beef+lamb new zealand GENETICS

VISUAL SHEEP SCORES

and additional recording traits

A guide to the scoring system used by nProve to help stud breeders and commercial farmers select sheep on visually-assessed traits.

October 2023

Introduction

nProve has a number of scored traits that can be recorded in sheep flocks. Some of these scores, such as bareness and dag score, are used in the New Zealand Genetic Evaluation (NZGE) and result in Indexes and/or Breeding Values for animals.

Some scores are not currently included in the evaluation but may be in future. Other scores should be considered as standardised scores for breeder use and can be reported but not used in the evaluation – e.g. feet and leg fault scores.

How to use this guide

There are eight sections to this guide. Each trait has been colour-coded to its relevant section.

1. Bare Points
2. Body Condition Score
3. Dag Score
4. Entropion (turned-in eyelids at birth)
5. Conformation Traits
6. Reproduction Traits
7. Wool Traits
8. Additional Traits reported in nProve

For each trait, there are simple instructions provided on 'why' it is recorded, as well as 'how' and 'when' to visually score sheep.

The majority of traits are scored on a 1 to 5 scale, and in most cases, Score 1 depicts LEAST expression and Score 5 depicts MOST expression of the trait's characteristics. However, there are some exceptions. For example, Tail Length and Tail Skin (measured in cm), Wool Shedding (1 to 10 scale) and Entropion scores (0 to 2 scale).

Sheep should be scored according to the illustrations with the aid of the words that describe the scoring scale. Half scores are not available except for Body Condition Score. If more than one person/team recording a score, then use a different mob code for each scorer.

Acknowledgements

B+LNZ Genetics Evaluation Technical Team
Sheryl-Anne Newman, AgResearch
Natalie Pickering, Focus Genetics

Contents

BARE POINTS

Breech Bareness

The amount of bare skin around the anus and breech area. Applies predominantly to Maternal breeds, but can be recorded in Terminal breeds.

Heritability: Approximately 50% heritable.

Why: To enable breeders to select for bareness to reduce the need for crutching for dags, and may help to reduce flystrike.

When: Wool cover or degree of wool bareness around the breech area can be scored at weaning or when recording other traits such as Autumn liveweight or Dag score in lambs.

Repeat Trait
BBREECH and BBREECH18 recorded once only. BBREECHMA can be recorded annually.

Reporting trait
Breeding Value: BBREECHBV. A higher value indicates a more bare breech area.

Index: Dual Purpose Bare (DPB) a combined Index consisting of BBREECHBV + BBELLYBV. A higher value indicates more bareness.

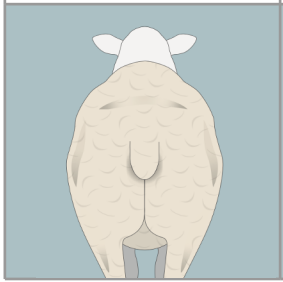
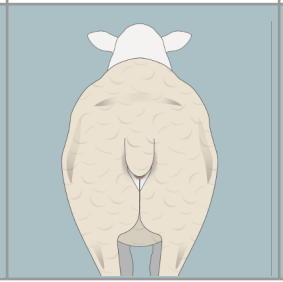
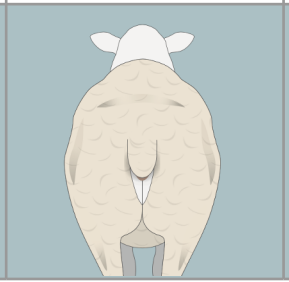
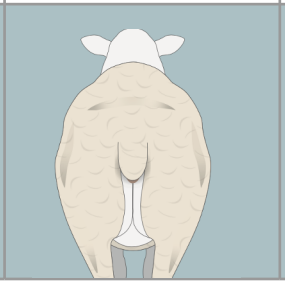
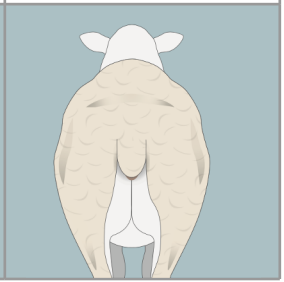
How to score: Scored on a 1-5 scale based on the degree of bareness around the anus and breech area, with Score 1 being very woolly and Score 5 being completely clear of wool. Do not use half scores.

Currently, the evaluation only uses lamb records, but records at 18-months and mixed-age are likely to be used in future.

- Lambs: BBREECH
- Two-tooths: BBREECH18
  (not currently used in the evaluation)
- Ewes: BBREECHMA
  (not currently used in the evaluation)

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviations: BBREECH

Score 1	Score 2	Score 3	Score 4	Score 5
No bare skin visible. Wool right up to anus.	Small area of bare skin directly around the anus.	Area of bare skin around anus - does not fully extend to start of testicle/udder.	Area of bare skin around the anus and vulva (ewe lambs) extends to start of testicles/udder.	Extensive area of bare skin around the breech, extending down the legs, testicles/udder.
				

Bare Belly

The amount of wool on the belly and udder area. Applies predominantly to Maternal breeds, but can be recorded in Terminal breeds.

Heritability: Approximately 50%. Bare Belly is associated with reduced body fleece weights.

Why: Belly bareness can reduce shearing and crutching costs and make access to the udder easier at lambing.

When: Commonly scored at hogget shearing (FW12). Can be scored on lambs at lamb shearing or crutching. For older ewes (18-month or mixed-age) it can be scored when crutching or shearing over the shearing board.

Repeat Trait
BBELLY and BBELLY18 recorded once only, BBELLYMA can be recorded annually.

Reporting trait
Breeding Value: BBELLYBV. A higher value indicates a more bare belly.

Index: Dual Purpose Bare (DPB) a combined Index consisting of BBREECHBV + BBELLYBV. A higher value indicates more bareness.

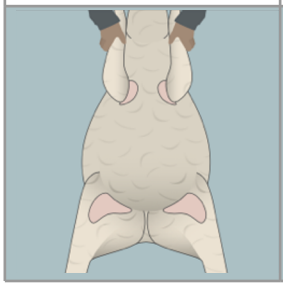
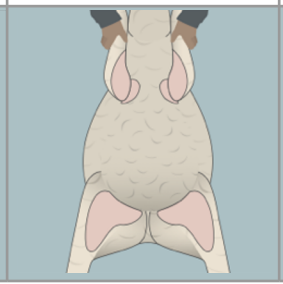
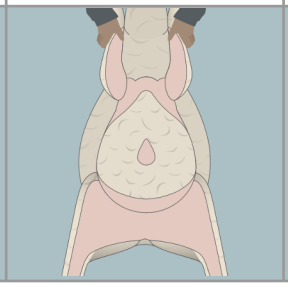
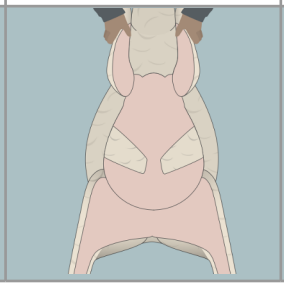
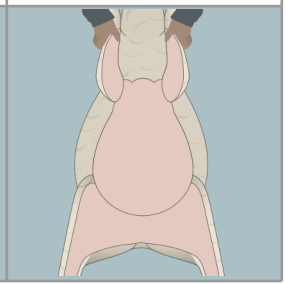
How to score: Scored on a 1-5 scale based on the degree of bareness around the leg axilla, and belly wool length and coverage. A Score 1 being very woolly and Score 5 being completely clear of wool. Do not use half scores.

