

## What is the Economic Impact of Infertility in Beef Cattle?<sup>1</sup>

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Beef producers need cows to become pregnant, deliver healthy calves, and wean productive calves to make their operations viable. The failure of breeding females to become pregnant directly impacts the economic viability of every beef operation, yet few producers realize how infertility impacts their individual operations. Infertile beef cows and heifers can fall into three primary groups: 1) cows that fail to become pregnant during the breeding season (usually 60 to 120 days); 2) cows that become pregnant but fail to calve; and 3) cows that become pregnant late in the breeding season. Infertility that leads to the failure of a cow or heifer to calve during the subsequent calving season results in the single largest economic loss to beef producers, because no economic return will be realized from those cows for at least one additional year (unless producers have multiple breeding seasons or a split breeding season). Cows that fail to become pregnant during the breeding season do not give producers an opportunity to market a calf, becoming an economic liability to producers.

Beef females fail to become pregnant for numerous reasons, such as anestrus/prepuberty (cows and heifers that do not start their estrous cycles during the breeding season), disease, or sub-optimal

management. In addition, cows may also become pregnant but fail to calve because they lose their pregnancy at some stage of gestation due to a disease or trauma event. Either way, the economic impacts of cows failing to calve is profound. Approximately 34.5% of all U.S. beef producers utilize pregnancy detection as a management method to determine whether cows are pregnant and use the tool to make culling decisions. Pregnancy detection usually occurs about 30 to 90 days after the end of the breeding season. In the southeastern United States (including Florida), only 19.4% of producers use this tool for making culling decisions. Pregnancy diagnosis affords producers an opportunity to cull cows that are not pregnant. However, in an effort to maintain a steady population of brood cows, removing these cows from the herd may reduce a producer's flexibility to cull other cows that may fail to produce thrifty calves, or that should otherwise be culled for more legitimate production characteristics such as poor genetics, temperament, structural concerns, and poor health. Previous reports (Bellows et al., 2002) indicate that approximately 4.5% of the cow herd is culled annually because they fail to become pregnant!

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For the 65.5% (or 81.6% in the southeastern United States) of beef producers who fail to use pregnancy diagnosis in their operations, the first opportunity that they have to determine which cows are not pregnant is after the subsequent calving season. At that point, producers may decide to either retain the cows that failed to calve, or cull those cows prior to the next breeding season. Either way, there is a significant cost to the producer for maintaining those cows for a full year without producing a calf. With no calf sale, costs of supplemented feed, pasture, and other expenses directly decrease the lifetime profitability of open cows. Often overlooked or neglected facets of infertility are the cows that become pregnant but fail to calve or calve later in the calving season. When cows are diagnosed as pregnant, but fail to calve or calve late in the calving season, they have a negative impact on the return a producer may realize from the sale of calves. For instance, infertility during the early stages of the breeding season that resolves with time can manifest itself in the form of reduced calf weight. As an example, calves gain between 1.5 and 2 pounds per day while suckling their dam. A calf conceived on the first day of the calving season has the opportunity to gain 90 to 120 more pounds than a calf born 60 days into the breeding season. Reducing infertility will ensure that more females calve toward the beginning of the calving season.

Producers can calculate the impact of fertility on their own operations, by simply calculating the revenue generated by exposed cows in the herd. Using recent data (CattleFax, 2008) the following example demonstrates the cost of infertility on a typical Florida operation. Example: Calf price for 500 weight feeder calves is \$1.00/lb; percentage of pregnant cows is 85%; and, weaning weights average 500 pounds. Therefore, the following calculation may be used (assuming that there is little or no difference in the maintenance costs of a pregnant or nonpregnant cow):

1. Value of weaned calf per exposed cow if 100% cows are pregnant =  $500 \text{ lbs} \times 100\% \times \$1.00/\text{lb} = \$500 \text{ per cow}$
2. Value of weaned calf per exposed cow when 85% cows are pregnant =  $500 \text{ lbs} \times 85\% \times \$1.00/\text{lb} = \$425 \text{ per cow}$

3. Loss due to failure to become pregnant during the breeding season =  $\$500 - \$425 = \$75$

Thus, this case demonstrates that infertility costs the producer \$75 per exposed cow (or \$5 per exposed cow for every 1% decrease in pregnancy rate). In addition, there are additional costs associated with calf mortality after calving and late-calving cows that also decrease the overall revenue per exposed cow. Obviously producers cannot overcome all infertility, but understanding the costs associated with infertility may ensure that changes occur to enhance the factors responsible for improving fertility and reduce the negative influences on fertility. Management related factors are: 1) nutritional management to ensure that postpartum anestrus or prepuberty can be overcome; 2) selection of fertile animals among breeds and within breeds; 3) use of crossbreeding for hybrid vigor; 4) selection and handling of animals in ways that reduce stress; 5) use of reproductive management tools such as estrous synchronization and artificial insemination to alter the calving distribution; 6) following a stringent vaccination program to reduce the incidence of disease; 7) use of bulls that have passed a breeding soundness exam and are capable of breeding all of the cows in a pasture or herd. Environmental factors are: 1) heat stress that reduces conception and pregnancy rates; 2) overly extensive beef operations that limit the implementation of sound management procedures; and, 3) excessive rain and mud that reduce fertility.

Perhaps with small changes to beef cattle operations Florida producers can reduce the overall losses to the Florida beef industry and the national beef industry. When extrapolated from the data reported by the National Animal Health Monitoring Service (NAHMS 1997) and inventories accessed using the National Agricultural Statistics Service (NASS) the cost of infertility to the 950,000 cows owned by Florida beef producers exceeds \$71 million. In addition, the cost of infertility to the entire U.S. producers with a cow population of 42.5 million cows likely reduces revenue in excess of \$1.06 billion.

## References

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