



Animal name: Striped hyena (*Hyaena hyaena*)

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We would highly encourage any institutions using contraception in their animals to assess the efficacy and safety of the bout through hormonal, and behavioural monitoring. If you would like more information on how to do this please contact EGZAC.

Contraceptive methods	GnRH agonist (implant)	GnRH agonist (injection)	Progestagen (implants)	Progestagen (injection)	Progestagen (injection)	Surgical/Permanent
Contraceptive Product:	Deslorelin acetate	Luprolide acetate	Etonogestrel 68 mg	medroxyprogesterone acetate;	proligestrone 100mg/ml	
Commercial Name:	Suprelorin ®	Lupron ®	Implanon® Nexplanon®	Depo-Provera®, Depo-Progevera®	Delvosteron®	
Product Availability:	4.7mg ('Suprelorin 6') and 9.4 mg ('Suprelorin 12') widely available through veterinary drug distributors in the EU.	Luprolide acetate licenced for human use	Manufactured by Bayer Schering Pharma AG. Available through human drug distributors	Manufactured by Pfizer. Widely available throughout Europe through human drug distributors.	Manufactured by MSD animal Health UK, Intervet Europe. Licensed for use in female dogs, cats, and ferrets; available through veterinary distributors.	N/A
Restrictions and/or permit required by Importing Country:	EGZAC recommends: always check with your local licencing authority	Data deficient	EGZAC recommends: always check with your local licencing authority	EGZAC recommends: always check with your local licencing authority	EGZAC recommends: always check with your local licencing authority	N/A
Mechanism of action:	GnRH agonist suppress the reproductive endocrine system, preventing production of pituitary and gonadal hormones. As an agonist of the GnRH initially stimulates the reproductive system -which can result in oestrus and ovulation in females or temporary enhancement of testosterone and spermatogenesis in males- therefore additional contraception needed during this time. Please see below and refer to Deslorelin datasheet for detailed information	GnRH agonist suppress the reproductive endocrine system, preventing production of pituitary and gonadal hormones	Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation	Anti-estrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation	Anti-estrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation	Castration and Ovariohysterectomy/ovariectomy - recommended Permanent contraception by surgical gonadectomy, with similar side effects to those in domestic species - weight gain, loss of secondary sex characteristics Vasectomy - Caution Surgical procedure in which the ductus deferens are cut, tied, cauterized, or otherwise interrupted. Genrally considered irreversible though reversible techniques have been successful in certain species. Vasectomy of males will not prevent potential adverse effects to females from prolonged, cyclic exposure to endogenous steroids associated with the obligate hormonal pseudo-pregnancy that follows ovulation in most hyaenids. Endogenous steroids and steroid contraceptives cause similar side effects.
Insertion/Placement:	Sub-cutaneous, in a place where it can be easily detected or seen for removal at a later date (i.e. upper inner arm); refer Suprelorin fact sheet for effective method of implant placement (tunnellisation)	Injectable	Intramuscular or subcutaneous. EGZAC recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Injectable intramuscular	Injectable subcutaneously - do not inject intradermally or into subcutaneous fat or scar tissue	Surgical
Females	RECOMMENDED	Data deficient	Not recommended	Not recommended	Not recommended	Ovariohysterectomy recommended
Dose	GnRH agonists are considered the safest reversible contraceptives, but dosages and duration of efficacy are not well established for all species; side effects are generally similar to those associated with gonadectomy, especially the potential for weight gain unless diet is controlled. Dosages and duration of efficacy have not been well established for exotic hyaenid species. As a guide: 3-4 x 4.7 mg for a minimum of 6 months; 3-4 x 9.4 mg for a minimum of 12 months. Please contact EGZAC for specific dosage information.					

