

Giraffidae



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Contraceptive methods:	GnRH agonist (implant)	GnRH agonist (injection)	GnRH Vaccine	Progestagen (injection)	Progestagen implant	Progestagen (oral)	P2P vaccine	Surgical/ Permanent
Contraceptive Product:	Deslorelin acetate	Luprolide acetate	GnRH protein conjugate	Depot medroxyprogesterone acetate	Etonogestrel	Altrenogest	P2P vaccine consists glycoproteins proteins derived from the pig zona pellucida capsule emulsified with Freund's modified complete adjuvant for primary vaccination and Freund's incomplete adjuvant for boosters.	N/A
Commercial Name:	Suprelorin®	Lupron®	Improvac®	Depo-Provera®, Depo-Progevera®,	Implanon	Regu-mate®	Porcine Zona Pellucida	Vasectomy
Product Availability:	4.7mg (Suprelorin 6) and 9.4 mg (Suprelorin 12) widely available through veterinary drug distributors in the EU. 9.4 mg (Suprelorin 12) is also available through Virbac, Australia.	Luprolide acetate licenced for human use	Available through veterinary drug distributors.	Manufactured by Pfizer. Widely available throughout Europe through human drug distributors.	Manufactured by Merck. Widely available throughout Europe through human drug distributors.	Regu-mate® Equine 2.2ml/mg oral solution and Regu-mate® Porcine 0.4% w/v oral solution widely available through veterinary drug distributors.	Not available in Europe. Can be imported from the USA. WWW.SCCPZP.ORG	N/A
Restrictions and/or permit required by Importing Country:	EGZAC recommends: always check with your local licencing authority	Data deficient	Current knowledge: widely available throughout European countries. EGZAC recommends: always check with your local licencing authority about extra-label use	EGZAC recommends: always check with your local licencing authority	EGZAC recommends: always check with your local licencing authority	EGZA recommends: always checking with your local licencing authority	Veterinary import permit required the EU and other countries. EGZAC recommends always checking with local licencing/veterinary authorities	N/A
Mechanism of action:	GnRH agonists suppress the reproductive endocrine system by preventing production and release of pituitary LH and FSH. As an analogue of 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 may be needed during this period.	GnRH agonists suppress the reproductive endocrine system by preventing production and release of pituitary LH and FSH. As an analogue of 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 may be needed during this period.	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.	Progestagens inhibit GnRH release and therefore the LH and FSH release, thus inhibiting follicular development and ovulation. It mimics endogenous progesterone.	Progestagens inhibit GnRH release and therefore the LH and FSH release, thus inhibiting follicular development and ovulation. It mimics endogenous progesterone.	Progestagens inhibit GnRH release and therefore the LH and FSH release, thus inhibiting follicular development and ovulation. It mimics endogenous progesterone.	The P2P antibodies interfere with fertilisation by binding to the ZP glycoprotein receptors that surround the egg of the vaccinated female, blocking the binding and subsequent penetration of sperm.	Surgical procedure in which the vasa deferentia are cut, tied, cauterized, or otherwise interrupted
Insertion/Placement:	Sub-cutaneous, in a place where it can be easily detected or seen for removal at a later date; refer Suprelorin fact sheet for effective method of implant placement (tunnelisation)	Injectable: intramuscular or subcutaneous	Injectable intramuscular or subcutaneously	Injectable intramuscular	Subcutaneous implant	Administered orally in feed or dosed with a syringe. Gloves must be worn when administering Regu-mate® (absorption through the skin can cause disruption to the menstrual cycle and prolongation of pregnancies in humans).	Injectable Intramuscular	Surgical
Females								
Dose	As a guide for giraffes: 4 x 4.7 mg for a 6 month duration or 4 x 9.4 mg for a 12 month duration - however 5 implants have been used if the female is not completely suppressed. DO NOT CUT IMPLANTS	There are various formulations from 1-6 months. Dosing information is not available; extrapolation from human literature is likely the best place to start.	Two injections of 400ug are given 35 days apart and boosters are usually administered every 4 months/yearly, although duration can vary between species.	The recommended dose is 450mg every 45-90 days (if oestrus occurs, increase by increments of 100 mg). However most repeat treatments are carried out every 30-45 days.	3 to 5 implants 68 mg per implant) every two years.	Regu-mate® Equine: 0.044 mg/kg daily. However no data has been reported regarding efficacy.	~ 100 µg of protein in 0.5 ml of diluent (see instructions) emulsified with Freund's complete modified (primary) or incomplete adjuvants (boosters). Administered by deep intramuscular injection. The first booster should be given at least 3 weeks before expected breeding or pairing of sexes. Subsequent boosters should be administered every 8 months.	N/A
