



Sheep Ireland LambPlus

Protocols and Procedures

Managing Animal Identification and Performance Trait Recording

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Introduction

The establishment of a new genetic improvement scheme has created opportunities for recording information on new traits and for new methods for recording existing traits.

The purpose of this document is to provide relevant practical information on animal identification as well as a set of protocols for trait recording for those producers involved in LambPlus. The development of this protocol for accurate recording is intended to set a precedent for quality information gathering and evaluation in the future. It provides key points about the management of animal identification and of recorded animals to maximise the quality of the information collected. This entire document should be read prior to beginning trait recording to ensure that no important information is overlooked.

How this document works

This protocol is set out as follows:

- A focus on the individual identification of animals, an extremely important aspect of performance recording, including managing tagging and DNA- and EID-based technology.
- Mating management
- Performance recording of lambs until weaning including instructions and protocols
- Instructions and protocols for performance traits measured in a timeline from weaning until adulthood.

Advice is provided on whether recording should be conducted by you or a technician. Within each section (where applicable) information is given on when to collect data.

Managing animal identification

The accurate identification of recorded animals is essential for several reasons.

- Accurate identification is critical to ensure that the correct performance information is linked to the appropriate animal.
- The identification of lambs to their sire and dam is essential in order to build a robust pedigree. Pedigree is very important, especially for traits that are poorly inherited (such as number of lambs born and survival). Performance information from relatives helps to build up a picture of genetic merit, when the performance of individual animals is heavily clouded by random environmental events.
- Knowledge of pedigree is important to manage matings to avoid problems associated with inbred lambs.

The identification (ID) scheme

The new Sheep Ireland identification scheme enables lifetime animal identification through modifications of the existing NSIS system.

On entrance to the Sheep Ireland LambPlus scheme, there is a requirement to adopt a modified animal identification system that has been established to facilitate accurate lifetime identification of individuals, irrespective of how many times they change from one flock to another.

The key attributes of this system are outlined below.

The permanent identification of existing ewes, rams, hoggets, and lambs in your flock will be required. This will entail not only the inclusion of a new tag into the right ear of the animals but also the linking of existing identification (whether it be a tattoo or within flock ID) to the new Sheep Ireland Identification so that Sheep Ireland can ensure that the existing performance information for each animal is linked to that animal's new permanent ID.

Identification procedure

The new system (herein defined as the LambPlus ID) associated with LambPlus has a number of modifications and key attributes. The following protocols should be adhered to in the advent of the situations outlined below:

1. In the case of adult animals in a participating flock that have an NSIS tag in the left ear only, an identical tag can be placed in the right ear. In the case of animals that have entered into the flock and have a tag in the right ear, that right ear tag can be replaced with an identical tag to that in the left ear. A variation of this applies to those producers entering LambPlus as MALP breeders and this is outlined in the double tagging section below.
2. Double tagging at birth of all lambs with permanent, identical NSIS tags. This will not only provide lifetime identification of the animals but offers the ability to recover identification if it is lost from one ear.
3. The original left NSIS tag would become the permanent identifier. This will stay with the animal for its lifetime.
4. The like-for-like replacement of the NSIS tag (white) for all animals in either the flock of birth or another flock, providing the flock owner is a Sheep Ireland participant. This will ensure that no animal within the Sheep Ireland performance recoding scheme will have a change of ID (if a tag is lost), while involved.
5. If an animal moves from one participating LambPlus flock to another flock participating in LambPlus, the two original tags can be left in place.
6. If the animal moves to a non-participating flock, the normal NSIS rule applies and the right ear tag is replaced with the new flock owner's tag. For Sheep LambPlus participating flock

owners who purchase in stock from a non-participating flock or from abroad, like for like replacement of tags is allowed.

Some important comments about animal ID

Animal ID is fundamentally important. Where sufficient animals have a known sire and dam, Sheep Ireland builds a pedigree for a flock. When Sheep Ireland performs genetic evaluations, it uses the permanent LambPlus ID tag to build this pedigree. If errors in the pedigree (or parentage) have been found and they are corrected, the next time a genetic evaluation is performed, the new pedigree will be generated and used. So it is important to correct errors in ID when you become aware of them. The link developed between recorded progeny and the sire is not immediate in a sheep breeding situation (as it is in a cattle breeding situation). With natural mating, an association is made between the ram and the ewe by the mating group the ewe was in (this is recorded on a mating pre-list). It is not until the lamb is recorded to the dam that a link (essentially via the dam) is made between the sire and the lamb. This is dissimilar to a cattle breeding situation where the sire is recorded at insemination.

Double tagging

Below are protocols for implementation of double tagging of existing animals, separately for LambPlus pedigree breeders versus MALP breeder flocks, including double tagging requirements and timing of tagging.

