

Clinical and endocrine effects of LHRH immunization in male alpacas (*Vicugna pacos*)

S. Nielsen¹, CL Fite¹, DM deAvila², S. Sandoval¹, JJ Reeves^{2,3}, A. Tibary^{1,3}

¹College of Veterinary Medicine, Department Veterinary Clinical Sciences, ²Department of Animal Sciences, ³Center for Reproductive Biology, Washington State University, Pullman 99164-7060 USA

The decapeptide luteinizing hormone releasing-hormone (LHRH) is a protein that triggers the release of follicle stimulating hormone (FSH) and luteinizing hormone (LH). The use of LHRH immunization for sterilization of mature males has been described for many species, but not alpacas. The objectives of this study were to evaluate the use of LHRH immunization for non-surgical sterilization and identify its effects on spermatogenesis, testosterone production, and testicular size.

An hCG stimulation test was performed on 18, 2-3 year old male alpacas prior to group assignment and again at the end of the study. The 18 male alpacas were divided into three groups: intact males LHRH immunized (n=8), intact males given only adjuvant (n=5), and castrated males given only adjuvant (n=5). The LHRH immunized group received 1.0 mg of LHRH protein conjugated in ovalbumin (ovalbumin-LHRH) followed by two boosters, one month apart. Serum samples were collected for testosterone assays every two weeks until the last booster, then every month until the end of the study at six months. Changes in testicular and accessory sex gland size were monitored with calipers and transrectal ultrasound measurements taken monthly until the end of the study. Spermatogenesis was evaluated histologically in testicular biopsies. Pre and post-immunization observations of testicular size, spermatogenesis, and hormonal changes was analyzed using a GLM analysis of variance. Repeated measurements statistical method was used to determine the effect of immunization on hormonal variation, testicular size, and accessory sex gland size within groups.

There were no statistical differences in clinical and endocrine parameters between the LHRH immunized and the non-castrated adjuvant group, based on testosterone concentrations and testicular volume. However, five of eight immunized males, designated as responders, had testosterone concentrations below 0.5 ng/mL. These concentrations remained low after the last booster at d 56. These males had decreased spermatogenic activity and testicular size, but prostate size was unaffected. There were significant decreases ($p \leq 0.05$) in testosterone concentration and bulbourethral gland size in castrated males, due to androgen loss.

There was an effect of LHRH immunization on clinical and endocrine parameters in a subset of alpacas. The reason for different responses to immunization among alpacas is not clear. Other investigations of dose and immunization frequency are in progress.

Keywords: LHRH immunization; Endocrinology; Male alpaca