

# Stillborn Calves in Michigan Linked to Iodine Deficiency

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Last spring, stillborn calves were being reported in Michigan beef cow-calf herds where a large proportion of the diet consisted of sugar beet pulp. The losses were attributed to iodine deficiency, even though these herds were supplementing cows with a trace mineral mix that included iodine. Sugar beet pulp, as well as other alternative feed stocks, has the potential to be goitrogenic. Therefore, increased iodine supplementation is suggested when including beet pulp, turnips, or other goitrogens as a primary component of the diet.

The thyroid gland requires iodine to make thyroid hormone which is important for regulating metabolism. When insufficient iodine is available to the thyroid gland, a condition called goiter occurs which is characterized by an enlargement of the thyroid gland. In adult cattle, clinical problems from goiter are rarely seen, but can result in reduced fertility and milk yield. However, congenital goiter in developing fetuses can occur when iodine deficiency occurs in the dam. Calves with congenital goiter may be stillborn or weak at birth. They may also be blind and lack a full haircoat.

Goitrogens are dietary components that inhibit iodine uptake from the gut and potentially resulting in the

development of goiter. Examples of goitrogens are brassicas like turnips, rape-seed, or kale. Parts of other feeds such as white clover, carrots, linseed, cassava, sweet potatoes, lima beans, millets, peanuts, cottonseed, and soybeans also have the ability to decrease iodine uptake. Sugar beet pulp may also be associated with iodine deficiency. Even when the dietary levels of iodine are sufficient, feeding a ration with goitrogens can lead to iodine deficiencies and subsequent goiter. High calcium levels in drinking water may also decrease the adsorption of iodine. When iodine levels in the ration are already marginal, the risk of goiter increases.

Soils in the Great Lakes, Midwest, Northeast, and Rocky Mountain regions have been shown to be deficient in iodine levels. This results in crops and feedstuffs that are also low in iodine.

Iodine requirements for beef cattle are 0.23 mg/lb diet or 0.5 ppm (range of 0.2 - 2.0) of the total diet, as indicated by the National Research Council. This requirement of 0.5 ppm is raised to 1.0 - 2.0 ppm if goitrogens are present in the diet. The maximum tolerable level in the diet of beef cattle is 50 ppm. Sources indicate that if 25% or more of the diet is made up of feedstuffs associated with goitrogenic crops, then

dietary iodine levels should increase to 1.0 ppm, especially for cows in late gestation or early lactation.

On the label of free-choice mineral mixes, iodine may be in the form of calcium iodate or ethylenediamine dihydroiodide, which are both quite stable and available. Additional supplementation of iodine in less stable forms (more susceptible to loss of iodine with exposure to light, heat, moisture, or other factors) includes potassium or sodium iodide, which are often used to fortify salt with iodine. Iodized salt is still a recommended source of supplemental iodine for all parts of the country, especially where origin of crops is unknown.