Pedigree breeders

Tagging existing animals (inventory update)

For pedigree breeders double tagging will be required with an identical tag to that of the existing NSIS tag in the right ear to be placed in the left ear. These will be ordered

Timing of tagging

It is recommended that application of the second tag to existing animals be carried out as soon as possible (i.e. immediately after joining LambPlus). Application during the winter months will minimise infection of the tagged ear.

Suggested times:

- Pregnancy scanning
- 30 days pre-lamb at clostridium vaccination
- At lambing (allowing ewes and lambs to be double tagged at the same time)
- At weaning

MALP breeders

Tagging existing animals

For MALP breeders a system utilising a special MALP tag will be required for existing animals. This will involve the application of a numeric tag that will be correlated with the left ear NSIS tag at weighing (all existing animals will be weighed and have breed recorded as a first step in LambPlus MALP involvement). These tags will be supplied by Sheep Ireland and will be inserted by a technician at the commencement of the involvement in the LambPlus MALP.

Timing of tagging

It is recommended that application of the second tag to existing animals be carried out as soon as possible (i.e. immediately after joining LambPlus MALP). A technician will contact you to organise a time that suits. Application during the winter months will minimise infection of the tagged ear.

Suggested times:

- Pregnancy scanning
- 30 days pre-lamb at clostridium vaccination
- At lambing (allowing ewes and lambs to be double tagged at the same time)
- At weaning

DNA parentage (CPT, MALP, and DNA parentage recording flocks)

DNA parentage provides the opportunity to not only minimise the disturbance of lambing ewes and accurately identify each lamb to a dam, but also provides the opportunity to store blood samples potentially valuable in the future. DNA parentage will be used to allow multi-sire mating, ensure accuracy of parentage recording, and reduce the work load required at lambing. This will mean that all ewes, rams, and lambs utilising a DNA-based parentage system will be DNA sampled.

As a participant in the Sheep Ireland LambPlus CPT or as a performance recording breeder:

- You will be required to record lambing performance information, regardless of the fact that DNA parentage recording will be used. Detailed pregnancy scanning to determine litter size at scanning and foetal age can also be used to obtain birth data.

As a participant in Sheep Ireland LambPlus MALP or as a breeders using DNA parentage:

- You will be provided with the option of recording lambs at birth (data of birth and litter size), or alternatively detailed pregnancy scanning to determine litter size at scanning and foetal age can be used to obtain birth data.

General protocols for collection of DNA samples are presented.

General protocol

- These protocols are applicable to general sampling only using DNA ear tags; however specific sampling instructions will be provided by the technology company offering the product/ service, once this has been established.
- The ideal time for collection of DNA samples on progeny is at lambing via ear cartilage with a DNA tag.
- Ewes and rams can be DNA sampled at any stage (prior to any selection or culling points in the progeny with time allowed for parentage to be established and genetic evaluation to be carried out) but it is recommended that this be done at mating. Over time, it might be expected that the majority of parents have had their DNA samples taken as lambs and repeat samples should not be necessary.
- Whichever instructions are used, they should be adhered to, to avoid contamination or ineligible DNA samples being taken.
- Ensure that prior to testing the required numbers of testing kits are available.
- Read and understand the entire instructions before beginning.
- Ensure that enough information is recorded with the blood sample to enable identification of the animal (i.e. Sheep Ireland ID, sex, year etc).
- Ensure samples remain dry and out of sunlight.

Some important comments about DNA parentage recording

The DNA sample does not need to be taken from lambs at birth; however, there is considerable importance in pregnancy scanning ewes whose lambs are to be matched using this method because:

- if DNA samples are not taken from dead lambs, there is no way to determine litter size of ewes; and
- if recording of birth date and birth rank is not practical, then foetal aging (with ultrasound) is required (early-born, mid-born versus late-born) as a proxy for date of birth in order to correct for the environmental advantage accruing to lambs born earlier in the season and consequently having a higher age at measurement. Number of lambs present at pregnancy scanning should also be recorded.
- Alternatively, if easily achievable, lambs could be identified into 3 day birth time frames by colour marking and location marking (i.e. crown versus rump) of lambs during lambing.

DNA parentage information

- Effective DNA parentage matching requires mating group and tail ringing group information to be recorded accurately. In DNA parentage, the sire and dam of the lamb are predicted as accurately as possible, however on occasions where the potential dam is established to half sisters, for example, the parentage may only be established to one of two dams. By providing mating and tail ringing group information the likely parents can be limited as much

as possible. Ensure that mating and tail ringing group information is collected for ewes and lambs.

Electronic Identification (EID) (CPT and MALP flocks, and flocks using EID)

All progeny will be electronically-tagged for identification purposes in CPT and MALP flocks. This protocol can also be used by those performance recording flocks utilising EID. Electronic tagging will simplify data collection for all traits and also simplify animal management (drafting, feeding management, record keeping). The ewes may also be electronically identified. Tagging may be in the ear or via a bolus.