Currently, the evaluation only uses lamb records, but records at 18-months and mixed-age are likely to be used in future.

- Lambs: BBELLY
- Two-tooths: BBELLY18
  (not currently used in the evaluation)
- Ewes: BBELLYMA
  (not currently used in the evaluation)

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviations: BBELLY

Score 1	Score 2	Score 3	Score 4	Score 5
Full belly coverage and deep into the leg axis.	Clearer area around hind leg axis and teats. Shorter belly wool.	Larger clear area around leg axis, short wool on belly.	Some short belly wool present.	Belly area has little or no wool, clear around leg axis.
				

Bare Face

The amount of wool on the face. Predominantly applicable to Maternal breeds but can be recorded in Terminal breeds.

Heritability: 44% to 68% was estimated in New Zealand Romneys*.

Why: Bare heads can reduce wool blindness, shearing time and improve ear tag readability.

When: Commonly scored at hogget shearing (FW12). Can also be scored at lamb shearing or crutching. For older ewes, it can be scored when crutching or shearing over the shearing board.

Repeat Trait
Scored once on an animal.

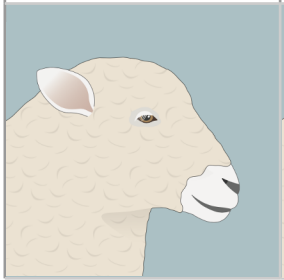
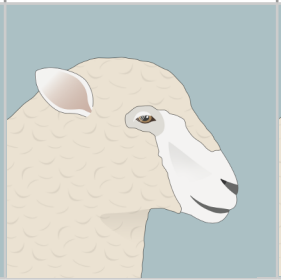
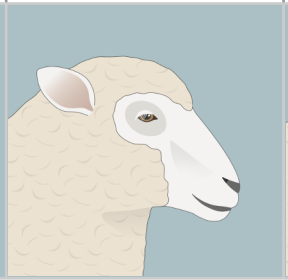
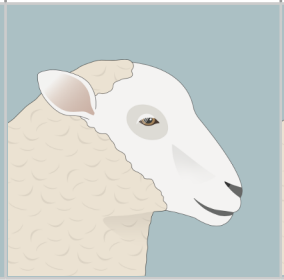
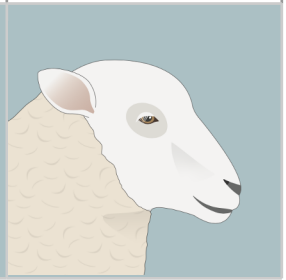
Reporting trait
Bare Face score (BFACE) can be added to quick views and reports within nProve.

A higher score indicates more face bareness.

How to score: Scored on a 1-5 scale based on the degree of bareness around the face area, with Score 1 being very woolly and Score 5 being completely clear of wool. Do not use half scores.

Record ID, mob, date, score, and scorer if more than one.

**Selection response in NZ Romney sheep; face cover. H.T Blair, D.J. Garrick, A.L. Rae and G.A. Wickham. NZ Journal Agricultural Research 1984 Vol 27.*

Score 1	Score 2	Score 3	Score 4	Score 5
Full face cover, topknot and cheeks fully covered.	Wool covering, with clear areas immediately around eyes and mouth. Wool between ears and eyes.	Some top knot wool, with clear areas around eyes and front cheeks/mouth. Wool between ears and eyes. Less wool on lower jaw.	Some wool on topknot and lower jaw towards ears.	No wool on topknot, in front of ears or lower jaw.
				

Bare Legs

The amount of wool on the legs. It is applicable to Maternal and Terminal breeds.

Heritability: Moderately heritable. It is part of the bareness suite of genes, many of which seem to operate independently.

Why: Animals with bare legs reduce shearing costs and the accumulation of dags, mud and seeds.

When: Can be scored at weaning, or at Autumn measurements through to hogget shearing.

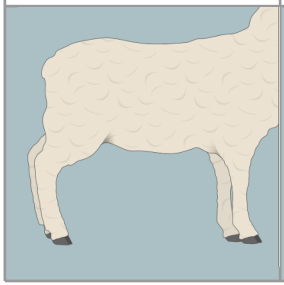
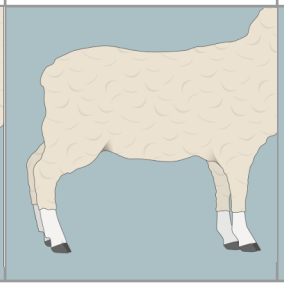
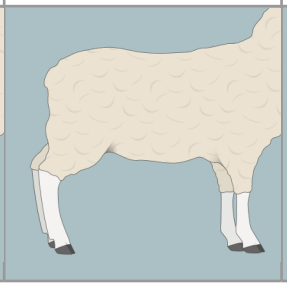
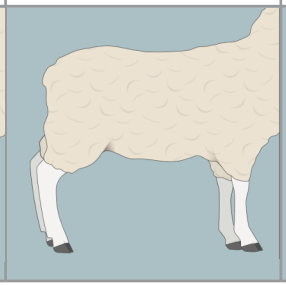
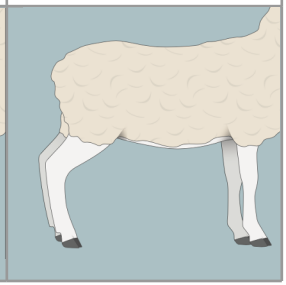
Repeat trait
Scored once on an animal.

Reporting trait
Bare Legs score (BLEG) can be added to quick views and reports within nProve.

A higher score indicates more leg bareness.

How to score: Scored on a 1-5 scale based on the degree of bareness around the leg area, with Score 1 being very woolly and Score 5 being completely clear of wool. Do not use half scores.

Record ID, mob, date, score, and scorer if more than one.

Score 1	Score 2	Score 3	Score 4	Score 5
Legs fully covered in wool to the hoof area.	Approximately 25% of the front and back legs are bare of wool.	Approximately 50% of the front and back legs are bare of wool.	Approximately 75% of the front and back legs are bare of wool.	Front and back legs bare of wool, both inside and up to the main body fleece growing area.
				

Bare Scrotum

The amount of wool on the scrotum area. It is applicable to Maternal and Terminal breeds.

Heritability: Moderately heritable. Part of the bareness suite of genes, many of which seem to operate independently.

Why: Bare scrotums reduce the potential for dags, lessening the workload and time required during crutching and shearing. Additionally, they can help reduce heat stress damage to sperm in high-temperature environments.

When: Can be scored at weaning, post Autumn measurements through to hogget shearing.

