



# Getting Ready for Tupping

## **Introduction**

Hybu Cig Cymru/Meat Promotion Wales (HCC) was established in April 2003 and is the strategic body for the promotion and development of the Welsh red meat industry. Its mission is to develop profitable and sustainable markets for the benefit of all stakeholders in the supply chain.

It brought together the red meat activities of three organisations, namely the Meat and Livestock Commission in Wales (MLC Cymru), Welsh Development Agency and Welsh Lamb and Beef Promotions Ltd. Each organisation was responsible for different aspects of red meat activity, which have now been integrated into HCC's work.

HCC is now the sole body for the promotion and development of red meat in Wales.

This booklet forms part of a series of publications produced by HCC's Industry Development Team.

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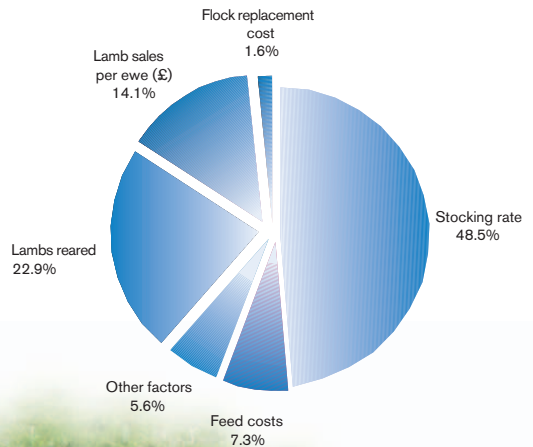
## The Importance of the Topping Period

Topping represents the beginning of the sheep year; a successful start is an essential foundation for a profitable enterprise as a small lamb crop conceived at topping limits the enterprise from the very start.

### Choosing the Topping Date

A variety of flock management systems are practised in the UK to optimise use of low cost resources such as grazing or meet demands for out of season lamb. These dictate both the optimum time of lambing and suitability of breed of ewe and ram to the production system employed. Within a popular breed such as the North of England Mule, choice of topping date will affect lambing percentage. Typically these ewes will scan at 220 % when topped at the peak of the breeding season in September/October, but will scan closer to 180% if topped in August for an early crop or December for a grass lambing in late April/May.

*Contribution to top-third superiority in gross margin per hectare for lowland spring lambing flocks*



## Breeding and the Industry

At an industry level, breeding Factors to Factors to consider for your sheep enterprise:

- Integration with farming system
- Utilisation of labour
- Planned lamb marketing period
- Breeds of dam and sire

*Breeding table (based on 147 days gestation)*

<b>6 Weeks Prior to Topping</b>	<b>Topping</b>	<b>Lambing</b>
26 June	7 August	1 January
10 July	21 August	15 January
27 July	7 September	1 February
10 August	21 September	15 February
25 August	6 October	1 March
8 September	20 October	15 March
25 September	6 November	1 April
9 October	20 November	15 April
25 October	6 December	1 May

## Preparing the Ewes for Compact Topping

### Breeding and the Industry

Most British breeds have a restricted breeding season during which time ewes will take the ram during a series of oestrus periods which last a day or two and occur at 17 day intervals until pregnancy is established. The onset is brought about mainly by the change in photoperiod following the longest day, but this varies between breeds and years. The mountain breeds, such as the Welsh Mountain, tend to be much later than the lowland breeds; the Dorset Horn in particular has a very extended breeding system, making it suitable for early lambing.

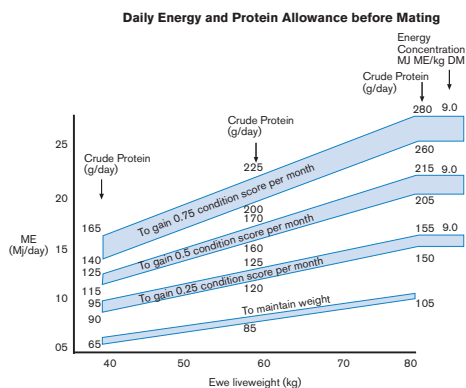
Weaning is the starting point to consider for next seasons lamb crop. Ewes need sufficient time to recover condition, so weaning should be no later than mid August for lowland breeds and mid September for hill breeds. Wean after 12 weeks of lactation in a dry year when grass growth is insufficient for reasonable milk yield.

## The Influence of Body Condition

Ewes, which achieve a high level of body condition at mating, have higher ovulation rates and higher lambing percentages. Low body condition delays the onset of oestrus and increases the proportion of barren ewes. Ovarian follicle growth actually starts around 6 months before the breeding season. Follicles, each of which contain a developing egg, go through a hormone responsive phase as ewes enter the breeding season, many of them however go into regression and do not produce a follicle that is capable of ovulating and shedding a viable egg. Inadequate nutrition and poor body condition accentuates this and reduces ovulation rate. The beneficial effect of good body condition operates by reducing the number of follicles that go into regression and fail to ovulate.

To ensure that ewes are in the correct body condition at tupping, it is necessary to assess condition score around 10-12 weeks earlier. An increase of half a unit in condition score is equivalent to approximately seven per cent liveweight or 5 kg for a 75 kg ewe. The graph shows energy and protein requirements for different bodyweights of ewes gaining at either 0.25, 0.5, or 0.75 condition score units per month.

*Daily energy and protein allowance before mating*



Successful feeding prior to tupping maximises the number of ewes cycling, reducing the lambing period to around three weeks. To gain 0.5 condition score units per month ewes require the equivalent intake of a twin bearing ewe two weeks pre-lambing, so an early assessment is essential to get ewes back in condition.