Training will be required in the installation and operation of electronic ID tags, hardware, and software, and this will be dependent on the product used and required systems for that product.

General protocol

- Installation of a race reader for sheep management will be required, and this to be integrated with electronic weigh scales and farm management software
- Installation of EID tags in lambs at birth. If an ear tag is to be used, electronic tagging can occur either at birth or at the first management event (40 day weight) in the lambs' life if an ear tag is used. Using a bolus will require tagging at a later age only (weaning)
- Ensuring the maintenance of tags during the lifetime of the animal is essential (i.e. retag animals that have lost tags and ensure the appropriate data is linked to the new tag)

Mating management

Good mating records are important for accurate pedigrees on next spring's lambs.

Identifying your ram team

All the rams you use need to be correctly identified on the Sheep Ireland system. Uniquely identify them using the permanent LambPlus ID system. You will need to specify this for homebred rams as well as for rams from another stud that have been bought-in or used via AI.

Single sire mating

For each ram, record the LambPlus ID of all ewes he is mated to. Records should be kept of those ewes that are embryo transfer (ET) recipients. Recording the recipient(s) will ensure that the donor is known of reach lamb. This will ensure that the lamb can be linked to its' genetic dam at birth (via the association of dam (or donor) with recipient on the mating list). By submitting this mating list to Sheep Ireland, the database will automatically identify each lamb's sire when their dam's tag is recorded at lambing.

Ewe management

Management of recorded ewes need not be much different to commercial lambing ewes. Many producers feed single-bearing and multiple-bearing ewes differently, perhaps providing additional feed or some meal for multiples and so on, as they would for commercial ewes. However, there are some things to be aware of in order to get the most value from the measurements you collect.

- You will need to identify the group ewes are in at lambing so that Sheep Ireland can correct for 'group effects' – e.g. better feed to twins. This is important when groups are fed separate for a long time – e.g. supplemented from lambing through to weaning. The grouping of animal involves assigning ewes to a group from group 1 upwards (depending on the number of groups). It is as simple as ensuring the ewes in the same group get the same group number, not the group number itself.
- Lambing groups should be as 'genetically random' as you can make them – i.e. by all means lamb singles separate from multiples, but have ewes that went to a mix of sires in each lambing group. If all ewes in group A are mated to sire 1, while all ewes in group B went to sire 2, Sheep Ireland will not be able to say how much of any difference in the performance of lambs born to these ewes is due to the group effect or to the sire effect.

Mating ewe lambs

If you mate ewe lambs, their mating and lambing details can be recorded just as you do for the older ewes. There are some key things to be aware of when recording ewe lamb mating and lambing information.

- As with older ewes, we need to identify the difference between ewe lambs that were not exposed to the ram and those that were mated but failed to conceive. Animals not mated need to be recorded as having unknown lambing performance, whereas those mated but not pregnant will be assigned as so (barren when given the opportunity to get pregnant). **This is an important difference.** For example, a lambing string “.1121” for a five year old ewe is not the same as a lambing string “01121” when calculating genetic merit for number of lambs born for the ram that sired these females. The ewe fate codes at lambing will ensure that unmated ewes are identified.
- Some breeders mate ewe lambs but don't intend to keep their lambs as replacements. This can provide useful information on litter size for the daughters of sires and it is obtained one year earlier. You could assess this by pregnancy scanning or by collecting lambing information from mated ewe lambs.
- Sometimes, 2-year-old ewes that were mated first as a ewe lamb show slightly different performance than ewes that were not. Sheep Ireland can identify and correct for this, provided records on which animals actually lambed as a ewe lamb are available.

Performance recording

How to record

The focus of performance recording and data capture in LambPlus is web-based, offering the realisation of cost savings to you as the breeder. If you have web access then recording parentage and performance information directly via your LambPlus logon site is encouraged. You will be able to print off recording sheets to allow ease of recording in the field and transfer of information directly to animal events. There will also be an option to enter data through your farm management software.

Alternatively you can contact LambPlus (on LoCall) and request a performance recording pack, which will contain recording sheets for parentage and trait recording, and an ID and performance recording protocol. This can be returned to Sheep Ireland for entry to the database.

Electronic hand-held systems should also be available in time for data recording which will synchronise with the Sheep Database, and will interact with electronic ID readers.

In any case data should be entered into the database as soon as possible after recording the event. This will ensure the maximum amount of data is available for evaluation at any time point where results are required.

Some important comments about pedigree and performance recording

Data should be collected on all of the animals (lambs born) and these animals uniquely identified. Be conscious that it is harder to correct errors (which occur in any system) at a later time.

It is always valuable to put in the date of measurement. If measurements were taken over several days (e.g. weaning weights for different groups, weaned over a week) then put the date alongside each set of group data. This allows Sheep Ireland to most accurately adjust for animals having different growth periods prior to weaning.

