

# Constructing Diagrams to Represent the Management System of a Beef Herd <sup>1</sup>

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Figure 1 presents an overview of the major events in a beef cattle operation. It includes annual management cycles for adult cows, calves, replacement heifers, and bulls. The diagram can be used as a quick reference to understand herd management and can serve as an operational calendar for making management decisions. The purpose of this paper is to construct a series of diagrams that can be used to outline the major beef cattle production activities for an entire year. Figures 2 through 13 illustrate the approach used to construct the overview of the beef herd represented in Figure 1. Figures 14 through 17 are additional diagrams used to represent the different animal phases (cows/calves/heifers/bulls) in the herd. Figure 2 begins with a line representing a group of pregnant cows that have recently had calves weaned from them and are labeled "**PREGNANT DRY COWS.**"

"**CALVING STARTS**" in the group of pregnant dry cows at a date approximated by adding the estimated gestation length for this particular breed of cows to the date the bulls were added to the cow herd. The "**CALVING PERIOD**" lasts for a period established by the length of the herd's breeding season and is illustrated by a dark "shaded" area on the

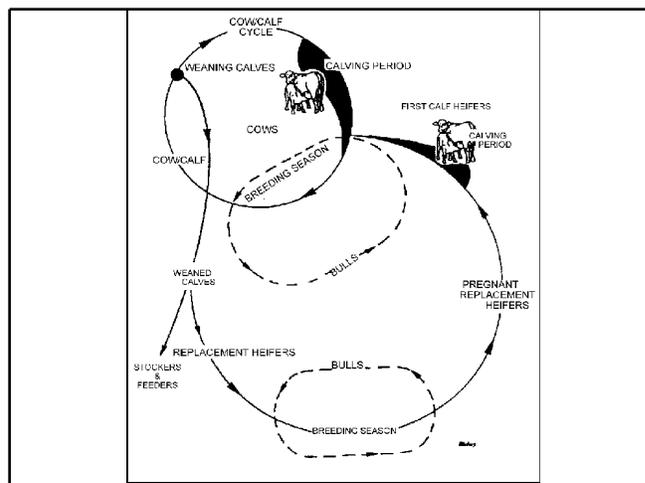


Figure 1 .

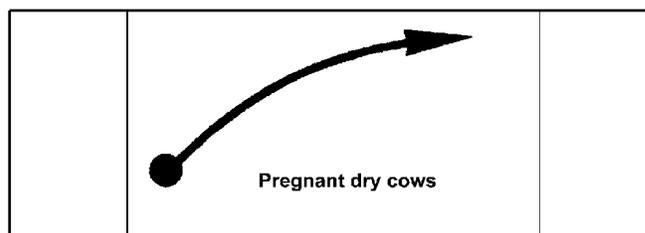


Figure 2 .

diagram. The end of the calving period is labeled "**CALVING ENDS**" on the diagram. (Figure 3)

1. This document is Bulletin 278, one of a series of the Department of Large Animal Clinical Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. First printed September 1992. Reviewed March 2000. Please visit the EDIS Web site at <http://edis.ifas.ufl.edu>.  
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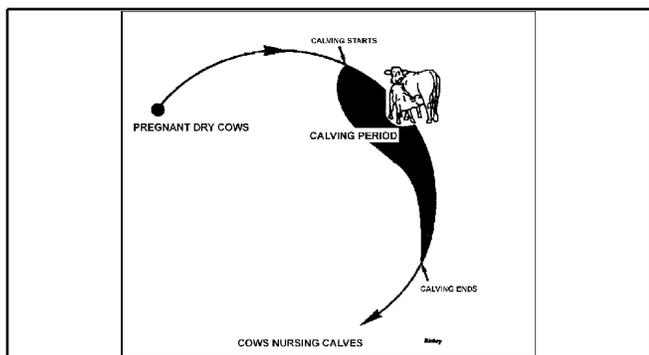


Figure 3 .

As the calving season nears an end, the breeding bulls are added to the cow herd and the "**BREEDING SEASON**" begins. The addition of the bulls to the cow herd is illustrated as an arc intersecting the cow cycle and begins with the label "**BULLS IN.**" (Figure 4)

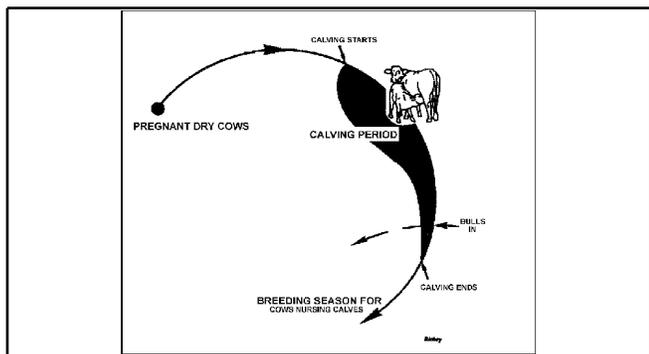


Figure 4 .

