

Effect of Age at Puberty/ Conception Date on Cow Longevity

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KEYWORDS

• Longevity • Heifers • Conception date • Puberty

KEY POINTS

- A cow needs to wean 3 to 5 calves to pay for her development costs. Therefore, longevity of a beef female is important to the sustainability and profitability of any beef operation, and the greatest percentage of cows culled from the herd were for pregnancy status (33%).
- Age at puberty is a critical trait, because pregnancy success during the breeding season has been correlated with the percentage of heifers that reached puberty before or early in the breeding season. Puberty is influenced by both age and weight.
- Survival analysis of heifers indicated that a greater proportion of the heifers that calved in the first 21 days of their first calving season remained in the herd longer when compared to heifers that calved later.
- Heifers that calve early as 2-year olds tend to calve early throughout their life.

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- Long postpartum intervals decrease the proportion of cows that are cycling at the start of the breeding season and thereby decrease the probability of pregnancy during the breeding season. In beef cattle, postpartum interval length is influenced by a variety of factors including suckling, nutrition, age, dystocia, season, genetic variations, stress, and disease.
- There is a moderate genetic correlation between age at puberty and postpartum interval, indicating that there are a common set of genes that are involved with the initiation of reproductive cycles. Furthermore, a negative genetic correlation between age at puberty and heifer pregnancy rate indicate that genetic selection to decrease age at puberty would result in an increase in heifer pregnancy rates.

INTRODUCTION

Calving late as a heifer has long been reported to increase the chance of calving late or not calving the following year,¹ and heifers that calve early tend to remain in those calving groups throughout their life.^{1,2} According to a review by Patterson and colleagues,³ heifers need to calve by 24 months of age to achieve maximum lifetime productivity. Furthermore, heifers that lose a pregnancy or conceive late in the breeding season are likely to not have enough time to rebreed during the subsequent defined breeding season,³ and any cow that misses a single calving is not likely to recover the lost revenue of that missed calf.⁴

A cow needs to wean 3 to 5 calves to pay for her development costs.⁵ Therefore, longevity of a beef female is important to the sustainability and profitability of any beef operation. Considering the importance of longevity, an important question is as follows: Why are females culled from a beef herd? According to the 2007–08 NAHMS survey, the greatest percentage of cows culled from the herd were for pregnancy status (33.0%); other reasons for culling included age or bad teeth (32.1%), economic reasons (14.6%), other reproductive problems (3.9%), producing poor calves (3.6%), temperament (3.6%), injury (2.9%), udder problems (2.7%), bad eyes (1.8%), and other problems (1.8%). Furthermore, 15.6% of cows (animals that have previously calved) culled were less than 5 years of age and 31.8% were 5 to 9 years of age. These females that are culled from a herd before producing 5 calves increase the developmental cost of other heifers and do not contribute to the profitability and sustainability of the operation. Therefore, understanding how puberty and conception date can affect pregnancy success and longevity can have a tremendous impact on the profitability and sustainability of an operation.

FACTORS THAT AFFECT AGE AT PUBERTY

Puberty in the bovine female has been defined as the first ovulation that is accompanied by visual signs of estrus and normal luteal function.⁶ Age at puberty is a critical trait when heifers are to be bred during a restricted breeding season and expected to calve at 2 years of age,⁷ because pregnancy success during the breeding season has been correlated with the percentage of heifers that reached puberty before or early in the breeding season.⁸

Several studies have reported that heifers reach puberty at a genetically influenced size⁹ and that heifers developed to lighter weights will be older when they reach puberty.^{8,10} Across several breeds, both age and post-weaning gains have been shown to affect onset of puberty.^{7,11} Therefore, timing of puberty depends on both age and

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