The first-cross ewe lambs are transferred to the lowland areas, the third tier, where they are generally crossed with rams of the **terminal sire breeds**, e.g. Suffolk, Texel and Charollais, to produce slaughter lambs. Although this is the general trend there are many regional variations.

### *Lambing percentage of ewes in various body condition at mating*

Type of ewe	1	Body condition score* at mating				3	4
		1	2	2	3		
Lambs born per 100 ewes to ram							
<b>Hill Ewes</b>							
Scottish Blackface	-	79	-	-	162	-	-
Welsh Mountain	60	65	105	116	123	-	-
Swaledale	-	78	133	140	156	-	-
<b>Lowland</b>							
Masham	-	-	-	167	181	215	-
Mule	-	-	149	166	178	194	192
Greyface	-	-	147	163	176	189	184
Welsh Half-bred	-	126	139	150	164	172	-
Scottish Half-bred	-	-	148	170	183	217	202

\* scale: 0 - emaciated, 5 - very fat

### **Benchmark condition score**

Record ewe condition score at weaning and treat accordingly, with the poorest getting additional grass or feed (0.4 kg/day cereal) as necessary. Improving the condition of the ewe (replacing fat reserves lost during the preceding lactation) is the first priority. Normally there is ample time between weaning and mating to achieve this on autumn grass, but it takes 3 months on a twice maintenance diet to increase the body condition score of a 75 kg lowland ewe from 2 to 3.5. Concentrate supplement at grass is not needed if grass quality is high and sward height is maintained at 6 cm. On poor quality grass or where swards are below 4 cm feed 0.4 kg cereal /day.

### **Maintain high feed intake at mating**

Just prior to ovulation, ovulatory follicles are stimulated on a day-to-day basis by the ewe's nutrition. Ewes with a higher level of feed intake are able to produce extra ovulations by the development of ovulatory follicles that otherwise would have regressed and failed to ovulate. This is the reason for 'flushing' ewes prior to tupping i.e., increasing their feeding level. Recent research shows that the adverse effects on ovulation rate of poor nutrition 6 months prior to the breeding season can be offset by flushing in the two weeks prior to tupping. Thus, if ewes had a particularly stressful summer lactation and lost a lot of condition try flushing them prior to mating.

## Maintenance feeding after tupping

Having achieved the correct body condition at mating and achieved high feed intake, the next priority is to maximise embryo survival. All the evidence points to a maintenance feeding level in the first month of pregnancy being best for ensuring maximum embryo survival. Such a system avoids the suppressing effect of high feeding levels on the key hormone (progesterone) that is required for the maintenance of pregnancy and embryo survival, while at the same time avoiding any deleterious effects of undernutrition. For early lambing ewes, mated in August, the availability of grass is such that steps have to be taken to restrict herbage allowance to maintenance during the first month of pregnancy.

## Management summary

- Choose target body condition score at tupping for the system. Aim for 3.5 for lowland sheep and 2.5 to 3 for hill flocks.
- Wean no later than 20 weeks from lambing to allow time for body condition recovery. Where possible wean twins earlier than the rest
- Separate ewes into thin, average and fat groups and manage accordingly.
- Overfat ewes (4+) should be slimmed on poor or bare pasture 2 to 4 cm high, prior to flushing for two weeks on 4 to 6 cm swards. An alternative to bare pastures would be to keep them indoors on straw, water and 150 g/head/day of soya + 15 g/head minerals/vitamins.
- Thin ewes (2 or less) should be grazed on pastures over 6 cm high to recover condition. Gains of over 0.3 condition score units per month could require supplementation of up to 0.4 kg whole cereal/head/day.
- Ewes in good condition should be grazed on pastures 4-6 cm high over the tupping period, but if grass quality is poor or intake limited, access to a feedblock with an intake potential of 200 g/day during the first 21 days of tupping and fed at one per 30 ewes/week has been shown to increase scanning percentage.
- Plan grass fields and fertiliser usage to try to meet these group requirements both before and during the tupping period. Save the most sheltered paddocks for mating on.



## Culling and Health

After weaning it is important to identify ewes are fit for continued future breeding and not limited by poor health. It is necessary to check teeth and udders and that feet are sound and mark or sell culls. Any stressful treatments such as dipping, or foot treatment need to be completed well in advance of tupping. Stress after mating increases loss of embryos through foetal reabsorption in early pregnancy.

## Management Practices to Consider from Weaning

- **Good records** are essential, and ewes, which have had problems, such as vaginal prolapse, mastitis, poor milk production, or bad mothering ability, should be culled. Ewes, which have run without lambs, may be retained in more extensive flocks, but they should be marked for subsequent monitoring.
- **Udder:** Check the udder for excessive heat, lumps and hardness. Drying the ewes off can be done by putting the ewes on bare pasture or in a shed with straw and water for three days. Look for possible cases of orf or damaged teats. Time spent at this stage saves time at lambing. Too many ewes with single quarters greatly increase fostering requirements at lambing.
- **Legs** should be examined for any evidence of injury or disease such as swelling in joints or thickening of any part in the leg. Trim feet if necessary, foot bathe and cull ewes with chronic footrot that fail to respond to a long lasting action antibiotic treatment
- **Teeth** should be examined and the mouth checked. A standard for the flock should be set depending on the nature of the farm, the type of sheep and form of winter-feeding and sheep culled accordingly. Broken mouthed ewes must be assessed on their ability to survive the winter and rear a lamb.
- Do not forget to check **gimmers**. Although they may not have lambed they may have obvious problems that will make them unsuitable for breeding.
- Purchase flock replacements from **Enzootic Abortion of Ewes (EAE) Accredited** flocks. If there are known abortion problems, or risk of infection from neighbouring sheep a vaccination programme should be undertaken six weeks before tupping. Keep flock replacements separate from the main flock for as long as possible to observe any ill health.
- **Control footrot** by trimming, footbathing and use of antibiotics as required. If the disease is widespread, a vaccination programme should be considered.
- A **pre-flushing wormer** should only be necessary with higher stocking rates and/or ewes in poor condition and where a faecal egg count of over 300 eggs per gram (epg) confirms the need. Ectoparasite control, including louping ill vaccination on tick infested hill pastures, should also be considered.

