Ram Buyers Guide

HYBU CIG CYMRU
MEAT PROMOTION WALES

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Cronfa Amaethyddol Ewrop ar gyfer Datblygu Gwledig: Ewrop yn Buddsoddi mewn Ardaloedd Gwledig
The European Agricultural Fund for Rural Development: Europe Investing in Rural Areas

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Hybu Cig Cymru / Meat Promotion Wales
Tŷ Rheidol, Parc Merlin, Glanyrafon Industrial Estate
Llanbadarn Fawr, SY23 3FF
Tel: 01970 625050 Fax: 01970 615148
Email: info@hccmpw.org.uk

www.hccmpw.org.uk

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Introduction

This booklet aims to provide the reader with an understanding of how to select rams on performance figures. By selecting on performance figures and utilising the best available genetics, flock performance and profitability can be improved significantly.

Selecting breeding stock with high performance figures is widely recognised as the single most effective tool for increasing economic returns and efficiency of livestock production. Essentially, this is achieved by identifying the best performing animals on weight gain, conformation, and maternal value.

HCC runs a genetic improvement programme supporting breeders to performance record their pedigree animals. HCC also provides support to commercial breeders on how to select animals on performance to maximise production and profitability.

More information on HCC's genetic improvement programme please visit our web site www.hccmpw.org.uk.

Contents

Breeding for Profit

A progressive breeding strategy will influence the two main components of flock profitability: lamb output and costs of production.

Lamb output

The breeding potential of the flock will influence the value of lamb produced per ewe, firstly through the ewe's genes for prolificacy and maternal care and subsequently through the lamb's genes for growth and carcase quality.

Costs of production

Reductions in labour and housing requirements can be achieved through genetic selection for easier management and health. Reductions in feed and fertiliser can be achieved by enhancing lamb growth rates.

Flock profitability = output – costs
A progressive breeding strategy can influence both factors

Establishing Breeding Goals

When establishing breeding goals, identify traits that could be changed to increase profitability.

Compare these two lowland flocks who are keeping their own replacements and selling lambs deadweight.

	Farm A	Farm B
Number of lambs sold per ewe	1.15	1.72
Av. carcase weight per lamb	19.2kg	17.1kg
Proportion meeting abattoir weight specification	89%	68%
Proportion overfat	14%	5%
Proportion poor conformation	0%	18%

Each farm will require a different type of ram.

Farm A needs a ram with superior maternal attributes to increase the number of lambs born and reared per ewe. A ram with negative fat EBV should be considered to avoid over fat lambs.

Farm B requires a ram with superior genetics for growth and muscling, with acceptable maternal attributes to maintain current levels of prolificacy.

Assess flock strengths and weaknesses by:-

- Comparing flock performance (rearing percentages and weights) against similar enterprises
- Comparing costs of production against industry benchmarks
- Calculating how profitability would change with changes in productivity

Identify the factors that will improve flock financial returns
Select breeding stock with the right genetics for the system

Assessing Breeding Potential

A ram's appearance will be influenced by his breeding potential, age, health and management. Appearance alone can be a poor guide to breeding potential for growth and carcase traits and provides little information about maternal traits, such as prolificacy and milking ability.

In Signet recorded flocks, measures of "performance" such as prolificacy, lamb growth rate and muscling are collected on an annual basis. Differences in age, sex and flock management are taken into account, together with data from known relatives, to provide the best possible prediction of breeding potential (genetic merit).

These predictions are referred to as Estimated Breeding Values (EBVs). The seven main EBVs are shown below.

Estimated Breeding Value (EBV)	Trait
Eight Week Weight (kg)	Early growth rates
Scan Weight (kg)	Growth rate
Muscle Depth (mm)	Muscling across the loin
Fat Depth (mm)	Leanness
Litter Size (% lambs)	Female prolificacy
Maternal Ability (kg)	Milking ability
Mature Size (kg)	Ewe mature size

EBVs provide the best guide to assess breeding potential

An Investment in Breeding

Farm trials and research work have consistently shown a financial benefit in using rams with superior EBVs. Typically these benefits have been £2 to £3.50 per finished lamb and considerably more where female replacements are retained. A high EBV ram that increases returns by £3/lamb could be worth an extra £600 over his working lifetime.

Investment in rams with superior breeding potential is highly cost effective providing they possess the right genetics for the flock and have a long, productive lifetime.

Buying a ram with the right EBVs represents a sound investment

Focus on Growth Rate

Growth rate is a key driver influencing the productivity and hence the profitability of commercial sheep flocks.

