



Effect of feeding a DHA-enriched nutraceutical on the quality of fresh, cooled and frozen stallion semen

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## Abstract

Eight stallions were used in 2 × 2 crossover study to determine if feeding a nutraceutical rich in docosahexaenoic acid (DHA) would improve semen quality. Stallions were randomly assigned to one of two treatment groups ( $n = 4$  per group). Stallions were fed their normal diet (control) or their normal diet top-dressed with 250 g of a DHA-enriched nutraceutical. Feeding trials lasted for 14 week, after which a 14-week washout period was allowed and the treatment groups were reversed for another 14 week feeding trial. Feeding the nutraceutical resulted in a three-fold increase in semen DHA levels and 50% increase in the ratio of DHA to DPA in semen. Sperm motion characteristics in fresh semen were unaffected by treatment. After 24 h of cooled semen storage in an Equitainer™, total and progressive motility did not differ between treatment groups, but sperm from stallions fed the nutraceutical exhibited higher velocity and straighter projectory ( $P < 0.05$ ). After 48 h of cooled storage, increases in the percentages of sperm exhibiting total motility ( $P = 0.07$ ), progressive motility ( $P = 0.06$ ) and rapid motility ( $P = 0.04$ ), were observed when stallions were being fed the nutraceutical. For a subset of four stallions, whose progressive sperm motility was <40% after 24 h of cooled storage when fed the control diet, feeding the nutraceutical resulted in improvements in mean progressive motility of sperm after 24 h ( $P = 0.10$ ) and 48 h ( $P = 0.03$ ) of storage. Feeding the nutraceutical resulted in similar improvements in motion characteristics being observed in frozen–thawed semen. While it appears that feeding the nutraceutical may improve the motion characteristics of cool-stored stallion semen, it may be most beneficial for stallions of marginal fertility whose sperm do not tolerate the rigors of cooling and storage. The nutraceutical also appeared to improve the freezability of semen. More dramatic improvements in semen quality may be observed if modifications in the main fat content of the diet are incorporated with the DHA supplement.

**Keywords:** Stallion; Semen; Motility; Diet; Fatty acids