- **Check trace element and vitamin** status by asking your veterinary surgeon to blood sample 10 non-supplemented ewes. Selenium and cobalt deficiencies can reduce reproductive performance.
- **Vaccinate ewe lambs or other flock replacements** for clostridial disease and pasteurella where this is a problem.

## Raddling

- Raddle markers are mainly used on farms with insufficient housing space at lambing for the entire flock. The colour changes allow ewes to be grouped on expected lambing dates for starting late pregnancy feeding, housing and lambing supervision. If too many ewes hold to first service in relation to lambing facilities, rams can be re-raddled after 7-10 days to split them, with the colour changed at 16-17 days to identify repeat services, if felt necessary.
- Crayon harnesses need checking daily to avoid chaffing etc which can put the ram off work. They should be fitted two days before the rams' work to avoid problems. They should be tightened regularly as the rams will lose weight and the harness slacken. Checking and changing the crayons can be done with the minimum of stress to the flock by training the rams to bucket feeding to aid catching them.

Some farmers may also wish to use raddles to check rams are working – usually when they are used for the first time.

## Preparation for Mating Hill Ewes

### Condition of Hill Ewes

- The first chance to assess if hill ewes are back on track for fitness is at the shearing in July when ewes should be between 2 and 2.5. The most effective way to make a positive impact on ewe condition is moving forward the weaning date, giving ewes more time to recover on their return to the hill. This is a better use of a scarce resource than bringing a group of lean ewes on to the inbye land early, before tupping.
- Hill ewes should be in good condition, and feet trimmed prior to mating. Dipping should be carried out in advance of tupping. Any thin ewes should be put on better inbye pasture 6 weeks prior to tupping.

- Many farmers crutch or ring-tail their ewes to aid conception or completely clip the tails to ensure that the ewes keep clean over the winter months
- Many hill farmers with improved inbye ground available only allow ewes access to their own hill breed of tup for the first cycle (17 days) then follow up with a terminal sire eg Texel/Beltex or Cheviot. This has the advantage of only keeping purebred replacements from the most fertile ewes and with good aftercare, expensive hill tups last longer and later born lambs meet a good store trade.
- Underfeeding after tupping or bad weather may result in death of the embryo. If this happens before day 12 the ewe will return to oestrus at the normal time. If the embryo dies after day 12, oestrus is delayed and so the ewe will appear to be pregnant. Depending on the length of the tupping period and subsequent weather she may or may not end up empty. Even in ideal conditions, embryo loss is normally 10-30% in the first 35 days of gestation, but it is usually only partial, so that the twin is reduced to a single. On a flock basis, nutritionally induced losses seldom exceed 15%. Assuming snow cover is not excessive and that under it there is still a reasonable quantity of vegetation, feeding 250 g of sugarbeet pulp without hay would be a reasonable precaution. Blocks are useful where regular feeding is difficult but high feed block intake is expensive, and a sign that sheep should be moved onto rested areas.

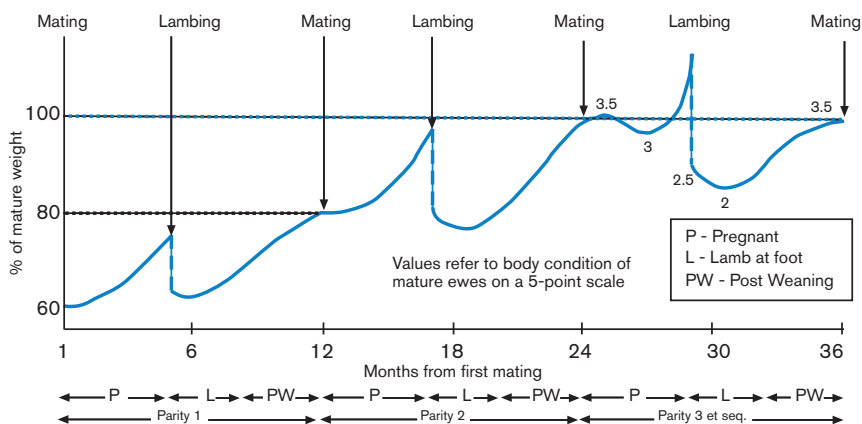
## May Lambing Ewes

- For a May lambing flock, ewes must be mated during December and January when grazing is in short supply and the weather is unpredictable. Prolonged periods of wet weather can lead to a dramatic loss of ewe body condition, while shorter periods disrupt grazing behaviour with possible adverse effects on ovulation rate and embryo survival. To ensure that ovulation rate and lambing rate are maximised, ewes should be mated in sheltered fields and a body condition score of 3-3.5 should be maintained throughout the mating period. Preparations for mating should start around six weeks prior to the intended date of ram introduction, and those fields identified for mating rested from grazing.
- Where sward height is below 4 cm in the weeks leading up to mating, ewes can be supplemented with limited access to forage brassicas or hay/silage given ad libitum. Thin ewes (CS<2.5) should additionally be supplemented with up to 400 g/day concentrate (whole cereal, molassed sugarbeet pulp) to improve their condition. During the mating period, provision of a small amount of concentrate (~250 g/day) to all ewes is beneficial in helping to maintain nutrient intake and reproductive performance under adverse environmental conditions. High-energy feedblocks fed during the first cycle can achieve a similar improvement.