High growth rates can:

- Increase the weight of lambs being sold
- Increase production efficiency by reducing days to slaughter
- Improve the timing of lamb sales to target high priced markets
- Increase the proportion of lambs sold off grass

Which EBVs are important?

Eight Week Weight EBV (kg)
Estimates breeding potential for growth from birth to 8 weeks old

Interpretation

A ram with an EBV of +3 is expected to produce lambs that are 1.5kg heavier at 8 weeks than a ram with an EBV 0. (figures derived from 50% genetic potential of ram)

Scan Weight EBV (kg)
Estimates breeding potential for growth from birth to 21 weeks old

Interpretation

A ram with an EBV of +4 is expected to produce lambs that are 2kg heavier at 21 weeks than a ram with an EBV of 0. (figures derived from 50% genetic potential of ram)

Growth rate is important under any system, including extensive management and store lamb production.

Remember:

- High growth rates will only be realised under good management with adequate feed and good flock health
- Increasing lamb growth rates can result in an increase in ewe mature size; this may not always be desirable

Rams with high EBVs for growth rate will increase lamb weights and reduce days to slaughter

Focus on Carcase Conformation

A significant proportion of lambs presented for slaughter do not meet the target specification due to them being overfat or poorly conformed. Selecting rams with superior EBVs for carcase attributes can increase flock returns.

How is carcase conformation measured?

Muscle and fat depth across the loin are measured using ultrasound as lambs reach 21 weeks of age. Computed Tomography (CT) enables even more accurate measures of muscle and fat yields to be collected on the live animal.

Which EBVs are important?

Muscle Depth EBV (mm)
An assessment of muscling across the loin that provides a good prediction of total lean meat yield.

Interpretation

A ram with an EBV of +2mm is expected to produce lambs with an extra 1mm of eye muscle depth compared to a ram with an EBV of 0.

Fat Depth EBV (mm)
Negative values indicate the potential to produce leaner carcases or carcases that can be taken to heavier weights.

Interpretation

A ram with an EBV of –1mm is expected to produce lambs with 0.5mm less fat across the loin compared to lambs sired by a ram with an EBV of 0.

Abattoir kill sheets and price grids indicate how much emphasis to place on carcase traits.

A ram's fat depth EBV will influence how quickly lambs can be finished. In extensive systems where quick finishing is important, it may be desirable to select a ram with a slightly positive fat depth EBV.

Research has shown that selecting leaner breeding lines is not detrimental to ewe or lamb survival.

Muscle and fat depth EBVs can be used to enhance carcase grades for fat class and conformation

Focus on Maternal Performance

The number of lambs reared and sold has a major impact on flock profitability. Selective breeding can be used to produce more productive ewes.

Maternal EBVs are not only of interest to flocks selecting female replacements but they are a vitally important part of ram selection - as these attributes can't be assessed visually.

Which EBVs are important?

Litter size born EBV
Indicates the prolificacy of a ram's daughters.

Interpretation

A ram with a litter size EBV of +0.2 is predicted to produce ewe lambs that produce 0.1 (10%) more lambs than a ram with an EBV of 0.

Maternal Ability EBV (kg)
Indicates rams whose daughters will produce faster growing lambs due to their milking ability.

Interpretation

A ram with a maternal ability EBV of +0.5 is expected to sire ewes whose progeny will be 0.25kg heavier at 8 weeks than a ram with an EBV of 0.

Using EBVs to enhance (or reduce) prolificacy is more reliable than simply selecting rams reared as singles, twins or triplets. Flock management should be reviewed if large increases in prolificacy are planned.

Maternal breeding decisions must be made with great care as these traits will be expressed in the flock for successive generations.

EBVs provide the only accurate way to assess a ram's breeding potential for maternal traits

Focus on Mature Size

There is a genetic relationship between lamb growth rate and ewe mature size, which makes it difficult to select for one trait and not influence the other. Breeders retaining their own replacements must consider how selection to increase lamb growth rate will affect ewe mature size.

Which EBVs are important?

Mature Size EBV (kg)
Indicates size at maturity.

Interpretation

A ram with a mature size EBV of +8 is predicted to produce ewes that are 4kg heavier than a ram with an EBV of 0.

or Scan Weight EBV (kg)

Where flocks are not recording mature size, the Scan Weight EBV can be used to identify breeding lines that will be heavier at maturity.

