ABSTRACTS

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CONTRACEPTION OF LIONESSES, CHEETAHS AND WILD DOGS USING THE GNRH AGONIST IMPLANT SUPRELORIN®

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In southern Africa with its well developed wildlife industry, population management of certain carnivore species such as lions, wild dogs and cheetahs is essential, particularly in smaller fenced game reserves and for captive populations. Left unmanaged such species reproduce rapidly leading to depletion of prey species. Inbreeding under such conditions is another danger that needs to be considered. The traditional method of reversible carnivore contraception involved the use of long-acting progestin implants. Medium to long term use of such implants are known to cause a number of side effects, some of which can be life threatening. The GnRH analogue, deslorelin, in a long-acting biocompatible subcutaneous implant (Suprelorin® and Suprelorin12®, Peptech Animal Health, Sydney), was developed for use in domestic dogs and cats where it has been shown to be a safe and effective means of contraception. Following initial stimulation the release of both LH and FSH is down-regulated. The overall result is down-regulation of ovarian and testicular functions although in some species it is not effective in males. This paper describes some of the results experienced with Suprelorin® and Suprelorin12® in cheetahs, lions and wild dogs.

In cheetahs the 4.7 mg deslorelin implants (Suprelorin®) have been used successfully in both sexes. During the first week after treatment females attract males for 1-2 days (see lionesses). Mating does not occur and certainly no pregnancies have been recorded. The subsequent anoestrus lasts at least 18 months, however, to maintain contraception we recommend treatments at annual intervals. At least 35 males have been treated on an annual basis and some for up to 10 years without side effects. Down-regulation of fertility in males takes longer than in females and viable sperm were noted for up to 6 weeks post treatment. During the first two years there was a rapid decrease in testicular volume to 61.1% and 40.3% of original volume, respectively, reflecting a rapid reduction in spermatogenesis. This was followed by a slower decline to reach 28.6% of the original volume after 7 years of annual treatment. Down-regulation of testosterone synthesis was rapid and by 6 weeks basal levels were recorded. Appearance of penile spikes, which are androgen dependent, was a good subjective method of determining the presence of androgen activity. We encountered two males that appeared to be more resistant to the effects of the implant. One year after the first implant both still had viable sperm albeit some reduction in testicular size. As a result we decided to use two 4.7 mg implants for each these males during the annual treatment.

Male lions (Panthera leo) were not targeted for Suprelorin® treatment. Although likely to be effective, the treatment would certainly result in loss of androgen dependent manes. Twenty three captive and 40 free-ranging lionesses in South Africa were treated using 3x4.7 mg, 2x4.7 mg, 9.4 mg or 4.7+9.4 mg deslorelin implants. Thirty one lionesses were treated more than once at 11 to 60 month intervals and some for up to 10 years. In Brazil two captive lionesses were treated with 9.4 mg implants and faecal progesterone and oestradiol concentrations monitored. All combinations of deslorelin showed the length of contraception...
to be around 30 months. As in cheetahs, lionesses attracted males for a couple of days during
the first week after the initial treatment. This short period of activity was associated with an
oestradiol peak and subsequent brief rise progesterone in the faeces of the Brazilian lionesses.
Once again there were no negative consequences associated with this. Three lionesses showed
short periods of heat, with or without mating, between 6 and months after treatment. None of
these resulted in pregnancy nor did they affect the duration of the contraceptive period. One
of the Brazilian lionesses showed similar sexual behaviour 17 months after treatment. The
behaviour of this female could be explained by the presence of small faecal oestradiol peaks
during the same period. No subsequent increase in faecal progesterone could be observed. The
findings confirmed the field observations in South Africa. No side effects occurred although a
number of the lionesses were treated repeatedly for up to 10 years.

Our initial work in African wild dogs using 6 mg deslorelin implants produced good results.
In females this formulation employed 1-2 months before the breeding season was 90% successful. Anoestrus that lasted through the breeding season (February-March) was induced. Ten percent of females came into heat within the first month of treatment, were mated and carried pregnancies to term. Similar to cheetahs, male wild dogs remained fertile for about 6 weeks but after that became azoospermic until the following breeding season. Annual treatment of males 2-3 months prior to the breeding season prevented pairs or packs from breeding. The new 4.7 mg implants (Suprelorin®), however, only provided partial down-regulation leaving males fertile and able to sire litters. The fact that partial suppression was achieved prompted us to test the effects of a double implant (2x4.7 mg); work that is currently underway. Suprelorin® and Suprelorin12® are also being tested in females.

In conclusion deslorelin implants (Suprelorin® and Suprelorin®) provide a safe and effective
means of controlling reproduction in captive or free-ranging populations of lions and cheetahs. Where contraception is to be maintained in lions we recommend that the second
treatment should take place after 12 months and thereafter at 24-month intervals using the 9.4
mg implants. In cheetahs both sexes should be treated annually using the 4.7 mg implants. Perhaps a double implant (2x4.7 mg) should be considered for the initial treatment in male
cheetahs. Further work is required in African wild dogs before recommendations can be
made.