Because of the 90 day breeding season and the estimated 285 day length of gestation, calving season and breeding season will overlap by approximately 10 days ( $90+285-365=10$ ). The bulls remain with the adult cow herd for the duration of the "**BREEDING SEASON.**" After the bulls are removed ("**BULLS OUT**"), the adult cow herd continues in the annual cycle as pregnant cows that are nursing calves born during the preceding calving season. The cows are illustrated on the diagram as "**PREGNANT COWS NURSING CALVES.**" (Figure 5)

Eventually, calves nursing the pregnant cows will be weaned, and the cows will continue in the cycle as "**PREGNANT DRY COWS,**" thus completing the annual cycle for the adult cow herd. The diagram now illustrates the beginning and the end of the "**CALVING PERIOD,**" the beginning and end of the "**BREEDING SEASON,**" and the time of "**CALF WEANING.**" (Figure 6)

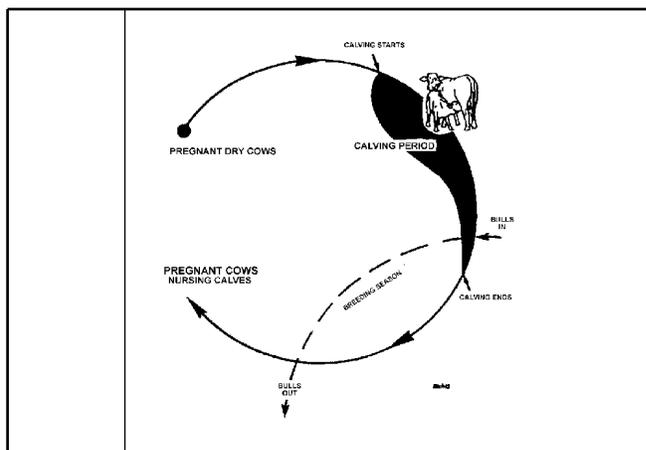


Figure 5 .

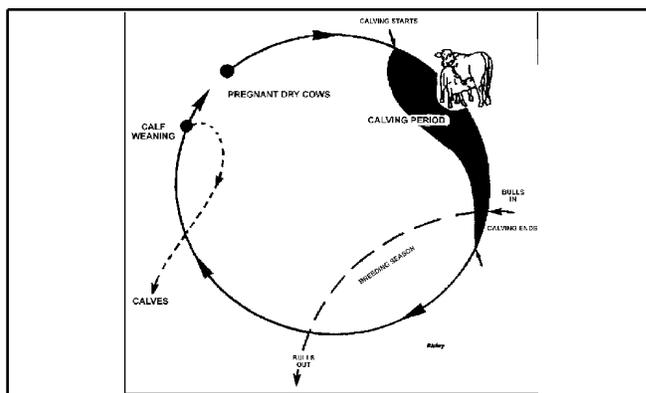


Figure 6 .

After the calves are removed from the cow herd at "**WEANING**", a portion of them will be sold as stocker and feeder calves. This is illustrated in Figure 7 by the "**WEANED CALVES**" line, ending with a "**STOCKER & FEEDER**" label.

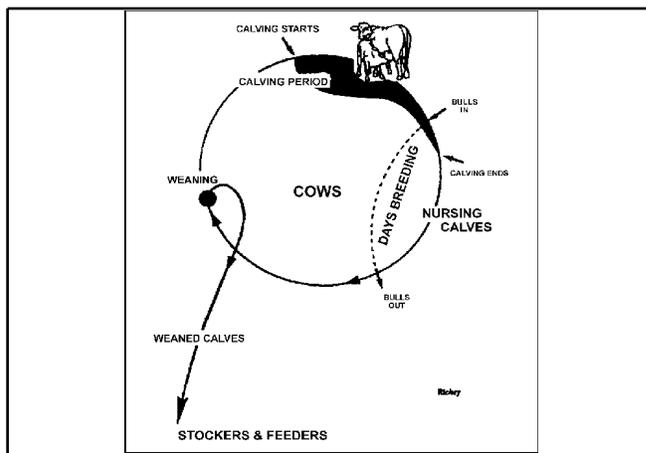


Figure 7 .