Advantages of greater ewe mature size

- Lambs with superior growth rates
- Increased milking ability and prolificacy in some breeds, subject to adequate nutrition
- Increased cull ewe value
- Potential to increase breeding stock value where larger ewes are in demand

Disadvantages of greater ewe mature size

- Increased feed requirements
- Poor performance in a harsh environment
- Increased capacity needed for housing
- Heavier, stronger sheep to catch and handle
- Lower stocking density

The optimum ewe mature size for a flock depends on the target lamb market and available farm resources

Breeding Indexes

EBVs aid the selection of breeding stock for specific traits. They can also be combined into Breeding Indexes, where each EBV is weighted according to its relative economic importance.

The most commonly used indexes are shown below.

Index	Aim	Contributing EBVs
Terminal Sire Index	To increase the yield of lean meat in the carcase whilst limiting any associated rise in fatness	Scan weight, muscle depth, fat depth and gigot muscularity
Maternal Index	To enhance pre-weaning growth rates and lamb survival by improving maternal ability	Eight week weight and maternal ability
Longwool Index	To enhance lamb growth rates and carcase quality whilst limiting increases in ewe mature size	Muscle depth, maternal ability, scan weight and mature size
Welsh Index (Carcass+)	To enhance maternal ability, lamb growth and carcase quality	Maternal ability, scan weight muscle depth and fat depth
Hill 2 Index	Improve the overall financial productivity of the hill ewe	Scan weight, litter size, maternal ability, mature size

Indexes simplify decision making; ranking animals on the basis of a single breeding objective

Accuracy Values

An EBV predicts the breeding merit of a ram for a specific trait. The degree to which this EBV reflects the "true" breeding merit of the ram depends on how much performance data is available for analysis.

Accuracy values range between 0% and 100% and indicate the likelihood of an EBV or Index changing (up or down) over time.

Ram Lamb	EBV	Accuracy
Scan weight	5.0	78%
Muscle Depth	3.2	67%
Fat Depth	0.3	69%

Stock Ram	EBV	Accuracy
Scan weight	4.5	97%
Muscle Depth	2.8	92%
Fat Depth	0.2	94%

The ram lamb has superior EBVs, but his lower accuracy values indicate there is a greater chance that they may change in future evaluations

High accuracy values provide buyers with the confidence that a ram's EBVs are accurate and close indicators of his true breeding potential.

Rams with low Accuracy Values

EBVs based on limited amounts of information are adjusted towards an average figure until more data becomes available. Amongst those rams with low accuracy values there may be individuals with good genetics but a lack of performance data means they are difficult to identify using EBVs.

Ram buyers can use accuracy values to predict the likelihood that a ram's EBVs will change over time

A ram's genetic strengths and weaknesses can be assessed by comparing his EBVs against the breed benchmark.

Compare the breeding potential of these two rams against the breed benchmark shown below.

	EBV	Accuracy
8 Week Weight EBV	1.98	94
Maternal Ability EBV	0.26	51
Litter Size EBV	0.03	48
Scan Weight EBV	4.75	94
Muscle Depth EBV	3.47	95
Fat Depth EBV	0.11	96
Welsh Index	287	93

	EBV	Accuracy
8 Week Weight EBV	2.28	92
Maternal Ability EB	1.15	52
Litter Size EBV	0.14	58
Scan Weight EBV	3.56	92
Muscle Depth EBV	1.16	94
Fat Depth EBV	-0.02	95
Welsh Index	216	91

Breed Benchmark	Average	Top 25%	Top 10%
8 Week Weight EBV	1.12	1.60	2.22
Maternal Ability EBV	0.29	0.66	0.99
Litter Size EBV	0.03	0.07	0.13
Scan Weight EBV	2.13	3.10	4.08
Muscle Depth EBV	0.95	1.59	2.13
Fat Depth EBV	-0.06	-0.24	-0.40
Welsh Index	173	209	244

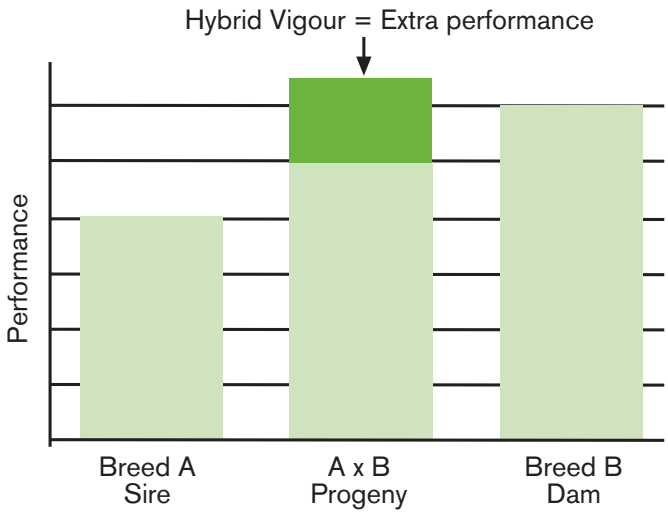
Ram A would be ideal in a flock looking to enhance the carcase attributes of slaughter lambs. Ram B would be well suited to a flock looking to breed more productive female replacements.

