

Contraception in female Tasmanian devils (*Sarcophilus harrisi*): dose-response effects, efficacy and health parameters when using deslorelin implants

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The selective use of contraception for endangered species breeding programs is a relatively new approach to wildlife management, but has many potential applications. The Save the Tasmanian Devil Program (STDP) uses contraception in their insurance metapopulation with the aims of equalising founder representation, controlling breeding within group housing situations, and preserving wild behaviours. Before this approach was taken, we conducted preliminary studies to ascertain the efficacy, duration of effect, optimal dosage, and any potential side effects of the proposed contraceptive on individual animals. This study assessed the dose-response effects of Suprelorin® contraceptive implants (Peptech Animal Health, Sydney, Australia) containing a gonadotrophin-releasing hormone (GnRH) agonist, deslorelin, on female Tasmanian devils. Either one (n=5), two (n=5), or no (n=5) 4.7 mg implants were administered to the devils, with quarterly GnRH challenges used to test the hormonal responsiveness over two breeding seasons. During the challenge the pouch appearance was recorded, blood samples were taken for complete blood count analysis, and body weight was measured. There was an interactive effect of treatment group and month on the level of hormonal responsiveness ($P < 0.001$), with treated females being suppressed relative to controls (with the exception of the mid-breeding season). At the end of the second breeding season, high dose animals were more suppressed than low dose animals, suggesting a dose-response effect. In the middle of the second breeding season, 80% of animals in both low and high dose groups had very oily pouches, compared to none in the first breeding season, indicating a return to oestrus. There was also an interaction between treatment and month on proportion change in body weight following contraception ($P = 0.013$), yet there were no significant differences between treatment groups at each month. When comparing diet allocation for these females (varied monthly based on their body condition), a much greater proportion of treated females were on the weight loss diets post contraception, compared with pre-contraception and controls, potentially indicating an effect of contraception on body condition. From the blood analysis we found that high dose females had increased packed cell volume, red cell count and haemoglobin in comparison to controls, but all were still within the normal range for Tasmanian devils. In conclusion, both dosages are effective for at least one breeding season, with a reduced effect in the second, there were no apparent negative effects on general health, yet captivity and contraception may have an additive effect causing devils to be overweight.