

A PRELIMINARY REPORT ON THE USE OF TRANQUILIZING COMPOUNDS IN HANDLING WILDLIFE

BY

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INTRODUCTION

Wildlife workers frequently need to calm or immobilize wild animals to prevent shock or injury while handling them. Although wild animals have been successfully moved by use of tranquilizer-like drugs administered by subcutaneous injection, relatively little prior work has been aimed at learning how to capture and handle wild animals by orally administered substances.

This work deals in a general manner with all of these problems but does not conclude our efforts toward solving any of them. Despite the often rather crude field conditions under which parts of our investigations were made, we have been so encouraged by some of the results that we feel that a preliminary report is in order.

Because of the several species used and the variety of objectives sought, this report is broken into segments to examine the work done towards the attainment of each objective.

We would like to define our usage of terms as we apply them to deer.

Wild deer: A free roaming wild deer or one recently reduced to captivity.

Penned deer: A deer raised in captivity or confined to a pen but one that cannot be closely approached by man.

Pet deer: A deer, whether free or penned, that will approach man or can be closely approached by man.

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OBJECTIVES

Our objectives have been to explore the uses of tranquilizer-like substances for the following:

1. To prevent mortality caused by shock and mechanical injury.
2. To immobilize animals requiring detailed examination.
3. To condition wild animals to captivity.
4. To use a tranquilizer-type drug to capture wild animals.

Objective 1

To prevent mortality caused by shock and mechanical injury.

Procedure 1

Animals used for this were grey foxes (*Urocyon cinereoargenteus*), nutria (*Myocastor coypus*), grey squirrels (*Sciurus carolinensis*), raccoon (*Procyon lotor*), deer (*Odocoileus virginianus*), and domestic turkey.

Tranimal was used hypodermically on all of these animals except raccoons, which were dosed with powdered Tranimal.

Test animals were restrained while the hypodermic injections were given into the large muscles of the hindquarter. Oleagenous Tranimal in concentrations of 50 mg. per cc. or 100 mg. per cc.

was used on deer. Foxes and nutria were treated with 50 mg. per cc. concentrations. For grey squirrels and turkey 5 mg. per cc. aqueous solution was used. Pure powdered Tranimal was given to raccoons on the end of a wet wooden spatula.

Results I

NUTRIA

Nutria were readily made docile by the injection of Tranimal. While 30 mg. of the active material would produce noticeable symptoms of tameness in an eight-pound animal (average) and a dose of 100 mg. would render the animal comatose for 12 to 15 hours, no mortality was experienced. Complete recovery was always made in 24 to 30 hours. One of the first symptoms demonstrated is hunger. Very heavily dosed animals would continue to eat until muscular incoordination caused particles of food to fall out the sides of their mouths. Recently captured nutria injected with moderate doses and immediately released could be induced back into the pens with a piece of sweet potato. They would stand on their back legs when the food was offered from above. A slight incoordination of the back legs was noted after heavy treatment. Treatment and retreatment of four nutria failed to produce any mortality, although what we consider a normal dose was greatly exceeded on several occasions.

FOXES

Adult grey foxes were injected with Tranimal in doses ranging from 11 to 55 mg. The onset of reaction was from 3 to 10 minutes. At all levels of dosage docility was obtained. Complete apparent recovery was from 12 to 30 hours. No mortality was ever caused during these experiments. Wild trapped foxes are believed to have gained weight during captivity.

SQUIRRELS

On one occasion three adult grey squirrels were dosed 2.5, 5 and 10 mg. of Tranimal. Recovery time ranged from 20 to 48 hours. The squirrel that had the heaviest dose was aroused and given water at 24 hours after medication. After repeatedly lapping water from the handler's fingers this animal went into deep sleep. The recovery that occurred at 48 hours was deliberately stimulated by continued handling. Upon recovery of coordination this squirrel would not offer to bite the handler although the two lighter dosed squirrels could not be handled at that time.