By comparing a ram's EBVs to the breed benchmark his genetic strengths and weaknesses can be quickly assessed

Exploiting Hybrid Vigour

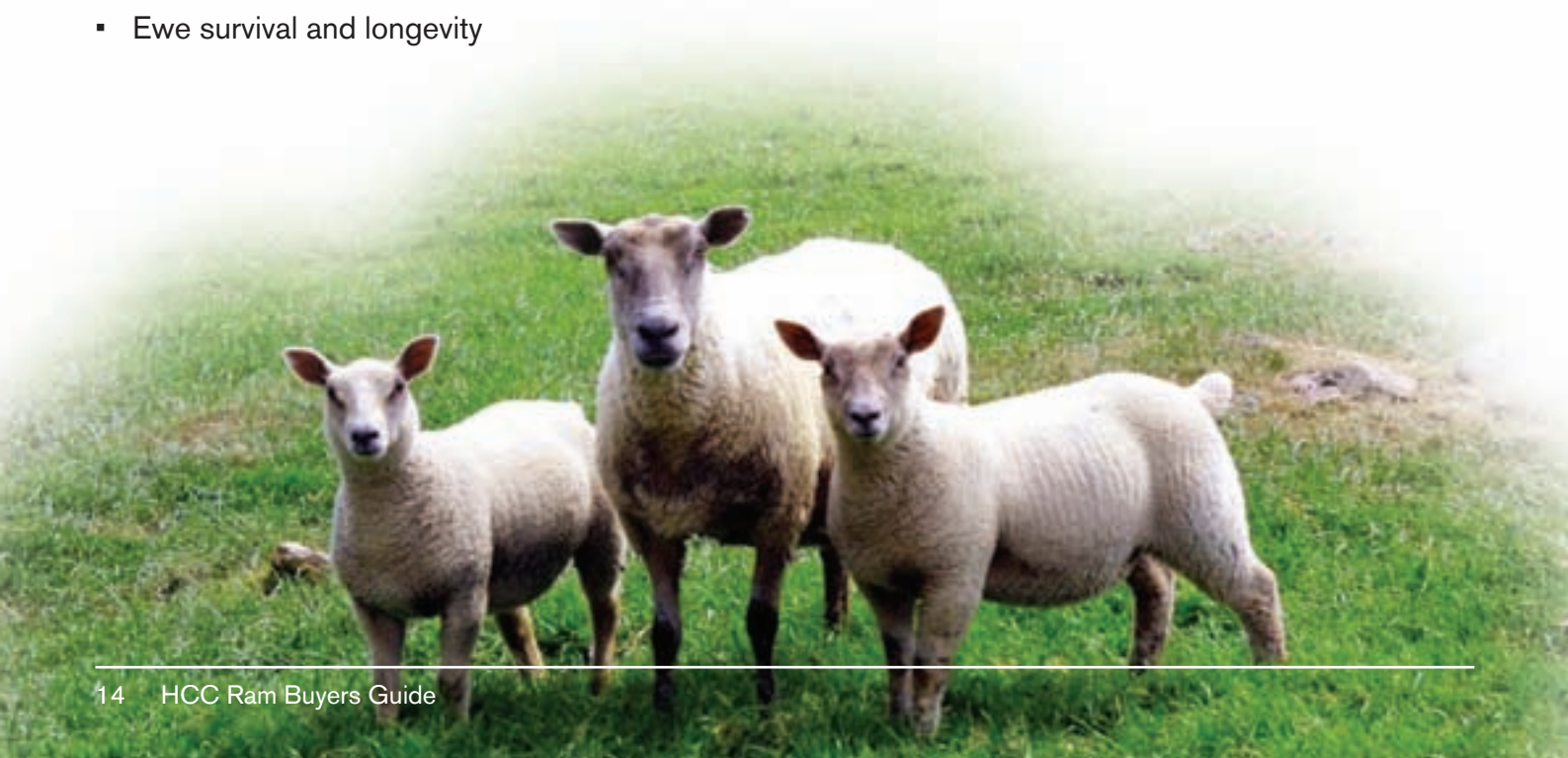
Many traits can be easier to improve through crossbreeding and the exploitation of hybrid vigour alongside within-breed selection using EBVs.

