



EASTERN
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JUN 13 1988

TO: Roger Rector, Superintendent, AINS

7 June, 1988

ASSATEAGUE Chick Fagan, Asst. Superintendent, AINS

ISLAND

Jack Kumer, RMS, AINS

John Karesh, Research Director, NPS, N.E. Region

FROM: Jay F. Kirkpatrick

RE: STATUS OF FERTILITY CONTROL PROJECT

In December and January of 1987/88 the anti-zona pellucida vaccine was prepared at the University of California-Davis, by Irwin Liu, and tested in a captive domestic mare for antibody production. This particular batch of vaccine appeared particularly good and the increase in antibody titers is shown in Figure 1.

Beginning on February 29, 1988, administration of the vaccine to Assateague horses was initiated. Between February 29 and March 10, 28 sexually mature mares between the North Inlet and Bunting Road were given 0.5 cc of vaccine + 0.5 cc of Freund's Complete Adjuvant, either by means of a dart or with a jab-stick. Between March 12 and March 21, 25 of those 28 mares received a second shot, which consisted of 0.5 cc of vaccine + 0.5 cc of Freund's Incomplete Adjuvant + 0.5 cc of phosphate buffer solution (PBS). Between April 16 and April 25, 18 of the 25 which received two shots received a third shot.

Based on the performance of the vaccine previously tested in captured feral horses there is little question that the 18 mares receiving the three shots will remain infertile through the 1988 breeding season; the efficacy of the vaccine with the two- and one-shot mares remains the only real question. Preliminary results will be available sometime during the fall of 1988, when we pregnancy test the treated mares.

The original experimental design called for a total of 25 mares treated once, 20 of those treated twice, and 15 of those treated three times, thus we were able to exceed the requirements of the experimental design. There were several events which worked in our favor and several which did not. The absence of visitors during much of this time was a clear benefit, and the weather was extremely good during the entire time of treatment. We were

without a vehicle for the first week and this slowed us down quite a bit. Also, among the mares moved to Chincoteague were three mares targeted for treatment. All in all we were fairly pleased with just how well the project worked out. One of our concerns before this test was the likelihood of small abscesses developing at the point of injection. Consequently we made every effort to examine the horses after treatment. We were able to identify a total of three abscesses - about the size of a quarter - on three horses. The abscesses formed within two to three days and drained within seven to nine days. After seeing the abscesses, we are quite comfortable that the incidence and seriousness are so minor as to not be a factor. Another observation we made has to do with the amount of time and effort necessary to get to the horses. We have been working exclusively from the land, but during March and April, the horses are almost always on the bay side. Weather permitting, a small motorized craft capable of shallow waters would permit access to large numbers of animals with only minimum effort. As it stands now, we have to explore one finger of land at a time, after struggling through the brush to get there. As often as not, the horses are on the next finger which requires a time-consuming circuitous detour to get to them.

Working in cooperation with Ron Keiper, we were also able to develop an excellent census for the entire AINS herd. We have, with this year's foal crop (thus far), just about 145 horses. The dynamics of this horse herd were the subject of an earlier memorandum. Before the year is out we will be able to develop a correction factor which can be applied to aerial counts, on the basis of Terry Bashore's counts this spring.

There is one final dimension of this particular approach to fertility control that should be tested. We have strong data to support the idea that the mares treated three times will remain infertile this year, and our best guess is that we will see a substantial reduction of foals among the mares treated twice. The remaining concept to be tested is that of the booster shot. Since we now have 18 mares X 3 shots and another 7 x 2, these animals should be treated with a booster dose in March of 1989. Failure to take advantage of this situation will cost about three years in order to have such an opportunity. I would like to submit a proposal for that investigation, but will not do so until advised by AINS.

A second consideration for all to think about is the remaining mares which have not been treated. There are 14 sexually mature mares between the North Inlet and Bunting Road which have not been treated at all. A bit more frightening are the 22 adult females south of Bunting Road. With the current foaling rates these 36 mares will be producing about 15 foals annually. Ideally, I would recommend that AINS give serious thought to treating as

many of the remaining 36 sexually mature mares as possible during the next year.

This will be a serious task since the conversion of the current three- or two-shot administration vaccine to a one-shot vaccine will not be ready until the spring of 1990 at the earliest. Nevertheless, IF the two-shot mode works we could probably get about 90% of the entire AINS herd treated, and IF the booster shot works, AINS would be in a position to keep the herd under reasonable control until the one-shot vaccine is available.

On the basis of these thoughts I am disposed to submit two separate proposals to AINS for the coming year. The first proposal would simply test the booster shot concept among treated horses, and, as long as AINS can continue to provide a vehicle, would cost relatively little - probably about \$3,500. I am most concerned about this proposal since we would all lose three years if we did not follow up on what we have accomplished. The second proposal would address treating the remaining fertile mares and would include the training of NPS staff in designing a long-term fertility control program and in carrying out the treatment. This will be a bit more costly because of the volume of vaccine that we would have to prepare.

Before putting pen to paper however, I believe all involved should give some thought to this and provide me with some feed-back. If you find merit in these ideas and advise me to do so, I can prepare proposals by an early September deadline. I don't know exactly how the NPS research funding procedure are carried out, but I might suggest something which would protect all of us. We will have our initial pregnancy testing results sometime in mid-fall. If the NPS would prefer to defer a decision on funding until we know a bit more about our success rate, the risk would decrease substantially.

I am off to Australia on June 16th, at the invitation of the Australian government, to promote the use of this vaccine in controlling their 350,000 horses! And you guys think you have problems! I will be back about July 18th. I would appreciate hearing from any or all of you regarding your thoughts and whether I should prepare the new proposals. Best wishes for a good summer.

ABSORBANCE RATIO. (EA₄₀₅ / RA₄₀₅)

Fig One
ANTI-PORCINE ZONA ANTIBODY CONCENTRATIONS AFTER
ZP VACCINATIONS IN THE MARE CORKY (ELISA)