Be aware of common ID errors such as duplicated animals (e.g. two weaning weights for same lamb), unknown animals (e.g. no animal on database has that ID). These can be caused by errors transposing letters when writing down at recording (e.g. read it as 213/08 but record it as 231/08). Using pre-printed pre-lists from Sheep Ireland can help a lot in minimising such errors. EID systems will eliminate these sorts of errors when recording performance information.

Recording lambs

A lot of important information can be recorded when a lamb is first handled. Make sure you keep full records for every lamb born:

- Each lamb is recorded against its birth dam and sire (single sire mating and mating list will record the sire). You will not have to write the sire tag in at lambing.
- Each live lamb will have a unique LambPlus ID tag. Dead lambs or culled lambs need to be recorded but needn't be given a tag number. However some breeders find it easier to give them a dummy tag number (this will be defined by Sheep Ireland) that helps keep track of

dead lamb numbers, and ID the lamb with a mortality code. **Best practice is to always identify dead lambs that a ewe has in your lambing records, even if the lamb is not tagged.**

- Each lamb needs a birth date. Sheep Ireland adjusts performance measurements to remove the effect of differences in age - e.g. weaning weights are adjusted to accurately compare the growth of the first and the last lambs born. Writing in a date only once a week can penalise some lambs (born late in week) and benefit others (born early in week). This birth date information may arise either from recording birth data (manually) or from foetal aging (with ultrasound – early-born, mid-born versus late-born).
- Each lamb needs to have sex recorded, for performance adjustment and to separate the sexes for reporting purposes. Where lambs are born dead, or culled at birth, it is useful to record sex where this can be determined. Sex codes are presented below. For many later measurements, adjustments need to be made for sex as part of the genetic evaluation statistical process.
- Each lamb should have birth weight recorded. This provides useful information which can be linked to lamb survival and lambing difficulty.

Fate codes at lambing

Sheep Ireland uses codes to determine the time at which the lamb died, and any comments on the reason the lamb died contribute to the evaluation of lamb survival. The following are important points.

- Dead lambs need to be recorded. Sheep Ireland must know about dead lambs to determine birth rank for surviving lambs and for genetic evaluation of lamb survival as an economically important trait. It is useful to record the date that the lamb died (if known), as Sheep Ireland may use this in the future. The lamb mortality code should be recorded to identify the time the lamb died.
- Some lambs need a 'lamb rearing code' to indicate that they are something other than healthy lambs reared by their birth dam e.g. fostered or hand-reared.
- When lambs are fostered onto other ewes, this should be recorded, whether or not the foster mothers are stud ewes. Sheep Ireland needs to know about this to estimate merit for survival and for weaning weight.
- For lambs with no 'lamb mortality code' or 'lamb rearing code' it will be assumed that they are raised by their dam normally.
- Similarly ewes with no lambing fate code are assumed to be raising a lamb normally.

Lamb fate codes

Lamb mortality code	Description
DM	Died due to misadventure
DB	Born dead (before tagging)
DL	Died later (after tagging before tail ringing)
DW	Died between birth and weaning (usually used when recording weaning weight)
DD	Died defect
CU	Culled at birth
Lamb rearing code	Description
FO	Fostered
HR	Hand reared
ET	ET progeny
DE	Defect

NB: The DM code should be used to identify lambs that have died due to non-genetic causes. It is important that lambs where the reason for death is known to be non-genetic (e.g. smothered) that this code gets preference over other codes.

The DW code is commonly used when recording weaning weight, if a lamb is not present, but the timeframe between birth and weaning at which the lamb died is not known.

The DD code should be used to record lambs that have a defect, which caused death e.g. closed anus.

The DE lamb rearing code should be used to define lambs that are reared with a defect e.g. cryptorchid (a cryptorchid is an animal in which one or both testes have failed to descend into the scrotum).

Lamb sex codes

Lamb sex code	Description
M	Male
F	Female
U	Unknown

Ewe lambing fate codes

Sometime ewes are assigned a code at lambing to indicate that they did something other than raise their own healthy recorded lamb's e.g. foster mother, unrecorded progeny. If ewe lambing fate code column is left blank think implies the ewe raised her own lamb(s) as normal. Below are the ewe codes at lambing.

Ewe fate code	Description
FM	Foster mother

AB	Aborted
LU	Lambled – Unrecorded progeny (e.g. by terminal sire in late lambing stud ewe)
NM	Not mated
SI	Screened in

NB: Screened in implies that the ewe has been brought in from outside the performance recorded flock (e.g. from a commercial flock)

Trait recording

The development of the Sheep Ireland genetic improvement scheme brings about the recording of new information. Protocols have been adjusted to accommodate a wider range of economically important traits. The performance traits recorded are:

- 40 day weight
- Weaning weight
- Any further weights up to 180 days of age
- 140 day ultrasonic muscle depth
- 140 day ultrasonic fat depth
- Faecal egg count
- Feet score
- Dag score
- Lambing difficulty
- Lamb mortality and reason for mortality
- Adult ewe live weight (taken at 18 months of age)
- Ewe disposal record

A protocol is provided for the timing and recording of each of the traits outlined above. These protocols are presented on a time scale following a lamb from weaning.