In addition, heifer calves selected as potential breeding replacements for the herd are separated from

the "**WEANED CALVES**" and begin their cycle as "**REPLACEMENT HEIFERS.**" (Figure 8)

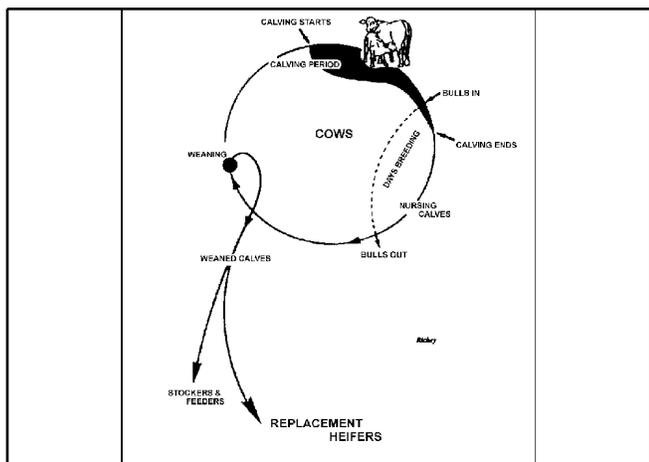


Figure 8 .

As the "**GROWING REPLACEMENT HEIFERS**" reach the desired weight and age to be bred, bulls are introduced to the heifers, and the "**BREEDING SEASON**" for the replacement heifers begins. The beginning of the heifers' breeding season is illustrated in Figure 9 by an arc intersecting the heifer line; this point of intersection is designated as "**BULLS IN.**" The beginning of the heifers' breeding season needs to be well planned so that the heifers can calve at a time that allows them to fit into the breeding season of the adult cow herd. This may mean that the beginning of the heifers breeding season begins 30 days before the beginning of the breeding season for the adult cows.

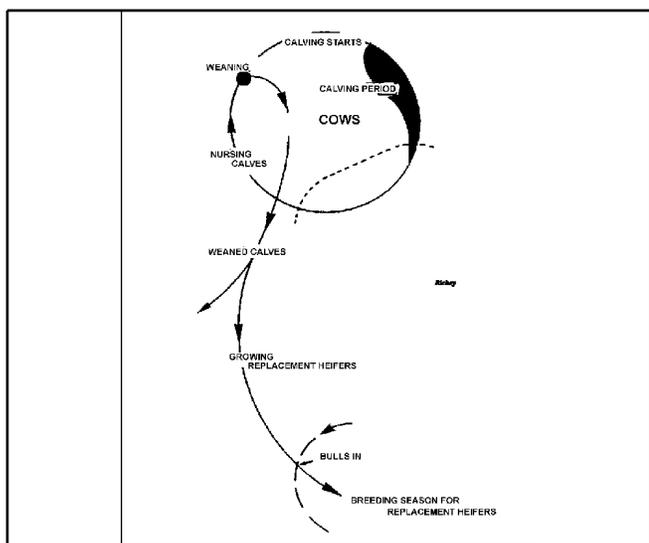


Figure 9 .

The heifer "**BREEDING SEASON**" ends when the bulls are removed ("**BULLS OUT**") from the heifers. The cycle continues as "**PREGNANT REPLACEMENT HEIFERS.**" (Figure 10)

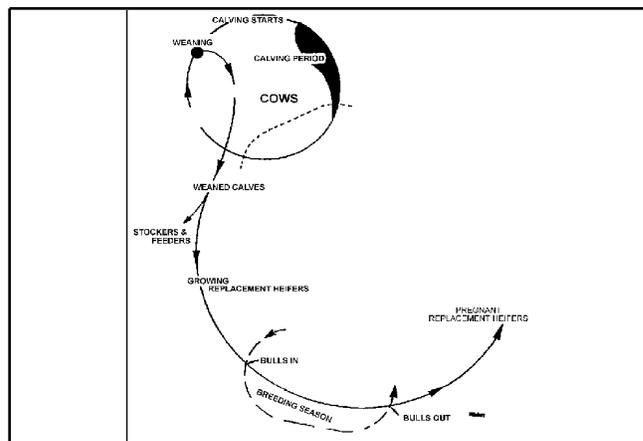


Figure 10 .

