Why do we care about high LH levels in spayed and neutered dogs?

Gonadectomy results in high levels of LH (luteinizing hormone)

The loss of gonads after spaying and neutering means that the body no longer produces gonadal hormones, such as testosterone and estrogen. In addition, this change throws the Hypothalamic-Pituitary-Gonadal (HPG) axis out of balance. Without negative feedback from the sex hormones, the hypothalamus continues to produce GnRH, which tells the pituitary to make more and more LH (until the LH levels reach as high as 30 times that of intact dogs).

Is there a problem with high LH?

Any tissue influenced by the hormones in the HPG axis will be affected by the loss of sex hormones due to this imbalance. Dr. Michelle Kutzler has shown that many tissues express LH receptors, including skin and hair follicles, the anterior cruciate ligament, the thyroid and adrenal glands, and cancers such as lymphoma and hemangiosarcoma. These tissues may become overstimulated when LH levels are too high in spayed and neutered dogs. This overstimulation can impact organ function and even result in cancer, immune problems, abnormal behaviors, and orthopedic disorders.

Evaluating LH in spayed and neutered dogs

Rebalancing hormones involves restoring them to their normal level – or within the normal range for intact dogs. Supplying testosterone and/or estrogen is part of the treatment, but this may not fully address high LH levels. Thus, the second part of hormone restoration is to lower LH levels. If you are in the United States, quantitative canine LH testing can be performed at the Colorado State University Endocrinology Lab (see next page for sample submission details). All other laboratories that measure canine LH will only provide a positive result (for spayed/neutered dogs) or a negative result (intact dogs).

Interpreting LH tests

Endocrinology laboratories at veterinary diagnostic laboratories that conduct canine LH assays have reference ranges for intact and neutered male and female dogs. Most veterinary reference laboratories (Antech, Idexx) do NOT provide reference ranges because their results are NOT quantitative. It is not recommended to test LH levels at these laboratories, as the results are of little value.

The goal is to return high LH levels to those of an intact dog. There is a great deal of individual variation in LH levels, but it is likely that a spayed or neutered dog will have LH well above the range for intact dogs. Weekly testosterone subcutaneous injections will slightly reduce LH levels, but may will not bring it down to LH levels found in intact dogs. Alternatively, treating dogs with a GnRH agonist (deslorelin implant, marketed as Suprelorin®) will reduce LH levels to that of intact dogs for several months.

A hormone restoration treatment plan will need to be made by a veterinarian based on specific disorders a dog may have related to the lack of sex hormones and/or high levels of LH. This includes evaluating any underlying conditions the dog may have that would not make them a good candidate for hormone replacement therapy.

(cont. on next page)

Submitting samples to Colorado State University

Note: Colorado State University cannot routinely accept samples for LH testing due to the high costs and low number of requests. They may accept samples only at certain times of year.

- Before sending any samples for LH testing, contact them to inquire about availability by calling (970) 491-1645.
- If they are accepting samples, fill out the appropriate forms and mail to the address provided by the university.*
- Do not ship on Fridays, as samples are not received on weekends. It is best to ship on Mon.-Wed.

*Samples from Canada can be mailed to them and should include a letter stating that the sample has no known infectious agents (please check specific regulatory requirements).

Colorado State University Reference Range for LH

Note: This is the RIA assay data.

Luteinizing Hormone		
Species	**Reproductive Status**	**Baseline**
Canine	Bitch, intact	0.3-2.0 ng/ml
	Bitch, spayed	2.9-54.5 ng/ml
	Dog, intact	0.8-11.2 ng/ml
	Dog, neutered	7.2-27.0 ng/ml
Feline	Queen, intact (anestrus or unmated estrus)	0.2-1.8 ng/ml
	Queen, spayed	3.5-9.3 ng/ml
	Tom, neutered	3.0-10 ng/ml

Importing Deslorelin Implants

Licensed veterinarians and pharmacists can legally import deslorelin implants into the U.S. for treating dogs through VMD Access. Go to vmdsciences.com or use the QR code to request an account or to get started with an importation request form.

Learn More

For more information, please visit the Parsemus Foundation:
https://www.parsemus.org/project/hormone-restoration-in-dogs/