

# NADIS Health Bulletin



Knowledge transfer to farmers

To test your knowledge and understanding of the control of this condition, try our instantly marked self assessments, by clicking here

Health Quiz

## Flock nutrition throughout pregnancy

*Phil Scott DVM&S, DipECBHM, CertCHP, DSHP, FRCVS*

It can be a sobering experience for sheep farmers to compare ultrasound scanning rates in February (often 205% for lowground mule flocks) to lamb weaning rates in August (often only 155% at best). What can be done to reduce such losses, most of which occur within the first three days after birth?

The provision of a good grass sward to ewes for up to one month before mating is a farming tradition employed to increase ovulation rate and embryo implantation rate, and ultimately results in larger litters. While such nutritional manipulation makes physiological sense, what are the real consequences of this management practice? It must not be forgotten that triplet-bearing ewes are more prone to pregnancy toxemia (Fig 1), vaginal prolapse (Fig 2), evisceration through a vaginal tear, and rupture of the prepubic tendon (Fig 3). In some field studies the mortality rate of triplet lambs was 44 per cent (Fig 4) compared to 7 per cent for twins. Nutrition throughout pregnancy is essential for triplet lamb survival but the very high price of cereals and compound feeds means that supplementary feeding to pregnant ewes must be allocated accurately to achieve maximum profits yet ensure ewe health and lamb viability.

### Mating period and pregnancy

The excellent weather October should ensure that the following targets were achieved in spring-lambing flocks:

All ewes should be mated during the first 17 days of the service period

Less than 10 per cent of ewes should return to service

Rams should be removed after two oestrous cycles (5 weeks)

At scanning time 98 per cent (or greater) ewes should be pregnant

Abortions should total less than 2 per cent

95 per cent (or greater) ewes should rear lamb(s) to weaning



**Fig 1: Triplet-bearing ewes are more prone to pregnancy toxemia**



**Fig 2: Triplet-bearing ewes are more prone to vaginal prolapse**

## Pregnancy

Pregnancy can be divided into three stages:

		Weeks
First trimester	Implantation	2-7
Second trimester	Placental development	8-14
Third trimester	Foetal growth & development	15-21

### **Implantation**

In many management systems pasture is reserved for the 5 to 6 week mating period and for one month or so thereafter. Dietary energy supply around the time of implantation, and during the first six weeks of gestation, is therefore adequate because sufficient autumn grass is still available.

### **Placental development**

Weather and/or grazing conditions need to be severe for at least 10 days during mid gestation to impair placental development. However, reduced lamb birthweights can occur when placental development has been limited by competition in the uterus from triplet (or larger) litters. The birth of twins with disproportionate weights eg 5.5 kg versus 3.5 kg probably indicates that three embryos implanted and underwent early foetal development but one foetus failed to develop further, and was resorbed. The limited number of attachment points available to the placenta of the remaining foetus in that horn of the uterus results in poor growth and a much reduced birthweight compared to its twin.

### **Foetal growth and development**

Real-time B mode ultrasound scanning should be undertaken between 45 to 90 days of gestation to determine foetal number thereby ensuring more accurate and selective concentrate feeding during the last 6 weeks of gestation when 75 per cent of foetal growth occurs.

The importance and influence of adequate ewe energy supply during late gestation on lamb survival cannot be overemphasised. Many studies have found significantly higher lamb perinatal mortality in the progeny of underfed ewes with the effects greater in triplet than twins lambs; singletons were largely unaffected by dam nutritional status. Reports have detailed lamb mortality rates in excess of 40 per cent for triplet lambs when their dams were underfed compared to 7 per cent in twin lambs born to well-fed dams - is flushing such a good idea if your weaning rate is around 155%?

Dietary energy supply to ewes relative to the metabolic demands of the developing foetuses can be accurately determined during late gestation by your veterinary surgeon measuring a chemical (3-OH butyrate) in the ewes' blood (Fig 5). Increased 3-OH butyrate values reflect inefficient utilisation of ewe body reserves caused by the high glucose demand from the developing foetuses not matched by dietary energy supply. What does this mean for the sheep farmer?