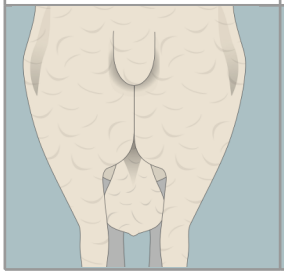
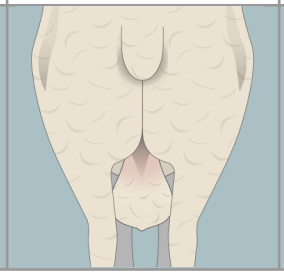
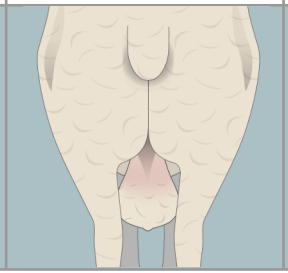
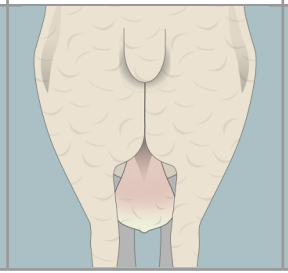
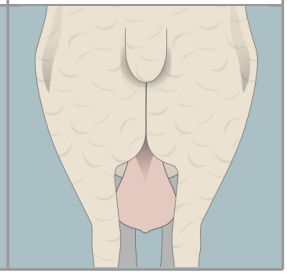
Repeat Trait
Scored once on an animal.

Reporting trait
Bare scrotum score (BSCROTUM) can be added to quick views and reports within nProve.

A higher score indicates more scrotal bareness.

How to score: Scored on a 1-5 scale based on the degree of bareness around the scrotum, with Score 1 being very woolly and Score 5 being completely clear of wool. Do not use half scores.

Record ID, mob, date, score, and scorer if more than one.

Score 1	Score 2	Score 3	Score 4	Score 5
Full wool covering of front and back of scrotum.	Approximately 25% of the scrotum is bare of wool.	Approximately 50% of the scrotum is bare of wool.	Approximately 75% of the scrotum is bare of wool.	Scrotum is completely bare of wool (100% bare).
				

Tail Wool Moult

Relates to the wool moulting from the tip of the tail to the base on the dorsal or outside of the tail. Predominantly applicable to Maternal breeds.

Heritability: The trait is heritable and likely to be under the control of relatively few genes, so could be introduced into non-moulting flocks/breeds. Appears to be associated with increased breech bareness and shorter tail length.

Why: The moulting of tail wool is associated with less dag formation and the shedding of dags, particularly in untailed sheep, and reduced incidence of flystrike.

When: Moulting of tail wool occurs around Spring and is usually complete by the end of October.

Moulting starts at the tip of the tail and progresses up and over the tail stump when assessed by light plucking*. Without light plucking, assessed visually on wool loss, moulting appears to start at the top and moves down the tail as the longer wool at the top is lost.

Sheep that have been tailed/docked, can still be assessed for moulting of the tail stump and area immediately above it.

Repeat trait
Can be scored annually.

Reporting trait
Tail Wool Moult score (TAILMLT) can be added to quick views and reports within nProve.

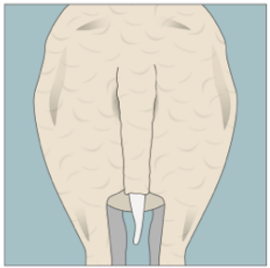
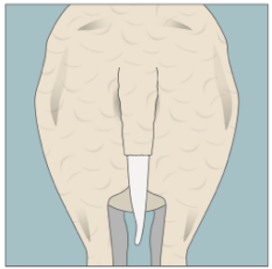
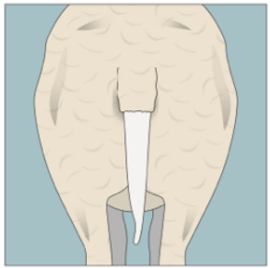
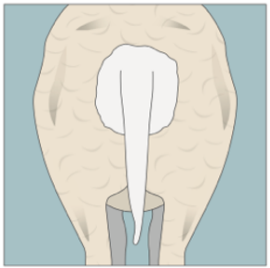
A higher score indicates greater moulting of the tail.

How to score: Scored on a 1-5 scale based on the degree of moulting, with Score 1 being no moulting and Score 5 being completely clear of wool (fully moulted). Do not use half scores.

A gentle plucking force can be applied to a small staple of wool using the thumb and index finger, beginning at the tip of the tail. If the wool easily comes away from the tail, the sheep is determined to be moulting and further gentle plucking up the tail can assess the extent of the moulting.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviations: TAILMLT

Score 1	Score 2	Score 3	Score 4	Score 5
Tail has full covering of wool on outer side.	Approximately 25% of tail wool moulted – **could be from either the top down or tip up.**	Approximately 50% of tail wool moulted – **could be from either the top down or tip up.**	Approximately 75% of tail wool moulted – **could be from either the top down or tip up.**	Wool has been moulted from the full tail and up and over the tail base. For tailed sheep, the tail stump and base area are clear.
				

**Moulting of tail wool reduced dag accumulation in yearling sheep. D.R. Scobie, K.G. Dodds and D. O'Connell. Australian Society of Animal Production 2016*

Tail Length and Tail Skin

Relates to the length of the tail from anus to tip and to the length of bare skin on the underside of the tail.

Heritability: Tail length has a high heritability - approximately 70% when measured on a continuous scale in centimetres and about 26% when scored as short, medium or long. To make selection gains in a trait, it must be heritable and variable in a population. Generally, within pure breeds, there is less variation in tail length than in composites, depending on the breeds involved and the genes inherited.

Why: Short tails may negate the need to tail/dock lambs, reducing labour and costs. Bare skin under the tail may reduce the propensity for dags to accumulate.

When: Tail length and Tail Skin are measured at tailing/docking on young lambs.

Reporting trait
Breeding Values: Tail Length Score (TLENSCBV) - a higher value indicates a longer tail.

Tail Skin (TSKINBV) - a higher number indicates a greater length of bare skin under the tail.

Index: Not as yet.

How to score

Tail Length - two approaches.

1. Tail Length (TLEN) - preferred measurement
measured in centimetres from the anus to the tip using a ruler at tailing (preferred method)

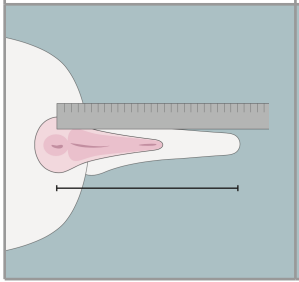
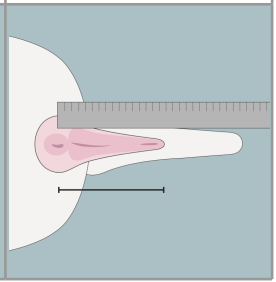
2. Tail Length Score (TLENSC):
Score 1= less than 15cm,
Score 2 = between 15cm - 25cm,
Score 3 = greater than 25cm.

Tail Skin

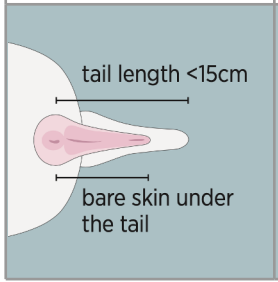
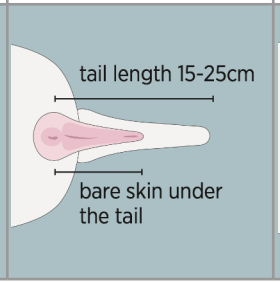
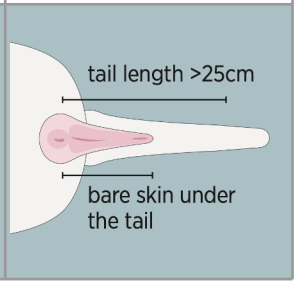
Measured with a ruler – the length of the clear skin from the anus along the underside of the tail. If recording Tail Skin (TSKIN) you must also record Tail Length (TLEN), so the interaction between the two can be accounted for in the evaluation.