Latency to effectiveness:	3 weeks average as deslorelin initially stimulates the reproductive system - please refer to Deslorelin datasheet for detailed information - separation of the sexes OR additional contraception needed during this stimulatory phase (see product data sheet ~2mg/kg Megestrol acetate pills or altrenogest (Regumate®) daily, 7 days before and 8 days after can be used to suppress the stimulation phase).	3 weeks average as GnRH analogues initially stimulate the reproductive system. Separation of the sexes OR additional contraception needed during this stimulatory phase (~2mg/kg Megestrol acetate pills or altrenogest (Regumate®) daily, 7 days before and 8 days after can be used to suppress the stimulation phase).	Unknown for most species. In domestic mares percentage anoestrus after primary and first booster is 80 and 100% respectively.	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. Alternative contraception can include Oral Progestagen such as megestrol acetate pills (Ovarid) or altrenogest (Regumate®).	Up to 1 day when inserted on day 1 to 5 of the oestrous cycle	It has been demonstrated that 95% of mares will be suppressed within 3 days. However seperation or other contraceptive methods should be used for 7-14 days after the contraception is administered. Alternative contraception can include Oral Progestagen such as megestrol acetate pills (Ovarid).	2-3 weeks after the last vaccination during year 1 (primary course of vaccination 2 injections 2-4 weeks apart, preferable 3 injections). Separation of the sexes is advised from the beginning of the initial vaccination course until at least 2 weeks after the last injection during the first year.	N/A

Oestrus cycles during contraceptive treatment:	Initial oestrus and ovulation (during the stimulatory phase) followed by a period of anoestrus. To suppress the initial oestrus and ovulation you can follow the megestrol acetate/altrenogest protocol mentioned above.	Initial oestrus and ovulation (during the stimulatory phase) followed by a period of anoestrus. To suppress the initial oestrus and ovulation you can follow the megestrol acetate protocol mentioned above.	Unknown but it should be suppressed; highly successful at inducing anoestrus in domestic horses.	Oestrus behaviour may be observed. Ovulation and cycling can occur in adequately contracepted individuals (but is unlikely and the degree of suppression is dose dependent).	Unlikely to occur	Ovulation and cycling can occur in adequately contracepted individuals (but is unlikely and the degree of suppression is dose dependent).	PZP normally does not interfere with follicular development and ovulation which means that females should cycle normally	N/A
Use during pregnancy:	Not recommended, can cause abortion	Not recommended	Unknown	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. Progestagens in late pregnancy seem not to interfere with parturition in primates, but this is a taxon-specific phenomenon. Lemuridae treated with depoprovera in the first of second to trimester of pregnancy had a successful parturations.	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. Progestagens in late pregnancy seem not to interfere with parturition in primates, but this is a taxon-specific phenomenon. Lemuridae treated with depoprovera in the first of second to trimester of pregnancy had a successful parturations.	Progestagens are not recommended in pregnant animals because of the possibility of prolonged gestation, stillbirth, abortion, etc. in some species, although the effect may depend on dose. An advantage of oral preparation is that it can be discontinued in the last trimester.	Does not interrupt pregnancy or affect fetus	N/A
Use during lactation:	No known contraindications once lactation has been established.	No contraindications once lactation established	Unknown	Considered safe for nursing infant.	Considered safe for nursing infant.	Considered safe for nursing infant.	No known contraindications	N/A