The length of the breeding season for the replacement heifers is designed to allow the "more fertile heifers" to be bred. The length of the breeding season is usually less than that of the adult cow herd. The age of the heifer at breeding depends largely on the ranch's ability to adequately develop the replacement heifer to breed at 14 to 15 months of age and to calve as 2-year-olds. Many operations chose to breed heifers to calve as 3-year-olds rather than make an effort to get the heifers ready to breed at 14 to 15 months of age.

Calving begins for the "**PREGNANT REPLACEMENT HEIFERS**" depending upon the start of the preceding breeding season and the length of the gestation period for their particular breed. The length of the calving period depends also upon the length of the preceding breeding season. The calving period for the replacement heifers is illustrated in Figure 11 by a dark, shaded area attached to the heifer cycle and labeled "**CALVING PERIOD.**" After calving, the heifers are designated "**FIRST CALF HEIFERS**" and are considered to be adult cows.

The cycles of the bull herds used in the breeding of the adult cow herd and the replacement heifers must be completed. The "closed" bull cycles are labeled "BULLS" and are designated as such in Figure 12. The diagram, thus far, represents an overview of the major events occurring in a beef herd. All that is

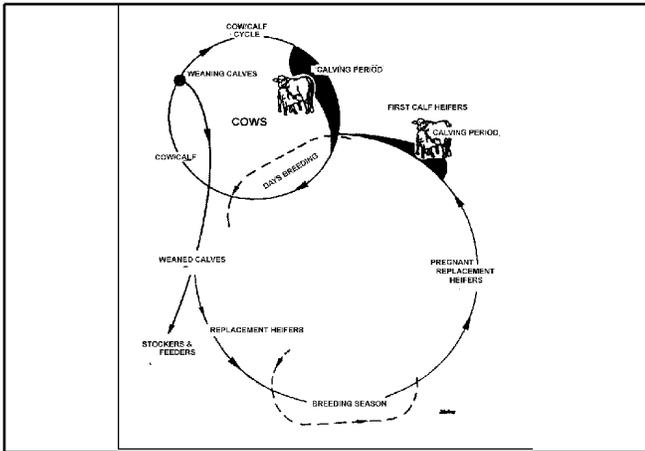


Figure 11 .

lacking are the dates when major events begin, end, or occur, and the lengths of certain events.

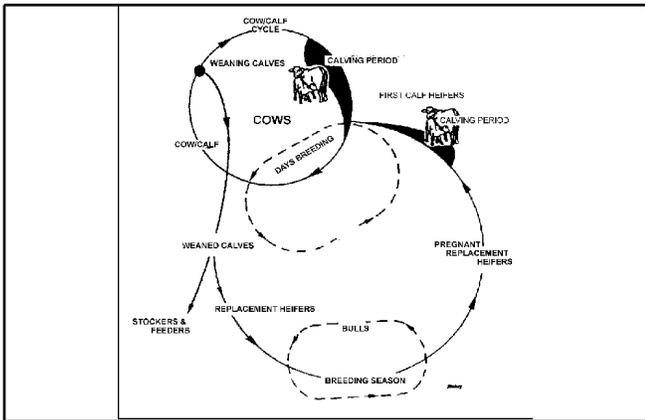


Figure 12 .

The information in Table 1 is required to complete the overview of the beef herd.

Several of the dates or lengths of events may be calculated if other dates and/or lengths are known. For example if the dates for the start and end of the breeding season are known, the length of the breeding season can be calculated. If the date for the start of the breeding season and the length of the breeding season is known, the end of the breeding season can be calculated. By knowing these dates and the estimated length of the gestation period for the breed of cattle, dates for the beginning and end of the calving period can be calculated. With dates and lengths of major events included, the diagram can now serve as an overview of the beef cattle operation and as an operational calendar for quick reference in making decisions.

Although Figure 13 may appear to be complicated, closer inspection reveals an outline that allows a systematic inspection of each phase of the beef operation. That outline includes separate diagrams for the management phases of adult beef cows, calves, replacement heifers, and breeding bulls. The following four figures (Figure 14, Figure 15, Figure 16, and Figure 17) are diagrams representing the different phases in a beef cattle operation.