Recording a lamb from weaning

NB: There are a number of aspects of recording in the following protocols that apply to a lamb prior to weaning. These components of the protocol are marked as such.

Weighing events

As a prerequisite to weighing, scales should be calibrated using reference weights to ensure accuracy of weight data collection. Weight records are essential in determining growth rate, and multiple weights are required to achieve this. Growth rates can be divided into pre-wean and post-wean.

Therefore **weaning weight** is a key **performance measurement**. Important points to be aware of are:

- Record the weight of all the lambs, including small lambs and later born ones. If one sire leaves small progeny, we need to take account of this, even when we intend to cull them.
- The date that each weight is taken should be recorded.

- It is good practice to treat all animals the same where possible but the Sheep Ireland system's ability to handle 'group effects' will overcome differences if management can't be the same (e.g. one group had to be left in the yard longer before weighing). At weighing record the group is applicable.
- Electronic systems will enable efficient recording of weaning weight information. Scales which let you enter the tag number and record the weight save writing. Some data loggers can collect the weights and prepare them for Sheep Ireland in a single operation. Such systems can alert you if you attempt to add another weight for a lamb that already has a weight recorded

For later and earlier weights including 40 day weight (*pre-weaning record*), autumn weights, and mature weight) the protocols are much the same as those for weaning weights. It is best to:

- Weigh all animals still present, male and female, for the best information about post-weaning growth in your flock.
- Remember to identify different groups that have been run separately up to this weighing.
- Record the weighing date. This is most important where groups are weighed on different dates but should be recorded anyway.
- Ewe mature weight should be measured at hogget mating (approximately 18 months) and then subsequently at mating each year.

You or the technician

It is expected that involvement in Sheep Ireland LambPlus will require you to develop the capability to weigh animals and record weight information.

Ultrasonic scanning

Many breeders take ultrasound measurements in the autumn of loin muscle and of fat depth to get information about carcass meat traits. To get the most value from ultrasound scanning it is best to:

- Scan enough progeny per sire to get reliable estimates of genetic merit – a minimum of 10 per sire is recommended. You don't have to measure every lamb – larger flocks may measure ram lambs only but smaller flocks will need to measure ewe lambs as well to get sufficient scanning information for accurate genetic evaluations.
- It is important that the animals that make it to scanning are spread across a reasonable proportion of sire lines.
- Ultrasound measurements can be affected by the stance of the sheep. Stressed sheep may not stand in a consistent way and cause the results to be biased. Discuss with your scan operator how to minimise such effects and so maximise the quality of the data collected.
- You should supply to Sheep Ireland eye muscle depth, eye muscle width and fat depth together with the live weight and date at scanning.

When to collect data

It is recommended that ultrasound scanning for fat and muscle depth be carried out at 140 days-of-age. Weight should be collected at this time also. Scanning at this time will increase the accuracy of evaluations, providing better information by which to make selection decisions on.

You or the technician

This service will be provided by a technician

Faecal egg count (FEC)

Faecal egg counting and analysis is used in genetic evaluations of resistance to internal parasites. The following are the protocols for recording FEC, including **1. Faecal egg count monitoring test**, and **2. Faecal egg count testing for breeding value analysis**.

Faecal egg count monitoring test (*pre-weaning record*)

The aim is to allow the parasite burden to build up in the lambs so that the average egg counts in the lambs reaches a minimum of 500 eggs per gram before FEC testing for genetic evaluation purposes is undertaken. Sampling of randomly selected animals can be done at any time to monitor the rise in egg counts if necessary.

- Collect FEC samples from 15 randomly selected lambs using the standard sampling method (outlined below) in the first week of March (around six weeks of age) to establish the average egg counts in the lambs.
- All lambs should be drenched at this stage (after collection) while still on the ewes.
- Eight to ten days later, collect FEC samples from 15 randomly selected lambs, again using the standard sampling method.

Guidelines for the standard sampling method for collection of faecal samples from lambs (random collection for FEC monitoring test)

Lamb faeces must be collected and can be pooled for analysis. Ensure that each FEC sample is from a lamb not a ewe.

Ensure that:

- Each sample collected is fresh and from a *different* faecal deposit
- The *same volume* of material is collected from each faecal deposit using scoop
- Samples are collected *about the same time of day* for duration of study

Collection of faecal material

1. Date and label the bag/ pottle required for sample collection.
2. Corner the sheep in the field/ holding pen, hold and allow defecating.
3. Walk in one direction through group and collect a scoop of fresh lamb faecal material, level the scoop using the back of a stick and place in the desired sample bag (lamb faecal material is easily discriminated from ewe faecal material by size (and colour) differences . Repeat this procedure from different fresh faecal deposits to obtain at least 30 samples in the one bag.

