

Contraception Use and Guidelines for black howler monkeys (*Alouatta caraya*)

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The EAZA RMG are data deficient for this species. As such, we would request that all institutions using contraception in their black howler monkeys submit their data to the Contraception Database, either via our online survey (egzac.org) or by submitting the relevant information to contraception@chesterzoo.org.

We would highly encourage that any institutions using contraception in their animals assess the safety and efficacy of the product with behavioural, hormonal, and reproductive tract monitoring. For more information, please do not hesitate to contact the EAZA RMG (contraception@chesterzoo.org).

Product information sheets with additional information on each of the recommended products below are available on the EAZA RMG website (egzac.org).

Males

Deslorelin acetate (Suprelorin): Subcutaneous implant- 2x 4.7 mg implants for a **minimum** duration of 6 months and 2x 9.4 mg implants for a **minimum** duration of 12 months. Duration of efficacy can show individual variation. There is an initial 3-4 week stimulation phase of the reproductive system when individuals are first contracepted that cannot be suppressed in males. During this period, testosterone concentrations will increase, and you may therefore observe an increase in testosterone-mediated behaviours such as aggression or sexual behaviour. It may take up to 8 weeks after males are first implanted for viable sperm to clear their system, therefore we would advise separating the sexes during this time or using additional contraception in the females. Deslorelin is designed to be fully reversible however, we have no records of reversal on the database for this species. We would recommend removing all implants to facilitate reversals, so they should be placed in locations with thinner skin e.g. inner arm, inner thigh, umbilical region. A possible side effect includes to feminisation of males; males may loss muscle and overall weight, becoming the size and weight of females.

Females

Deslorelin acetate (Suprelorin): Subcutaneous implant- 1-2x 4.7 mg implants for a **minimum** duration of 6 months and 1-2x 9.4 mg implants for a **minimum** duration of 12 months. Records from our database suggest using 2 implants for sp. >7kgs BW. Duration of efficacy can show individual variation. As in males, females will go through an initial stimulation phase to the reproductive system after first being implanted. To suppress the initial stimulation phase supplement the first bout with additional contraception such as oral megestrol acetate pills (Ovarid/Megace) daily, 7 days before and 8 days after implantation. Deslorelin is designed to be fully reversible; 33% of individuals allowed to breed after contraception reversed, with time to conception ranging between 5 months and 1.5 years after the estimated date of implant

expiry. We would recommend removing all implants to facilitate reversals, so they should be placed in locations with thinner skin e.g. inner arm, inner thigh, umbilical region. General side effects include increased appetite and weight gain.

Medroxyprogesterone acetate (Depo-Provera): Intra-muscular injection formulation- Dosage is 20mg/kg approximately every 45-90 days depending upon the individual. Latency to effectiveness is approximately 1-3 days post-injection however, it is recommended that the sexes are either separated for one week, or alternate contraception is used at this time. Depo-Provera is designed to be fully reversible and we have five records of reversal in the database with time to conception ranging between 5 months – 1.5 years after the estimated expiry of the contraceptive. As Depo-Provera is not an implant, you will need to wait for the drug to clear from the individual's system and there is individual variation in time to reversal. A possible side effect of Depo-Provera is that females may develop male secondary sex characteristics and aggression may increase. Weight gain may also be a side effect. It is not recommended for use throughout pregnancy. There are no contraindications once lactation is established.

Etonogestrel (Implanon/Nexplanon): Subcutaneous implant- ½ to 1 implant is recommended for full coverage, although successful contraception has been achieved using ⅓ for individuals weighing up to 6kgs. We would advise that ½ an implant is used for individuals weighing >6kgs, and a full implant if suppression is not seen at lower doses. As there is a latency to effect of 7-14 days, separate the sexes for 7-14 days after the implant was inserted. Implanon is designed to last between 2-3 years, but this will depend on the individual. Due to low level follicle stimulation, it is possible that oestrus swellings will continue throughout the bout. Depending on the individual, swellings may also only appear after a few months. If signs of oestrus do occur, check that the implant is still in place and the date the implant was inserted. In some cases, the dose may need to be increased to completely eliminate sexual swellings. Implanon is designed to be fully reversible however, we have no records of reversals in this species on the database. We would recommend removing all implants to facilitate reversals, so they should be placed in locations with thinner skin e.g. inner arm, inner thigh, umbilical region. General side effects include increased appetite and weight gain. Apart from continued oestrus swellings, weight gain is another possible side effect of Implanon.

Birth control pills: BC pills are available in different dose formulations (e.g 21 days with 7 days of placebo to allow menstruation to 90 days before the placebo week). Treatment can begin at any time throughout the female's cycle however, the pill may not be effective in the first month of treatment if it begins close to the time of ovulation, it is therefore recommended to separate the sexes for approximately 2 weeks. Signs of oestrus can occur if you leave time for the 7 day placebo however this week is not necessary. BC pills are designed to be fully reversible however, the time of reversal can vary between individuals, and we do not have any records of reversals in this species although they have been documented in a number of primate species. A side effect of the pill is possible weight gain and some antibiotics (e.g rimfampicin, ampicillin, doxycycline) may make the pill less effective. Birth control pills have been used to prevent the stimulation phase and as supplementary contraception when males have been contracepted.

If you would like any more information on any of these products, please see our product information sheets available on our website at www.egzac.org/Documents.aspx