Two freshly caught grey squirrels were removed from traps and injected with .2 cc. of aqueous Tranimal which contained 1 mg. of active material. These squirrels were returned to the live traps and hauled 90 miles to a release area. Four hours after capture they still did not have the typical skinned nose appearance of squirrels previously transported in traps. One of these animals was observed to lick its forefeet and wash its face while the handler held the cage up for another person to inspect from a distance of two feet.

TURKEY

Four domestic turkey were tested with Tranimal. Three birds were treated while one bird was used as a control. The weights of these birds ranged from 9¼ to 11 pounds and they were given 5, 10 and 30 mg., respectively, of Tranimal intramuscularly. Reaction was noted within five minutes. Within 30 minutes all birds had exhibited droopiness and instability and could be considered in a state of tranquility. Recovery was complete within twelve hours. From these observations we conclude that approximately 1 mg. of Tranimal per pound of body weight seems to produce the desired reaction, at least in domestic turkeys. Wild turkeys were not available to this study.

DEER

An adult female White-Tailed Deer of about 80 pounds was injected with 150 mg. of Tranimal about two hours after her capture with a Palmer syringe gun. The syringe from the gun had been loaded with Palmer "Cap-Chur-Gem." After injection of the Tranimal she remained comatose for approximately 48 hours. It has been found in subsequent tests that the reaction observed on this animal was of unusually long duration for such a small dose. It is quite possible that the combined effects of the drugs used on this animal were responsible for such a long period of tranquility.

Two adult bucks were removed from traps and given 150 and 175 mg. of Tranimal. Their weights were estimated at 110 and 125 pounds, respectively. They were placed in the regular deer hauling bed on a pick-up truck, along with an untreated adult doe. Upon arrival at a release point a little more than two hours later both exhibited some muscular incoordination. The lighter animal after several starts ran off and circled back to the woods road and lay down about 300 yards from the release point. Upon being flushed by the truck, leaving the scene, he moved about 60 yards off the road and stopped before bounding off apparently fully recovered.

RACCOON

Cage type live traps were used to capture raccoons. These animals were easily made tranquil by allowing them to bite the end of a wooden spatula which had been dipped in water and then into powdered Tranimal. Since an unknown amount of the powder was delivered by this method it failed to assist us in evaluating dose size.

Three raccoons were immobilized successfully and all recovered in from 10 to 18 hours. This demonstrates that precise knowledge of dosage is not a prerequisite to the field use of this compound.

Objective II

To immobilize animals requiring detailed examination.

Procedure II

It was necessary to x-ray several wild doe deer to determine whether or not they were gravid. It required a little more than two hours to deliver them from the trapping area to the place they were x-rayed. Initial injections of 10 cc. of 100 mg. per cc. Tranimal were made in two instances. One animal was made calm enough to safely handle in the x-ray lab with only the initial dose. The other was given a 400 mg. booster as she appeared to be recovering. Another doe was given shots of 500, 500 and 400 mg. over a two-hour 15-minute period after she had ingested an unknown amount of powdered Tranimal on fresh apple bait.

All of these animals were released to a study pen after it was determined that none were pregnant. Each was still lying at the release point the morning after release. Two were stimulated to arise and stagger away upon the first approach. The one with 1,400 mg. of oleagenous Tranimal and no powdered Tranimal recovered the afternoon after treatment. She was hazed around in a small pen adjacent to the 160-acre study pen for 15 minutes. After she had apparently recovered she was driven into the large pen and was observed to travel $\frac{1}{4}$ mile until she turned out of the road and was lost to view.

Complete recovery of all these animals has been confirmed by recent checks.

We have additional tests with Tranimal for immobilizing deer with comparable results.

Objective III

To condition wild animals to captivity.

Procedure III

A darkened stall with a watering device and a swinging food tray was prepared to hold some gravid does until parturition. The stall had a 40-watt bulb with an outside switch and a 6-inch by 12-inch one-way-glass for viewing.