Use in prepubertals or juveniles:	Because deslorelin suppresses gonadal steroid output downstream, 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 dogs and cats. GnRH agonist use in prepubertal domestic cats and dogs (Kaya et al. 2015) was followed by reproductive cycles after treatment ceased. However, species differences may occur.	Data deficient in this group but likely to have a similar effect to deslorelin	Should be similar to deslorelin	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.	The use of synthetic progestagens in pre-pubertals or juveniles has not been fully assessed. Possible long-term effects	PZP-treated prepubertal white-tailed deer and feral horses were fertile as adults. Not associated with side effects in elephants. But there is no data for other species	N/A
Use in seasonal breeders:	N/A	N/A	N/A	N/A	N/A	N/A	Can be used in seasonal breeders but initial treatment and annual boosters should be carried out 2 and 1 months before the start of the breeding season respectively.	N/A
Duration	In male domestic dogs 4.7 mg and 9.4mg implants are licensed for 6 and 12 months respectively. Responses may vary widely between individuals. Down-regulation but not duration can be increased by increasing the number of implants.	Data deficient	Unknown for most of species. Improvac® generates short lived antibodies in the domestic pig (after 7-8 weeks following second injection antibodies start to decline). In mares it lasts one to two seasons after the first booster	Dose dependant: 45-90 days in general. However, effects could last 1-2 years in some individuals.	2.5 to 3 years.	Duration of effect is 1-3 days and must be administered daily as long as contraception is required. However latency to cycling and conception can vary between individuals.	Duration is related to the antibody titre the persistence of which varies according to species. Boosters are recommended at 6-month intervals to maintain contraception.	N/A
Reversibility	There is currently one case of a reversal. The female, treated once with 2x9.4mg, conceived 3 years later. Responses may vary widely between individuals. To increase the chance of reversibility, place the implant in such a way that facilitates removal.	Data deficient	Improvac is NOT designed to be reversible, although reversibility has been reported in white-tailed deer. Short lived antibodies. There are no cases of reversibility in this species. However, studies have shown reversibility in equids within a two year period.	Designed to be fully reversible and this has been demonstrated in this species although variations can occur. Individuals have been reported as successfully conceiving from 6 months to over 5 years after their final injection	Implanon is designed to be fully reversible however there are no cases of its use or reversibility in the Giraffidae family.	Designed to be fully reversible although variations can occur. However no reversals have been recorded in the giraffidae family.	Designed to be fully reversible however it has not been demonstrated in this species. Treatment for over 5 years has been associated with ovarian failure in some species. The possibility of ovarian damage makes this method unsuitable for animals that are valuable for captive breeding programmes or where reversibility is important.	N/A
Effects on Behaviour	Data deficient	Data deficient	Similar to surgical castration but short-acting (duration of antibody effect). No oestrus behaviour in mares.	Effects on behaviour have not been studied, every individual may react differently. Because it binds readily to androgen receptors and is anti-oestrogenic, females may experience male-like qualities (increased aggression, development of male secondary sex characteristics, etc). Further research is necessary.	Effects on behaviour have not been studied, every individual may react differently. Because it binds readily to androgen receptors and is anti-oestrogenic, females may experience male-like qualities (increased aggression, development of male secondary sex characteristics, etc). Further research is necessary.	Effects on behaviour have not been studied and individuals may react differently. Because it binds readily to androgen receptors and is anti-oestrogenic, females may experience male-like characteristics (increased aggression, development of male secondary sex characteristics, etc.) Further research is necessary.	Since usually the vaccine doesn't suppress oestrus cycles it has almost no effects on social behaviour.	N/A

