



Iodine Deficiency (Goitre)

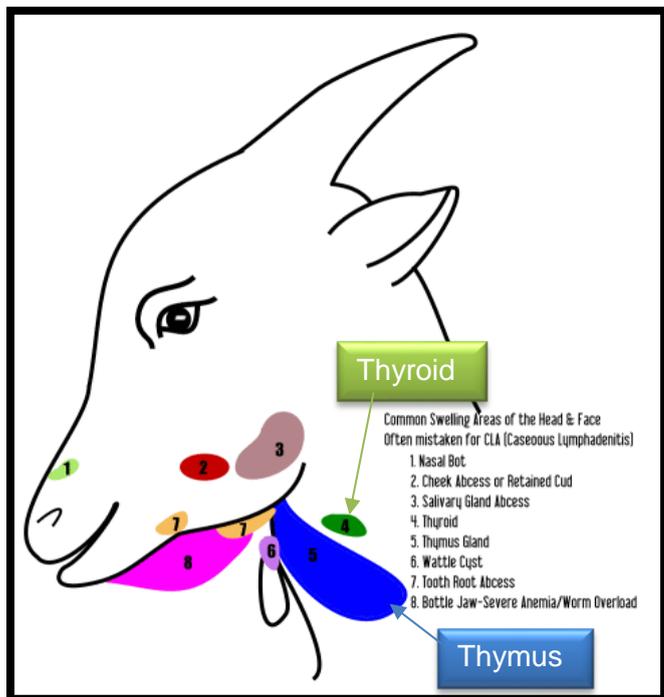


Figure 1: Anatomical location of the thymus and thyroid glands

Extreme Iodine deficiency results in decreased thyroid hormone and an enlargement of the thyroid gland, called a goitre.

Goitre is commonly misdiagnosed by goat producers when kids have an enlargement in the throat region. Many people mistake an enlarged thymus (No 5 on Figure 1) for an enlarged thyroid gland (No 4 on Figure 1) and it is important to distinguish the difference.

Figure 2 shows a lovely dairy kid from the Hunter with an enlarged throat region. I wrote about this kid in Browser's Bulletin 2, describing that this thymic hyperplasia (milk goitre) is a common condition that can be noticed in kids



Figure 2: Thymus hyperplasia (milk goitre)

from 2 weeks of age that will spontaneously regress around 6 months of age. Kids with a thymus enlargement are usually in ideal condition, with a good growth rate and a shiny coat.

Goats are highly susceptible to iodine deficiency, due to their preferred browsing behaviour and their breeding season. The foetus undergoes rapid development during the winter and early spring, but this is when the soil and pasture iodine levels are at their minimum. Studies have demonstrated that the iodine intake of grazing livestock increases during November, reaching a maximum during summer and decreases rapidly after autumn rains and continues to decrease throughout winter and early spring. Goats have a higher requirement for iodine than other livestock, with the rapidly growing Boer goats and the Angora goats being more susceptible to iodine deficiency than other goat breeds.

Mineral deficiencies will usually depend on specific geographical areas. Supplementation of the dam is essential in cold elevated areas away from the coast on the Great Dividing Range, the Tableland Regions, the Hill Country in Victoria and Tasmania and particularly those in high rainfall areas. There are certain areas that have marginal iodine levels so it is important to have a good understanding of potential deficiencies of your geographical location and the seasonal conditions that can exacerbate the problem (including high autumn rains and lush pasture growth in autumn and winter). **It would be highly unlikely to see iodine deficiency in goats in the Hunter Region.**

The records at the Elizabeth Macarthur Agricultural Institute State Laboratory show that Iodine deficiency is a rare condition (24 cases in 14 years) and none of the cases occurred throughout the Hunter Region. There are obviously other laboratories and diagnosis could certainly have been done by veterinarians on clinical signs alone. Many producers are also aware of iodine deficiency in their area and use preventative iodine drenches or iodised saltlicks in order to prevent an issue in their herd.

There are also certain goitrogenic plants that can produce a secondary iodine deficiency. Goitrogens have been detected in some feeds including legumes and forage crops, kale and cabbage. These plants prevent the accumulation of iodine in the thyroid gland. Goitrogenic plants are considered to be an unlikely cause of goitre in a herd but avoiding goitrogenic plants is recommended.

Ruminants store iodine very effectively in the thyroid and maintain thyroid hormone secretions through moderately long periods when iodine intakes are deficient, but the developing foetus does not have this thyroid hormone reserve and consequently affects the growth and development of the foetus. In these iodine deficient geographical areas it is recommended that pregnant does are given an oral iodine drench (potassium iodide drench) once or twice during the last two months of their pregnancy in regions that have known iodine deficient soils, fodder, feed and water.

Normally with iodine deficiency there will be a clinical syndrome occurring in the herd. Clinical signs seen include abortion, stillbirths and weak kids, sparse hair coats, susceptible to cold stress, respiratory problems and enlarged thyroid glands (see figure 3). In older goats they will show decreased production, poor growth rates, reduced appetite and subfertility. A subclinical deficiency will result in small weak kids without an obvious goitre that are susceptible to cold wet weather and mortalities may be high.



Figure 3: stillborn kid with enlarged thyroid glands and sparse hair coat

Diagnosis can be done on the clinical history, blood hormone level analysis of adult does and histological examination of the thyroid gland on aborted and stillborn kids.

Affected kids can be treated with 3-5 drops of Lugol's iodine in milk daily for 1 week but it is not always successful in these weak kids.

Treating goats with iodine unnecessarily can lead to iodine toxicity. Clinical signs that are seen with iodine toxicity include; a goitre, excessive nasal and ocular discharge, ill thrift, anorexia, coughing, bronchopneumonia, hair loss, dandruff, dermatitis, weight loss, increased heart rate, increased body temperature and immunosuppression.

If you have any further questions on Iodine deficiency and toxicity please drop me an email at kylie.greentree@lls.nsw.gov.au

References:

- <https://www.lls.nsw.gov.au/regions/central-tablelands/articles-and-publications/iodine-deficiency-in-sheep-and-goats>
- [http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/trace_elements_pastures_pdf2/\\$FILE/trace%20elements%20ch7.pdf](http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/trace_elements_pastures_pdf2/$FILE/trace%20elements%20ch7.pdf)
- EMAI NSW DPI Sample Manager records (2006-2020)
- Matthews, J; 2009. Diseases of the Goat
- National Research Council; 2006. Nutrient Requirements of Small Ruminants.
- Smith, M.C, Sherman, D.M; 2009. Goat Medicine

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