4. Remove air from bag and seal.

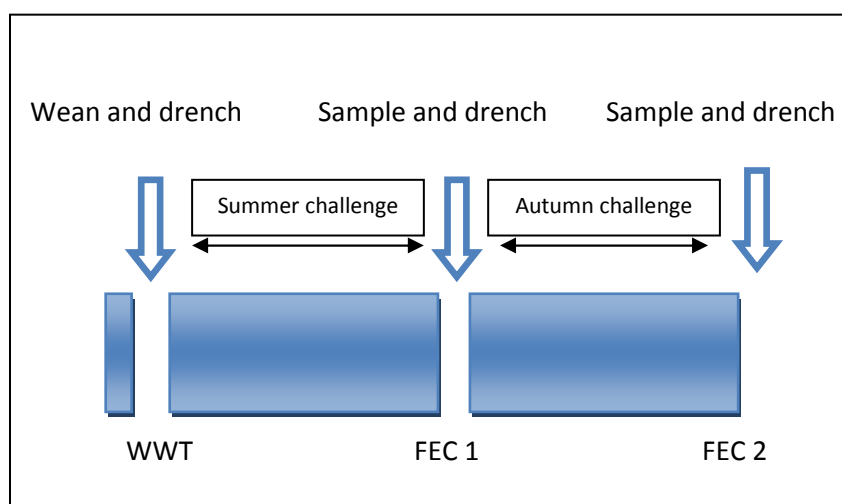
Do FEC test immediately if possible otherwise store in cool place preferably in fridge or surrounded by an ice pack.

Faecal egg count testing for breeding value analysis

At weaning, the first draft of lambs should be removed for first slaughter, and the remainder drenched. 6 to 8 weeks later **eight ewe lambs and eight ram lambs per sire from the remaining lambs should be FEC sampled at this point to give the FEC values used in the breeding value analysis.** To provide a more accurate estimate of an individual's genetic level of resistance, this can be followed by a further sampling 6 to 8 weeks later (the diagram below explains). However, any combination is possible, and collecting 2 samples several days apart at the end of the summer challenge is an option (i.e. both at the end of summer challenge).

In addition to the individual samples, ten repeat samples are collected for quality controls. These additional ten samples should be pooled. After splitting the pooled sample into two sets, one should be sent off with the original individual animal samples and the second pooled sample sent to an alternative laboratory for quality control testing.

FEC Challenge Protocol – ideal sampling points



Guidelines for the standard sampling method for the collection of faecal samples from lambs (collection for faecal egg count breeding value analysis)

Lamb faeces must be collected **separately**.

Ensure that:

- Each sample collected is fresh and from a *different* faecal deposit
- samples are collected *about the same time of day* for duration of study

Collection of faecal material

1. Date and label the required number of bags/ pottles for sample collection.
2. Corner the lamb in the race or holding pen, allow the lamb to defecate and collect the sample into the bag/ pottle. Extraction of faeces may be required.
3. **Ensure the bag/ pottle is labelled correctly and seal.**
4. Repeat the procedure for 8 ewe lambs and 8 ram lambs per sire

Do FEC test immediately if possible otherwise store in cool place preferably in fridge or surrounded by an ice pack.

FECPAK method for sheep faeces (assessment of FEC – eggs per gram)

For recording of FEC on individual animals the following protocol applies, when using the FECPAK kit. Alternatively the sample may be sent to a yet to be defined service provider.

1. Weigh fresh faeces less bag weight.
2. Add cold water to bag (three times the weight of the sample e.g. 10g of faeces then add 30ml of water).
3. Break up the sample in the bag to ensure an even suspension.
4. Add 30 ml of the sample to the FECPAK cylinder.
5. Add saturated saline up to the 230 ml mark.
6. Plug the FECPAK cylinder. Mix by inverting a number of times gently; avoid the introduction of air bubbles.
7. Wet the FECPAK filter with water prior to use, shake off the excess water and place the FECPAK filter on top of the jug.
8. Pass the mixed suspension through the sieve into the jug.
9. Mix the filtered material in the jug (figure of 8 motion with the 3ml Pasteur pipette).
10. Using the pipette aspirate a random sample of the solution and pipette (hold the pipette horizontally) the sample into the first chamber of the FECPAK slide. Repeat and fill second chamber of FECPAK slide.
11. Ensure no air bubbles are present in either chamber prior to counting. If bubbles are present, clean the slide, start afresh and refill the chamber as before.
12. Count eggs within the grids of chamber 1 and 2 (x 10 magnification). Total eggs counted in Chamber 1 + Chamber 2 x 30 = number of eggs per gram of faeces (epg).