Record ID, mob, date, score, and scorer if more than one.

PREFERRED MEASUREMENT
greater accuracy

TLEN	TSKIN
Tail Length Measured: centimeters from anus to end tail	**Tail Skin Measured**: centimetres from anus to end of bare skin (preferred measurement)
	

ALTERNATIVE OPTION: TAIL LENGTH SCORE (TLENSC)
lower accuracy

Score 1	Score 2	Score 3
Short: Tail length less than 15cm	**Medium**: Tail length between 15-25cm	**Long**: Tail length greater than 25cm
		

BODY CONDITION SCORE

Body Condition Score

The amount of fat and muscle cover over the short lumbar processes between the ribs and pelvis.

Heritability: Moderately heritable (16-20%) and highly repeatable (79-95%). Ewes that rank above or below the group average at one time are highly likely to rank similarly at another time.

Why: Maintaining good body condition (BCS) whilst being productive, adds robustness in challenging environments. It is recommended that BCS is recorded at mating with adult live weight.

When: The evaluation requires at least one BCS measurement. Best practice is to measure BCS and ewe liveweight at mating (BCSMATE). Record any differently managed groups with separate mob codes. The following can be recorded and may be used in research to determine if fluctuating BCS / LW affects ewe productivity or longevity. If there are multiple scores, the evaluation will use the largest data set.

- **Mating (BCSMATE) - Preferred**
- Pregnancy Scanning (BSCSCAN)
- Lambing (BSCLAMB)
- Weaning (BCSWEAN)
- Dry-off (BCSDRYOFF) - Dairy Sheep only.

Repeat Trait: Can be recorded annually at multiple times per year BCSMATE, BCSSCAN, BCSLAMB and BCSWEAN per animal.

Reporting trait
Breeding Value: Body Condition Score (BCSBV), a higher value indicates genetic merit for higher body condition.

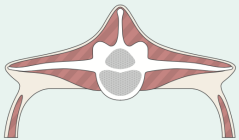
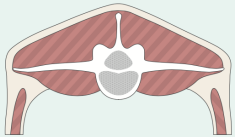
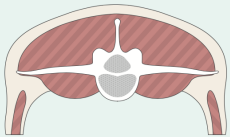
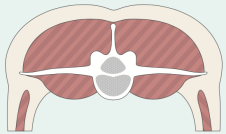
Index: Dual Purpose Body Condition (DPBC), a higher value indicates higher merit for body condition.

How to score: Scored on a 1-5 scale. Half scores can also be used - e.g BCS 3.5

Weigh all ewes, assess body condition by feel according to the 1- 5 BCS range over the lumbar spine regions feeling for fat and muscle coverage over the spinal column and the horizontal spinal processes. Muscle scanning data including fat depth measurement on young animals is also used as an early predictor of body condition score.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviations: BCSMATE

Score 1	Score 2	Score 3	Score 4	Score 5
Spine is very prominent, virtually no muscle on the back and it feels concave. You can feel short ribs individually from above.	Can feel spine easily, back muscle is slightly concave and not rounded. You can't easily palpate the short ribs from above.	Need moderate pressure to feel short ribs. Back muscle becoming rounded.	Can feel short ribs with strong pressure, back is rounded with soft light fat cover, muscle and fat under short ribs is deep.	Obese; fat rolls either side of spine, spine is in a dimple, impossible to feel short ribs, fat either side of tail head.
				

The Beef + Lamb New Zealand website has more resources, including a helpful learning module for Body Condition Scoring. Go to **beeflambnz.com** and search "body condition score"

DAG SCORE

Dag Score

The amount of faecal matter attached to wool around the bottom, back end and legs. Can be scored in Maternal and Terminal breeds..

Heritability: Moderately heritable (approx 30%). Slight negative association with production, but the NZGE + Dag Score Index allows for selection of animals with fewer dags and higher production.

Why: Fewer dags can reduce crutching costs and may reduce incidence of flystrike. Dagginess may be due to sensitivity to feed changes and consistency of faecal matter. It is not directly related to parasite resistance or resilience. The economic values within the Index are linked to crutching costs - i.e lower costs due to reduced dags.

When: For optimal dag score discrimination, over 50% of lambs need to have a score above 0 (no dags) in a mob. Lambs are scored twice, first at around 3 months, post-weaning (Dec-Feb), and then at the Autumn liveweight measurement (Mar-May). While you don't need both scores, only using one reduces Breeding Value accuracy. Ewes can be scored annually with DAGMA (dag mixed age), typically done at, or shortly after, weaning.

Repeat Trait: Dag mixed age (DAGMA) can be recorded annually on ewes.

Reporting trait
Breeding Values: Lamb Dag (LDAGBV) and Adult Dag (ADAGBV). A lower value indicates a reduced propensity to have dags.

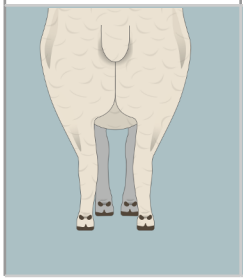
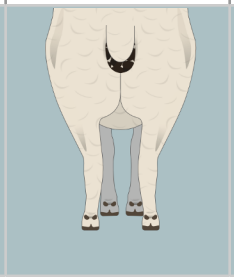
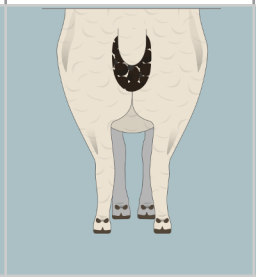
Index: Dual Purpose Dags (DPD) or Terminal Sire Dags (TSD). A higher value indicates a reduced propensity to have dags.

How to score: Lambs get a 0-5 dag score at around 3 months (DAG3) or after weaning, and/or at Autumn weighing (DAG8) around 6-8 months. Dag score pertains solely to fecal matter, not ewe lamb urine stains.

Ewes can receive annual scores (DAGMA) around weaning, using the same 0-5 score system as lambs.

Use mob codes to indicate lambs grazed together under similar feed and management conditions (e.g. drench regime). If some lambs were crutched while others weren't, record as separate mobs.

Trait Abbreviations: DAG3, DAG8 and DAGMA

Score 0	Score 1	Score 2	Score 3	Score 4	Score 5
No dags.	Small amount of dags.	Dags around anal area. Not extending to udder or testicles.	Moderate amount of dags.	Dags extend to inside hocks.	Dags extend through crutch and down back legs to feet.
					

EYELID SCORE

Eyelid Score: Entropion (in-turned eyelids at birth)

The number of in-turned eyelids at birth (entropion). Can be recorded in Maternal and Terminal breeds.

Heritability: Moderately heritable (approximately 18%*). Research work suggests there is variation across and within breeds indicating genetic progress can be made to reduce the incidence.

Why: Contact between eyelashes and external hair with the cornea causes pain and can lead to ulceration and blindness. Additionally, it can cause mis-mothering and poorer survival.

When: As soon as practical after birth – usually recorded at tagging or at tailing/docking.

Repeat trait: Recorded once as a lamb.

Reporting trait: Eye Lid Score (EYELIDS) can be added to quick views and reports within nProve.

