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## Improvest®

### Product Type

Immunocontraceptive (anti-GnRH vaccine)

### Manufacturer

Zoetis

### Product information

The anti-GnRH vaccine, Improvest, is approved by the FDA for domestic male swine to prevent boar-taint. It may also be effective in females, but to date there are limited data. Its mechanism of action as a contraceptive is by inducing GnRH antibodies, which in turn block native GnRH from binding to pituitary receptors, which prevents production of pituitary (FSH and LH) and gonadal (estradiol and progesterone in females and testosterone in males) hormones. The observed effects should be similar to those following ovariectomy or castration. It may be effective in a wide range of taxa and may be especially useful in reproductive or behavioral management of male artiodactyls, for which there are no alternative products.

### Safety to humans

The manufacturer warns that accidental self-injection could affect reproductive physiology of both men and women and may adversely affect pregnancy. If self-injection is suspected, even in the case of needle stick during the use of the product (loaded syringe with product), contact the Poison Control Center (Toll free: 1-866-531-8896) and refer to the product insert for further information. Improvest's mode of action is immunological like a vaccine. The first exposure either by self-injection or needle stick may prime the immune system. The risk of a physiological effect is greater after a second or subsequent injection than after a first. After self-injection or needle stick injury, the injured individual should do not administer the product, and/or any other product with similar action, in the future.

### Dosing

Due to the limited data on use of this product in many species, initial treatment for most species consists of two 400µg injections 1 month apart, which adheres to the manufacturer's instructions for domestic swine. From the limited data on wildlife species, subsequent boosters are needed at minimum every 4-6 months. The following two exceptions apply:

- The recommendation for giraffes is two injections of 600µg given 35 days apart with boosters administered every 2 months.
- The recommendation for hippos is two injections of 600µg are given 35 days apart with boosters are usually administered every 2-6 months.

### Ordering

To obtain the product, call Zoetis at 1-800-366-5288, choose option 2, then choose option 3 for the LIVESTOCK prompt, and ask for Improvest availability for zoos. Alternatively, email

[SupportUS@zoetis.com](mailto:SupportUS@zoetis.com) and inquire about Improvest availability for zoos. Currently, Zoetis handles each request for Improvest on a case by case basis.

### **Latency to effectiveness**

In domestic swine, Improvest becomes effective 1-2 weeks after the second injection, typically given 1-month after the first injection, so separation or alternative contraception should be used in females for 1-2 weeks after the second injection (first booster). Males may remain fertile for up to 2 months after the second injection, until residual sperm either degenerate or are passed (as following vasectomy).

### **Signs of estrus during treatment**

Unlike GnRH agonists (e.g., Suprelorin), Improvest should not cause an initial stimulation, or flare, of the reproductive system, but some evidence of a flare has been noted in giraffe. Estrous cycles should cease to occur after the second injection is administered.

### **Duration of efficacy and reversibility**

The data on duration of efficacy and reversibility for wildlife species are limited.

### **Use during pregnancy**

Since no data are available on the safety of Improvest in pregnant animals, its use should be avoided during pregnancy.

### **Use during lactation**

No data are available on the safety of Improvest in lactating females.

### **Use in pre-pubertal animals**

Because Improvest 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 dogs and cats. There are no data available on impact on future fertility when Improvest is used in pre-pubertal animals. Thus, caution should be used when considering treatment of pre-pubertal animals.

### **Precautions**

In general, the effects on body weight should be similar to those from ovariectomy or castration. Preliminary data indicate that increased appetite will result in weight gain, especially in females, unless food is restricted. In males, muscle loss may result in overall weight loss if not replaced by fat. In sexually dimorphic species, males may become the size (weight) of females. Animals may lose secondary sex characteristics (e.g., lions may lose their manes).

According to Zoetis, Improvest may cause mild transient local injection site inflammation. All adverse events should be reported to the AZA Reproductive Management Center and to Zoetis.

### **Consideration for seasonal breeders**

For females, both the initial injection and 1-month booster must be completed prior to the anticipated breeding season. For males, both injections must be completed at least 2 months before the anticipated breeding season, since sperm are typically produced in advance of first ovulation.

**Reporting Requirements**

All institutions using this product are asked to contribute contraception information for their animals to the AZA Reproductive Management Center's Contraception Database (<https://www.zoocontraceptiondata.org>). It is essential that accurate records of doses and treatment intervals be maintained, and results reported, to contribute to dosage development.

**For questions about the RMC Contraception Database, contact:**

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