

Animal name: Felidae

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We would recommend assessing any contraceptive bout with behavioural and hormone monitoring. For more information on this, please contact contraception@chesterzoo.org

Contraceptive methods	GnRH agonist (implant) RECOMMENDED	GnRH agonist (injection)	GnRH vaccine (injection)	Progestagen (injection) CAUTION	Progestagen (oral) CAUTION	Progestagen (injection) NOT RECOMMENDED	Progestagen (implant) NOT RECOMMENDED	Progestagen (implant) NOT RECOMMENDED	Surgical/Permanent
Contraceptive Product:	Deslorelin acetate	Luprolide acetate	GnRH protein conjugate	Medroxyprogesterone acetate 150 mg/ml	Megestrol acetate	Proligestrone 100mg/ml	Levonorgestrel 2x 75mg	Etonogestrel 68 mg	N/A
Commercial Name:	Suprelorin®	Lupron®	Improvac®	Depo-Provera®, Depo-Progevera®, Cenavul®	Ovarid/Megace®	Delvosteron® Covinan®	Jadelle®	Implanon® Nexplanon®	N/A
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.	Available through veterinary drug distributors.	Manufactured by Pfizer. Widely available throughout Europe through human drug distributors.	Manufactured by Virbac, available through veterinary distributors.	Manufactured by MSD animal Health UK, Intervet Europe. Licensed for use in female dogs, cats, and ferrets; available through veterinary distributors.	Manufactured by Organon. Available through human drug distributors.	Manufactured by Bayer Schering Pharma AG. Available through human drug distributors.	N/A
Restrictions and/or permit required by Importing Country:	The EAZA RMG recommends: always check with your local licencing authority.	Data deficient.	Widely available throughout European countries. The EAZA RMG recommends: always check with your local licencing authority	The EAZA RMG recommends: always check with your local licencing authority.	The EAZA RMG recommends: always check with your local licencing authority.	The EAZA RMG recommends: always check with your local licencing authority.	The EAZA RMG recommends: always check with your local licencing authority.	The EAZA RMG recommends: always check with your local licencing authority.	N/A
Mechanism of action:	GnRH agonist suppresses the reproductive endocrine system, preventing production of pituitary and gonadal hormones. As an agonist of the GnRH, it 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 is needed during this time. Please, see below and refer to Deslorelin datasheet in our Product Recommendations section for detailed information.	GnRH agonist suppresses the reproductive endocrine system, preventing production of pituitary and gonadal hormones.	Production of anti-GnRH antibodies by the immune system, neutralising endogenous GnRH activity. This results in a reduction of FSH and LH production by the anterior pituitary and, ultimately, in a reduction of ovarian follicular development and /or inhibition of testosterone secretion from the testes and spermatogenesis.	Anti-oestrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation. In felids, progestagen contraceptives are associated with progressive uterine growth and degeneration (i.e. endometrial hyperplasia) that can result in infertility, infection, and sometimes uterine neoplasia. Mammary tissue stimulation due to long-term progestagen exposure also can result in mammary gland neoplasia.	Anti-oestrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation. In felids, progestagen contraceptives are associated with progressive uterine growth and degeneration (i.e. endometrial hyperplasia) that can result in infertility, infection, and sometimes uterine neoplasia; mammary tissue stimulation due to long-term progestagen exposure also can result in mammary gland neoplasia.	Anti-oestrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation.	Anti-oestrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation.	Anti-oestrogenic activity. Interference with fertilization by thickening cervical mucus, interrupting gamete transport, disruption of implantation, inhibition of LH surge necessary for ovulation.	Castration: surgical removal of the testes. Vasectomy (caution): surgical procedure in which the ductus deferens are cut, tied, cauterized, or otherwise interrupted. Ovariohysterectomy: removal of one or both ovaries and the uterus. Ovariectomy: removal of both ovaries.