- Environmental stress at mating can be reduced by inwintering. Ewes should be housed at least two weeks prior to ram introduction to allow them to adapt to housed conditions. Ewes can be fed ad-lib silage + 0.3 kg concentrates per day for 30 days of tupping. Excessive artificial lighting over the mating period should be avoided.

## Management of replacement stock

The diagram below shows how the different age groups of ewes should increase in weight throughout their lifetime and the targets that need to be set to meet optimum reproductive performance during key phases. Many farmers fail to achieve good performance from young sheep because they have been poorly reared and not achieved target weight for age. Where scanning data are available it is definitely worth benchmarking reproductive performance by comparing the scanning percentage of the different age groups on the farm.



On lowland farms the ewes should have reached their mature body size by the time they are mated for the third time (assuming they were mated for the first time as a ewe lamb). Lambing percentage is usually less in those animals that are less than their mature body size at mating. Typically where ewe lambs are mated their production is about half of that of mature ewes. Where gimmers are mated for the first time i.e. at around 18 months of age then they will usually scan around 25% fewer lambs than the mature age groups. With slow maturing sheep like North Country Cheviots that may continue to grow throughout their lifetime if run on marginal farms, then you may see an increased lambing percentage in up to 4 or 5 crop ewes.



The minimum ewe lamb weight for a cross bred is around 45 kg. Ewe lambs at mating should be in condition score 3, typical of a finished lamb. Gimmers should be at least 65 kg in weight relative to a 75 kg mature ewe with a condition score of 3.

## **Two teeth (gimmers)**

The lambing percentage of two teeth (gimmers) can be lower if they are too fat or too thin. Target condition score at tupping is 3-3.5. Well grown gimmers that have had a good summer and autumn can be overfat by mating so adjust stocking rates/grass availability accordingly. Reasons for low output in gimmers that were mated in their first year of life could also be due to having suckled twins or having been weaned too late, with inadequate repletion of body reserves prior to the next mating. However where ewe lambs are weaned early and given plenty of food there is no reason why they should not perform well.

## **Tupping Ewe Lambs**

- Ewe lambs should be 60% of their expected mature liveweight by tupping . This is fairly close to the finishing liveweight of wethers of the same cross. For mules or halfbreeds target 38-43 kg at the start of flushing.
- Research has shown that ewe lambs shorn in mid-late September and tupped late in October had improved performance. Lambs from shorn ewe lambs were 0.3 kg to 0.6 kg heavier at birth, and grew faster (+20 g/day) to weaning. Provided shelter after shearing is available to avoid any adverse welfare issues the results show clear benefits from pre-mating shearing in spring lambing flocks.
- Good nutrition in the weeks immediately before tupping is essential to ensure high conception rates. Ewe lambs are capable of liveweight gains of 1 kg/week on good autumn pasture if conditions are good. Recently purchased ewe lambs may be carrying fluke and worm burdens and will require a dosing programme that kills all stages of the parasites. Vaccination with a clostridial or clostridial/ pasteurella combined vaccine is recommended if this has not already been done (two injections at 6 weekly intervals). Lambs purchased in some areas may also respond to trace elements. It is prudent to crutch ewe lambs before mating.
- Ewe lambs in oestrus tend not to seek the ram as actively as older ewes and therefore best results are likely to be achieved when they are kept in relatively small groups in small fields. Mating with older experienced rams rather than ram lambs is also recommended.

## Ewe Return to Service

- If full mating activity is seen but there is a high return rate early in the breeding period, then a problem with the tup is the most likely cause, but other factors are possible. Fertility problems are not uncommon. Surveys have suggested that 10% of tups are infertile with a further 30% having suspect fertility. This can be caused by specific reproductive problems, but any disease that causes fever or other factors such as stress associated with dipping or poor nutrition can adversely affect fertility. Problems are most often seen in older tups, but specific infections affecting ram lambs or shearlings appear to be becoming more common. These may affect a group of tups rather than just an individual.
- A first step is to check rams and take a semen sample if no obvious problem is found. The tup may be fertile but semen stores depleted due to overuse. This can be especially a problem in rams due to immaturity. The male: female ratio for ram lambs should be no more than 1:25. Orf can cause painful sores on the prepuce stopping the ram from mating. A sudden nutritional stress may have resulted in early embryonic death or infection with Toxoplasma or Border disease can also give early embryonic death and return to oestrus. Blood samples would be required to diagnose these conditions.

## How Many Rams Do You Need?

Numbers of rams per ewe will vary from farm to farm, typical UK levels are 1 ram per 40 ewes and one ram lamb per 25 ewes, but with fit mature rams mated to mature ewes under intensive lowland systems many farmers have worked with up to one ram per hundred ewes with success.

The number of rams per ewe is less important than the fitness of the rams. Overfed and overweight animals have lower mating capacity. Before going to this ratio have a vet check that the rams are sound, mate in groups of at least 3 rams/300 ewes and move sheep on to fresh pasture when half the sward height has been completely grazed. Do not use this ratio when tupping immature ewes.

In hill sheep flocks mated on extensive grazings, one ram to 50 ewes is typical; lack of ram power will increase the percentage of barren ewes. If there is sufficient inbye land available it might be possible to mate yearling ewes and any poorer ewes separate from the main flock. This can reduce the risk of inbreeding in hill flocks as it provides the opportunity of using purchased rams inbye for 2 consecutive years before their daughters enter the flock. After 2 years a new team of rams can be mated with the young ewes and the previous team used to mate to mature ewes on the hill.

