EAZA RMG

EAZA Reproductive Management Group

Animal name: Rodrigues fruit bat (*Pteropus rodricensis*)

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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)	GnRH agonist (injection)	Progestagen (implants)	Progestagen (injection)	Progestagen (implant)	Progestagen (injection)	Surgical/Permanent
Contraceptive Product:	Deslorelin acetate	Luprolide acetate	Etonogestrel 68 mg	Medroxyprogesterone acetate	Levonorgestrel 2x 75mg	Proligestrone 100mg/ml	-
Commercial Name:	Suprelorin ®	Lupron ®	Implanon® Nexplanon®	Depo-Provera®, Depo-Progevera®	Norplant® Jadelle®	Delvosteron®	Castration or hysterectomy recommended
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 Organon. Available 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.	-
Restrictions and/or permit required by Importing Country:	The EAZA RMG recommends: always check with your local licencing authority	Data deficient	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 reccommends: always check with your local licencing authority	-
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	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/Hysterectomy recommended. Permanent contraception by surgical gonadectomy; likely side effects include weight gain, loss of secondary sex characteristics
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 (tunnelisation)	Injectable	Intramuscular or subcutaneous. The EAZA RMG recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Injectable intramuscular	Intramuscular or subcutaneous. The EAZA RMG recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	Injectable subcutaneously - do not inject intradermally or into subcutaneous fat or scar tissue	Surgical
Females		**Data deficient**			**Data deficient**	**Data deficient**	**Hysterectomy**
Dose	As a guide 1 implant should be used. 4.7mg is recommended for a **minimum** duration of 6 months and 9.4mg is recommended for a **minimum** duration of 12 months. Please contact the EAZA RMG for specific dosage advice.	There are various formulations available lasting from 1-6 months. Dosing information is not available; extrapolation from human literature is likely the best place to start. Please contact the EAZA RMG with specific dosage advice.	¼ - ½ an implant (0.068g) is recommended for successful contraception in this species.	As a guide 5 mg/kg BW every 45-90 days. Dosages in our database are incredibly variable, ranging from 4-7mg/kg BW. Please contact the EAZA RMG for specific dosage advice.	**Data deficient.** Recommended 2/3 rod, depending on species and weight. Doses not well established.	50mg/kg was effective in Egyptian fruit bats and effective for about 3 monhs	-
Latency to effectiveness:	Deslorelin will have a latency to effect of 3-4 weeks during which a stimulation of the reproductive system will occur. For this reason separation of both sexes is recommended for approximately 3-4 weeks. If you cannot separate the sexes, in order to suppress the initial stimulation phase, the first contraceptive bout must be supplemented with an oral progestagen such as megestrol acetate pills (Ovarid/Ovaban/Megace) or altrenogest (Regumate®) daily, 7 days before and 8 days after the implant is inserted.	3 weeks average as GnRH agonists initially stimulates the reproductive system- **please refer to Deslorelin datasheet for detailed information** - separation of the sexes OR supplemental contraception is recommended during this time (see product data sheet. Megestrol acetate pills daily 7 days before and 8 days after implant insertion have been used to suppress-stimulation phase. The dose for domestic dogs is 2mg/kg, but must be extrapolated for other taxa).	7-14 days, separate sexes for 7-14 days after the implant is inserted.	1-3 days post injection. However, if the cycle stage is not known then extra time must be allowed; therefore, separation of the sexes or alternative contraception should be used for at least 1 week. Oral progestagen such as megestrol acetate pills (Ovarid) or altrenogest (Regumate®) can be used for this purpose to supplement the contraceptive bout.	7-14 days, separate sexes for 7-14 days aftter the implant is inserted.	1-3 days post injection. However, if the cycle stage is not known then extra time must be allowed. therefore, separation of the sexes or alternative contraception should be used for at least 1 week	-
Oestrus cycles during contraceptive treatment:	Initial oestrus and ovulation (during the 3 weeks of stimulation) then down-regulation. To prevent the stimulation phase, the megestrol acetate protocol described above is recommended.	Initial oestrus and ovulation (during the 3 weeks of stimulation) then down-regulation. To prevent the stimulation phase, the megestrol acetate protocol described above is recommended.	Oestrus is inhibited	Oestrus is inhibited	Oestrus is inhibited	Oestrus is inhibited	-