Feed provided was natural browse and commercial calf feed. One quart measure of feed contained 150 mg. of powdered Tranimal and one measure per deer was used each day.

After two weeks of captivity one deer gave birth to twin fawns, the other was not pregnant. The fawns died in the stall but the adults survived 19 and 20 days of captivity at which time they were removed by giving them massive doses of powdered Tranimal and transporting the wet doe directly to the study pen. The dry doe, who was not completely overcome by her portion of the 3000 mg. of powdered Tranimal, was subsequently given 1400 mg. of Tranimal by hypodermic injection and x-rayed before she was removed to the study pen. Prior to use of the dark stall and the Tranimal, four deer had died while they were held captive in net wire pens. None of these deer had ever received any Tranimal.

Other experiences gained by keeping captive nutria and foxes for investigation of Objective No. 1 have added to our knowledge of conditioning wild animals to captivity.

Objective IV

To use a tranquilizer type of drug to capture wild animals.

Procedure IV

A supply of powdered Tranimal was made available to us for testing in early 1963. Initial tests were aimed at determining the dose required to immobilize a deer. Pet deer were given varying amounts from 200 to 1100 mg. Test animals weighed 55 to 65 pounds. These small tame deer were readily handled several minutes after ingesting 500 mg. of the material. However, one dosed animal was injured when it became entangled in the fence and showed less reaction to 1100 mg. than others of the same size and age class did to a dosage of 500 mg.

Twenty-three deer in a four-acre pen were treated upon two occasions with Tranimal mixed in the regular ration. Too many deer divided the small doses and while several showed symptoms of incoordination none were caught.

Food was withheld for two days and then 63 gms. of Tranimal and 189 gms. of powdered sugar were thoroughly mixed with about 30 pounds of the commercial calf feed that the deer were accustomed to getting in 100-pound lots daily. Various birds and several grey squirrels came to the feed troughs as soon as the 30 pounds of baited feed was put out.

A movie camera, which had been set up about 20 feet from the nearest trough, was manned for three hours. During this time only two deer fed at all but within an hour after the camera and operator were removed from the pen some 12 to 14 deer took a portion of the ration. In all about one-half was consumed.

Several deer were observed to have a loss of equilibrium and the cameraman moved back into the pen to film capture efforts. Eight deer were captured and four of these were removed from the pen. The other four were marked with plastic collars and released in the pen. Twelve days later 42.5 gms. of Tranimal was mixed with three parts sugar and 20 pounds of feed and offered the 19 remaining deer. A number of deer were immobilized and four adult males were removed from the pen. Five pounds of feed remained uneaten. Another captive deer herd of 33 yearling and adult individuals was treated on May 7, 1963. This pen was only about one-half

acre in size and contained no ground cover. A corrugated metal shed and several large pecan trees provided the only shelter for deer.

Maintenance here had consisted of twice daily feedings of horse and mule feed. Feed was withheld for two periods the afternoon before and the morning of the date of the capture effort.

The feed was placed in the two troughs at 5:30 P.M. and a very old pet doe began to eat at once. All of the other deer were in the far corner or behind the shed and appeared to be very nervous at the sight of a stranger in their pen. All personnel waited 10 minutes in an adjoining yard and watched while only the pet doe ate. All personnel then moved from the area and removed all strange vehicles. At 6:05 two vehicles and six observers returned to a road intersection near the pen and watched the deer. There was the usual vehicle traffic and the deer appeared unconcerned although none were eating.

At 6:30 one observer entered the pen and discovered that about 2/3 of the feed had been consumed. Four more deer were seen eating after 6:30 and two of these fell into the troughs and remained there. The pen was entered at 7:10 and 24 deer were loaded into four trucks and hauled to a place where deer were needed and cattle feed was available for them. Some fawns were discovered in the pen and one fawn was trampled fatally. The mother of week-old fawns was captured, collared and released in the pen. The very old pet doe remained in a deep coma throughout the deer removal. An adult buck was restrained in a net and left in the pen and another adult deer broke out of the pen and escaped.