Effects on sexual physical characteristics	Not reported.	Not reported.	Similar to surgical castration but short-acting (duration of antibody effect).	Because it binds readily to androgen receptors and is anti-oestrogenic, females may experience male-like characteristics (increased aggression, development of male secondary sex characteristics, etc).	Not reported	Not reported.	Not reported. No social/behavioural side effects noted in African elephants studied for 12 years	N/A
Males	Not Recommended			Not Recommended		Not Recommended	Not Recommended	
Dose	N/A	N/A The information should be the same as for deslorelin unless there is data available	3 ml for the primary and 3 ml for each booster	N/A	N/A	N/A	N/A	Surgical vasectomy
Latency to effectiveness:	N/A	N/A	Testosterone 6-9 weeks to down-regulate. Androgen-related behaviour much reduced after the first booster in giraffe males.	N/A	N/A	N/A	N/A	Sperm may survive in the vas deferens for 6-9 weeks
Use in prepubertals or juveniles:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Possible with no interruption of puberty
Use in seasonal breeders:	N/A	N/A	Unknown for fertility but should be done at least 10 weeks prior to pairing with a female. Giraffes are seasonal. African elephant bulls have only dead sperm 6 months after initial vaccination and no sperm after 12 months.	N/A	N/A	N/A	N/A	N/A
Duration and Reversibility	N/A	N/A	Improvac is NOT designed to be reversible , although reversibility has been reported in white-tailed deer. Short live antibodies. However there are no cases in this species. Duration in African elephant bulls is 5-6 months. There are indications that it may cause irreversible infertility in elephant bulls after repeated use for four or more years. Reversal of testosterone production in elephant bulls 5-6 months.	N/A	N/A	N/A	N/A	Permanent for practical purposes
Effects on Behaviour	N/A	N/A	Similar to surgical castration but short-acting (duration of antibody effect). Decrease of androgen-related aggressive behaviour due to down-regulation of testosterone synthesis.	N/A	N/A	N/A	N/A	None - androgens maintained
Effects on sexual physical characteristics	N/A	N/A	Similar to surgical castration but short-acting (duration of antibody effect).	N/A	N/A	N/A	N/A	None - androgens maintained
General:								
Side effects	In general weight gain as would be seen with ovariectomy or castration.	Effects on weight should be similar to those from 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.	Occasional swelling at the vaccination site need to inject deep intramuscular in elephants, horses and giraffes.	Possible weight gain. EGZAC recommends always reading the manufacturer's data sheet. One report of uterine pathology on post mortem in a giraffe treated for more than two years with Depo-Provera		Possible weight gain. EGZAC recommends always reading the manufacturer's data sheet.	Treatment for over 5 years has been associated with ovarian failure in some species (species differences). In some species the failure to conceive can result in longer than usual breeding season (aggression and social disruption)	Possible surgical complications. Epididymal spermatic granulomas seen in sheep and goats.
Warnings	Duration may be reduced if implant is broken. Do not cut the implant.	Should not be used in conjunction with Depo-Provera.	It should be handled with extreme care to avoid handler accidents. EGZAC recommends always reading the manufacturer's data. Do not treat females with previous or current history of endometritis/metritis. The use of progestins can exacerbate existing uterine inflammation/infection. sheet	Do not administer to pregnant females because gestation may be prolonged with potential lethal effects. EGZAC recommends always reading the manufacturer's data sheet.		Do not treat females with previous or current history of endometritis/metritis. The use of progestins can exacerbate existing uterine inflammation/infection.	The only adjuvants used with P2P are Freund's modified complete and incomplete adjuvants. The complete adjuvant does not cause false positive TB results. Injection site reactions are less than 0.05%. Following the initial treatments, boosters are required, using only Freund's Incomplete adjuvant.	Make sure that the vas deferens was in fact located. Confirm the presence of sperm in the excised portion.
Reporting Requirements: In order to increase our knowledge of the efficacy of contraception methods in the Giraffidae family it is recommended that all individuals on contraception be reported to EGZAC								
References: 1) 2)								
Disclaimer: EGZAC 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								