- Ewe: ram ratios can be increased where rams are proven, in good condition – with sound feet and legs, and tupping is on improved pastures stocked heavily so the rams are in close contact with the ewes. To maintain high intake throughout tupping move the flock onto fresh pastures after half the grass on offer has been eaten.
- Tup lambs will serve ewes many times so only use them up to 2-3 weeks at a maximum and then turn out fresh ones.
- Hill ewes in season will travel to find a tup. They seldom need to be gathered closely to the tup. Excessive dogging causes embryo mortality so pay more attention to checking that each group has its tup quota than moving ewes around.
- As a general rule for traditional March/April lambing work on 3 per 100 ewes. This allows a ram lamb to be run with mature rams so he is not overworked in his first season and for any ram that goes lame. Investment in extra rams is less expensive than the cost of a protracted lambing.
- Don't put novices together; always mate maiden ewes/lambs with experienced rams.
- Split the flock into manageable groups for tupping with an odd number of rams.

## **Teaser Effect**

All male sheep excrete chemicals called pheromones and the presence of these substances creates hormonal responses in the ewe helping to trigger the onset of the oestrus cycle. This phenomenon can be used as an aid to concentrating the lamb period. To maximise this effect, ewes should be kept away from the sight, sound or smell of any male sheep for four to six weeks and then stimulated either by introducing vasectomised rams (teasers) or the increasing proximity of rams 10 to 14 days pre-tupping. Teasers should be used at a ratio of one per 100 ewes.

## Preparation of Rams for the Breeding Season

- If health problems are spotted early they may be corrected before the start of tupping or in the worst case alternative arrangements can be made to buy-in extra ram-power.
- If there is a hot spell of weather in the months prior to tupping be prepared to move rams from hot unsheltered paddocks to a shady building with good air flow at sheep level.
- Shear wool from testicles, particularly on ram lambs.
- Allow access to cool fresh water.
- If rams are panting indoors take two handpiece widths of wool off their back from neck to rump.
- Treat nuisance heads flies, but do not plunge dip.
- If selenium is deficient, inject with long-acting selenium (available from your veterinary surgeon) in the neck at 12 weeks pre-mating. Research has shown that following treatment of rams with supplementary selenium, larger numbers of ewes conceive and hold to term. Selenium is a critical component of the tail of the spermatozoa- low levels of selenium can result in coiled or broken tails so the motility of the sperm is impaired. Since many parts of the UK are selenium deficient, low lambing percentages may be related to selenium deficiency of the ram.

## Physical Assessment of Rams

Rams are expected to walk many miles over the the mating period on a limited diet, therefore ensuring a good body condition at the outset will pay dividends in terms of ram work rate.

- A ram should be in good above-average body score, but definitely not too fat (condition score 3.5). Remember that three weeks of good feeding are required for each additional 0.5 condition score. Show condition is too fat.
- The ram should be placed on a rising plane of nutrition commencing 6-8 weeks before he is required to work. A diet compromising “ad lib” quality roughage and concentrates containing protein sources such as soybean meal would be recommended.
- The concentrate should avoid high levels of magnesium and have a high calcium to phosphorus ratio in excess of 2:1. Including 1% salt may assist in the prevention of urinary calculi, some producers include 0.5% ammonium chloride to acidify the urine as a further precaution. The concentrate should be supplemented with a suitable mineral/vitamin mix as a precaution against trace mineral deficiencies.

- Give thin rams 250 g rising to 500 g/d of 16% crude protein sheep compound.
- **Teeth.** Incisors should meet the pad. Check cheek teeth for abnormalities or abscesses in the jaw, which could affect feeding. This can be done by running fingers along the jawbone checking for unusual lumps and bumps.
- **Feet and legs.** Sound feet and legs are essential for mobility and serving ewes. Treat any lameness or footrot immediately to avoid the problem developing. A vaccination programme is well worthwhile.
- **Fleece.** Inspect for external parasites and for the presence of lumpy wool and treat accordingly.
- **Sores.** Inspect for damage to brisket or head and treat as appropriate (wound, orf, headfly etc) Careful introduction and slow integration of purchased rams with rams with others will reduce fighting.



*Physical assessment of rams*

- Time should be taken to rule out any visible problems that may influence the ram's performance. It would be advisable to ask your vet to show you how to carry out an examination of the penis and testes on the first occasion and discuss the sort of problems that might be encountered. Any ram that has or is suspected of having an abnormality should be checked by a vet to determine the likely cause of the problem. If there is a query about the fertility of a ram, it is possible to collect a sample of semen and assess it for motility and sperm concentration. Although the presence of motile sperm in high numbers is not necessary a definite guarantee of a ram's fertility, it is a good indicator.
- Some careful clipping of fleece from around the end of the prepuce will remove any potential physical obstructions to mating.
- The skin of the scrotum should have a healthy appearance and any excess fleece here should be removed, since maintaining the testicles at a slightly lower temperature than the rest of the body actually aids sperm production. The testicles should feel smooth and firm, and be more or less symmetrical and move freely within the scrotum. At the base of the testicle a walnut sized hard lump the epididymis should become firm at the start of the breeding season, and the skin on the inside of the top of the legs should become coloured.

