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### Linseed Oil, Vitamin E Help Improve Cooled Semen Quality

If your stallion breeds throughout the winter, you might consider adding linseed oil and vitamin E to his diet to help ensure good semen quality. Researchers recently determined that adding these supplements to stallions' diets could help counteract the phenomenon of lowered sperm quality typically seen in the early breeding season—at least for cool-stored semen.

This is particularly important given that many mares bred early in the year have infertility issues of their own, said Christine Aurich, DVM, PhD, head of the Graf Lehndorff Institute for Equine Science, in Neustadt, Germany.

"A mare's fertility is not automatically lower early in the breeding season," Aurich said. "But mares that are bred early in the year are often barren mares, meaning they have not conceived the year before or they lost their pregnancy. We know that this is a sign of impaired fertility. Therefore, many mares bred early in the season may have a lower fertility with regard to their breeding history. So these mares should be bred with high-quality semen."

But those same mares often receive lower-quality sperm due to seasonal changes in quality, Aurich said. The semen cooling and freezing processes can easily damage the sperm membrane.

Researchers have noted that the damage is more pronounced during the early breeding season, reaching a peak around February.

While researchers still don't know why these seasonal changes happen, some suspect that it could be due to the membrane's fatty makeup, Aurich said. The winter sperm membranes might be weaker with fewer unsaturated fatty acids strengthening them. As a result, they don't survive the cooling and heating process as well, and their motility (movement) is lower, reducing their fertility.

Thus, increasing the stallion's unsaturated fatty acid intake at this time of year could help keep sperm membranes strong, she said. Combined with the antioxidants in vitamin E to reduce cell damage, the high content of unsaturated fatty acids present in linseed oil appeared to improve motility in cool-stored semen in Aurich's recent study.

In their study, Aurich and her fellow researchers evaluated semen quality in 11 Warmblood stallions known to have good fertility. Despite this good fertility, their motility levels dropped (as is common in most stallions) from November to February. The team divided the stallions into an experimental group that they supplemented with linseed oil and vitamin E, or an unsupplemented control group.

Semen analysis showed that in both groups, motility and sperm membrane quality decreased progressively from November to February. However, the stallions in the experimental group had a much less pronounced decrease in their cool-stored semen than those in the control group, Aurich said.

Supplementation with linseed oil and vitamin E didn't have any noticeable effects on frozen-thawed semen, however, she said. The researchers were not able to determine why the supplementation improved quality in the cooled semen but not the frozen semen.

Linseed oil complements horses with members of two essential fatty acid families: a-linolenic acid (an omega-3 polyunsaturated fatty acid, or PUFA) and linoleic acid (an omega-6 PUFA). It's a commercially available equine feed supplement, Aurich said.

Vitamin E is also widely available commercially as an equine feed supplement, sometimes sold in combination with selenium, she said. Because selenium can be toxic if ingested in high doses, look for a product that only contains vitamin E.

"Supplementation of stallions' feed with linseed oil (and antioxidants) during winter can contribute to improve cooled-stored semen quality at the beginning of the breeding season," Aurich said. "For a Warmblood stallion, approximately 100 mL per day should be given. This provides the stallion with unsaturated fatty acids which are not only beneficial for semen quality but also for hair coat, skin quality, etc.

"Some horses do not like the taste of linseed oil in the beginning, but easily get used to it," she added.

The study, "[Influences of a diet supplemented with linseed oil and antioxidants on quality of equine semen after cooling and cryopreservation during winter](#)," was published in *Theriogenology*.