

The First 42 Days Post-Breeding

Strategies to help achieve better pregnancy success after artificial insemination.

by Kindra Gordon, field editor

Perhaps you've bred cows for years, but do you know the stages of embryo development in the first 42 days after fertilization? Did you realize that it takes two weeks before the cow recognizes she's pregnant? Have you considered what role nutrition plays on pregnancy immediately before and after a cow is bred?

George Perry, a professor and extension beef reproductive management specialist with South Dakota State University (SDSU), is making it his mission to help cattle producers become more aware of factors affecting bovine embryo

development. Perry hopes the extra knowledge will help producers boost their herd's pregnancy rates and subsequent calf crop.

Biology basics

As a starting point, Perry likes to review the day-by-day steps for early embryo development (see table).

Of this process, Perry underscores, "In the first two weeks she (the cow) doesn't know she's pregnant ... and, it's not until day 42 that the embryo starts drawing the nutrients it needs."

He continues, "During the first month after fertilization, the embryo is free floating in the uterus living off of secretions. So, nutrients can affect survival and anything we do to change those uterine secretions can have a tremendous impact on survivability of that embryo."

Thus, Perry emphasizes that nutrition — especially consistency of nutrition — is critical immediately before and during the 42 days after breeding. He states, "Animals need to be on a good plane of nutrition to supply the nutrients to that embryo during its early development before it is firmly attached to the uterus and can draw nutrients from the animal."

Change protocol

Recognizing the importance of nutrition, Perry points out that a protocol of drylotting heifers through the winter and into breeding season and then immediately turning them out on grass afterward may not be best for pregnancy success. Even turning heifers out onto grass just prior to breeding may be risky.

He reports that some studies have shown that heifers going from drylot to forage lost as much as 3 pounds (lb.) per day — and 13-to-15 days after the diet change as many as 60% became anovular (not ovulating). Perry says studies have shown that even just a 6-day restriction in nutrition prior to or after artificial insemination (AI) has been shown to be detrimental to embryo quality.

Perry reports, "Those with prior grazing experience outperform those without it." He cites a study that showed replacement heifers grazing all winter had a higher average daily gain than heifers that were drylotted. Thus, he emphasizes that replacement females need some grazing experience several months prior to breeding.

"When we wean animals they transition from being with their mother to learning things on their own," he says. "What's interesting is after their first year and weaning,

Table 1: Early embryo development

Day 0	estrus
Day 1	ovulation and fertilization
Day 2	first cell division
Day 3	8-cell stage
Days 5-6	migration to uterus
Days 7-8	blastocyst (differentiation of cells)
Days 9-11	hatching
Days 15-17	maternal recognition of pregnancy
Day 19	attachment to the uterus
Day 25	placentation
Day 42	definitive attachment of the embryo to the uterus
Day 285	Birth

their willingness to try new food declines, which can affect the nutritional plane supplied to them.”

Adding supplementation may also help minimize the negative energy/nutrition balance. Perry reports that supplementing heifers with no prior grazing experience after being bred AI resulted in a 40-lb. weight gain and a 15% improvement in pregnancy success, while a group of heifers put on pasture with no supplementation lost 5 lb. between AI and pregnancy checking. Perry suggests that for animals on forage, energy may be ample, but protein may need to be supplemented depending on quality.

Another option: if heifers are accustomed to a drylot setting and feeding, after A.I. continue on the drylot for the first 42-to-45 days so that their plane of nutrition does not change — allowing the embryo to develop and attach to the uterus.

Reconsider shipping, too

Shipping stress can also have an impact on pregnancy success. But when you should — and should not — ship bred animals may surprise you. Perry says shipping AI-bred animals within five days of breeding actually isn't a problem. However, after day five and up to day 45 shipping should be avoided. He cites that embryonic loss from shipping stress can be 5-10% during that time. In one trial, bred females were shipped one hour to a facility on day 45 to be ultrasounded and shipped an hour back. They experienced 6% embryonic loss as a result. [AJ](#)

Remove calves?

Does removing calves from cows for a period of time at artificial insemination (AI) lead to better heat expression and conception? George Perry, South Dakota State University (SDSU), says yes, it does. Perry says especially on cows in thinner body condition or among those that haven't started cycling, removing calves for 72 hours can yield better expression of estrus and breeding success.