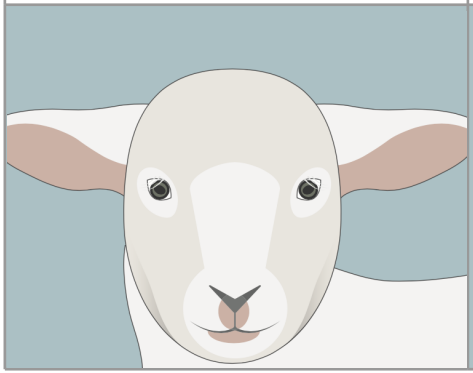
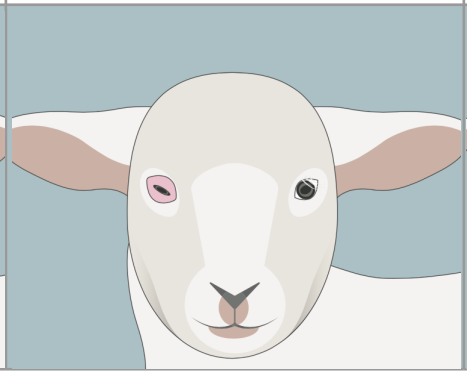
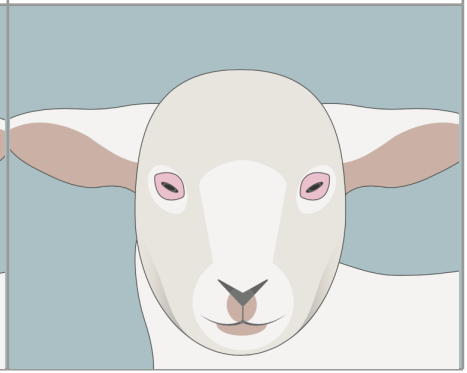
The score indicates the number of affected eyes.

How to score: Lambs are scored for the number of eyes affected 0, 1 or 2.

Record ID, mob, date, score, and scorer if more than one.

An inverted eyelid with weeping due to the irritation.

**The heritability of congenital entropion in dual-purpose New Zealand sheep. K.M.McRae, S.M.Clarke, K.G.Dodds. S.J. Rowe, S-A. Newman, H.J.Baird and J.C. McEwan.*

Score 0	Score 1	Score 2
No eyes affected.	One eye affected.	Both eyes affected.
		

CONFORMATION


4897

Pastern Angle (front and back)

The deviation of the foot leg angle from the correct angle. Can be scored in Maternal and Terminal breeds.

Heritability: Low to moderately heritable. Often foot and leg issues develop with age and may not be as apparent at younger ages.

Why: Results in poor hoof wear pattern, lameness and difficulty mating in rams. Shallow pasterns are likely to result in long hoof growth due to uneven wearing, and may increase lameness especially in males during the breeding season. An overly straight pastern is also undesirable as there is less flex in legs, particularly important for rams.

When: Lambs can be scored at 4+ months of age – though not recommended until the animal is close to mature size/development.

Rams can be scored prior to two-tooth sales and annually prior to mating.

Ewes can be scored annually, usually at or near weaning and/or prior to mating.

Repeat Trait: Can be recorded annually on ewes and breeding rams.

Reporting trait: Pastern Angle Front (PASTF) and Back (PASTB) Score can be added to quick views and reports within nProve. The most recent record will be reported.

How to score: Based on a 1 to 5 scoring system. Look at the angle of the lower joint relative to the leg, with Score 1 being too straight, Score 3 is the optimum and Score 5 is too angled.

Score front and back pasterns separately. The score recorded is the worst score for front and back pastern.

Scoring should be done on a clean, flat surface with sheep able to stand and move naturally.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: PASTF (front) and PASTB (back)

Optimum Score

Score 1	Score 2	Score 3	Score 4	Score 5
Very straight pastern.	Moderately straight.	Correct angle.	Moderately low angle.	Extremely low angle.

Leg Rotation

The angle of the legs relative to the body when viewed from the front and back.

Heritability: Low to moderately heritable. Foot and leg issues often develop with age and may not be apparent at younger ages.

Why: Issues with leg angulation can reduce mobility, and may impact on a males' ability to mate.

When: Lambs can be scored at 4+ months of age, though not recommended till an animal is close to mature size/development.

Rams can be scored prior to two-tooth sales and annually prior to mating.

Ewes can be scored annually, usually at or near weaning and/or prior to mating.

Repeat trait: Can be recorded annually on ewes and breeding rams

Reporting trait: Leg rotation front (LEGROTF) and back (LEGROTB) score can be added to quick view and reports in nProve.

The most recent record will be reported.

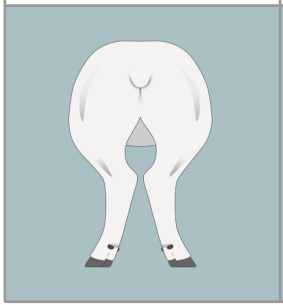
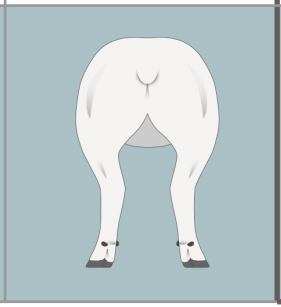
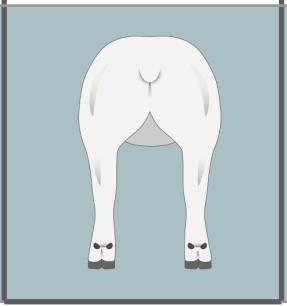
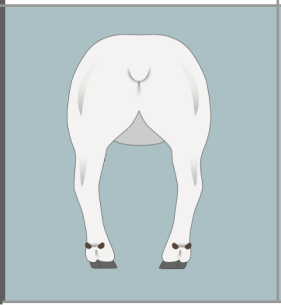
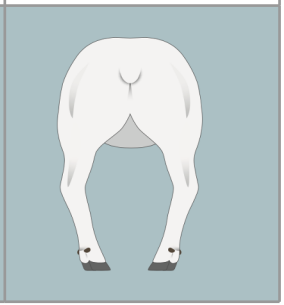
How to score: Based on a 1 to 5 scoring system. Look at the angle of the hock, with Score 1 being angled too inward, Score 3 is the optimum and Score 5 being angled too outward.

When viewed from the back, legs should be straight with feet square to the ground. Scoring should be done on a clean flat surface with sheep able to stand and move naturally.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: LEGROTF (Front) and LEGROTB (Back)

Optimum Score

Score 1	Score 2	Score 3	Score 4	Score 5
Severe inward deviation of the hocks (cow hocked).	Moderate inward deviation of the hocks.	Correct leg alignment. Straight with feet square to the ground.	Moderate outward deviation of the hocks.	Severe outward deviation of the hocks (bow-legged).
				

Foot Fault Score

The deviation of hooves from correct formation and wear.

Heritability: Feet and leg traits are low to moderately heritable. Issues often develop with age and may not be apparent at younger ages.

Why: Issues with poor feet/hoof integrity can affect grazing behaviour, animal welfare and longevity.

When: Lambs can be scored at 4+ months of age – though not recommended till an animal is close to mature size/development.

Rams can be scored prior to two-tooth sales and annually prior to mating.

Ewes can be scored annually, usually at or near weaning and/or prior to mating.

Repeat trait: Can be recorded annually on ewes and breeding rams

Reporting trait: Foot fault front (FOOTF) and back (FOOTB) can be added to quick views and reports within nProve. The most recent record will be reported.

