Synchronization 101

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Background

- Recent transplant from SE Wisconsin
- Family Dairy Farm Background
- DVM from UW–Madison
- ISU Extension & Outreach Dairy Specialist for NW Iowa
- I-29 Dairy Outreach Consortium

How about YOU?
Overview

- Importance of a Good Repro. Program
- Concept of Synchronization
- Hormones
- Conception Risk
- Reproductive Success
- Developments in Achieving High Pregnancy Rates

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What will a good Reproductive Program allow you to achieve?
A good reproductive program:

Keeps Days in Milk (DIM) low

- DIM low - a higher percentage of cows in early lactation and at peak
- The ideal range for DIM in a herd is between 150 and 170 DIM.
- It is estimated for every one-day increase in average DIM above 150 you will lose 0.17 pounds of milk per cow.
  - 190 DIM vs 160 DIM = 5 lbs less milk
A good reproduction program:

Increases number of calves born

- Increasing heifer calves augments the dairy’s flexibility in culling decisions
- Increasing bull calves improves income, as increasing heifer calves allows management greater flexibility in culling decisions.
- With more heifers available, the dairy has the option of:
  - selling open heifers for export
  - selling bred heifers
  - selling springing heifers
  - doing more voluntary culling
A good reproductive program: Lower culling rate

• Culling for reproductive reasons is the single-highest reason cows leave the herd.

• Reducing the amount of cows culled for reproductive reasons, will allow culling for low production.
A good reproduction program:

Knows when to stop breeding

- What are some reasons that you follow to determine when a cow is no longer breed?

Other Factors
Goals of Reproduction

• Pregnancy rate: >22%
  – Cow inseminated within 21 of end of VWP>90%
  – Heat detection rate >65%
  – Conception rate: >35%
  – Cow pregnant by 150 DIM: >70%

• Lactating herd confirmed pregnant: >50%
• Cows culled for reproduction: <5%
• Age at first calving: 22-24 months
Concept of Synchronization

Definition of Synchronization – To cause to occur at the same time or rate.

- Estrus (heat) detection, Ovsynch, Presynch, Resynch, CIDR
Hormones

- **Progesterone (P4)**
  - Hormone that supports pregnancy
  - Produced & secreted into circulation
    - by the corpus luteum (CL) during estrous
    - by the placenta during pregnancy

- **Prostaglandin F2α (PGF2α)**
  - Hormone that induces labor
  - Causes luteolysis of the CL
    - Inhibiting the production of progesterone
  - Produced by the uterus
Hormones

• Gonadotropin-Releasing Hormone (GnRH)
  – Causes the release of another hormone: Luteinizing Hormone (LH)
  – Luteinizing Hormone (LH) + Follicle Stimulating Hormone (FSH)
    • Both hormones (LH & FSH) are produced by the pituitary gland
    • Stimulates the growth of ovarian follicles
    • Causes ovulation allowing a CL to form in the place where the oocyte was released on the ovary
Conception Risk

• Factors influencing conception with Artificial Insemination (AI)
  – Cow fertility
  – Bull fertility
  – Accuracy of heats
  – AI efficiency

Information provided courtesy of Dr. Paul Fricke, PhD Dept. of Dairy Science; UW – Madison (http://paulfricke.dysci.wisc.edu/extension-2/about/ – Five Keys for Reproductive Success)
Conception Risk

- Fertility of cow
- Fertility of bull
- Insemination when fertile ovum
- Technician skill
The cow fertility issue is complicated.
Reproductive Success

- Inseminate cows quickly after your Voluntary Waiting Period (VWP)
- Inseminate cows during the correct time in their estrus cycle – ovulation
- Improvements to AI efficiency
- Identify non-pregnant cows promptly after insemination
- Aggressively re-inseminate non-pregnant cows

Information provided courtesy of Dr. Paul Fricke, PhD Dept. of Dairy Science; UW – Madison
(http://paulfricke.dysci.wisc.edu/extension-2/about/) – Five Keys for Reproductive Success)
Keys to getting cows pregnant

Days in Milk

Dry Period | Calving | VWP | Allowable Breeding Time | DNB

Transition Cow Management

Timely First Insemination

Early “Open” Exam

Quickly re-breed open cows

Confirm pregnancy

Breeding Strategies

All of the components require “managerial” efforts

Culling Strategy
Achieving High Pregnancy Rates

• Progesterone effects on Ovsynch
  – Low-progesterone levels at first GnRH
  – Incomplete luteal regression
  – Decreased fertility at Timed AI (TAI)

• Additional PGF$_{2\alpha}$ treatment in the Ovsynch protocol
  – 24 hours after 1$^{st}$ PGF$_{2\alpha}$ treatment

• Achieving a 30% Pregnancy Rate

Information provided courtesy of Dr. Paul Fricke, PhD Dept. of Dairy Science; UW – Madison (http://paulfricke.dysci.wisc.edu/extension-2/about/) —Fertility Programs to Achieve High 21-day Pregnancy Rates in High-Producing Holstein Dairy Herds)
Resynch for 2\textsuperscript{nd} and greater TAI

32 d After AI
Pregnancy Diagnosis with US

25 days
After TAI

CL+ (~80%)
Pre-
G1

CL- (~20%)

PGF

56 h

G2

12 h

TAI

PGF

56 h

CIDR Insert

G1

7 d

PGF

24 h

32 h

PGF

24 h

32 h

TAI

Information provided courtesy of Dr. Paul Fricke PhD Dept. of Dairy Science; UW – Madison
(http://paulfricke.dysci.wisc.edu/extension-2/264-2/)
Summary

• Good reproduction results in more calves and higher milk production and more profit!!

• Good reproduction can be achieved by:
  – Calve cows in healthy
  – Inseminating cows shortly after the VWP
  – Rapid identification and re-insemination of open cows

• New technologies have the potential to improve reproduction
The End
Questions??
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