- **Semen Testing.** If in doubt, your veterinary surgeon can take semen samples to assess the fertility status over at least two different dates.
- **General Health.** Do not forget to include your rams in routine health treatments such as clostridial and pasteurilla protection. When using anthelmintics adjust the dose, rams are typically 30 per cent heavier than mature ewes of the same breed.
- The lag phase of at least 6-8 weeks of sub-optimal fertility following recovery from an illness has other implications. If a ram is suffering from an infection that is not immediately obvious (i.e. significant intestinal worm burden), his production of meat, wool and sperm will suffer. Measures taken to counteract these problems, which themselves may stress the ram, should be carried out 6-8 weeks before the animal is needed.
- Check horns are not touching the face. You should be able to pass your fingers between the horns and the head. Up to 2 cm thickness of horn can be removed by cutting it back parallel to the face using a meat saw. If the end of a horn is coming into the face a proportion of the horn will need removing by cutting across it. Only a vet should do this, as it will bleed profusely.
- Tups purchased from no-tick areas are likely to be susceptible to tick-borne diseases. You should consult your vet if these are a problem on your farm.



*Measuring of the scrotum*

## Health Testing

Rams should be tested for Border disease and *Actinobacillus seminis* before being used in the flock. This especially applies to any rams purchased from outside the farm whose health status is uncertain.

- It is good practice to quarantine new tups for a period of 10 days allowing diseases to develop and for the animal to settle after sale and transport. It is false economy to put a new ram straight in with your stock ewes.

There are two types of disease which rams may pass on to other sheep in the flock: infectious diseases, which are transmitted via dung, breathing or contact; and venereal, or sexually transmitted diseases.

## Infectious Diseases

- **Caseous Lymphadenitis (CLA)** is a blood borne bacterial infection which causes skin lumps, abscesses and wasting in sheep. Purchased rams must be closely examined for lumps particularly in the neck region; check all rams available at a sale to ensure the sellers flock is free. There is no blood test available or approved treatment so any animal with lumps should be examined by a vet before introduction to the flock.
- **Maedi Visna** is a progressive wasting disease of sheep easily passed on from an infected animal. Flocks are tested for Maedi Visna in the Sheep and Goat Health Scheme and it is preferable to purchase rams from MV accredited flocks or, if that is not possible, to blood test them before introduction to ewes and other sheep.
- **CODD (Contagious ovine digital dermatitis)** is a disease causing severe lameness. The disease differs from footrot in that an ulcer starts above the hoof, penetrates downwards and causes loss of the hoof shell. It does not respond to normal footrot treatment, requiring specific antibiotic available from a vet.
- **Border Disease** causes wasting and ill thrift in some sheep, although many animals are aborted or stillborn. It is a viral disease spread from persistently infected animals that contracted the disease in the womb when the immune system was not fully functional. It is similar to bovine viral diarrhoea (BVD) in cattle, and gets its name from occurrence in the Welsh Borders. A single blood test can be carried out to ensure rams are not carrying the virus.
- **Sheep Scab** is commonly introduced in flocks through newly acquired rams. Although the ram may appear normal, it can be carrying the parasite and pass it on to other sheep. Commonly the disease is not noticed in ewes until after tugging time and then there are problems with treatment because the ewes are pregnant. Once again injecting new arrivals with anthelmintic injections can prevent the condition. This will also eliminate any anthelmintic worms.
- **Salmonella.** Often after periods of acute stress such as sales and transport this organism will cause acute disease in a newly bought ram. Since it is a highly infectious agent, it is best to prevent its introduction to the flock by quarantine for at least 10 days on arrival home.

## Venereal Disease

- There is perhaps only one true venereal disease of sheep (ulcerative balanitis) and it is an ulcerative condition affecting the prepuce, penis and vulva sometimes the skin. It seems to pass readily from ram to ewe at mating being seen within 3 weeks of service. The first sign of blood around the vulva and irritation and ulceration. It is important at this point to examine the ram for signs of disease on the prepuce and penis. Affected rams should be withdrawn from the flock. The problem commonly resolves without adverse effect on lambing percentage and recovered rams rarely develop the disease again.

## Other

- It is useful to fleece mark all rams, which are to be turned out to the hill so that they can be easily seen from a distance. The flock should be gathered frequently over the mating period to ensure that all ewes come into contact with rams. Strategic use of feed blocks over the tupping period can help to keep the flock from straying too far from the rams and helps conception rates. Introduction of fresh rams to stimulate mating activity after 14 days will also be beneficial.

## After tupping

- The net expenditure on your tups represents 20% of the total flock replacement cost. However a ram is only used for 6 weeks and sadly many are neglected for the rest of the year. Identify old rams for culling – animals with poor mouths, bad feet or excessively poor condition.
- Get rams back in condition score 2.5 to 3 quickly – lean rams have few reserves to fight off infection. Feed up to 0.7 kg of concentrates per day. Don't use cattle compound for tups. If the replacement policy is to buy ram lambs remember they have to put on condition and grow. They do not compete well with older rams so need to be treated as a separate group.
- Treat wounds, and separate out injured rams from the mob.
- Check brisket for sores and treat.
- Pare feet and footbath regularly.
- Treat rams with anthelmintics or a fluke and worm dose in hill areas. Increase the dose, as tups are typically 30% heavier than ewes. Ram lambs are twice as susceptible to worms as ewe lambs as they have higher protein requirements for growth, which on protein restricted diets means less is available to produce immunity.
- Get a vet in at the first sign of respiratory problems.

## Genetic Assessment of Rams

With margins under pressure it is essential that you choose rams which are value for money and which will perform well when you get them home.

Demand from the home and export markets had focused attention on reducing fat levels in lambs. Research work at the Scottish Agricultural College in Edinburgh has demonstrated that selection for increased lean in a terminal sire breed such as the Suffolk can be readily transmitted to their offspring. The trials showed that lambs from high lean index sires produced crossbred lambs from Mule ewes around 0.75kg dcw heavier at the same fat level than those from an unselected control. Translated into the lifetime of a sire, this should produce a premium of £360 for a ram covering 50 ewes each year for four years.