When to collect data

For the faecal egg count monitoring test samples should be collected when lambs are around six weeks of age.

For faecal egg count testing for genetic evaluation purposes samples should be collected from individual animals at weaning.

You or the technician

It is expected that FEC sampling will be carried out by you as the breeder. Analysis may be conducted by you, if you have the tools, or samples may be sent to a lab (to be defined). For more information see <http://www.fecpak.com/pr-sheep.aspx>

Foot scoring

Foot health related problems, including footrot can be assessed by scoring feet (left front and hind and right front and hind) into a range of categories describing increasingly severe definitions of footrot. Scoring should be carried out on all adult sheep including hoggets. EID will simplify the recording process. The following are categories by which an animal may be recorded:

0. Normal hoof. No signs of any foot lesion, infection or irritation
1. Mild interdigital dermatitis ('scald') with some loss of hair. Slight to moderate inflammation confined to inter-digital skin and may involve erosion of epithelium
2. More extensive interdigital dermatitis and necrotising inflammation of inter-digital skin
3. Severe interdigital dermatitis and under-running of the horn of the heel and sole
4. Severe interdigital dermatitis and under-running of the horn of the heel and sole and with under-running extending towards the walls of the hoof

Contemporary group

Sheep Ireland does need to know if there have been systematic differences between groups of animals that are foot scored within a year. These may be due to different management (feeding groups) or a different operator scoring them for foot health. These treatment differences can be accounted for by assigning animals to different groups. You can think of them as "groups" on the basis of whether they were run together, or not, during the period when foot lesions developed, on whether some sheep were treated while some were not, and on the basis of who performed the foot scoring.

When to collect data

Scoring should be carried out on all adult sheep including hoggets routinely twice a year, once pre-mating and once at weaning (hoggets should be included at these times regardless of whether they are mated or not). This will ensure that accurate estimates of genetic merit for footrot resistance. In addition any observations and/or treatments for foot health problems should be recorded outside the routine check time. The more data collected the better in this case.

You or the technician

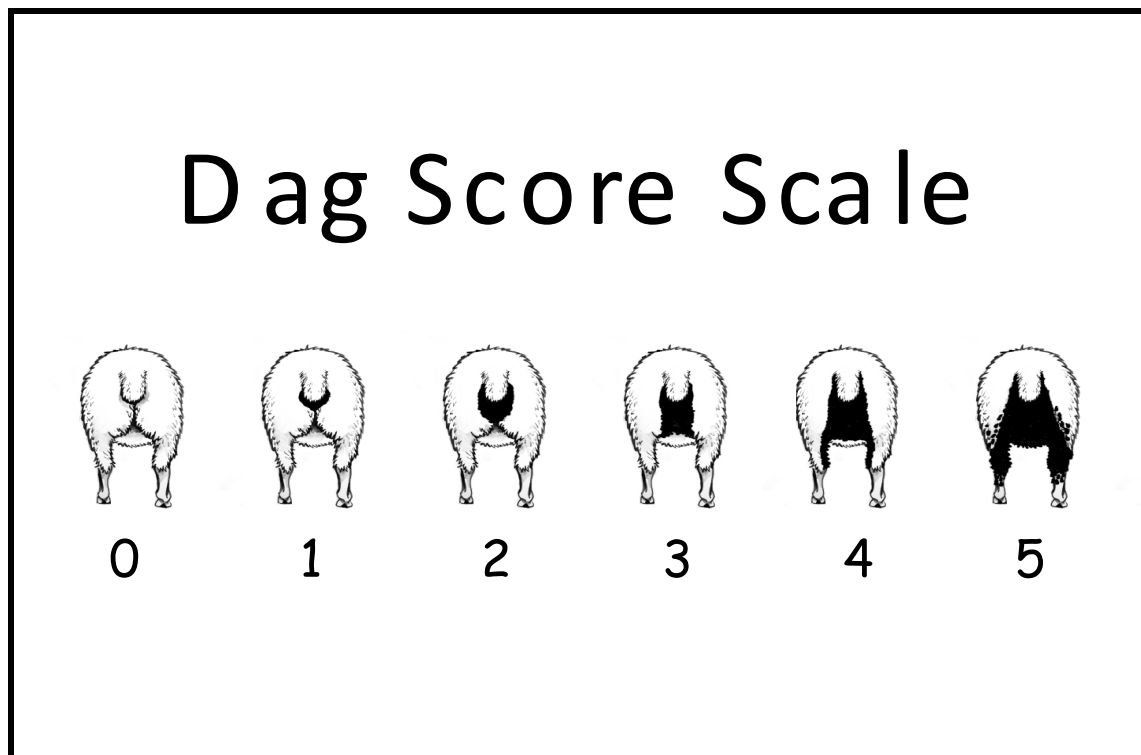
Foot scoring should be carried out by you as a breeder

Dag Scoring

The Dag Score scale

Sheep Ireland uses a scoring system displayed in the diagram below. This shows a 6-point scale ranging from 0 (no dags) to 5 (very daggy). However, smaller scales can be used e.g. a 4-point scale from 0 to 3 is suitable. **The key is to be consistent when scoring a group of sheep and for these sheep to have been run under similar conditions.** The dag score scale given below just shows the degree or extent of faecal contamination of the fleece. This should not be confused with urine stain in ewe lambs and hoggets.