Insertion/Placement:	Subcutaneous, in a place where it can be easily detected or seen for removal at a later date (e.g. proximal medial aspect of forelimb or hindlimb; inner thigh; umbilical area, loose fleshy skin at base of pinna; side of neck). Refer to Suprelorin Product Recommendation sheet for effective method of implant placement (tunnelisation).	Injectable.	Injectable intramuscular or subcutaneously.	Injectable (intramuscular).	Orally (daily).	Injectable (subcutaneous - do not inject intradermally or into subcutaneous fat or scar tissue).	Intramuscular or subcutaneous. The EAZA RMG recommends subcutaneous, upper inner arm for visibility (aid for later removal).	Intramuscular or subcutaneous. The EAZA RMG recommends subcutaneous, upper inner arm for visibility (aid for later removal).	N/A
Females	RECOMMENDED	Data deficient	Data deficient	CAUTION - see side effect below	CAUTION - see side effects below	Not recommended	Not recommended	Not recommended	Ovariohysterectomy/ovariectomy - recommended
Dose:	Dosages and duration of efficacy are not well established for all species. Current dosing recommendations are a single implant for felids up to and including cheetah/leopard size; and 2 implants for the larger species. Most tiger subspecies should receive 2 implants unless overconditioned or very large ⁹ . 4.7mg implants are effective for a minimum of 6 months and 9.4mg for a minimum of 12 months. However, evidence from lions, leopards, tigers, and cheetah indicate that the average duration of efficacy however is about 1 year for 4.7mg and 2-3 years for the 9.4 implant ^{1,4,9} .		Data deficient. In lionesses, two injections of 600ug are given 5 weeks apart and boosters are usually administered every 4-6 months. Each dose should be split into two parts, injected on either side to achieve a better immune response. Doses for other species have not been well established.	2.5-5 mg/kg body weight every 2 months, no more than 2 consecutive seasons . If a progestin is used, treatment should only be short term, because of the increased likelihood of side effects with prolonged exposure.	2-5 mg/kg daily orally for seasonal breeders, no more than for 2 consecutive seasons or used to avoid the stimulation phase associated with GnRH implant (see GnRH recommendations).				N/A
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. 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® or oral birth control pills daily, 7 days before and 7 days after implantation has been used to suppress initial stimulation phase). If supplementation of the first bout is not possible, sexes should be separated to prevent pregnancy during this time. Note that this will not prevent any adverse effects of sustained elevations in progesterone during the stimulation phase, should ovulation occurs. Treatment MUST commence when the female is in anoestrus or dioestrus (i.e. non-pregnant luteal phase).		Latency to effectiveness can be up to 6 weeks, so separation of the sexes is recommended if possible.	If a progestin is used in felids, treatment should start well BEFORE any signs of prooestrus, since the elevated endogenous oestrogen can exacerbate side effects of the progestin.	If a progestin is used in felids, treatment should start well BEFORE any signs of prooestrus, since the elevated endogenous oestrogen can exacerbate side effects of the progestin.				Immediate.
Oestrous cycles during contraceptive treatment:	Initial oestrus and ovulation (during the 3 first weeks of stimulation) may occur and then cycling is suppressed. To avoid the initial oestrus and ovulation, the subsequent progesterone production, and the associated deleterious effects of this, you MUST follow the megestrol acetate protocol mentioned above.		Data deficient , but cycling should be suppressed.						
Use during pregnancy:	To date: not recommended.		Unknown.	Not recommended. Progestins should not be used in pregnant animals, since they may suppress natural signals and mechanisms necessary for normal parturition (e.g. uterine contractions). Thus, progestins should only be administered to females CONFIRMED non-pregnant.	Not recommended. Progestins should not be used in pregnant animals, since they may suppress natural signals and mechanisms necessary for normal parturition (e.g. uterine contractions). Thus, progestins should only be administered to females CONFIRMED non-pregnant.				
Use during lactation:	No contraindications once lactation established.		Unknown.						

