

# Appendix D. Contraception As An Option on The Jicarilla Wild Horse Territory

Research into the use of contraceptives to limit the growth of wild horse herds has been ongoing since the 1970s, both in herds on western rangelands and on several eastern barrier islands. Four of these herds on eastern barrier islands are currently managed with immunocontraceptive agents. Tests with immunocontraceptives have been conducted on a few of the larger wild horse herds in Nevada. However, no free ranging western horse herds have yet been managed at their respective AML level with contraceptives. [221]

During the late 1980s, the National Park Service (NPS) research team on Assateague Island National Seashore turned to an immunocontraceptive agent, porcine zona pellucida (PZP), for the wild horses on the island, which had been reported to block fertilization in dogs, rabbits, and primates. In order for sperm to attach to the ovum and fertilize the egg, there must be complementary proteins on both the surface of the sperm and the zona pellucida (ZP) of the ovum. PZP is a foreign protein against which the treated mare produces anti-PZP antibodies. These antibodies attach to the mare's zona sperm receptors on the ovum and block fertilization. Zona pellucida from domestic pig ovaries (obtained from slaughter houses) is minced and the PZP is obtained from screening filtration. Freund's Complete Adjuvant (FCA) is mixed with the PZP in order to enhance its effects when it is initially injected into mares intramuscularly.

Experimental PZP application on the wild horses of Assateague Island began in 1988. Following promising reductions in the pregnancy rates in mares, the NPS in 1994 began to stabilize the growth of the population solely using PZP immunocontraception. The Assateague research team also developed non-invasive methods to assess the pregnancy rates of, and detect ovulation in, free-ranging treated and non-treated mares by analyzing reproductive steroid metabolites in feces and urine. These methods require the sample be taken in the field from individually recognizable mares, but no captures are necessary.

While PZP is considered an experimental agent by the federal Food and Drug Administration (FDA), it does appear to meet most of the safety concerns of the BLM who currently has several research studies ongoing with the vaccine. PZP does not enter the food chain, its effects passively wear off with time if the injections are terminated, normal reproduction can be resumed, following up to seven years of use, and it does no harm if injected into mares that are already pregnant — they carry foals to term. Initial research suggests native PZP does not affect ovarian function, hormonal health, or safety in pregnant animals. Life span and health of treated mares may be increased, apparently due to the absence of stresses from pregnancy and lactation. Treated mares apparently live about five to ten years longer than do untreated mares that continue to get pregnant and produce young. One initial study suggested harem behaviors are not influenced. There appear to be no generational effects — offspring of treated mares are able to reproduce normally. The agent is about 90% effective in blocking fertility in mares. [221] [223] [224]

Best results using PZP are achieved following an initial “primer” dose, followed by annual “booster” shots. The initial injection, or primers, may be administered to mares following gathers when they are in chutes during capture. Alternatively, in those populations where the individual mare can be both recognized and approached on foot for darting, the injection may also be administered remotely by means of a 1.0cc dart with a Pneu-bait or Dan-Inject dart gun. A second booster shot is then required for each year of immunocontraception. Following the second or third year of treatments, only an every-other or every-third year booster is needed. Following cessation of the annual treatments, the agent and the antibodies passively decline, anti-fertility effects wear off, and normal reproductive function is resumed the subsequent year. However, following seven or more years of treatment, the anti-fertility effects may be permanent for individual mares. [223] [224]

Progress is continuing on development of a time-release pellet vaccine of PZP that will allow two years (actually ~22 months) of fertility control with only a single shot injection. Progress on this time-release form is encouraging, although efficacy rates are variable and may be slightly lower (~ 85%) than for the conventional multiple injection program. Currently two year vaccine cannot be remotely administered. [221]

Two major drawbacks of conventional PZP and Time-Release PZP have been identified by BLM managers: (a) the brief duration – managers prefer a one-shot, three to five-year duration, and (b) the fact that the most effective known adjuvant, FCA, present some health concerns in both humans and horses. While the one-year or two-year durations of these forms may be adequate, and even preferred for small populations of wild horses, managers of the larger herds, such as herds in Nevada and Wyoming, have a critical need for a single application agent that lasts longer. If a gather is held during the summer or early fall, and the Time-Release PZP is injected, only one effective season of contraception may be achieved. Some mares could become pregnant late during the second subsequent summer. There are some concerns about lower survival of late born foals.

BLM is also seeking an alternative adjuvant to FCA. FCA causes a false positive TB test in humans following accidental injection or needle stick, and can cause granulomas at injection sites in treated mares. The granulomas are generally small and shrink over time when the injection is into the buttock area of the horse. Presently, these risks are mitigated by only allowing persons trained and certified to administer the PZP and FCA mixture. However, a safer alternative adjuvant is desired. Modified Freund's Adjuvant (MFA) and other adjuvants may be potential replacements, but the efficacy and duration of these replacements needs to be evaluated under controlled conditions. In particular, there has been no direct comparison of the relative effectiveness of fertility control with the less objectionable MFA compared to FCA under controlled conditions. BLM will substitute a new adjuvant as soon as an effective replacement can be found for FCA.

Sufficient prior work with PZP has been conducted on wild horses in Nevada and on Assateague Island to justify BLM field trails at this time. However, significant unanswered questions remain concerning population and behavioral effects of the treatments that must be addressed before BLM proceeds with broad-scale management applications of fertility control. [221]

For most wild horse populations 70% of all reproductively active females would need to be maintained in an infertile state to achieve a stable population. Regardless of control strategym, genetic variation is lost much more slowly if young animals are treated (e.g. removed or rendered temporarily infertile). The most practical control program would likely involve both contraceptives and periodic removals. Contraceptives could reduce growth rate and are likely to be cost-effective while removals permit management to rapidly adjust overall population size [222].

The cost of gathering 70% of breeding mares to treat with the two year contraceptive every two years could render contracepting alone impractical since most of the horse population would need to be gathered to access the breeding mares. If single year contraceptives were used to maintain infertility, a very intensive management program including remote delivery would be necessary. The BLM is currently carrying out intensive studies on three small populations of wild horses using the single year vaccine and remote delivery [225]. There are no wild horse populations in the western states that are being managed solely through the use of PZP.

Permission to conduct research using PZP is covered under an Investigational New Animal Drug Exemption (INAD #8857) filed with the Food and Drug Administration (FDA) by the Humane Society of the United States (HSUS). All BLM wild horse management areas must provide ap-

proved gather plans and environmental assessments detailing the contraception research before the research can be initiated in any specific area. Permission must be granted by the HSUS [224]. The BLM is currently working with HSUS and a Field Trial Plan for Wild Horse Fertility Control is in place for the use of PZP under the stated guidelines.

The Forest Service has not to date entered into any research program for the use of the PZP vaccine. However, the opportunity may exist to initiate a research program under existing BLM protocol established in their Field Trial Plan for Wild Horse Fertility Control [225]. Implementing a research program would require working closely with HSUS along with the Science and Conservation Center (SCC), Zoo Montana, the maker of the vaccine. The actual research plan would require the approval of HSUS.

Fertility control cannot be used to reduce herds of wild horses that are substantially over AML, or alone to limit population growth. Fertility control can assist the gather and removal program in achieving these two goals. [221]