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## *Welfare Implications of Ovariectomy in Cattle*

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### **THE ISSUE**

Bilateral ovariectomy or “spaying” is a surgical procedure and management tool used by some producers in the cow/calf and feedlot sectors. The technique prevents pregnancy and eliminates the primary source of estrogen by surgically removing the ovaries. The advantages commonly noted for spaying heifers include: prevention of pregnant heifers in the feedlot, elimination of estrous-suppressing feed additives, no need to test stocker heifers for tuberculosis when they are marketed to out-of-state feedlots, improved average daily gain and feed conversion compared with similarly managed intact heifers, and the ability to graze and feed heifers in the vicinity of bulls. These advantages are generally thought to outweigh the disadvantages of the procedure. Disadvantages include: the surgery is irreversible and therefore spayed heifers cannot be selected as breeding replacements, the cost of the procedure, risk of death following surgery, welfare concerns, and limited access to spay services in some areas.

### **WHAT IT IS**

Ovariectomy in bovids may be performed using a flank or vaginal approach.

The flank approach is initiated by clipping, anesthetizing and scrubbing the left paralumbar fossa for aseptic surgery.<sup>1</sup> A 15-cm vertical incision through the skin and aponeurosis of the external abdominal oblique muscle is then made. A grid approach is used to bluntly introduce the fingers through the remaining musculature and peritoneum. The ovaries are then identified and amputated with scissors or an ovariectomy instrument.

The vaginal approach is performed by isolating the ovaries via rectal palpation.<sup>1</sup> The vulva and perineal region is scrubbed and a spay instrument is introduced into the vagina. A colpotomy incision is created by introducing the spay instrument through the fornix of the vagina dorsolaterally to the cervix. There are two spay instruments that are commercially available in the United States, the Kimberling-Rupp<sup>2</sup> instrument and the Willis<sup>a</sup> ovariectomy instrument.<sup>1</sup> The Kimberling-Rupp instrument consists of a trocar point on a double-walled tube with a window for introduction of the ovary. The ovary is placed inside the tube via rectal palpation and the operator then slides the inner chamber to amputate the ovary, which is deposited in the tube. The procedure is repeated for the other ovary. The ovaries are removed from the abdominal cavity when the instrument is withdrawn. The Willis ovariectomy instrument consists of a single rod, flattened on its cranial end with a keyhole opening for ovary removal. The instrument is introduced into the vagina in the same manner as the Kimberling-Rupp instrument. The ovary is placed into the keyhole opening in the spay instrument, using rectal palpation, and the instrument is forcefully retracted to sever the ovarian pedicle. The procedure is repeated to amputate the remaining ovary. When the Willis instrument is used the amputated ovaries are not removed from the abdomen and remain within the peritoneal cavity.

## **SURGICAL COMPLICATIONS**

Complications from transvaginal spaying include hemorrhage and peritonitis; both may be fatal.<sup>3,4</sup> Peritonitis may be caused by unintentional intestinal or rectal perforation.<sup>4</sup> The mortality rate is much higher when the surgeon is inexperienced.<sup>3,4</sup> Hemorrhage is most significant when the animal is pregnant, due to increased blood flow through, and the risk of cutting, the uterine arteries.<sup>3,4</sup>

## **PAIN**

Little research and few formal animal welfare assessments regarding pain and discomfort experienced by the bovid during and after spaying have been published.<sup>3</sup> Clinical signs that have been interpreted as indicating postsurgical discomfort include walking stiffly, excessive recumbence, and raised tailheads.<sup>3,4</sup> In studies where discomfort was monitored and recorded after spaying, all spayed heifers appeared to have no measureable discomfort by day 5 following surgery. In one study the discomfort experienced by the animals was considered to be comparable to that following normal rectal palpation.<sup>5</sup> However, it should be noted that behavioral responses to painful stimuli may not be proportional to the degree of pain experienced.<sup>3</sup> Behavioral responses may not be an adequate measure of pain, especially for prey animals. In other species, studies have established an association between spaying and subsequent pain, and efforts to mitigate pain are routine.<sup>2</sup> Pain is also evident when there is trauma to the vaginal wall due to parturition and it is common to use epidural anesthesia when procedures are performed to repair this tissue.<sup>3</sup>

## **PHYSIOLOGIC STRESS**

Blood cortisol concentrations have been studied as indicators of physiologic stress in animals. One study found that regardless of whether ovariectomy was performed via the flank or vaginal approach, cortisol concentrations were increased following the procedure.<sup>6</sup> This study also evaluated serum haptoglobin concentrations, which in cattle can indicate a systemic inflammatory response. Haptoglobin serum concentrations were significantly higher in flank spayed heifers versus controls and vaginally spayed heifers from 8 to 96 hours post-procedure.<sup>6</sup> Haptoglobin was not significantly increased in vaginally spayed heifers versus controls at any time point of the study.<sup>6</sup>

## **NCCAW**

The National Consultative Committee on Animal Welfare (NCCAW) in Australia has noted that it may be beneficial to have a 12-hour feed curfew to reduce rumen fill and assist with the performance of the procedure.<sup>7</sup> NCCAW has also stated that spayed cattle should be monitored for the first few days after the procedure for indications of surgical complications and should not be moved long distances in the time immediately following the procedure.<sup>7</sup>

## **SUMMARY**

AVMA recommends that proper aseptic technique and restraint be utilized with all ovariectomy procedures in cattle. The AVMA considers flank ovariectomy performed without anesthesia to be inhumane. Pain and discomfort should be minimized as much as possible before, during, and after spaying. Performing pregnancy diagnosis prior to spaying heifers could reduce the risk of complications.

## **FOOTNOTES**

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<sup>a</sup> Novotny Metal Products, Bridgeport, WA.

## REFERENCES

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- <sup>7</sup> Australian Government Department of Agriculture, Fisheries and Forestry. National Consultative Committee on Animal Welfare. Cattle Spaying. <http://www.daff.gov.au/animal-plant-health/welfare/nccaw/guidelines/livestock/spaying> Accessed Aug 13, 2009.