<p>Side effects</p>	<p>Deslorelin first stimulates then suppresses oestrus in females. Species with induced ovulation (e.g., felids, some mustelids, and bears) may ovulate and become pseudo-pregnant (which also occurs in canids) when first treated. In males, initial stimulation may be accompanied by increased aggression or sexual interest. Oestrous behaviour or even copulation may occur during a transition phase near the end of the period of contraceptive efficacy. Pseudopregnancy, endometrial hyperplasia, and pyometra may be associated with the use of GnRH agonist as a result of high progesterone levels during the stimulation phase, after oestrus and ovulation induction. A more recently developed Suprelorin® (deslorelin) protocol using Ovarid® (megestrol acetate) to prevent the initial stimulation phase, followed by implant removal when reversal is desired, may be a safer contraceptive option.</p>		<p>Occasional swelling at the vaccination site - vaccination site abscess may occur. The EAZA RMG recommends always reading the manufacturer's data sheet.</p>	<p>In felids, progestagen contraceptives are associated with progressive uterine growth and degeneration (i.e. endometrial hyperplasia) that can result in infertility, infection, and sometimes uterine neoplasia. Mammary tissue stimulation due to long-term progestagen exposure also can result in mammary gland neoplasia. Risk of pseudopregnancy, endometrial hyperplasia, and pyometra increases with exposure to prolonged circulating progestagens.</p>	<p>Risk of pseudopregnancy, endometrial hyperplasia, and pyometra increases with exposure to prolonged circulating progestagens.</p>	<p>Risk of pseudopregnancy, endometrial hyperplasia, and pyometra increases with exposure to prolonged circulating progestagens.</p>	<p>Risk of pseudopregnancy, endometrial hyperplasia, and pyometra increases with exposure to prolonged circulating progestagens.</p>	<p>Risk of pseudopregnancy, endometrial hyperplasia, and pyometra increases with exposure to prolonged circulating progestagens.</p>	<p>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 felids. Endogenous steroids and steroid contraceptives cause similar side effects.</p>
<p>Warnings</p>	<p>Causes initial gonadal stimulation that MUST be suppressed to avoid negative effects of long-term exposure to progesterone (see above); correct administration is essential - see product information sheet.</p>		<p>It should be handled with extreme care to avoid handler accidents. The EAZA RMG recommends always reading the manufacturer's data sheet.</p>	<p>SHOULD NOT BE USED PRIOR TO GnRH IMPLANT PLACEMENT. Depo-Provera® should not replace megestrol acetate, because its initial high levels and prolonged release can interfere with Suprelorin® efficacy.</p>					<p>Precautions - Vasectomy is not recommended for species with induced ovulation because mating will result in female pseudopregnancies with prolonged periods of progesterone elevation, which can cause pathology of uterine and mammary tissue. Endogenous progesterone and progestin contraceptives cause similar disease. We would strongly discourage tubal ligation in felidae due to the associated risk of developing uterine pathology.</p>

Reporting Requirements: In order to increase our knowledge of the efficacy of contraception methods in the felidae family it is recommended that all individuals on contraception be reported to the EAZA RMG.

References:

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- 9) Guthrie, A, Strike, T, Patterson, S, Walker, C, Cowl, V, Franklin, AD, Powell, DM. (2021) The past, present and future of hormonal contraceptive use in managed captive female tiger populations with a focus on the current use of deslorelin acetate. *Zoo Biology*, 1-14. doi: 10.1002/zoo.21601.
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- 11) Cecchetto M, Salata P, Baldan A, Milani C, Mollo A, Fontaine C, et al. (2017) Postponement of puberty in queens treated with deslorelin. *J Feline Med Surg* . doi:10.1177/1098612X16688406.

Disclaimer: The EAZA RMG endeavours to provide correct and current information on contraception from various sources. As these are prescription only medicines it is the responsibility of the veterinarian to determine the dosage and best treatment for an individual.