

Free Online Tool to Help Producers Incorporate Artificial Insemination in Beef Herds

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The development of estrus synchronization protocols has facilitated the use of artificial insemination in beef cattle. These protocols allow producers to inseminate cows or heifers at a fixed time without the need of estrus detection. Several different protocols are currently available to synchronize beef females and producers are often overwhelmed with the complicated terminology and large numbers of protocols. Different factors will influence the selection of an estrus synchronization protocol. For example, protocols recommended for cows are different than protocols for replacement heifers. Within the protocols recommended for cows, protocols for *Bos taurus* breeds are slightly different than protocol for *Bos indicus*-influenced cattle. To overcome the challenges associated with the selection of an estrus synchronization protocol, Extension personnel across the U.S. developed different tools to facilitate the selection and use of these protocols. The purpose of this article is to objectively guide Georgia producers through the use the EstruSynch planner, an online free tool that helps producers plan and budget their artificial insemination program.

The EstruSynch planner was developed from a collaborative effort between the Southeast Cattle Advisor, Iowa Beef Center, and the Beef Reproduction Task Force. The planner can be accessed through the ugabeef.com website under the [Tools](#) tab. Producers can access this tool by clicking on the "Estrus Synchronization" link. This tool allows producers to plan their breeding seasons in three easy steps. **Step 1:** Enter herd information, select a breeding program, and enter input cost. **Step 2:** Select one of the recommended systems. **Step 3:** Visualize results that will include a budget and a breeding calendar.



Step 1

Breed type: Select "Bos taurus" for European breeds (Angus, Herefords, Limousin, etc) and "Bos indicus" for cows that have $\geq 50\%$ of their breed from a Bos indicus breed (Brahman, Nelore, etc).

Age: Select "cows" for groups of females that already had at least one calf. Select "heifers" for virgin heifers between 12 and 24 months of age.

Head in the group: Enter the number of animals in the group.

Date start breeding: Select the date in which females will be bred. This date should be selected based on when females need to start calving.

Insemination method: Select "Estrus AI" to perform artificial insemination based on estrus expression only. Select "Estrus AI & Clean up AI" to perform artificial insemination based on estrus expression followed by a clean up fixed-time artificial insemination at the end of the estrus detection period. Select "Fixed-time AI" to artificially inseminate all cows at the same time.

Time of the day: Time in which artificial insemination of the herd will start.

Days from the last AI bull turn in: Enter the time interval in days between the last artificial insemination and the day bulls will be turned in with the herd. This information will be used to include the day in which bulls will be turned in the breeding calendar.

Input cost: The suggested costs are based on general industry averages for labor, estrus synchronization products, and semen costs. Numbers should be changed depending on the herd.

In this example, a group of 100 beef cows exposed will be exposed to artificial insemination. This group is scheduled to be inseminated on December 20th, 2021. All cows will be inseminated in the same day using a fixed-time artificial insemination approach. Bulls will be turned in with the cows 14 days after the artificial insemination and stay with the herd until the end of the breeding season. This approach allows veterinarians to differentiate pregnancies that were generated by insemination from pregnancies that were generated by natural service when performing a pregnancy diagnosis with ultrasonography. This example uses input costs to estrus synchronization products, labor, and semen suggested by the website.

EstruSynch
estrus synchronization planner

Herd Information	Step 1
Select System	Step 2
Results	Step 3

Herd Information

Breed Type:
Bos taurus

Age:
Cow

Head in group:
100

Breeding Program

Date to start breeding:
12/20/2021

Time of day:
8:00 AM

Insemination method:
Fixed-Time AI

Days from last AI bull turn in:
14

Input Costs

Labor costs (\$/hr):
13.50

PG (\$/dose):
2.80

GnRH (\$/dose):
2.90

CIDR (\$/insert):
11.00

Semen (\$/unit):
25.00

next

Step 2

In step 2, the EstruSynch will recommend estrus synchronization protocols based on the information entered in Step 1. These protocols will be divided into "Recommended" and "Less Preferred". Click on one of the Recommended protocols and a short description of the protocol will be provided. If more than one protocol is available, select the protocol based on the description provided that better fits the needs of the operation.

In this example, based on the information included in Step 1, the recommended protocols are the 7-day CO-Synch + CIDR or the 5-day CO-Synch + CIDR. The 7-day CO-Synch + CIDR protocol was selected because it requires fewer trips to the chute compared with the 5-day CO-Synch + CIDR protocol. The EstruSynch also provides a brief description of the protocol after the recommended portion. The chosen protocol in this example does not require estrus detection and can initiate cycles in some noncycling females. Additionally, although the protocol results in good pregnancy rates, lower fertility is expected in cows less than 50 days postpartum at time of PG injection.