Utilising this benefit requires a knowledge of which individual rams are genetically superior. This information is available from flocks recording in the national Signet Sheepbreeder Scheme [www.signetfbc.co.uk](http://www.signetfbc.co.uk), tel: 01908 844195.

Flocks in this scheme use liveweight gain and ultrasonically measured muscle and fat depths to produce Estimated Breeding Values (EBVs) for each of these traits and an overall combined Lean Index. These values can either be based on a within-flock comparison or an across flock analysis.



*Genetic Assessment of Rams*

- Research has shown that terminal sire tups with high index scores produce crossbred lambs with higher value, leaner carcasses. Progeny of high index rams have been shown to have 1.5% less subcutaneous fat, and 0.5% more saleable meat yield. Lambs with high index sires also reached their marker weight about 10 days quicker. When the saving in grazing days is combined with the higher carcass value, the difference in performance is worth about £2 per lamb.
- Use Estimated Breeding Values (EBVs) to identify those animals with superior breeding potential. EBVs are calculated using a technique called Best Linear Unbiased Prediction (BLUP). BLUP uses performance records of the animal itself and its relatives. The resulting EBVs rank animals on the expected average performance of their progeny. EBVs are expressed in the units in which the trait was measured e.g. kg for liveweight, mm for muscle and fat depth. The sign on the EBV (+ or -) shows whether the animal has higher or lower breeding potential for that trait than an average animal.

- When picking rams at sales look out for those from recorded flocks with high index scores and/or favourable EBV's in the individual traits of most interest to you and your environment.

## **Ram Purchase Guide**

Britain is unique in having stratification at the heart of its sheep industry. Stratification is characterised by a three-tier breeding structure related to altitude and grazing.

- Ascertain whether flock records are within flock or part of an across flock analysis. EBV's and overall index then relate to that group of animals.
- A high EBV for scan weight (kg) indicates the animal's superiority in growth rate to around five months of age.
- A high EBV for muscle depth (mm) indicates superiority in depth of eye muscle, an indicator of overall lean meat content.
- A negative EBV for fat depth (mm) indicates a lack of subcutaneous fat over the eye muscle, resulting in leaner carcasses.
- A high Lean Index indicates the animal's overall superiority for producing commercial lambs with high growth rates, good muscling and leanness, i.e. efficient production of British Lamb for today's consumer.

## **Breeding for Scrapie Resistance in Sheep**

### **Brian Hosie, SAC Veterinary Services Group, Edinburgh**

- The genetic basis for susceptibility to scrapie is now well recognised and it is fundamental to the control of scrapie in the European Union. The specific gene associated with susceptibility to scrapie is called the PrP gene because it encodes for prion protein, protein that in a deranged or distorted form appears to be associated with the development of scrapie disease. Each individual sheep has two copies of this gene, one inherited from each parent.
- Five different patterns of the PrP gene are recognised in sheep and each pattern is associated with a different degree of scrapie susceptibility or resistance. Breeds vary in the frequencies with which each pattern occurs. Scrapie genotyping is the testing of a blood sample to determine the pattern on each copy of the PrP gene.

- The Government launched the National Scrapie Plan (NSP) for Great Britain in the summer of 2001 with the objective of reducing and eventually eradicating diseases like scrapie from the National Sheep Flock. The NSP is a long-term, voluntary plan, which initially consists of a breeding programme to increase the number of sheep that are genetically resistant to scrapie. All owners of purebred breeding flocks are urged to enrol their flock in the NSP.
- All adult (stock) rams in the flock plus any male progeny that are to be used for breeding within the flock are tested free under the NSP. A proportion of ram lambs born that year for sales will also be tested and additional ram lambs or females can be selected to bring the figure up to the minimum number for a cost-effective visit. During the visit, the sampler will administer an electronic identification device (EID) to each sheep entering the scheme. The EID uniquely identifies each sheep and the EID number appears on the genotype certificate with the results of the test. The results are grouped into five risk categories.
- At present rams in the top three categories may be used for breeding. Those in the bottom two categories must be slaughtered or castrated. These criteria will be tightened progressively over the next few years such that only rams in groups 1 and 2 may be used for breeding. There is no restriction on the ewes but clearly flock owners are advised to select ewes from the three better categories. In this way the next generation will have a reduced risk of developing scrapie. Breeders should buy rams that are in scrapie risk groups R1, R2 (or failing that R3) to give good resistance to the disease.
- Private genotyping services are available for the owners of flocks that do not qualify for the NSP or do not wish to apply at this time. Also some flock owners may wish to test sheep over and above those tested under the NSP. These flock owners can arrange for their sheep to be sampled by their own private veterinary surgeon and tested at private laboratories. These results remain confidential to the owner.
- A progressive increase in resistance to scrapie is sought while ensuring that breed characteristics and quality are maintained. The speed at which this can be implemented depends on the frequency of the different genotypes within the breed.



## Controlled Breeding and Oestrus Synchronisation

James Mylne, Britbreed Ltd

### Controlled breeding programmes

1. To advance the breeding season
  2. To enable top sires to be used through artificial insemination (AI)
  3. To concentrate the lambing period
- The golden rule for controlling breeding is to keep ewes from the sight, sound and smell of rams until teasing (see below) and mating. Do not allow ewes to move into pens or yards recently occupied by rams. Keeping ewes away from ram pheromones until the start of mating gives a more compact lambing.

Three methods are available to induce early breeding.

### Teaser rams

- Teasers can be used to stimulate ewes to breed thereby producing a tighter lambing pattern. They will not advance the breeding season significantly or affect ewes outside their normal breeding period. The operation to vasectomise a male sheep must be performed by a vet at least 2 months before intended use. To produce a teaser pick an animal with good libido, healthy and fairly young as they should last a few years. Allow one teaser per 100 ewes turned out no earlier than 14 days before the rams are turned out.