Hybrid vigour is the improvement in performance that is achieved by a crossbred over and above the average performance of its two purebred parents.



Whilst hybrid vigour can enhance growth and carcase traits, it has far more impact on low heritability traits influencing reproductive performance and longevity, these include:

- Lamb survival
- Ewe fertility
- Ewe prolificacy
- Ewe survival and longevity



Exploiting Hybrid Vigour

Producers breeding their own female replacements need to consider whether these are to be purebred or crossbred.

Advantages of breeding purebred females

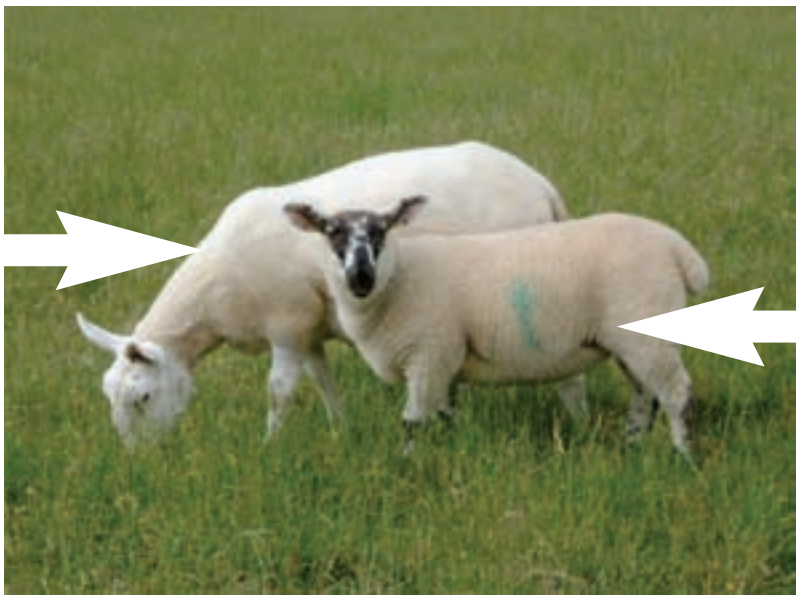
- Simple system, where only one breed is required
- Potential marketing advantages from purebred sales
- Greater uniformity amongst breeding and sale stock

Advantages of breeding crossbred females

- Exploitation of hybrid vigour
- Wide access to different genetics
- Faster potential rates of genetic change

Breeding strategies can be developed to incorporate hybrid vigour into the genetic makeup of both the ewe and the lamb.

Maternal hybrid vigour
Fertility and longevity



Direct hybrid vigour
Lamb Survival

Breeders can enhance important traits such as ewe fertility and longevity by exploiting hybrid vigour

Buying a Recorded Ram

Most of the rams traded in Wales are either purchased directly from breeder's farms or through the sale ring.

Signet Breeding Services performance records over 600 flocks, identifying the leading genetics amongst 40 different breeds of sheep. A Welsh Breeders' Directory giving contact details of recorded flocks is available from Hybu Cig Cymru Tel: 01970 625050 or from the websites; www.hccmpw.org.uk www.flockbook.org.

Advantages of buying on farm

- Rams can be bought at any time
- Lower bio-security risk
- Breeders can explain their breeding and feeding regime
- Rams destined for sale from the farm are often less highly fed
- Time to discuss requirements with breeder and provide feedback

When buying on-farm ask the vendor :-

- For the most recent EBVs and index
- If the ram has been scanned using ultrasound
- Where the ram would rank in comparison to the rest of the breed
- For the Genetics Trends report showing that the flock is improving.

A physical inspection is important. Pay close attention to each ram's feet, locomotion and the soundness of their testicles.

Buying a Recorded Ram

Advantages of buying at auction

- Catalogues containing EBVs are often available prior to sale
- Wider selection of recorded rams on display
- Competitive bidding

When buying at auction

- Obtain a catalogue in advance. The Breed Benchmark should be printed in the front
- Read the sale terms and conditions
- Create a shortlist of suitable rams on the basis of their EBVs
- Arrive in plenty of time to examine rams on your shortlist. Pay close attention to their feet, locomotion and the soundness of their testicles.
- Write notes in the catalogue
- Find a seat with a good view of the auctioneer

Always ask vendors whether they record; some don't actively display EBVs for their stock at every sale. Prior to purchase enquire about flock health status and the ram management regime. Complete the Ram Checklist at the end of this guide.

