

Putting Feed into Bulls at the Right Time

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If you raise bulls, you may be surprised to learn that there is a good chance that you are supplementing their feed at the wrong time. We often put feed into bulls from weaning to yearling to ensure they look their best for bull sales. However, studies show that nutrition between birth and weaning has a significant impact on successful testes development and fertility because testes development actually takes place from birth to weaning. These research studies showed that underfeeding bulls early in life can cause irreversible damage to their testicular development. Breeders may therefore want to consider an earlier nutrition supplementation window, prior to 25 weeks of age.

Historically, most beef producers relied on the dam's milk as the main source of nutrition for the young bull calf, coupled with supplemental feed as the calf got older. The Lethbridge Research Centre in southern Alberta studied the impacts of early-life nutrition on reproductive development in bulls. In those studies, Angus and Angus cross bulls were weaned at approximately 8 weeks of age to make it easy to feed them different diets. In the study, from 10 to 25 weeks of age the bulls were either fed a high protein, high energy diet consisting of 130% of their protein and energy requirements or a restricted diet of 70% of their energy and protein requirements. The well-fed bulls reached puberty approximately one month earlier, but more importantly, they had much more rapid testicular development and by 16 months of age, had testes that were 20 to 30% larger and produced 20 to 30% more sperm than the bulls that were underfed.

Not only did the underfed bulls have smaller testes and produce less sperm, but irreversible damage occurred in the testicular development of bulls that were underfed early in life. A separate research study conducted at the Lethbridge Research Centre showed that bull calves that were underfed from weaning to approximately 25 weeks and

supplemented (provided with 130% of their energy and protein requirements) after 25 weeks of age grew more quickly in response to the increased nutrition, but their testicular development did not improve. The supplemental feeding promoted testicular development, hastened puberty, and increased sperm production, and also did not have any negative effects on sperm structure or motility. There were no indications that the supplemental nutrition before 25 weeks had any adverse effects on sperm structure.

The bulls in these studies were weaned very early to make it easy to control their diet. Under practical farm conditions, we would expect creep feeding to produce similar results. Ideally the creep feed would be a balance of energy and protein with adequate minerals and vitamins, with calves fed to achieve target weight gains of about 1.2 kg/day before weaning. After weaning, bulls should be fed to achieve a moderate growth rate in the range of 1.0 to 1.6 kg/day. This approach should enable a bull to reach his full genetic potential for testicular development, hasten puberty and increase the probability of passing a breeding soundness examination as a yearling, while avoiding the negative consequences of excessive dietary energy after weaning.

The authors are faculty members at the University of Calgary, Faculty of Veterinary Medicine and have expertise in animal reproduction. Dr. Kastelic was a Research Scientist at the Lethbridge Research Centre from 1990 to 2012.

If you have questions or would like to discuss the research findings, please reach out by email: jpkastel@ucalgary.ca
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