The pick-up trucks were equipped with conventional deer hauling beds. Two of them had 150 pounds each of broken ice distributed in and on the straw of the bed. Small ventilation slots were provided to insure some air circulation while they were in transit. Two deer died during the four-hour trip to the release site. One was an adult buck that had been injured when it ran into a corner of the shed. The other loss was of a gravid doe. The two deer lost were in un-iced trucks. The day had been unusually hot for early May and the temperature at 3:00 P.M. in nearby Lake Charles was recorded as 87 degrees F.

When this pen was entered deer were found to be in several stages of sedation, with all showing some effects of the drug. Many were lying upon the ground in a normal position. Some of these were so comatose that the stimulation of handling failed to cause any symptoms of recovery. Most, however, would attempt to rise and would struggle with apparently normal muscular strength, but poor coordination after the handler grabbed them. Several standing deer were captured by one person shining a bright light in their eyes while a second man snatched their back feet from under them. Others were caught by use of a dip net type contraption with a 5-foot deep bag on an oval hoop 4½ by 3 feet.

As compared to previous daylight capture efforts darkness was believed to be a big help in reducing stress which hastens recovery from symptoms of tranquility.

On several other occasions both pet deer and penned deer have been controlled by use of the powdered Tranimal in their usual feed or by selectively handing pet deer bits of apple or sweet potato coated with Tranimal.

DISCUSSION AND CONCLUSIONS

Objective I was partially attained although we have not yet pinpointed the optimum dosage for the various test animals. While slight incoordination can be demonstrated in many animals at around 1 mg. per pound it is probably that less apparent symptoms are present at lower levels. We are convinced that we can put animals into a coma and transport them without any chance of mechanical injury to them. At present we believe that a great reduction of the shock of captivity

is attained by relatively small doses. We need additional work on this.

Objective II was reasonably well attained in that we feel that while Tranimal can be successfully used to produce a state of coma our results do not justify recommendation for this purpose.

The massive doses that are required to handle a wild animal generally insure a long period of immobility once handling had ceased. Animals trapped, treated and released would require protection from predation between release and full recovery.

Objective III was not fully attained although the trials were successful so far as they went. Since the addition of Tranimal to the ration was accompanied by the use of a different and possibly better type pen we cannot measure the role of Tranimal in the welfare of these deer.

Holding nutria and grey fox captive in small cages was facilitated by the frequent administration of Tranimal. Appetites were very definitely stimulated and aggressive behavior was lessened by small amounts of Tranimal.

Objective IV was explored more fully with deer. Although only pet deer and penned deer were handled we believe it possible to capture wild deer from any area where they can be induced to regularly take cattle feed, apples or sweet potatoes.

While we used powdered sugar as a spreader and with the idea that it may disguise any bad taste we have no evidence that the taste of Tranimal is at all objectionable to wild animals. Deer have been fed Tranimal without the sugar and appeared not to notice the taste when the substance is mixed with a little feed.

We have found that withdrawal of feed from penned deer for a day or two causes them to rapidly eat the treated feed when it is offered.

The first manifestation of onset is usually a shifting of weight on the back legs. This is usually followed by noticeable incoordination the first step or two when starting to walk. The deer may fall into some unnatural position but usually manages to orient the brisket, neck and head into the normal position of a deer at rest.

Ideal capture time is to treat just before dark and move deer under cover of darkness. Unusual human activity such as premature capture efforts or attempting to make treated deer repeatedly pass before a camera greatly decrease the effectiveness of the tranquilizer. If such activity is anticipated the dosage should be greatly increased.

Since often an unknown number of deer consumed an estimated amount of Tranimal our best idea of dosage comes from our experience with individual deer. Some deer can be handled with as little as 10 mg. per pound of body weight if they are allowed to remain quiet. One deer with 27 mg. per pound failed to completely yield to the drug for one and one-half hours while it was made to walk from one end of the corral to the other. Soon after it was allowed to become quiet it became comatose and was still down 24 hours later.