*Teasers can bring positive benefits to hill ewes tupped inbye in the form of concentrated lambing. As conditions and food supply can deteriorate quite rapidly during the tupping period, it makes sense to ensure that as many ewes as possible are tupped as early as possible after the rams are turned out. This may be particularly helpful in gimmers, where teasers may bring an improvement in overall reproductive performance.*

- The use of teasers at a ratio 1:25 has been shown to decrease the period of time over which a group of ewes ovulate. This may improve conception rates where frozen semen is being used.
- Pen ewes so that all the ewes for one sire are together. Ewes within this group showing oestrus first should be AI'd first.

- Sponges impregnated with the hormone progesterone can advance the breeding season by 4 to 6 weeks. The sponges are placed in the vagina for between 12 to 14 days. 48 to 60 hours after removing the sponge the ewes can be mated at ewe: ram ratio of 10:1. Pregnant mare serum (PMSG) can also be used as an injection at sponge removal to increase ovulation rate; it is essential when used with AI.
- Follow the instructions provided by the inseminator very closely. If you have not had experience of inserting sponges and treating ewes with PMSG, consult your local veterinary surgeon and ALWAYS provide him with a copy of the programme in plenty of time for him to organise the supply of the necessary drugs. You can ONLY obtain your sponges and PMSG through your own local veterinary surgeon.
- The success of AI depends on synchronising ovulation to the arrival of viable sperm in the reproductive tract. Sponges must be pulled from the ewes on time as instructed. If for any reason the removal of sponges is delayed, contact the inseminator immediately as this may affect the time ewes are to be inseminated.
- PMSG must be accurately administered. PMSG is mixed immediately before use and injected into the muscle in the hind leg. Use a 2 ml syringe to ensure accurate dosage. Any unused PMSG should be discarded as it rapidly degrades once mixed with water.
- Melatonin can be used to advance the breeding season by up to 6 weeks. It is a controlled release implant given at least 35 days prior to the tupping date. Ewes will not be synchronised using this technique, therefore normal ram power is required (one ram to thirty ewes).

## **Artificial Insemination**

### **Advantages of AI**

- A ram could mate 50 to 100 ewes naturally per year. Using cervical AI with fresh semen this would increase to 1000 over a 17-day period. With laparoscopic intrauterine AI using frozen semen, tens of thousands of ewes could be inseminated with stored semen over several months.
- Frozen semen can be imported and exported far easier than live animals, is cheaper to purchase and reduces the risk of disease transmission.
- Semen can be stored to provide insurance against untimely death, immobility or infertility.
- Rams can be checked for fertility before use. Every sheep is artificially inseminated, unlike rams, which may miss a ewe.

- Large numbers of ewes can be mated on one day. Ewes will lamb down over a concentrated period meaning a more efficient use of labour.

## **Cervical AI**

Cervical AI allows you to control breeding policy because:

1. Quality rams can be used more widely
  2. Total number of rams held can be reduced so less money is tied up
  3. Intensive breeding programmes can be introduced
  4. More economic use of labour and management time
  5. Earlier, tighter lambing i.e. higher prices because you control the lambing date.
- Conception rates to first service with AI is comparable to those achieved by natural service. With the control offered by AI, sheep producers have the opportunity of dramatically increasing the number of lambs produced by top sires in a given period.

## **The Benefits of Laparoscopic AI (Lap AI)**

- Fresh semen from your own ram can be inseminated, ensuring a tighter lambing period and increased sire use for a given period. Each ram used has a semen quality check, reducing the risk of repeat cycle ewes.
- Ewes conceiving to AI will lamb over 5 days, thereby reducing labour costs at lambing and allowing better utilisation of staff. Greater supervision at lambing will decrease lamb mortality.
- Lambing to AI can be timed so that a high percentage of lambs will be born within 2-3 days of your most suitable lambing date. This gives more lambs a better chance to be well grown for the early sales.
- Feeding and management of ewes can be more accurate, as ewes holding to AI will be at the same stage of pregnancy.
- AI assists in the efficient operation of national breed Sire Reference Schemes.
- Frozen semen can be purchased, rather than buying an expensive ram. This is very attractive to the smaller pedigree flock owner or the flock utilising semen from other countries. Access to top genetics without purchasing the ram is possible with AI.
- AI allows efficient ram sharing.

## What does Lap AI involve?

Lap AI involves the insemination of ewes synchronised with sponges and PMSG with fresh or frozen semen, using a laparoscope to enable insemination directly into uterus.

- Only Veterinary Surgeons are able to carry out this technique.
- Up to 300 ewes can be inseminated by one vet per day.
- Conception rates of 60-70% are averaged using frozen semen.
- Conception rates of 75-85% are averaged if fresh semen is used.
- Fresh semen from one ram can be used to inseminate up to 150 ewes/day.

## Choosing the best candidates for AI

- Ideally ewes should be weaned at least 6 weeks prior to AI, although good conception rates have been achieved with Friesland ewes being milked at the time of insemination, this is not recommended for meat producing sheep.
- AI should not be seen as a means of getting those ewes, which have a poor reproductive history in lamb, although the internal examination of non-breeders with a laparoscope sometimes enables the veterinary surgeon to diagnose the cause of infertility.
- Maiden ewes should all have cycled naturally before being synchronised for insemination; otherwise conception rates may be variable.
- Ewes should not be in over fat condition and be fed on a rising plane of nutrition.

## Further information

Please contact HCC's Industry Development Team

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For further information on this brochure or the work of HCC please visit

**[www.hccmpw.org.uk](http://www.hccmpw.org.uk)**