**Fig 3: Triplet-bearing ewes are more prone to rupture of the prepubic tendon**



**Fig 4: In some field studies the mortality rate of triplet lambs was 44 per cent compared to 7 per cent for twins**



**Fig 5: Dietary energy supply to ewes relative to the metabolic demands of the developing foetuses can be accurately determined during late gestation by your veterinary surgeon measuring a chemical (3-OH butyrate) in the ewes' blood**

### **Farm visit to by a veterinary surgeon to assess flock nutrition**

Ewes due to lamb during the first week should be body condition scored and blood sampled four to six weeks before the start of lambing time thereby allowing sufficient time to implement dietary changes. Ewe lambs and gimmers should not be sampled as they have significantly more singletons and may represent a skewed population. Thereafter, a random sample of 15 to 20 ewes should be blood sampled. If the flock has been scanned to determine foetal number an equal number of twin and triplet-bearing ewes should be sampled; there is little benefit in collecting samples from ewes with singletons other than to establish reference values. Sick ewes, thin ewes, and those not representative of the flock must be investigated separately and not included as part of the nutrition assessment exercise.

Details of the diet (Fig 6), forage analyses, and future alterations should be noted. Feed allocations must be checked on weigh scales and the number of sheep per group accurately determined - approximations lead to unnecessary errors.

The target mean 3-OH butyrate concentration is below 1.0 mmol/l thereby ensuring appropriate lamb birthweights, good colostrum supply by the ewe (Fig 7) and efficient and cost-effective use of supplementary feeds. 3-OH butyrate concentrations above 1.6 mmol/l in individual ewes represents severe energy underfeeding with the likelihood of pregnancy toxaemia (Fig 1) developing as pregnancy advances and foetal energy requirements increase unless dietary changes are implemented.

For example during a flock visit to determine nutritional management four weeks before lambing commenced the mean serum 3-OH butyrate concentration of 10 ewes sampled at random on this farm is 1.5 mmol/l. This underfeeding situation necessitates an extra 4 MJ ME/day (0.3 kg of concentrates) to return the ewes to a satisfactory level of energy supply (mean 3-OH butyrate concentration is below 1.0 mmol/l). The overall cost per ewe is approximately £1.50 per ewe but such timely correction would ensure appropriate lamb birthweight otherwise lamb mortality could have been twice to three times that normally expected especially amongst twins and triplets. Average lamb losses at lambing time are estimated to be 17-20%. Weaning an extra 100 lambs should be worth an extra £3000 in a 500 ewe flock (a four-fold return).

While farmers are advised to vaccinate their ewes against the clostridial diseases four weeks before lambing, a recent survey showed that 16 per cent of farmers do not. By ensuring ewes are in good condition at vaccination time, and receiving an appropriate level of supplementation as determined by the blood samples collected, you will guarantee plentiful accumulation of protective antibodies in the ewes' colostrum at lambing time. Thus it is important that farmers are aware of the



**Fig 6: Details of the diet, forage analyses, and future alterations should be noted**



**Fig 7: Achieving the target mean 3-OH butyrate concentration below 1.0 mmol/l thereby ensures appropriate lamb birthweights and good colostrum supply by the ewe so there should be no hungry lambs**



**Fig 8: Pay particular attention to the triplet litters**

importance of ensuring passive antibody transfer (colostrum ingestion) within the first six hours of the lamb's life (Fig 7).

### Follow-up visit during lambing time

A veterinary visit during lambing time is essential to discuss the results with the farmer and shepherd. Measurement (with a spring balance) and recording of lamb birthweights and ewe condition scores are essential to determine the success of your flock nutrition advice during late gestation. Pay particular attention to the triplet litters (Fig 8).

It is essential to determine any cost benefits from this exercise. Have reduced losses and greater lambs growth rates more than compensated for any increased feed bills? What are the improvements, if any, in terms of animal welfare? What improvements can be made for next year? Remember written reports remove doubts over specific points, and provide a record for future reference.

Copyright © NADIS 2007 [www.nadis.org.uk](http://www.nadis.org.uk)

*To test your knowledge and understanding of the control of this condition, try our instantly marked self assessments, by clicking here* **Health Quiz**

NADIS Health Bulletins are designed to improve farm income, animal health and welfare by promoting disease control and prevention.

Discuss how health planning can improve the profitability of your farm with your veterinary surgeon.

NADIS is supported by BPEX, EBLEX, HCC, QMS, Elanco Animal Health, Merial Animal Health and MLC.

