About this factsheet

One aim of any sheep enterprise should be to produce as many lambs as possible. However, a main contributory factor to the profitability of a sheep enterprise is the successful management of the breeding stock. Correct nutrition of breeding stock, as you will read, is an excellent way of ensuring success.

Nutrition for breeding sheep
(with special reference to Guyana)

To create a profitable sheep enterprise, the sheep farmer needs to pay attention to selecting appropriate animals for breeding, and to aim to wean as many lambs as possible. The higher the number and value of lambs over and above the operational costs (feed, shelter, and labour), the higher the returns to the farmer.

Although local sheep such as Corentyne White, Barbados Blackbelly, and their crosses, will breed at any time of the year it may help to restrict mating to specific times of the year to make it easier for the farmer to manage the flock. In this way, all the breeding ewes can be managed together, as a unit: their condition can be monitored more easily, and their needs for feed better controlled. The lambing season can be brought within a fairly narrow period enabling better supervision by the farmer, and more efficient use of resources such as labour and feed.

This factsheet recommends appropriate management of nutrition for the breeding flock but CARDI also recommends records are kept, the use of pasture (grazed or cut) is managed, and segregated housing is available.

There are four main phases to the breeding cycle which have different nutrition requirements:

- 4-6 weeks before mating
- mating period-early pregnancy
- mid-pregnancy (months 3-4)
- late pregnancy (months 4-5)
- lactation

Figure 1 (on page 2) shows the different stages in the breeding cycle which demand a reassessment of the nutrition needs of the ewes.

FEEDING BEFORE MATING

Local sheep in the Caribbean are generally fertile and responsive to the ram (period of oestrus) throughout the year, but if they are in poor condition, they may not be fertile. The primary aim of the feeding regime before mating is therefore to ensure that all ewes come into oestrus during the mating period. The ewes must be in good body condition to support the early embryonic life of the lambs.

On most farms, the breeding flock consists of older ewes with weaned lambs, and
Factors affecting nutritional requirements of the sheep flock

Younger lambs going to the ram for the first time. The older ewes are not likely to be in peak condition because of the demands lactation makes on them and so they should be given sufficient feed to bring them to their optimum mature weight—about 25-30 kg (55-65 lbs) for the Corentyne White and cross-bred. The target weight for good Barbados Blackbelly ewes may be 35 kg (75 lbs) or more.

The sheep's digestive tract needs a constant supply of good forage. Grazing sheep being prepared for mating should have daily access to good quality pasture. If the pasture is poor, or grazing time limited, the ewes may need some supplementary concentrate food. This is particularly important for rundown or younger ewes for the six weeks prior to lambing and the six weeks after.

The CARDI Caribbean Sheep Production and Marketing project carried out in Guyana determined an appropriate ration for feeding at this stage (see Table). This composite ration should be fed at 300-500 g (12-18 oz)/ewe/day but introduced gradually over a seven-day period starting at 75g (2-3 oz)/ewe.

Recommended composite ration for mating ewes in Guyana

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat middling</td>
<td>50</td>
</tr>
<tr>
<td>Rice bran</td>
<td>30</td>
</tr>
<tr>
<td>Molasses-urea (2%)</td>
<td>20</td>
</tr>
</tbody>
</table>

on the first day.

Rice bran is more expensive than wheat middling and molasses so this ration provides farmers in Guyana with nutritious feed but at a cheaper cost than if they used just rice bran.

MATING-EARLY PREGNANCY

Achieving a good body condition for the ewes at mating is particularly important: the farmer should not be easily able to feel the bony spine processes of the ewe's back. Nor, however, should the ewe be very fat.

Ewes in good condition tend to shed an optimum number of eggs (ovula) at ovulation. The ration shown above (see Table) may also 'flush' the ewes, i.e. encourage the production of more eggs. As the eggs are fertilized, they become implanted in the wall of the uterus and develop into embryos and foetuses. The condition of the ewe should be maintained during these first few weeks when the risk of losing the embryos is at its highest. The eggs do not become implanted until the third week after fertilization.

At this time, those ewes with poorer body condition should be separated out and given extra feed. These ewes have often previously weaned multiple litters of heavy lambs and if not fed properly now, will probably not be able to carry more than one lamb in the current breeding cycle.
MID-PREGNANCY
The foetus grows slowly up to the end of the third month of pregnancy, approximately half way to lambing. The foetus is now about 15% of the weight of the new born lamb, although the placenta and uterine wall of the ewe and the foetal fluids have reached their full size.
Ewes which were in good body condition at mating can be maintained solely on forages during mid-pregnancy without any detrimental effect, but if the forage supply is limited or of poor quality (as it often is during the dry season), supplementary feeding will be necessary. The demands of the growing embryo and foetus have, by now, drawn on the body reserves of the ewe and it is important that the farmer does not let her lose condition or weight at this stage.
Older ewes which were emaciated at mating, and younger ones which are still growing, may need additional feed to avoid excessive weight loss although they are probably carrying smaller foetuses than ewes in better condition. Younger ewes should be gaining weight steadily.