How to score: Based on a 1 to 5 scoring system. Look at the shape of the hooves, with Score 1 being correct and Score 5 being severely damaged, misshapen or overgrown.

Evaluate front and back foot integrity, considering side, sole, and digit arrangement. Record the highest score for front feet and for back feet.

Examine hoof alignment and integrity, including wall and sole condition (white line disease) for the front and back feet.

White line disease (Shelly hoof) results in separation of the hoof wall from the sole. Dirt can accumulate and lead to infections.

Assess sheep on a clean, flat surface where they can stand and move naturally. Closer inspection, (potentially at crutching), may be needed to assess hoof alignment and structural integrity.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: FOOTF (front) and FOOTB (back)

Score 1	Score 2	Score 3	Score 4	Score 5
Hooves aligned correctly. Hoof sole and wall sound, with an undamaged shape.	Mildly damaged, misshapen, overgrown sole and/or wall area of the digit (<25%).	Moderately damaged, misshapen, overgrown sole and/or wall area of the digit (25% to 50%).	Badly damaged, misshapen, overgrown sole and/or wall area of the digit (50% to 75%).	Severely damaged, misshapen, overgrown sole and/or wall area of the digit (>75%).
Side  Sole  Front 		Side  Sole  Front 		Side  Sole  Front 

Combined Feet/Leg Score (breeder custom score)

Some breeders use their own recording system and prefer a single overall score for each animal that they can report. However, this combined score cannot be used to calculate a Breeding Value because it combines different traits, and scoring standards may vary among breeders.

When: Lambs can be scored at 4+ months of age – though not recommended till in animal is close to mature size/development.

Rams can be scored prior to two-tooth sales and annually prior to mating.

Ewes can be scored annually, usually at or near weaning and/or prior to mating.

Repeat trait: Can be recorded annually on ewes and breeding rams.

Reporting trait: Combined Feet/Leg Score or Breeder Custom Overall Score (FEETSC) can be added to quick views and reports within nProve.

The most recent record will be reported.

How to score: Based on a 1 to 5 scoring system, with Score 1 being correct feet and legs, and Score 5 being severe fault(s).

Feet/Leg score is a combined trait which includes pastern angle, hoof alignment, hoof structural integrity and leg rotation faults into a single overall score for faults.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: FEETSC

Score 1	Score 2	Score 3	Score 4	Score 5
Correct hoof alignment, hoof structural integrity, correct pastern angle and correct leg orientation, and gait.	Minor faults.	Moderate faults.	Shows one or more bad faults.	One or more severe faults.

Jaw alignment

Relates to the relationship between the teeth on the lower jaw, in relation to the dental plate on the upper jaw. The score records the degree of misalignment of the teeth relative to the upper dental pad.

Heritability: Low to moderately heritable (approximately 13-15%) for jaw and teeth issues. May be impacted by inbreeding.

Why: Refers to the soundness of the formation of the lower jaw. Misalignment of the lower jaw and teeth relative to the upper biting plate can impact an animal's ability to eat efficiently.

When: At any time. For extreme cases this can be at docking/tailing, or it can be scored at later trait recording. Avoid recording during adult teeth eruption as swelling or presence of baby teeth may cause some temporary misalignment.

Repeat trait: Recorded once on an animal.

Reporting trait: Jaw Alignment Score (JAWS) can be added to quick views and reports within nProve.

How to score: Based on a 1-5 scale, with Score 1 being undershot, Score 3 is correct jaw alignment (optimum score) and Score 5 is overshot.

Assess teeth alignment relative to the dental pad, by running your finger under the top lip towards the teeth. If you feel the sharp edge of the teeth, they're too forward. Moving your finger back up, a noticeable bump should extend at least 5mm in front of the teeth for a perfect score.

The full dental pad is about 15-20mm wide with a groove in the middle running side to side. Teeth should line up with this groove for support during biting. Teeth are undershot only when they're behind this line and should be square to the jaw, not leaning forward.

A sheep's front teeth move forward in the jaw about 1mm per year. In young sheep, teeth need to be far enough back to allow for forward movement, ensuring correct alignment in old age.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: JAWS

Optimum Score

Score 1	Score 2	Score 3	Score 4	Score 5
Lower jaw is significantly shorter and teeth are not aligned with the upper dental pad. Undershot jaw.	Lower jaw is moderately shorter and does not quite align correctly with the upper dental pad.	Lower jaw is correctly aligned with upper dental pad.	Lower jaw is moderately extended beyond the dental pad.	Lower jaw is significantly longer and teeth protrude over the dental plate. Overshot jaw.
				

Horns

Relates to the presence of scurs or horns. It is applicable to both Maternal and Terminal breeds

Heritability: Horns and scurs are controlled by the presence and interaction of several genes. Sheep are assumed to be carrying horn genes, but the presence of a polled gene suppresses horn development. When poll genes are not present, horns or scurs can be expressed.

There are also additional horn modifier genes which determine whether males or females show horn development and scur genes that can interact with other horn-related genes.

Why: Scurs and horns are undesirable as they negatively impact animal handling, shearing and processing. Horns and scurs can result in carcase bruising.

When: Horn development and scurs are usually visible early. Lambs are scored at weaning to Autumn.

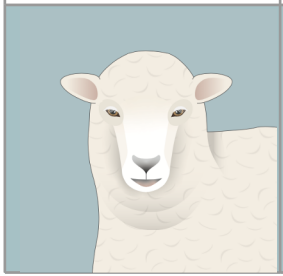
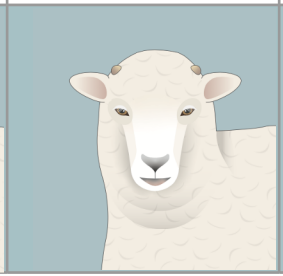
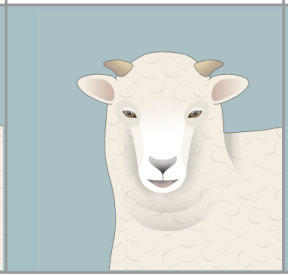
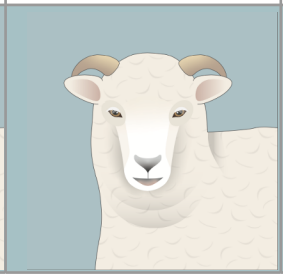
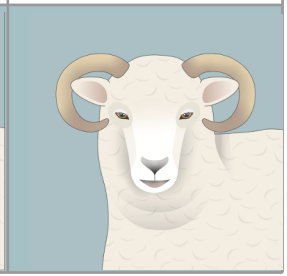
Repeat trait: Recorded once on an animal.

Reporting trait: Horn Score (HORNS) can be added to quick views and reports within nProve.

How to score: Scoring is based on a 1 to 5 scale, where Score 1 is polled and Score 5 is full horn development.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: HORNS

Score 1	Score 2	Score 3	Score 4	Score 5
Polled. Complete absence of horn development.	Presence of small scurs <30mm.	Presence of scurs. Approx 30-60mm.	Presence of small horns.	Development of proper horns.
				

REPRODUCTION

Maternal Behaviour Score

The response of the ewe to the presence of the lambing shepherd when tagging lambs after birth.

Heritability: There are variable reports of heritability, but most are generally low.