Use during pregnancy:	**Data deficient.** Not recommended as may cause abortion	**Data deficient.** Not recommended as may cause abortion	Progestagens are not recommended in pregnant animals because of the possibility of prolonged gestation leading to dystocia, stillbirth and abortion in some species, although the effect may depend on dose. Progestins should only be administered to females **CONFIRMED** non-pregnant.	Not recommended for use in pregnant animals because of the risk of prolonged gestation, stillbirth or abortion, etc. in some species, although the effect may depend on dose. Progestins should only be administered to females **CONFIRMED** non-pregnant.	Progestins should not be used in pregnant animals, since they may suppress uterine contractions necessary for normal parturition. Progestins should only be administered to females **CONFIRMED** non-pregnant.	Progestagens are not recommended in pregnant animals becauze of possibility of prolonged gestation, stillbirth, abortion etc in some species. Although the effect may depend on dose.	-
Use during lactation:	No contraindications once lactation established; however, treatment during pregnancy may impede proper mammary development.	No contraindications once lactation established; however, treatment during pregnancy may impede proper mammary development.	Considered safe for nursing; Does not affect lactation, but etonogestrel is excreted in milk.	Considered safe for nursing infant.	Considered safe for nursing; Does not affect lactation, but levonorgestrel is excreted in milk.	Considered safe for nursing infant	-
Use in prepubertals or juveniles:	**Data deficient** in this group, see product information sheet. Deslorelin may prevent epiphyseal closure of the long bones, resulting in taller individuals.	**Data deficient.** Lupron® may prevent epiphyseal closure of the long bones, resulting in taller individuals.	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects on fertility are not known.	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects on fertility are not known.	**Data deficient**	**Data deficient**	-
Use in seasonal breeders:	-	-	-	-	-	-	-
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	Lupron® is available in various formulations lasting from 1 to 6 months, but because the release of hormone from the depot formulation varies by individual, actual duration of efficacy can vary considerably.	The duration of this product can last 2.5 to 3 years.	Dose dependant: 45-90 days in general. However, effects could last 1-2 years in some individuals.	Jadelle is designed to last between 2-3 years, but this depends on the individual.	Dose dependant however, 30 days in general.	Permanent
Reversibility	Deslorelin is designed to be fully reversible and we have two records of reversal in chiroptera in which time to offspring birth ranged between 1-2 years after the implant was inserted. It is unknown if the implants were removed; removal of implant may hasten time to reversal. Implants should therefore be placed in locations with thinner skin e.g. in the arm although this may increase the risk of implant loss in chiroptera.	Lupron® is designed to be fully reversible however there are no current cases of reversal in bovidae.	Implanon is designed to be fully reversible however we do not have any records of reversal in this species. Removal of the implant to aid reversibility is recommended; implants should therefore be placed in locations with thinner skin e.g. in the arm although this may increase the risk of implant loss in chiroptera.	Designed to be fully reversible but individual variations can occur.	Jadelle is designed to be fully reversible, however time to reversal can vary.	Delvosteron is designed to be fully reversible, short acting, however time to reversal can vary	-
Effects on Behaviour	**Data deficient**	**Data deficient**	**Data deficient;** because progestagens can suppress ovulation it can be expected that courtship and mating behaviour will be affected in some way. Further research in the subject is necessary	Effects on behaviour have not been studied; there may be individual variation in response. Medroxyprogesterone acetate binds readily to androgen receptors and are antiestrogenic; females may experience male-like qualities (increased aggression , development of male secondary sex characteristics, etc.) Further research in the subject is necessary.	Effects on behaviour have not been studied, every individual may react differently. Because it binds readily to androgen receptors and is antiestrogenic, females may experience male-like qualities (increased aggression , development of male secondary sex characteristics, etc.) Further research in the subject is necessary.		-

