



BEEF CATTLE RESEARCH UPDATE

Britt Hicks, Ph.D., PAS
Area Extension Livestock Specialist
Oklahoma Panhandle Research & Extension Center

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The Age of Surgical Castration Affects the Healing Process in Beef Calves

A 2007-08 USDA survey of U.S. beef cow operations found that about 59.2% of operations castrated any bull calves prior to sale.¹ The percentage of operations that castrated any bull calves prior to sale increased as herd size increased (50.3, 75.0, 85.1, and 95.3% of operations, respectively, for herd size of 1-49, 50-99, 100-199, and 200 or more beef cows). This same survey reported that most operations (74.5%) castrated bull calves at an average age of less than 93 days, but almost one of five operations (18.4%) did not castrate calves until they were over 122 days old. Beef Quality Assurance Guidelines recommend that bull calves that are not herd sire prospects be castrated as early in life as possible (preferably, between birth and four months of age). All methods of castration have been shown to cause significant acute pain and distress resulting in vocalizations, restlessness, decreases in stride length, and altered standing posture. This survey also reported that for operations that castrated bull calves, the percentage of operations that used a blade ranged from 44.5% of operations with 1 to 49 beef cows to 63.5% of operations with 200 or more beef cows. A higher percentage of operations with 1 to 49 cows castrated bull calves with a rubber band or tubing at 3 months old or less than did operations with 100 or more cows.

Research conducted at the University of California, Davis assessed the effect of age on healing and pain sensitivity after surgical castration of beef calves.² In this study, incision closure, swelling and pain sensitivity was measured in beef calves surgically castrated at 3 days of age (range of 0 to 8 days) or 73 days of age (range of 69 to 80 days). These researchers recorded closure of the incision using a 5-point scale (1 = fresh wound, 5 = no longer visible), weight gain, and inflammation (skin temperature and swelling, measured by scrotal circumference) on days 1, 3, 7, 11, 15, 18, 21, 25, 32, 39, 45, 61, and 77 after the procedure, until all incisions were fully healed.

They reported that the incisions of younger calves healed more quickly than older ones (fully healed, median 39 vs. 61 days; $P = 0.002$). However, the younger calves had relatively more swelling in the days after castration ($P < 0.001$). The swelling resolved in older calves by day 10. Whereas, in younger calves it took 25 days for the wound area to return to the same size it was immediately after castration occurred.

Average daily gain (ADG) was lower in the days immediately after surgical castration in all calves. However, it took longer for older calves to recover their daily weight gain after the procedure ($P < 0.001$). Overall ADG after castration over 77 days was greater for younger compared to older ones (1.54 vs. 0.66 lb/day; $P < 0.0001$).

In this study, surgical castration wounds were inflamed for 1 to 3 weeks and took 77 days to fully heal. There was evidence of pain in response to palpation of the wound during this process, particularly soon after the procedure and at earlier stages of incision closure in calves castrated in the first week of life. These authors concluded that taken together, these results paint a mixed picture about the effects of age of surgical castration stating that "calves castrated soon after birth experience more tissue swelling and show more signs of

pain, but their incisions heal sooner and their weight gain is less affected, when compared to animals castrated around 73 days of age.”

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- ¹ USDA-APHIS. 2008. Pages 37-39 in Beef 2007-08, Part I: Reference of beef cow-calf management practices in the United States, 2007–08. USDA–APHIS–VS–CEAH, Fort Collins, CO. Available:
http://www.aphis.usda.gov/animal_health/nahms/beefcowcalf/downloads/beef0708/Beef0708_dr_PartI_rev.pdf.
- ² Norring, M., E. M. Mintline, and C. B. Tucker. 2017. The age of surgical castration affects the healing process in beef calves. *Transl. Anim. Sci.* 1: 358-366.

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