EstruSynch
estrus synchronization planner

Herd Information Step 1

Select System Step 2

Results Step 3

Recommended

- 7 Day CO-Synch+CIDR with Fixed-Time AI - 66
- 5 Day CO-Synch+CIDR with Fixed-Time AI

This system works well in cows.
No estrus detection required.
Fixed time AI can be done at 60 to 66 hrs. post PG injection.
All females require a GnRH injection at fixed-time AI.
This system can initiate estrous cycles in some noncycling females.
Expect lower fertility in cows less than 50 days postpartum at time of PG injection.

back next



Step 3

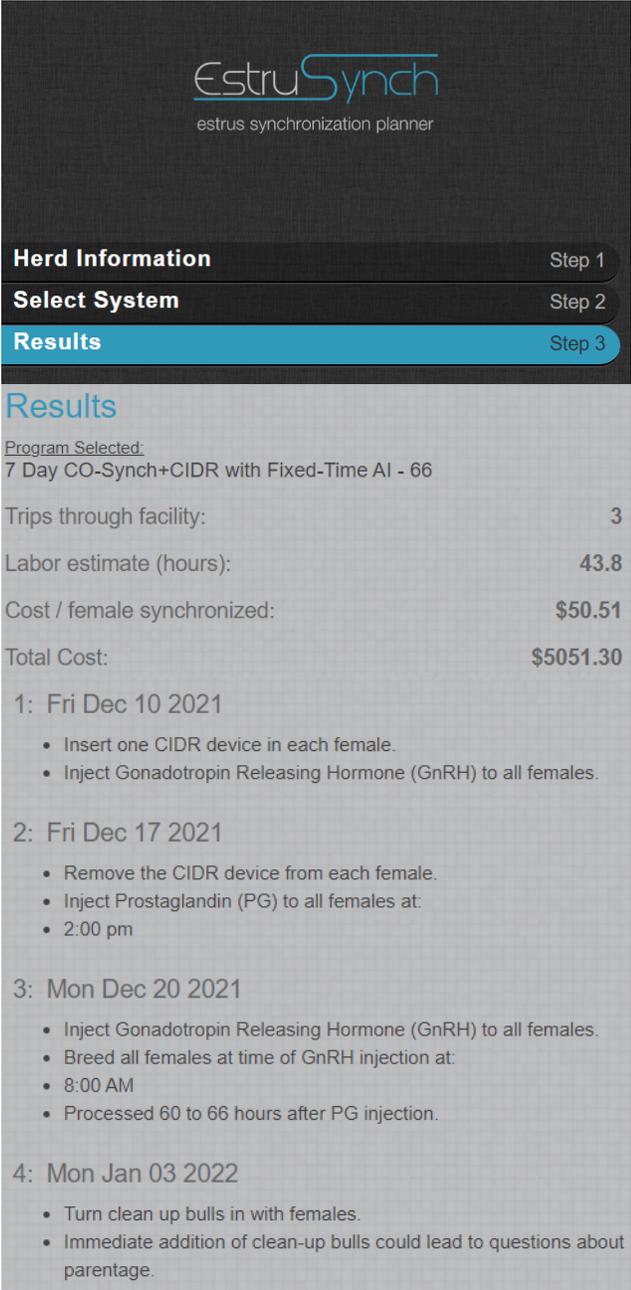
These are the results based on the information entered in Steps 1 and 2. This includes the number of trips to the chute required, hours of labor, cost per female synchronized and total cost of the program. Additionally, a calendar with the description of the activities performed in each day of the synchronization program. All the results can also be obtained in a email format by entering the desired email address in the website.

Based on the information entered in Steps 1 and 2, the example has a total cost per synchronized cow of \$50.51. Overall cost for this 100-hd herd is \$5,051.30, including labor, hormones, and semen.

This protocol would results in pregnancy rates that often range between 40-60%, meaning that half of the cow-herd would become pregnant in the first day of the breeding season. This will results in more cows calving in the beginning of the breeding season, resulting in older and heavier calves at weaning. Previous research indicates an increase in weaning weights of approximately 38 lb. per cow exposed when cows were fixed-time artificially inseminated before turning bulls in compared with cows exposed to natural service only (Rodgers et al., 2012). Interestingly, this study used sires with similar expected progeny differences (EPDs) for both artificial insemination and natural service breeding. If these performance differences are compared with today's cattle prices, regardless of the genetic improvement associated with artificial insemination, the added value from early calving would pay for all costs associated with this estrus synchronization and artificial insemination program.

In summary, the EstrusSynch is an easy-to-use tool that cattle producers can use to budget and plan their artificial insemination program. For more information on starting an artificial insemination program, please contact your local county agent or go to ugabeef.com.

The EstrusSynch planner is a collaborative effort between the Southeast Cattle Advisor, Iowa Beef Center, and the Beef Reproduction Task Force.



EstrusSynch
estrus synchronization planner

Herd Information Step 1

Select System Step 2

Results Step 3

Results

Program Selected:
7 Day CO-Synch+CIDR with Fixed-Time AI - 66

Trips through facility:	3
Labor estimate (hours):	43.8
Cost / female synchronized:	\$50.51
Total Cost:	\$5051.30

1: Fri Dec 10 2021

- Insert one CIDR device in each female.
- Inject Gonadotropin Releasing Hormone (GnRH) to all females.

2: Fri Dec 17 2021

- Remove the CIDR device from each female.
- Inject Prostaglandin (PG) to all females at:
 - 2:00 pm

3: Mon Dec 20 2021

- Inject Gonadotropin Releasing Hormone (GnRH) to all females.
- Breed all females at time of GnRH injection at:
 - 8:00 AM
- Processed 60 to 66 hours after PG injection.

4: Mon Jan 03 2022

- Turn clean up bulls in with females.
- Immediate addition of clean-up bulls could lead to questions about parentage.



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