Latency to effectiveness:	3 weeks average as GnRH agonist initially stimulates the reproductive system- please refer to Deslorelin datasheet on this website for detailed information - separation of the sexes or additional contraception is needed during this time in order to suppress the initial stimulation phase (see product data sheet. ~2-5mg/kg Megestrol acetate pills /Ovarid® daily 7 days before and 8 days after has been used to suppress initial stimulation phase). Treatment MUST commence when the female is in anoestrus.					
Oestrus cycles during contraceptive treatment:	Initial oestrus and ovulation (during the 3 weeks of stimulation) may occur and then no oestrus cycle. To suppress the initial oestrus and ovulation with the concomitant progesterone production and the associated deleterious effects of this you MUST follow the megestrol acetate protocol mentioned above.					
Use during pregnancy:	Not recommended		Progestins should not be used in pregnant animals, since they may suppress uterine contractions necessary for normal parturition. Thus, progestins should only be administered to females CONFIRMED non-pregnant.			
Use during lactation:	No contraindications once lactation established					
Use in prepubertals or juveniles:	Data deficient. Deslorelin suppresses gonadal steroids; its use may delay epiphyseal closure of the long bones, resulting in taller individuals, similar to the effects of pre-pubertal spaying and neutering in domestic cats and lions. GnRH agonist use in prepubertal domestic cats was followed by reproductive cycles after treatment ceased however, species differences may occur.					
Use in seasonal breeders:	Data deficient. Should start at least 1 month prior the breeding season. In females, GnRH agonists can induce estrus and ovulation even during the non-breeding season in some taxa					
Duration	Duration of efficacy has not been well established as a guide: 4.7 mg implants will suppress for a MINIMUM of 6 months; 9.4mg will be effective for a MINIMUM of 12months. The average duration of efficacy however is ~1 year for 4.7mg and ~2 years for 9.4mg. Individual variation occurs but durations tends to be regular for a particular individual's contraceptive bout.					
Reversibility	Deslorelin is generally considered reversible although we do not currently have any records of reversal in this species. We currently have three spotted hyena females in our system who have been allowed to breed however, none have yet conceived three years after their implant was inserted. Duration to reversibility is extremely variable. Removal of implant is considered to aid reversibility.					Not reversible

Effects on Behaviour	Similar to those seen with gonadectomy but reversible.					
Effects on sexual physical characteristics	Similar to ovariectomy but should be reversible. Weight gain has also been observed.	Some dichromatic species may change colour	Some signs of oestrus might occur. Ovulation may also occur even though pregnancy does not ensue.			
Males	Data deficient	Data deficient	Not recommended	Not recommended	Not recommended	Vasectomy
Dose	Data deficient. Generally not used for contraception in males as effectiveness is harder to monitor (ensuring continued absence of sperm requires regular ejaculate examination). It can, however, be used to ameliorate aggression in males of some species, but higher doses than in females are required (~ double). In general, 4x 4.7mg implants are recommended for a MINIMUM of 6 months, and 4x 9.4mg implants are recommended for a MINIMUM duration of 12 months. Please contact EGZAC for specific dosage instructions.					N/A
Latency to effectiveness:	Depending on the species there may be fertile sperm present in vas deferens for 6-8 weeks post treatment or even longer. Testosterone decreases after 3-4 weeks but sperm can stay fertile for many weeks after. Research in black flying foxes shows reduced sperm motility after 1 month and aspermic ejaculations after 5 months.					Post-vasectomy allow 6-8 weeks post surgery to ensure no viable sperm is in the ejaculate. Keen sexes apart during this period or contracept the females
Use in prepubertals or juveniles:	Data deficient in this group, see product information sheet. Deslorelin suppresses gonadal steroids, its use may delay epiphyseal closure of the long bones, resulting in taller individuals, similar to the effects of pre-pubertal spaying and neutering in domestic cats. GnRH agonist use in prepubertal domestic cats was followed by reproductive cycles after treatment ceased. However, species differences may occur. There appear not to be any such problems in cheetahs.					
Use in seasonal breeders:	Data deficient. In males, GnRH agonists can transiently stimulate testosterone production even during the non-breeding season. Treatment should begin more than two months prior to the anticipated breeding season to prevent initiation of spermatogenesis, because it appears that suppression of sperm production is more easily accomplished before it has commenced.					
Duration and Reversibility	Duration of efficacy has not been well established as a guide: 4.7 mg implants will suppress for a MINIMUM of 6 months; 9.4mg will be effective for a MINIMUM of 12months. Deslorelin is considered reversible although this has not yet been demonstrated in this species. We would recommend removal of the implant to aid reversal time, therefore we would advise placing the implant in a location that facilitates removal e.g. the inner thigh and umbilical areas.					Vasectomy is generally considered irreversible however, some successful reversible techniques have been used in certain species, but no publications in exotic hyaenids.
Effects on Behaviour	Testosterone related aggression is likely to decrease. Data deficient in this group, see product information sheet.					Vasectomy does not affect male behaviour.