Effects on sexual physical characteristics	Similar to gonadectomy. GnRH agonists may cause the suppression of physical secondary sexual characteristics.	GnRH agonists may cause the suppression of physical secondary sexual characteristics.		Because Medroxyprogesterone acetate binds readily to androgen receptors and is antiestrogenic, females may experience male-like qualities (increased aggression, development of male secondary sex characteristics, etc.)	**Data deficient**	**Data deficient**	-
Males	**Recommended**	**Data deficient - effects should be similar as deslorelin**	**Not recommended**	**Not recommended**	**Not recommended**	**Not recommended**	**Castration**
Dose	**Data deficient** in this species, but data from other species suggest that 1 implant x 4.7 mg for a **minimum** of 6 months; 1 x 9.4 mg for a **minimum** of 12 months should provide effective contraception.	-	-	-			-
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.	-	-	-			Depending on species and individual, perhaps as long as 2 months or more
Use in prepubertals or juveniles:	**Data deficient** in this group, see product information sheet	-	-	-			**Data deficient**
Use in seasonal breeders:	-	-	-	-			-
Duration and Reversibility	Deslorelin is generally considered reversible. We currently have 1 record in our database of an individual siring offspring just under three years after the was implanted with a 1x 4.7mg implant. No information on when mate access was allowed at it is unknown whether the implant was removed. In black flying foxes, motile sperm was first seen in sperm 13 months after treatment with 4.7 mg. Variable flying foxes showed improvement in sperm motility after 3-4 months post implant for one male. Removal of the implant to aid reversibility is recommended; implants should therefore be placed in locations with thinner skin e.g. in the arm although this may increase the risk of implant loss in chiroptera.	-	-	-			The procedure should not be used in males likely to be recommended for subsequent breeding as reversal is unlikely
Effects on Behaviour	Testosterone related aggression is likely to decrease. **Data deficient** in this group, see product information sheet.	-	-	-			Castration will alter male sexual behaviour and may alter agression if related to male hormones
Effects on sexual physical characteristics	**Data deficient** in this taxon. Likely that body size may decrease, decrease testicular size, feminisation of males becoming size (weight) of females. Genital glands may decrease, altering odour.	-	-	-			Castration results in loss of secondary sex characteristics
General:							
Side effects	In general weight gain as would be seen with ovariectomy or castration. Increased appetite will result in weight gain, especially in females. Males may lose muscle and overall weight if not replaced by fat. Males may become the size (weight) of females. The EAZA RMG recommends always reading the manufacturer's data sheet.	In general weight gain as would be seen with ovariectomy or castration. Increased appetite will result in weight gain, especially in females. Males may lose muscle and overall weight if not replaced by fat. Males may become the size (weight) of females. Some dichromatic species may change colour. The EAZA RMG recommends always reading the manufacturer's data sheet.		Possible deleterious effects on the endometrium following prolonged use. Progestins are likely to cause weight gain in all species. In the human literature, Depo-Provera® has been linked to mood changes. Because it binds readily to androgen receptors and is anti-estrogenic, females may experience masculinisation (increased aggression, development of male secondary sex characteristics, in dichromatic species, aspects of male colouration, etc.) The EAZA RMG recommends always reading the manufacturer's data sheet.	Weight gain (progestins general)	Weight gain (progestins general)	-
Warnings	Causes initial gonadal stimulation. Duration may be reduced if implant is broken. Do not cut the implant. If implant is not completely removed at the end of treatment, residual circulating levels of deslorelin may affect time to reversal. **Should not be used in conjunction with Depo-Provera.**	Causes initial gonadal stimulation		Interaction with other drugs are known to occur and may influence protection against pregnancy. In some diabetic animals progestagens has led to an increased insulin requirement, it is advised that the product be used with caution in diabetic animals and that urine glucose levels are carefully monitored during the month after dosing. The EAZA RMG recommends always reading the manufacturer's data sheet.	The EAZA RMG recommends always reading the manufacturer's data sheet	The EAZA RMG recommends always reading the manufacturer's data sheet	The procedure should always be carried out under sterile conditions, potential for infection of the surgical wound.
Reporting Requirements: In order to increase our knowledge of the efficacy of contraception methods in chiroptera it is recommended that all individuals on contraception be reported to the EAZA RMG.							

References:

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