LATE PREGNANCY
Late pregnancy is often the most critical stage for growing foetuses. During the last six weeks of pregnancy about 70% of foetal growth takes place and there is a pressing need for proper nutrition. A ewe carrying a single lamb needs double the amount of feed than when she is not pregnant. A ewe carrying twins needs two-and-a-half times as much, and a ewe bearing triplets needs about three times as much.
The large increase in nutrient requirements is partly due to the inefficient conversion of the energy in feed into foetal growth. Because the rumen cannot increase in size and because the uterus is increasing in size, it is difficult for the ewe to eat enough feed to adequately meet the demands for multiple births. This is why ewes which were in good body condition before conception will utilize some of their body reserves during this period. However, the farmer shouldn't allow the ewe to lose too much of her body reserves and should reduce the amount of bulky feed given to her, especially very mature grass. He should feed concentrates high in fermentable carbohydrate and nitrogen and with some 'by-pass protein'.
If the ewe is not getting enough nutrients she will continue to draw on body reserves and will produce small lambs with reduced vigour, little colostrum in her milk, low milk yields, and may have a poor ability to mother. If the ewe was in good condition at mating and fairly good at mid-pregnancy, a slight loss in condition near to term will not have much effect on the final outcome of the pregnancy.
In Guyana, ewes should have access to good quality grass and be fed the ration on page 2 (or similar) from six to eight weeks before lambing at a rate of 500g (20 oz)/ewe/day increasing to 600g (32 oz)/ewe/day. The rate should be higher for ewes carrying twins. This progressive increase in feeding is also cheaper than giving a constant daily rate.
If hand mating was practised, i.e. if the ram was put to the ewes at specific period and mating was observed and recorded, lambing dates could be calculated with some precision. In such instances, the flock can be divided and fed according to requirements, especially during this critical phase. Also, ewes below target condition in the early stages of late pregnancy can be separated and given extra feed to ensure successful lambing and establishment of lactation.

LACTATION
After the demands of pregnancy, the ewe must rear her lamb and until it can eat enough solid food, which generally occurs at six to eight weeks after birth, it is solely dependent on its mother's milk. During this period, the ewe's requirement for nutrients depends on the number of lambs she is feeding. The energy requirements of a ewe suckling twins is 70% more than they were during the last two weeks of pregnancy. Since the uterus is now empty, the rumen has more space and the ewe can consume more bulky feed.
Nonetheless, ewes with many lambs can still not consume enough feed, especially of grass alone, to adequately meet the nutrient requirements of the lambs and continue to maintain herself in good condition. Good body condition at lambing helps to ensure an adequate level of fat reserves at the start of lactation.
The ewe has the ability to consume much more feed immediately after lambing. Thus, in the first week after lambing, intake is 20-40% more than the intake of the same feed in the last week of pregnancy. For a healthy ewe, feed intake will continue to
CONTROL AND PREVENTION

Husbandry
Muddy areas, especially around water-troughs, should be drained. Bedding should be kept dry and changed even before excessive fouling occurs.

The overgrown sidewall and toes of the feet should be trimmed to keep the foot flat on the sole and toes pointed. This will have to be done more frequently in the case of animals which are housed for long periods and have limited access to hard walking surfaces.

If the foot is infected, the dead, rotten tissues must be removed with a sharp instrument (hoof shears or knife or even a heavy scissors). Small pieces should be removed gradually to expose healthy tissue; bleeding is inevitable.

Drugs
After the removal of all dead tissue the animal should be allowed to stand in a suitable disinfectant solution (10% formalin or copper sulphate) before being placed on clean, dry ground. This treatment will have to be repeated at intervals until the foot heals.

When many animals are infected, the use of a foot-bath is recommended. In the case of large flocks, regular use of a foot-bath should be a part of the husbandry routine to prevent outbreaks of footrot.

JOINT-ILL OR NAVEL-ILL

Occurrence
Immediately after birth, the umbilical (or navel) cord is generally broken. If the raw tissue comes into contact with an unsanitary floor or bedding this can cause invasion by parasite-producing organisms, resulting in joint-ill or navel-ill. The parasitism is not likely to occur when lambing is on sun-drenched pastures.

Symptoms
Scars within a few days of birth may indicate a navel infection. If the attack is not severe the animal may recover but if the lamb shows a generalized stiffness, it might have picked up tetanus-causing bacteria (which are generally present in soil and manure). In such instances death results within a day or two since treatment is usually unsuccessful.

Prevention
The application of tincture of iodine immediately after birth not only disinfects the navel but also aids healing. It might be necessary to apply a second treatment within 12 hours or so.

For regular use, the iodine should be stored in a short, wide-mouthed container (e.g. a snap glass). This container can then be pressed against the navel region to completely immerse the stump of the navel cord.