

The fertility and sustainability of Swedish beef bulls

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Most Swedish beef cows and heifers are bred naturally, which makes selection of herd sires a critical decision affecting reproductive performance and profitability. It is essential that the bull is reproductively sound and produces semen of good quality and that the yearling bull has reached sexual maturity. Furthermore, it is important that the beef sire has healthy hind limbs to be able to mount properly. The reproductive potential of Swedish beef sires in general, and of yearling beef bulls in particular, is at present poorly documented. There is today no Bull Breeding Soundness Evaluation (BBSE) protocol in use and no satisfactory methods are available in Sweden, that facilitate collection and evaluation of semen of potential beef sires. Electroejaculation (EEJ), routinely used in many countries when conducting BBSE, is prohibited on unanaesthetised animals according to Swedish animal welfare legislation. Semen collection with an artificial vagina (AV) necessitates extensive training and, is thus, under field conditions, considered time consuming and difficult to apply practically. Consequently, semen samples from yearling and older beef sires are not evaluated before the bulls are offered for breeding purposes. There are indications that Swedish beef bulls have poorer sperm morphology than Swedish dairy bulls of the same age. In addition, Swedish farmers have recently become more aware of the impact of lameness on the fertility of the bulls.

The overall aims of this PhD-project are to:

- learn more about factors affecting fertility of Swedish beef sires, focusing mainly on sexual maturity and hind limb health.
- find useful tools in order to be able to routinely perform bull breeding soundness evaluations in beef bulls in Sweden.

In study I, we found that less than half of Swedish yearling beef bulls evaluated at the performance testing station have a mature spermogram at the time they are offered for breeding purposes at 11 to 13 months of age.

In study II-IV we evaluated the use of transrectal massage of the ampullae to collect semen from yearling beef bulls under field conditions in Sweden. We also compared sperm morphology in semen samples obtained by this method with morphology in samples obtained by cauda epididymal dissection, AV and EEJ. Our conclusion is that transrectal massage can be used to collect semen from yearling and older beef bulls in the field.

In the last study (V) we tested our hypothesis that joint disorder is a possible cause of infertility in beef sires. All the bulls in our study had joint lesions and the results indicated that a poor fertility outcome could be a result of bilateral joint pathology, without clinical signs of lameness.

Conclusions:

- Swedish beef sires have a later onset of puberty compared to dairy bulls.
- Transrectal massage is a useful technique that can be used to collect semen from beef bulls in the field.
- And finally, we suggest that joint lesions should be taken in to consideration as a contributory cause of reproductive failure in beef sires with or without symptoms of lameness.