Why: Used as an indicator of a strong Maternal mothering drive/bond, which may have a positive effect on lamb survival.

When: At lamb tagging, usually within 24 hours of birth. Can be recorded annually in ewes.

Repeat trait: Can be recorded annually on ewes.

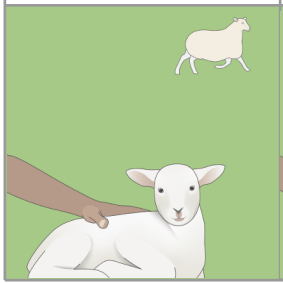
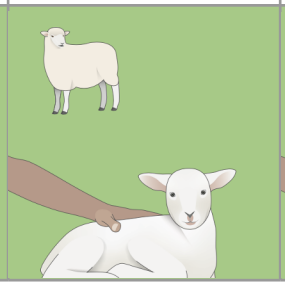
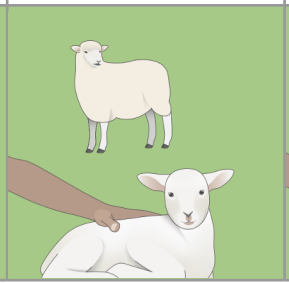
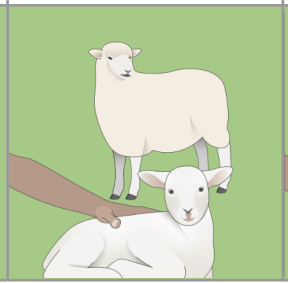
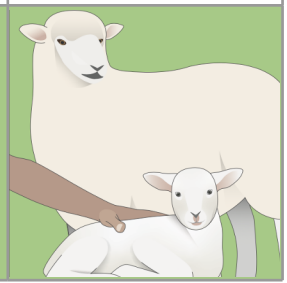
Reporting trait: Maternal behaviour score (MBS) can be added to quick views and reports within nProve.

The most recent record will be reported.

How to score: Based on a 1 to 5 scoring system, based on the how far the ewe retreats from the lambing shepherd at lamb tagging/recording after birth. A higher value indicates better mothering behaviour.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: MBS

Score 1	Score 2	Score 3	Score 4	Score 5
Ewe flees at the approach of the shepherd. Shows no interest in the lamb(s) and does not return.	Ewe retreats further than 10 metres but comes back to her lamb(s) as the shepherd leaves.	Ewe retreats to a distance that tag identification is difficult (5-10 metres).	Ewe retreats but stays within 5 metres.	Ewe stays close within 1 metre of the shepherd during handling of her lambs.
				

Lambing Difficulty

Lambing difficulty (dystocia) relates to the amount of assistance required at birth.

Heritability: Birth weight has been shown to be the most key factor influencing lambing ease, however, there are also other aspects such as lamb shape, pelvic area/shape that play a role in lambing ease.

Why: Lambing ease has an obvious impact on the profitability and productivity of a flock.

When: When shepherding at lambing, recorded as a ewe score.

Repeat trait: Can be recorded annually on ewes.

Reporting trait: Lambing difficulty score (LBDIFF) can be added to quick view and reports within nProve. The most recent record will be reported.

How to score: Based on a 1 to 5 scoring system, based on the degree of assistance required at lambing. A higher number indicates more assistance required.

If you regularly check ewes, it is reasonable to assume that ewes lambed between checks, can be considered unassisted if lambs show no sign of difficult birth (Score 1). If a ewe lambs unassisted between checks, but the lamb shows some sign of difficult birth (swollen head), then score as 2. If a ewe births unassisted, but the lamb is dead and shows signs of difficulty, then score as 3.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: LBDIFF

Score 1	Score 2	Score 3	Score 4	Score 5
Unassisted/ unobserved. Lambs show no sign of difficult birth.	Unassisted but signs of difficulty observed, OR easy pull. Lambs show some sign of difficulty e.g. swollen head, or easy assistance required to birth lambs.	Moderate Pull. Normal presentation. Possible that the ewe and/or lambs may not have survived if unassisted.	Hard pull or malpresentation. Significant intervention is required to birth lambs. Likely neither ewe nor lambs would have survived if unassisted.	Veterinary assistance, death of ewe and lambs, or ewe euthanised.
				

WOOL

Wool Colour

The amount of wool colour (yellowness) at shearing taken once in an animal's life, ideally when there is variation in fleece colour.

Heritability: Wool colour has a moderate heritability (approximately 15%). The interaction between skin characteristics (sweat, grease, etc), fleece structure and weather conditions mean some sheep are more likely to develop yellowing of the fleece than others.

Why: Wool colour develops under warm and moist conditions. Some sheep are genetically more or less pre-disposed to developing wool colour. White wool is more desirable for dyeing and results in brighter shades. More yellow wool limits dying shades, reduces brightness of colour and price is discounted.

When: At ewe or ram hogget shearing when there is variation in colour. If all fleeces are white, then no discrimination on colour is possible. A colour score at a later time or shearing on ewes can be recorded when there is more variation in colour.

Repeat trait: Scored once on an animal.

Reporting trait
Breeding Value: Wool colour score (COLSCBV), a lower value indicates whiter wool.

Index: Dual Purpose Wool Quality Colour (DPWQC), a higher value indicates more valuable whiter wool.

How to score: Based on a 1 to 5 scoring system. Colour is assessed using the colour score chart.

Open the fleece at a minimum of three sites – side of shoulder, mid-side, and hip, record the highest score across the three sites or assess at shearing.

Wool colour can also be assessed by laboratory incubation of a mid-side sample, this measurement should be entered into nProve as COLYZ.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: COLSC

Score 1	Score 2	Score 3	Score 4	Score 5
White	Off white	Creamy	Yellow	Very Yellow

Acknowledgement: Colour score chart courtesy of Meat & Livestock Australia

Fibre Pigmentation

The amount of coloured wool fibres on ears, legs and halo hair on the back of the neck, not black body spots or all black.

Heritability: wool pigmentation on ears, legs and halo hair has a low heritability.

Why: Pigmented fibres can downgrade wool value.

When: Docking/tailing to weaning.

Repeat trait: Recorded once on an animal.

Reporting trait: Wool Fibre Pigmentation Score (FPIGMT) can be added to quick views and reports within nProve.

How to score: Based on a 1 to 5 scale. A higher score indicates more pigmentation.

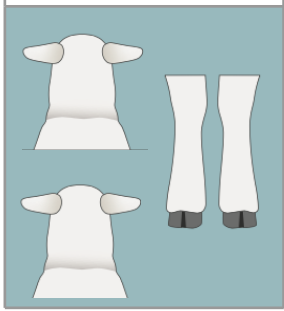
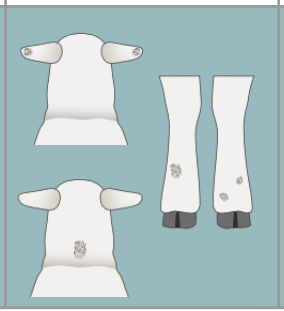
Fibre pigmentation pertains to the presence of coloured pigmented fibres on the ears, legs, and the back of the neck, which includes the birth coat and halo hair in lambs. These fibres can be either dark grey or rusty tan (halo hair on the back of the neck). An individual with no pigment on the ears, legs, or back of the neck receives a Score 1.