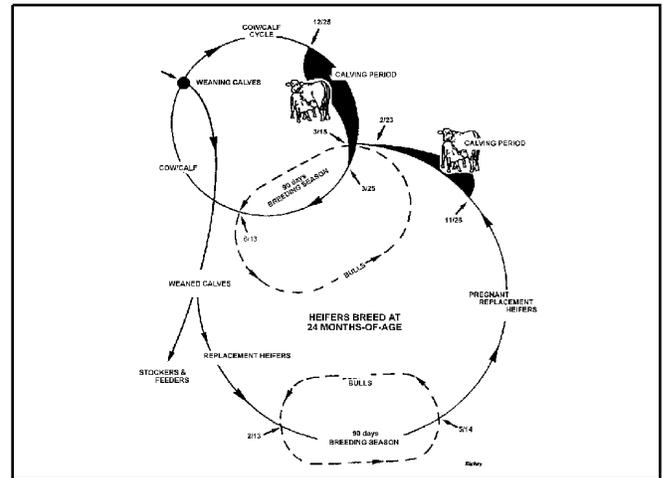


Figure 13 .

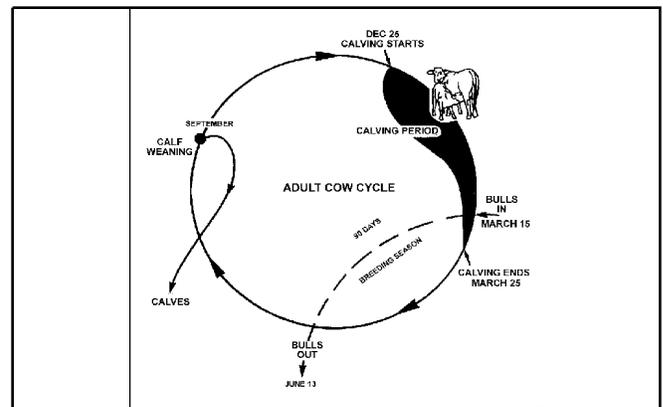


Figure 14 .

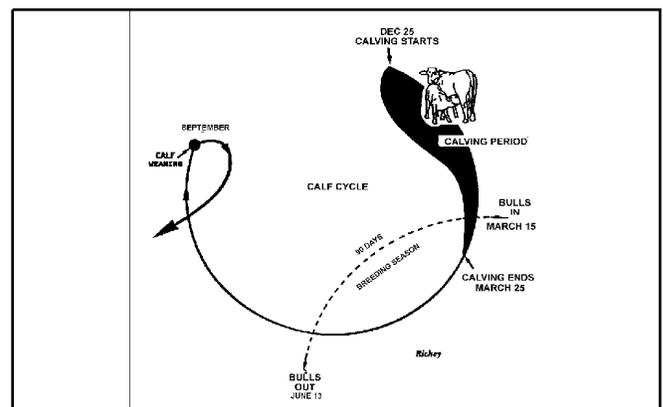


Figure 15 .

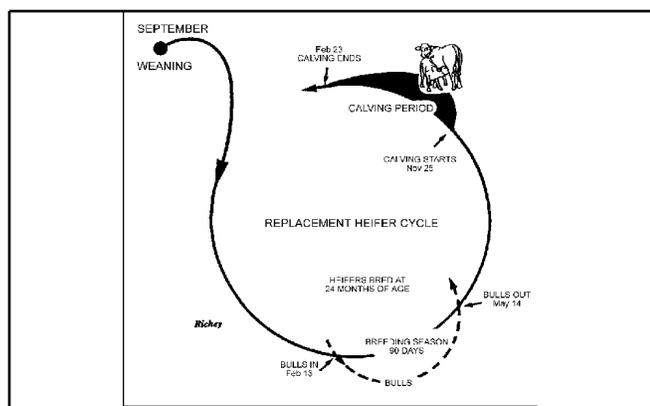


Figure 16 .

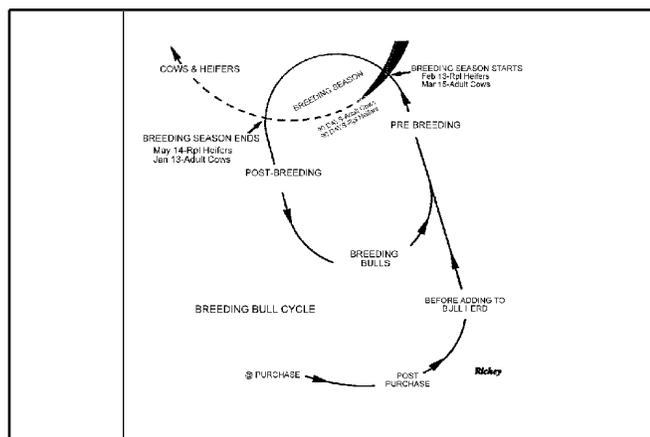


Figure 17 .

