



**Animal name:** Pinnipedia

**Fact Sheet Compiled by:** Veronica Cowl

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**Fact Sheet Reviewed by:** EGZAC working group at the EGZAC Annual Meeting 2017

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

Contraceptive methods	GnRH agonist (implant)	GnRH agonist (injection)	Progestagen (implants)	Progestagen (implant)	Progestagen (injection)	Progestagen (injection)	GnRH Vaccine	PZP vaccine	Vasectomy
<b>Contraceptive Product:</b>	Deslorelin acetate	Luprolide acetate	Etonogestrel 68 mg	Levonorgestrel 2x 75mg	medroxyprogesterone acetate;	proligestrone 100mg/ml	GnRH protein conjugate	PZP vaccine main components are antigens derived from porcine zona pellucida glycoproteins and an adjuvant to stimulate the immune response ( Freund's modified complete adjuvant for primary vaccination and Freund's incomplete adjuvant for boosters).	
<b>Commercial Name:</b>	Suprelorin® (61 records)	Lupron® (12 records)	Implanon® Nexplanon® (0 records)	Jadelle®	Depo-Provera®, Depo-Progevera® (143 records)	Delvosteron® (1 record)	Improvac® 2ml dose contains 300 ug of GnRH analogue-protein conjugate	Porcine Zona Pellucida (38 records)	
<b>Product Availability:</b>	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 Organon. 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.	Available through veterinary drug distributors.	Not commercially available in Europe. Can be imported from the USA.	N/A
<b>Restrictions and/or permit required by Importing Country:</b>	EGZAC recommends: always check with your local licencing authority	<b>Data deficient</b>	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	EGZAC recommends: always check with your local licencing authority	Current knowledge: widely available throughout European countries. EGZAC recommends: always check with your local licencing authority	License required UK and France; all other countries unknown. EGZAC recommends always checking with local licencing authority	N/A
<b>Mechanism of action:</b>	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	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	Stimulates the 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.	The PZP 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 ductus deferens are cut, tied, cauterised, or otherwise interrupted
<b>Insertion/Placement:</b>	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. EGZAC recommends sub-cutaneous, upper inner arm for visibility (aid for later removal)	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	Injectable intramuscularly or subcutaneously	Injectable intramuscular	Surgical
<b>Females</b>	<b>Data deficient</b>	<b>Data deficient</b>	<b>Data deficient</b>	<b>Data deficient</b>	<b>Data deficient</b>	<b>Data deficient</b>	<b>Data deficient</b>	<b>Recommended</b>	<b>Not recommended</b>
<b>Dose</b>	We would recommend 2 implants in pinnipeds. 2x 4.7mg implants will have a <b>minimum</b> duration of 6 months, while 2x9.4mg implants will have a <b>minimum</b> duration of 12 months. Individual variation can occur.	<b>Data deficient.</b> Lupron is available in varying dosages from formulations lasting 1-6 months.	<b>Data deficient</b>	<b>Data deficient</b>	2mg/kg body weight or 200mg per animal is recommended for this family.	<b>Data deficient</b>	<b>Data deficient</b>	There is evidence of successful cocontraception in a Northern fur seal administered with 5 vaccines of 65µg over 2 years <sup>2</sup> .	