The highest proportion of coloured fibres at any one site is also recorded. For example, if 75% of the fibres on the ears are coloured, the score is 4.

Lambs with black spots on the body or all black lambs are culled, and this category does not relate to them.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: FPIGMT

Score 1	Score 2	Score 3	Score 4	Score 5
Ears, Legs and back of neck free of coloured fibres.				A high proportion of coloured fibres at one or more sites.
				

Shedding

Relates to the degree that body fleece wool is shed annually, does not relate to shed fleece wool due to feed insufficiency.

Heritability: Wool shedding requires one copy of the shedding initiator gene. Other genes determine shedding pattern and extent.

Why: Shedding reduces shearing and crutching costs, but also lowers available wool for sale. It is different from stress-induced fleece loss, which occurs due to a feed pinch or illness. Stress-induced wool loss is widespread, while seasonal moulting starts from the belly and moves upward.

When: Around Nov-Jan for lambs (varies).
Birth date, birth rank, rearing rank, and liveweight affect shedding and should be recorded as they are included in the shedding module. Single-born lambs shed more than triplets. Best practice is to measure liveweight when recording shedding scores.

Ewe Shedding: Assess ewes for shedding when 15%-20% are fully shed, usually from Oct-Jan (varies).

Currently only lamb shedding information is used in the evaluation.

Repeat trait: Scored once on lambs (SHED), can be scored annually in ewes (SHEDMA).

Reporting trait: Shedding Score (SHED) on lambs and ewes (SHEDMA) can be added to quick views and reports within nProve.

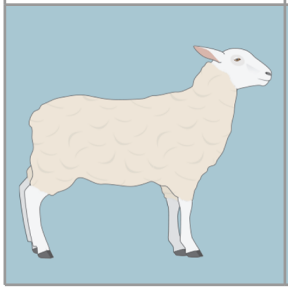
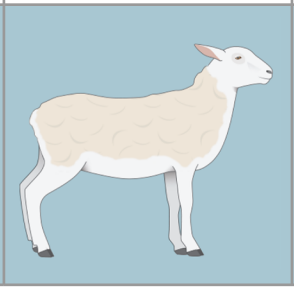
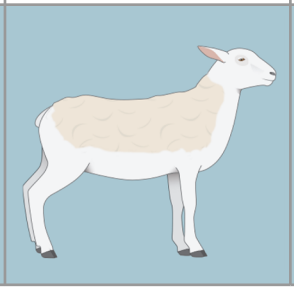
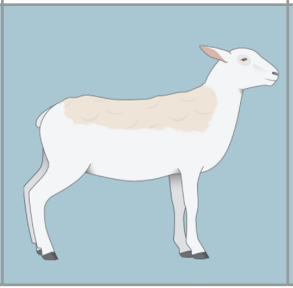
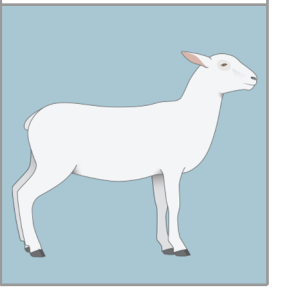
Breeding Value: Shedding (SHEDBV) is currently a research breeding value as data accumulates and genetic parameters are refined for the NZ sheep population.

How to score: Shedding is scored using a 0 to 10 scoring system where a higher number indicates more shedding.

Score 0 denotes no shedding, while Score 10 represents full shedding. For ease of scoring, each score corresponds to a percentage. e.g., Score 5 corresponds to 50% shed, and Score 10 corresponds to 100% shed. Half scores are not used.

Record ID, mob, date, score, and scorer if more than one.

Trait Abbreviation: SHED (lamb) and SHEDMA (mixed age)

Score 0	Score 3	Score 5	Score 8	Score 10
Wool over all the main fleece growing area.	Wool shed from 30% of the main fleece growing area.	Wool shed from 50% of the main fleece growing area.	Wool shed from 80% of the main fleece growing area.	All wool shed from the main fleece growing area. (100% shed).
				

ADDITIONAL TRAITS

Additional Wool traits that can be recorded and reported in nProve

Usually either assessed or results from a mid-side sample taken at hogget shearing.

Trait	Abbreviation	Measurement	Min/Max recording age	Comments
Adult Fibre Diameter	AFDIAM	Microns (lab measured)	Min 500 days	Breeding Value: AFDIAM BV. Used in DP Wool Quality Fineness Index (DPWQF)
Fibre Diameter	FDIAM	Lab test result on mid-side, on hoggets	180-350 days	Breeding Value: FDIAM BV. Used in DP Wool Quality Fineness Index (DPWQF)
Fibre Fineness	FFINE	Fibre Diameter assessed by a wool classer	180-350 days	Breeding Value: FDIAM BV. Used in the DP Wool Quality Fineness Index. Has an impact on the value of the wool
Fibre Curvature	FCURV	Lab test result on mid-side sample	100-500 days	Curvature is a measure of crimp expressed as degrees per millimetre.
Fibre Curvature Standard Deviation	FCURVSD	Lab test result on mid-side sample	100-500 days	Measure of variation in fibre curvature
Fibre diameter co-efficient of variation	FDIACV	Lab test result on mid-side sample	100-500 days	Measure of the variation in fibre relative to the mean

Trait	Abbreviation	Measurement	Min/Max recording age	Comments
Fibre Diameter Standard Deviation	FDIASD	Lab test result on mid-side sample	100-500 days	Measure of the variation in fibre diameters within a fleece
Fibre Diameter Standard Deviation Along	FDIASDA	Lab test result on mid-side sample	100-500 days	Measure of the variation in fibre diameter along the fibre
Fibres less than 15 microns	FIBRE<15	Lab test result on mid-side sample	100-500 days	Proportion of fibres less than 15 microns
Bulk	BULK	Volume (lab test)	240-530 days	Filling capacity of wool
Comfort Factor	CF	% of fibres exceeding 30 microns (lab test)	100-500 days	Fibres over 30 micron increase the “prickle” feel
Kemp score	KEMPS	Assessed score 0-9 (9 = lots of kemp)		Kemps dye differently and have a harsh feel
Lustre Score	LUSTS	Assessed score 0-9 (9 highly lustrous fibres)		Can be desired in some products
Medullation Count	MEDC	Lab test result on mid-side sample	240-530 days	Hollow wool fibres (can dye differently)

Additional traits that can be recorded and reported in nProve

Trait	Abbreviation	Measurement	Min/Max recording age	Comments
Birth Weight	BWT	In kg	0 to 10 days	Maybe used in future
Docking weight	DWT	In kg	2 to 100 days	Not used
Flystrike	FLYSTR	Score 1 for flystrike affected individuals	10 to 365 days	
Hogget Oestrus date	HGTOEST	Date of first oestrus. Vasectomised rams with crayons	100-350 days	For flocks not hogget lambing may indicate potential for hogget lambing
Lameness Score	LAME	Scored 1-5 5= severely lame	No age restrictions	Mainly used for dairy sheep
Length anus to hock	LANHOCK	In cm from the anus to the point of the hock	0 to 400 days	
Scrotal circumference	SCROTAL	In cm at widest point	60 to 600 days	Higher value = greater circumference.
Skin Depth	SKIN	Ultra-sound usually when meat scanning. Recorded in 1-10mm	30 to 600 days	Higher value – greater skin depth, may be related to increased lamb survival (H Blair Massey University)

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