facilities and handling
- Temperament of animals
- Stress and associated hormones inhibit reproduction
- Uterine environment

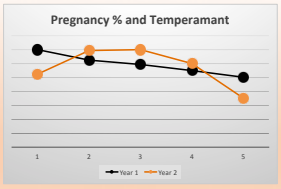


Sources of stress

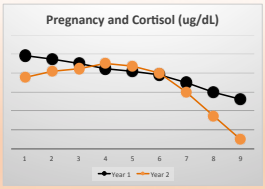
- Not used to facility
- Cattle not handled often
- "Handler induced"
- Transportation
- Fasting
- Genetics
- Change

Temperament, cortisol, and pregnancy

(Cooke et al., 2009)

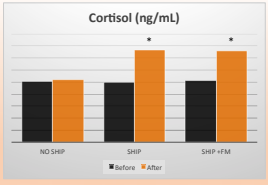


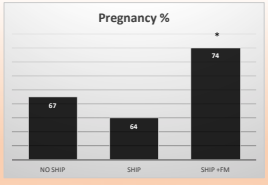
Range 90% - 45% (approximate)



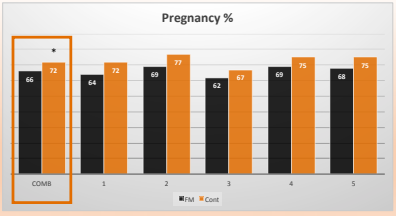
Range 98% - 45% (approximate)

Shipping increases cortisol (Merrill et al., 2007)





Handling decreases pregnancy rates (Geary et al., 2010)



Cortisol is not only player and not all bad

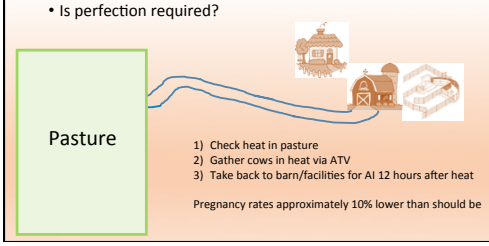
- Treating cows with ACTH increased Cortisol levels
  - No cows aborted (n = 20) (Geary, 2011)
- Cortisol detected in uterine flushes of sheep (Dorniak et al., 2012)
  - Hypothesized to actually help establish pregnancy (Dorniak et al., 2012; Dorniak et al., 2013)

Managing stress take home

- Cull high stress animals
- If you have to ship, do it prior to day 5 (after AI) or after day 42
- Familiarize animals with facility prior to AI
- If you keep cattle in corral for a few days, make sure they are comfortable with eating and drinking in that situation
- Be aware of changing weather events
- Keep "energy level" at a minimum (cattle and cattle handlers)

Profit/cost per pregnancy

- Is perfection required?



1) Check heat in pasture
2) Gather cows in heat via ATV
3) Take back to barn/facilities for AI 12 hours after heat

Pregnancy rates approximately 10% lower than should be

Profit/cost per pregnancy

	A	B
Cows	100	100
Preg to AI %	70	60
Increased value	$10	$10
Total increase	$700	$600
Difference/yr	$100/100 cows	

	C	D
Cows	100	100
Preg to AI %	70	60
Increased value	$50	$50
Total increase	$3,500	$3,000
Difference/yr	$500/100 cows	

How much would an ideal facility cost?

If nothing else….

- Have good records and a good plan
- Manage for breeding all year
- Good nutrition
- Low stress
- Healthy herd

Thank You!