

# **Efficacy of remotely delivered primers of controlled-release porcine zona pellucida vaccines (PZP-22) in a New Mexico wild horse (*Equus caballus*) herd**

<sup>1</sup>Carey, K.A., <sup>1</sup>Ortiz, A., <sup>2,5</sup>Grams, K.A., <sup>3</sup>Elkins, D., <sup>4</sup>Turner, J.W., Jr., and <sup>1</sup>Rutberg, A.T.

<sup>1</sup> Cummings School of Veterinary Medicine at Tufts University, North Grafton, MA, USA;

<sup>2</sup>Humane Society of the United States, Gaithersburg, MD, USA; <sup>3</sup> Mt. Taylor Mustangs, Santa Fe, NM, USA; <sup>4</sup> Department of Physiology & Pharmacology, University of Toledo, Toledo, OH, USA;

<sup>5</sup>Current address: Science and Conservation Center, Billings, MT, USA

**CONTACT:** Allen Rutberg, [allen.rutberg@tufts.edu](mailto:allen.rutberg@tufts.edu)

Wild horses protected in the United States under the Wild Free-Roaming Horse and Burro Act of 1971 are experiencing population growth that has overwhelmed the historical management strategy of removal and adoption. Porcine zona pellucida (PZP) is an injectable immunocontraceptive vaccine that has been used to reliably induce reversible infertility for population control in wild horse populations. However, means and timing of delivery and vaccine longevity remain important issues for many management applications. At Jarita Mesa Wild Horse Territory (JM WHT) in Carson National Forest, NM, USA, delivery of PZP vaccines is challenging because resident wild horses are wary of people, and constraints of weather and terrain make the herd inaccessible during the optimal winter delivery time. In this study, we examined the efficacy over two years of late spring treatment with a single dart administration of PZP emulsion plus controlled-release pellets (PZP-22). A total of 157 individuals including 66 females > 1 year old were documented in 2011. From 4 April – 16 June 2012, 26 females (including 3 yearlings) identified by color and markings were bait-trapped, darted with PZP-22 at the trap site, and immediately released. The herd was observed and photographed in the summer of 2013 and 2014 to identify the foaling status of the treated mares. Foaling rate (FR) in PZP-22-treated mares was reduced by 79% relative to untreated mares in 2013 (year one) and by 38% in 2014 (year two), although the difference was only significant in 2013. The two treated mares who foaled in 2013 were the last vaccinated, indicating they might have become pregnant before antibody titers reached contraceptive levels. Untreated mares 4 years of age and older were significantly more likely to foal than younger mares. Despite the reduction of FR in treated mares in 2013, the FR of the entire herd did not differ significantly from the FR in 2011, probably because of the relatively small proportion of mares treated in 2012. This study represents the first demonstration of efficacy of priming doses of PZP-22 delivered by dart instead of by hand. Treating a larger proportion of the population could measurably reduce the FR of the population.