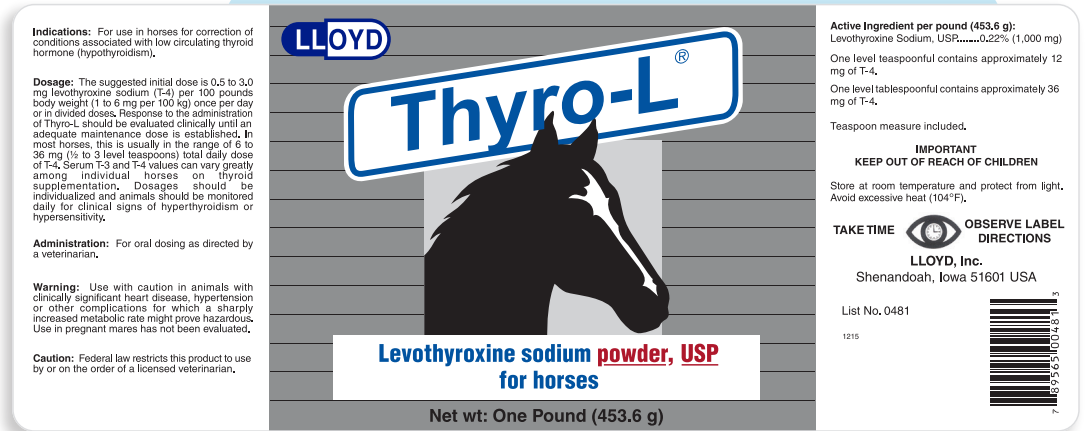




LLOYD IS THE LEADER AND GLOBAL EXPERT IN LEVOTHYROXINE.



# Thyro-L<sup>®</sup> (levothyroxine sodium powder), USP

## WHY TRUST THE PIONEER?

Levothyroxine for horses was introduced by LLOYD in 1965 as iodinated casein powder, Thyrone<sup>®</sup>, and was replaced with Thyro-L<sup>®</sup> in 1996. LLOYD developed the Levothyroxine Sodium Powder specification monograph for USP. It is the only (levothyroxine) USP powder available for horses.

## HOW DOES THYRO-L<sup>®</sup> SET A HIGHER STANDARD - FOR LEVOTHYROXINE SODIUM POWDER FOR HORSES?

Only Thyro-L<sup>®</sup> meets the higher powder, USP standard for an oral pharmaceutical powder and can make this claim on the front mast of its label. Check the label of any other T4 powder product. You will see that it only contains Levothyroxine Sodium USP as a **listed ingredient** [Levothyroxine Sodium USP (**0.22%**)], which simply indicates a type of raw material.

Meeting the higher powder, USP standard is more difficult for a pharmaceutical blend to achieve. However, it is important because this higher USP standard provides more assurance that the accuracy of the T4 dose (scoop) is consistent for the horse each time it is administered.

**Thyro-L<sup>®</sup>**  
TRUST THE PIONEER AND STANDARD



1-800-831-0004  
www.lloydinc.com

# Thyro-L®

Levothyroxine sodium powder, USP

## HOW SUPPLIED

One-pound bottles and ten-pound pails.  
Teaspoon measure included in each bottle or pail.

## INDICATIONS

For use in horses for correction of conditions associated with low circulating thyroid hormone (hypothyroidism).

## DOSAGE

The suggested initial dose is 0.5 to 3.0 mg levothyroxine sodium (T-4) per 100 pounds body weight (1 to 6 mg per 100 kg) once per day or in divided doses. The recommended daily dose is 1/2 to 2 1/2 level teaspoons for a 500 kg (1,100 lb) horse.

Response to the administration of Thyro-L should be evaluated clinically until an adequate maintenance dose is established. In most horses, this is usually in the range of 6 to 36 mg (1/2 to 3 level teaspoons) total daily dose of T-4. Serum T-3 and T-4 values can vary greatly among individual horses on thyroid supplementation. Dosages should be individualized and animals should be monitored daily for clinical signs of hyperthyroidism or hypersensitivity.