Using the diagram below is recommended when gaining experience in scoring, and the best way to achieve consistency is practice! Do not be unduly worried about variation in the way the scores are applied between years or between flocks. During the genetic evaluation Sheep Ireland will remove the effects of differences between years and flocks.



Contemporary group

Sheep Ireland does need to know if there have been systematic differences between groups of animals that are dag scored within a year. These may be due to different management (feeding groups) or a different operator scoring them for dagginess. These treatment differences can be accounted for by assigning animals to different groups. You can think of them as “groups” on the basis of whether they were run together, or not, during the period when dags developed, on whether some sheep were crutched or drenched while some were not, and on the basis of who performed the dag score.

The effect of drenching

Animals can scour for many reasons other than internal parasites. There is no need to avoid drenching in order to seriously challenge sheep to scour. However, in order to get the best discrimination for genetic merit for dag score, we should aim to get 30-40% of sheep with a dag score greater than zero. Any less will make it harder to discriminate the sheep less prone to dags from those more prone to dags. You can crutch and drench sheep after scoring them.

When to collect data

Sheep Ireland can use two scores of dagginess to predict genetic merit for dag score. You do not have to record both but the accuracy is lower if you record only one. The first score is collected soon after weaning (DAG4 – at 4 months), and the second in the autumn (DAG8 – at 8 months). Typically lambs have NOT been crutched prior to DAG4, while they are crutched after that and well before DAG8 data is collected.

You or the technician

Dag scores will need to be recorded by you as a breeder.

Lambing difficulty

Sheep Ireland uses a scoring system on a 3-point scale ranging from 1 (no lambing or non-mandatory assistance) to 3 (prolonged intervention). During lambing any ewe that requires assistance of any sort should be recorded as doing so, with those that require none also assigned a status. As with dag scoring, **the key is to be consistent when scoring a group of sheep and for these sheep to have been run under similar conditions.** The level of lambing difficulty can be defined based on the level on intervention required at lambing, and can be categorised into the following 3 discrete groups:

1. No assistance or non-mandatory intervention for convenience
2. Moderate assistance required, no adverse impact on ewe or lamb
3. Significant difficulty requiring prolonged intervention by farmer and/or vet, and/or noticeable subsequent impact on ewe and/or lamb performance

You or the technician

Lambing difficulty scoring should be carried out by you as a breeder.

Ewe disposal record

It is useful to have ewe disposals recorded with a disposal reason for culled ewes. Sheep Ireland can use this information to evaluate longevity. It is essential to identify voluntary disposal reasons (i.e. due to poor performance, or poor breeding values) versus involuntary disposals such as “found dead” or “accident” or death or culling for disease. When culling is carried out it is important to record the date. The culling codes are listed below, and can be selected when recording animal events.

Ewe culling/death codes

Ewe fate code	Description
DM	Dead misadventure (e.g. knock out by gate)
DU	Dead unknown
LD	Died lambing difficulty
IN	Culled infertility
LP	Culled low performance
OA	Culled old age
IJ	Culled injury
FH	Culled health
AB	Culled abortion
TY	Culled poor type (legs, hock/ hoof soundness, jaw)

You or a technician

As a breeder you will be expected to record ewe culling and death records.

Bringing it all together

You've now collected a suitable set of information to allow some evaluations to be carried out for terminal and maternal traits:

- Number of lambs born is generally assessed from lambing records. An alternative strategy is to use pregnancy scan information or a combination of the two.
- Longevity is assessed from deaths of related animals
- Growth to weaning has been measured at weaning and post-weaning growth has been measured in the autumn weight.
- Mature ewe weight is assessed from later weights (notably 18-month mating weight).
- Muscling and fat depth has been measured with ultrasound scanning at the autumn weighing.
- FEC is used to assess resistance to internal parasites
- Dag score, foot health and lambing difficulty allow assessment of rams for traits that increase costs.

The Sheep Ireland system adjusts these measurements for non-genetic effects in your flock then combines it with information about the performance of related animals to generate measures of genetic merit. These can be listed sire summaries to display the range of genetic merit amongst the group of rams. Such reports will help you identify the best animals overall plus outstanding individuals for various traits.

Contact support

LambPlus Locall - 1850 600 900

Field tech support - 086 1216546 (Graham)