Ram Fertility

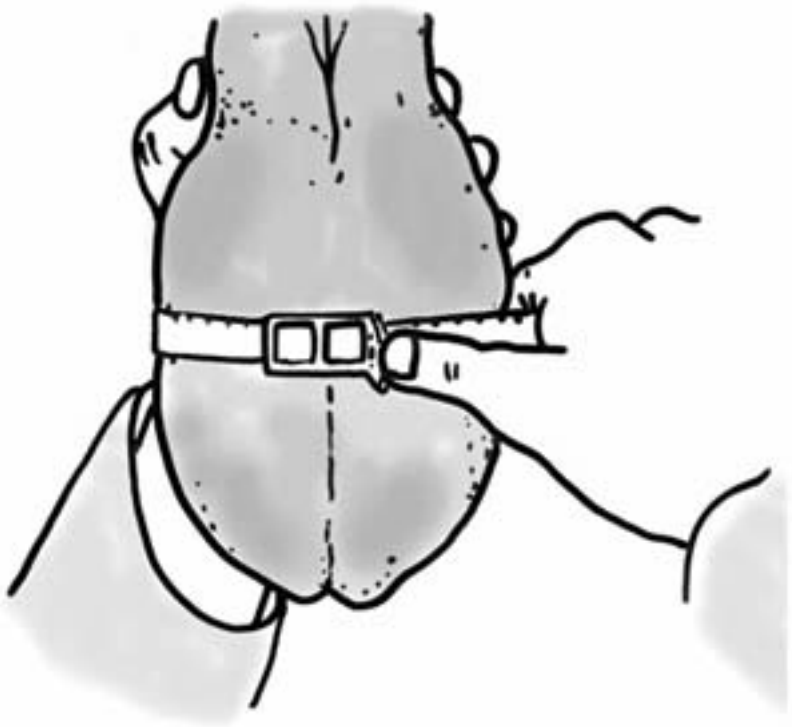
Ram fertility is vitally important. Infertile rams are a major cause of economic loss.

To avoid buying a ram with poor fertility, consider checking :-

- Scrotal size and tone
- Structure of sheath and penis
- Semen quality – particularly in an old or juvenile ram
- Behaviour – including his libido and willingness to mate
- Structural soundness – an unfit or lame ram is more likely to be subfertile
- Pre-sale feeding and management

Testicle size is important as it directly influences daily sperm production and mating load.

Testicle size will be influenced by the age, breed and body condition of the ram. Testicle tone is also important. Testes should be firm and springy, with no evidence of hardness, lumps or swelling.



Size matters. Rams with large, firm testicles are more likely to be highly fertile

Looking after a New Ram

Place new rams into a quarantine area.

- Treat rams to prevent the introduction of worms and external parasites into the flock
- Gradually change their diet onto their new ration
- Avoid heat stress; consider shearing them and ensure they have access to shade.
- Put rams onto the same vaccination regime as the rest of the flock
- Watch new rams when they are working. Monitor their condition and remove any that are rapidly losing weight or being bullied

Sperm production takes 7 weeks, so next year inspect your ram team 10 weeks before tupping.

- Rams should be in body condition score 3.5 by tupping time
- Check testicles for abnormalities and tone
- Feed a quality high protein ration to any in poor condition or with soft, undeveloped testicles
- Ensure feet are sound. Treat any that are lame
- Check teeth
- Ensure their vaccination status is up to date
- Treat for worms and external parasites
- Consider a selenium and zinc supplement
- Keep rams healthy and stress free until tupping time

Ram Checklist

Breeding Objective	Importance to flock	EBV of Interest	Current Breed Average	Ideal EBV
Example				
Early growth rate	Yes	8 Week Weight	4.2	Over 6
Slaughter lamb				
Early growth rate		8 Week Weight		
Later growth rate		Scan Weight		
Muscle depth		Muscle depth		
Fat depth		Fat Depth		
Female replacements				
Prolificacy		Litter Size		
Maternal Ability		Maternal Ability		

Health Check

MVA .....

Scrapie Genotype .....

Vaccine Status

Blue Tongue .....

Clostridial Diseases .....

Structural Soundness

Teeth .....

Legs & Feet .....

Body Condition Score .....

Testicles

Size .....

Tone .....