A diagram for specific use in management of the "ADULT COW CYCLE" is a twelve-month cycle and is easily developed by enlarging the adult cow portion of the **BEEF CATTLE OPERATION** over-view (Figure 13). Note that the dates and lengths of major events have been included in Figure 14 to allow easy reference to these events. Figure 15 represents the "CALF CYCLE" management of the beef operation and is developed by beginning the cycle with the start of the cows' calving period and ending the cycle shortly after calf weaning. Note that this diagram is simply that portion of the **ADULT COW CYCLE** during which the cows are nursing calves, and also includes the dates and lengths of major events occurring in the beef herd. The "REPLACEMENT HEIFER CYCLE" begins with calf weaning and ends after the heifers have calved (Figure 16). The length of the "REPLACEMENT HEIFER CYCLE" is dependent upon the age at which the heifers calve; some operations calve heifers as 2-year-olds and others calve heifers as 3-year-olds. Information pertaining to the management of the heifers prior to weaning can easily be obtained by

referring to the "CALF CYCLE" diagram (Figure 15). After the replacement heifers have calved they are usually recognized as adult cows, and management information about them can be obtained by looking at the **ADULT COW CYCLE** (Figure 14); however, if the first calf heifers are to be managed differently, it would be advantageous to have a separate diagram for them. Simply use the **ADULT COW CYCLE** diagram and relabel it as "FIRST CALF HEIFERS."

The "BREEDING BULL CYCLE" diagram is used to indicate management of the bulls beginning with their PURCHASE, and following them through the **POST-PURCHASE, BEFORE ADDING TO THE BULL HERD, PRE-BREEDING, and POST-BREEDING** periods (Figure 17).

The "BREEDING BULL CYCLE" diagram represents the management of bulls used to breed the adult cow herd as well as the bulls used on the replacement heifers. Both groups of bulls can be represented on one diagram by indicating the differences (if any exist) in the beginning and ending of the respective breeding seasons. Any differences in the length of the breeding seasons can easily be recognized by indicating, for example, "90 DAYS - ADULT COWS" and "0 DAYS - RPL HEIFERS" just below "BREEDING SEASON" on the diagram.

The timing of annual events in a beef cattle production system interact very closely to each other. The use of the "CYCLE" approach to represent the management of the different phases of the beef operation allows for a quick assessment of the operation so that appropriate recommendations for changes can be understood by all parties involved with management decisions. If all parties have identical perceptions of the operation and the interactions between the different cattle phases, recommendations more readily "fit" the beef operation.

Examples of the use of the "CYCLE" system can be found in the Proceedings of the **FORTIETH ANNUAL BEEF CATTLE SHORT COURSE**, May 1-3, 1991, sponsored by the Animal Science Department of the University of Florida, Gainesville, Florida. Specific papers that utilize the "CYCLES" are as follows:

1. "MANAGEMENT CYCLES IN BEEF PRODUCTION"
2. "REGIONAL AND SEASONAL FORAGE PRODUCTION LIMITS"
3. "HERD HEALTH FOR THE BEEF CATTLE OPERATION"
4. "MANAGEMENT AND UTILIZATION OF RANGE IN FLORIDA"
5. "MANAGEMENT AND UTILIZATION OF COMPLEMENTARY FORAGES"
6. "APPLICATION OF SYSTEM CONCEPTS IN COW-CALF MANAGEMENT"

**Table 1.**

| <b>Table 1.</b>                                      |          |
|--|----------|
| <b>Adult cow herd</b>                                |          |
| Start of Breeding Season                             | 3/15/90  |
| End of Breeding Season                               | 6/13/90  |
| Length of Breeding Season                            | 90 days  |
| Length of Gestation (Herefords)                      | 285 days |
| Start of Calving Season                              | 12/25/90 |
| End of Calving Season                                | 3/25/91  |
| <b>Replacement Heifers</b>                           |          |
| Start of Breeding Season                             | 2/13/90  |
| End of Breeding Season                               | 5/14/90  |
| Length of Breeding Season                            | 90 days  |
| Start of Calving Season                              | 11/25/90 |
| End of Calving Season                                | 2/23/91  |
| <b>(Heifers calve 30 days before adult cow herd)</b> |          |
| <b>Heifers are bred to calve as 3 year-olds</b>      |          |