## ADMINISTRATION

Thyro-L can be administered by mixing the daily dose in the concentrate or by top dressing on grain, preferably rolled or ground. To facilitate proper adhesion of Thyro-L to the ration, slightly moisten the grain with water or liquid supplement.

## WARNING

Administer with caution to animals with clinically significant heart disease, hypertension or other complications for which a sharply increased metabolic rate might prove hazardous. Use in pregnant mares has not been evaluated.

## INGREDIENTS

Each pound (453.6 g) contains:

Levothyroxine Sodium USP.....0.22% (1,000 mg)

Each level teaspoonful contains approximately 12 mg of T-4.

## CAUTION

Federal law restricts this drug to use by or on the order of a licensed veterinarian.

Store at room temperature. Protect from light.

Avoid excessive heat (30°C or 86°F).

## KEEP OUT OF REACH OF CHILDREN

## IN PRACTICE

### Thyro-L in the Medical Management of Insulin Resistant Obesity

Equine obesity has become a significant health concern primarily because of its association with Insulin Resistance (IR) and laminitis. Chronic IR results from the body's inability to respond to insulin, which subsequently diminishes effective glucose utilization. IR is believed to influence laminitis through mechanisms of distal vasoconstriction, exaggerated inflammatory response, platelet stimulation, and reduced capillary recruitment. It is these effects that are thought to interfere with the body's ability to supply glucose to the hooves. Obesity further exacerbates this condition through the lipotoxic effects of elevated free fatty acids (FFA) and the pro-inflammatory state created as monocytes migrate into adipose tissues. The increased force placed on dermo-epidermal attachments in the hoof of these animals is also likely to influence the development of laminitis.

Insulin resistance is a primary component of Equine Metabolic Syndrome (EMS), also characterized by regional adiposity, hypertriglyceridemia, hyperleptinemia, and increased laminitis risk. Effective management of obese IR and EMS horses is focused on feeding a low non-structural carbohydrate grass hay. Use of IR-specific supplements like Target IR™, are a common approach to counteract the risk of vitamin and mineral deficiencies with a restricted, grass-hay only diet. Incorporation of a consistent exercise regimen and elimination of pasture grazing are also key components in managing insulin resistance.

When management practices fail to reduce body mass, short term medical therapy may be indicated. According to work performed by Nicholas Frank, DVM, PhD, ACVIM, and others at the University of Tennessee College of Veterinary Medicine and elsewhere, Thyro-L can be used to accelerate weight loss in these animals, safely and effectively.

## Research Findings

Thyro-L can be administered to horses with IR/EMS to accelerate weight loss and improve insulin sensitivity. A greater than twofold increase in mean insulin sensitivity was detected, with coinciding body weight reduction, when levothyroxine sodium was administered to healthy mares at dosages ranging from 24-96 mg/day over 8 weeks.

## Administration

Thyro-L can be administered by mouth or in the feed at a dosage of 48 mg (4 tsp) per day for 3-6 months to induce weight loss. Smaller ponies and Miniature horses can receive 24 mg/day for the same time period. Treated horses should be weaned from Thyro-L once ideal weight has been attained by reducing the dosage to 24 mg (2 tsp) for 1 week, followed by 12 mg (1 tsp) per day for an additional 2 weeks.

## REFERENCES

Frank N. Equine metabolic syndrome. *J Equine Vet Sci* 2009;29:259-267.

Frank N, Elliott S.B., Boston R.C. Effects of long-term oral administration of levothyroxine sodium, on glucose dynamics in healthy adult horses, *Am J Vet Res* 2008;69:76-81.

DVM360 Web site. Equine Metabolic Syndrome. Available at: <http://veterinarymedicine.dvm360.com/vetmed/article/articleDetail.jsp?id=628244&sk=&date=&pageID=8>. Accessed Nov 17, 2010.

Product Name	Product Number
Thyro-L® 1 lb bottle	0481
Thyro-L® 10 lb pail	0482

Manufactured by



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