<b>Latency to effectiveness:</b>	Down regulation occurs approximately 3-4 weeks after first being administered with deslorelin, to suppress the initial stimulation phase megestrol acetate pills are recommended if separation of the sexes is not a possibility.	Data deficient	Data deficient	Data deficient	Latency to effectiveness is approximately 1-3 days and it is recommended that alternative contraception is used for 7 days if individuals cannot be separated during this time.	Data deficient	Data deficient	Data deficient. As a guide: 1 month after the second booster.	
<b>Oestrus cycles during contraceptive treatment:</b>	Data deficient. In theory, oestrus cycles should cease.	Data deficient. In theory, oestrus cycles should cease.	Data deficient	Data deficient	Data deficient	Data deficient	Data deficient	Not suppressed.	
<b>Use during pregnancy:</b>	Data deficient. Not recommended.	Data deficient. Not recommended.	Data deficient	Data deficient	Not recommended	Data deficient	Data deficient	Not contraindicated.	
<b>Use during lactation:</b>	Data deficient. Not recommended.	Data deficient. Not recommended.	Data deficient	Data deficient	Not recommended	Data deficient	Data deficient	Not contraindicated.	
<b>Use in prepubertals or juveniles:</b>	Data deficient. Not recommended.	Data deficient. Not recommended.	Data deficient	Data deficient	Not recommended	Data deficient	Data deficient	Data deficient.	
<b>Use in seasonal breeders:</b>	Data deficient. At least 2 months before the start of the breeding season.	Data deficient. At least 2 months before the start of the breeding season.	Data deficient	Data deficient	Data deficient. At least 1 month before the start of the breeding season.	Data deficient	Data deficient	Data deficient. Boosters should start at least 2 months before the start of the breeding season. The breeding season may be prolonged if PZP is administered.	
<b>Duration</b>	Data deficient. As a guide: 2x4.7 mg for a minimum of 6 months; 2x9.4 mg for a minimum of 12months.	Data deficient. Lupron is available in varying dosages from formulations lasting 1-6 months.	Data deficient	Data deficient	Data deficient. As a guide: 1-3 months however, the effect can be prolonged up to 2.5 years.	Data deficient	Data deficient	In grey seals, it has been demonstrated that the vaccine could be effective for >3 years <sup>1</sup> .	
<b>Reversibility</b>	Deslorelin is designed to be fully reversible however, we do not have any records of reversal in our database. To improve reversal the implants should be placed in a position that would allow greater chances of removal such as the loose skin where the flipper meets the body/axillary area	Data deficient.	Data deficient	Data deficient	Depo-Provera is designed to be fully reversible and we have one record of a northern fur seal giving birth to live young 2 years after being initially treated with Depo-Provera. Unfortunately we do not know what dose she was injected with. It must also be noted that the reversal time can be unpredictable varying between treated individuals.	Data deficient	Data deficient	We have one record of a reversal in a California seal who gave birth to live young 1.5 years after being treated with PZP. This female reversed after a course of 3 vaccinations.	
<b>Effects on Behaviour</b>	Data deficient.	Data deficient. Potential increases in aggression.	Data deficient	Data deficient	Females may experience increase in aggression.	Data deficient	Data deficient	In principle no effects.	
<b>Effects on sexual physical characteristics</b>	Females may experience weight gain due to an increase in appetite.	Data deficient. Potential loss of body mass.	Data deficient	Data deficient	Females may and develop male secondary sexual characteristics.	Data deficient	Data deficient	In principle no effects.	
<b>Males</b>	Data deficient	Data deficient	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended	Not Recommended	Data deficient
<b>Dose</b>	Data deficient	Data deficient. Lupron is available in varying dosages from formulations lasting 1-6 months.						Two injections of 300ug for California sea lions or 450ug for Patagonian sea lions are administered 4 weeks apart, followed by boosters every 6 months thereafter. In some individuals, you may need to re-vaccinate after 5 months.	
<b>Latency to effectiveness:</b>	Data deficient. Fertile sperm may be present in the vas deferens for 2 or more months following implantation, therefore it is advised to keep the sexes separated during this time or use additional contraception.	Data deficient.						At least 2 weeks following booster.	
<b>Use in prepubertals or juveniles:</b>	Data deficient. Not recommended.	Data deficient. Not recommended.						Data deficient	
<b>Use in seasonal breeders:</b>	Data deficient. At least 2 months before the start of the breeding season.	Data deficient. At least 2 months before the start of the breeding season.						Unknown, but if used should be done at least 6 weeks prior to the breeding season. There is experience of some European individuals that breed outside of the South	

<b>Duration and Reversibility</b>	Suprelorin is designed to be fully reversible, and we currently have two records of reversal in a harbour seal, and a northern fur seal. The fur seal sired offspring 3 years after being implanted with 3x4.7mg implants, while the harbor seal sired young 4 years after being implanted with 2x9.4mg implants. We would recommend removing the implants to aid reversal.	<b>Data deficient.</b> Lupron is available in varying dosages from formulations lasting 1-6 months.						Data deficient for most of species. Improvac has not been tested for reversibility by the manufacturer, however the antibodies are short-life and it is presumed to be reversible. There have been some cases of destruction of the testicular tissue in some male deer. It should be used with caution.	
<b>Effects on Behaviour</b>	<b>Data deficient.</b> Dominance may be affected.	<b>Data deficient.</b> Potential increases in aggression.						Similar to surgical castration but short-acting (duration of antibody effect). It may decrease male aggression due to downregulation of testosterone synthesis.	
<b>Effects on sexual physical characteristics</b>	<b>Data deficient.</b> Loss of secondary sexual characteristics should be expected.	<b>Data deficient.</b> Loss of secondary sexual characteristics should be expected.						Similar to surgical castration but short-acting (duration of antibody effect). Effect on secondary sexual characteristics (i.e. antler cycle might be affected)	
<b>General:</b>									
<b>Side effects</b>	<b>Data deficient</b>	<b>Data deficient</b>						Occasional swelling at the vaccination site - need to inject deep intramuscular, avoiding the blubber layer. Can cause severe stiffness if injected into the neck muscles. Side effects may include anorexia or low appetite following injection, inflammation at the vaccination site, which may lead to lameness. It is advised that you administer the contraception in a treatment site, away from the pool as a precaution, and wait 1-2 hours before allowing access to the pools again.	
<b>Warnings</b>	<b>Data deficient</b>	<b>Data deficient</b>						It should be handled with extreme care to avoid handler accidents. EGZAC recommends always reading the manufacturer's data sheet	
<b>Reporting Requirements:</b> in order to increase our knowledge of the efficacy of contraception methods in the Pinniped family it is recommended that all individuals on contraception be reported to EGZAC									
<b>References:</b>									
1) Birth control for grey seals. R.G Brown, W.C Kimmins, M Mezei, J.L Parsons, B Pohajdak, W.D Bowen (1996) <i>Nature</i> , 379, pp. 30-31									
2) Reproductive Hormone Levels within Captive Female Northern Fur Seals ( <i>Callorhinus ursinus</i> ) with and without Chemical Contraceptives. Shawn Larson and C. J. Cason(2007). <i>Aquatic Mammals</i> , 33(2), pp.195-201									
<b>Disclaimer:</b> 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									