PREGNANCY KETOSIS

Pregnancy Ketosis (Twin Lamb Disease) is a metabolic disease of late gestation ewes. The disease exists when the nutrient requirements of the growing lambs in the uterus exceed the nutrient intake of the ewe. While the concept of the disease is easy treatment and prevention can be more difficult. To explain the frustration of treatment and prevention let us first examine a typical ewe during gestation.

In the first two trimesters of pregnancy the fetus is growing rapidly. While the growth is rapid, the size of the fetus is still small, and the nutrient requirement for that growth is minor compared to the nutrient requirements of the ewe. At six weeks before lambing the fetus is only about 1/3 of the size it will be at full term. During the first two trimesters the increased appetite of the ewe will generally compensate for the increased nutrient demand on her body from the fetus. During the last six weeks things begin to change. First of all as the lamb grows its nutrient requirements increase exponentially. In this stage the glucose requirement is 70 to 85 grams of glucose per lamb per day added on to the 85-100 grams that is required for non-pregnant ewe maintenance. Secondly, as the lamb or lambs grow the ewe begins to run out of space in her abdomen. The increased appetite compensation is no longer effective as she physically cannot eat enough of the same feed to compensate for the lambs. At this time management needs to offer more nutrient dense feedstuffs to help the ewe maintain herself, her lambs and the added growth of lambs.

If the ewe cannot consume enough nutrients she will sacrifice herself for the lamb's maintenance and growth requirements. She does this by metabolizing fat and using it to fulfill her maintenance requirements. Metabolically this is similar to a starvation senerio, despite the fact that she is consuming feed. The severity of the imbalance between calories coming in and calories being spent determines how much energy from fat is mobilized and how rapidly it is mobilized. Fat is utilized as an energy source in the form of ketones. Ketones can be used efficiently by many tissues in the body. The problem occurs when ketone levels become too high. This causes depression and reluctance to eat. This results in even higher ketones, more depression and a self-potentiating downhill spiral. The ewe eventually becomes weak and unable to stand.

Treatment of ewes with ketosis involves preventing the condition from getting worse and/or aborting the fetus. If the ewe is close to lambing we recommend inducing the ewe to lamb with dexamethasone (5 mL, I.M.). Inducing ewes with dexamethsone is the closest replication of natural labor that is available. Ewes generally do not begin labor for 24-48 hours after injection. Ewes can be maintained with propylene

glycol, 4-6 oz. orally 3-4 times a day and Predef (2mL, S.Q. every other day). Appetite stimulants such as Vitamin B complex and probiotics may also be beneficial. All of this will not correct the problem but can help maintain the ewe for a few days if she is close to lambing. If the ewe will not live long enough for induction of labor, lambs should be by Caesarian Section. If the ewe is not close to lambing we recommend that the lambs be aborted with dexamethasone.

Prevention of pregnancy ketosis should be a management goal each year as sheep go through gestation. Prevention really starts in the first trimester. Both fat ewes and thin ewes are at high risk for ketosis. Ewes should be condition scored after breeding and sorted accordingly. Practically this may mean that you have two gestating pens, one with heavy-conditioned ewes and one with thin ewes. Alternatively it many mean that a few of the thin ewes are gestated with ewe lambs. Ewes can be examined by ultrasound and sorted based on number of lambs they are carrying. Ewes carrying twins need 180% more nutrient energy intake than ewes carrying singles and for ewes with triplets the number is 240%. Certainly the number of gestating groups depends on what is practical and labor-efficient for the individual farm. Over-conditioned ewes can lose weight during the first two trimesters but must be gaining weight by the third or they are at risk for ketosis. Thin ewes should be gaining weight throughout gestation. Correct conditioned ewes should maintain their condition through the first two trimesters and gain in the third. Shearing ewes before lambing increases feed intake and thus is beneficial in preventing ketosis. Increasing nutrient density in the third trimester is most easily accomplished by feeding grain starting about 6 weeks before lambing. Moving from poor quality hay to higher quality hay is also beneficial. With highly prolific ewes grain and specifically corn is necessary as the ewe does not have much room in the abdomen for feed.