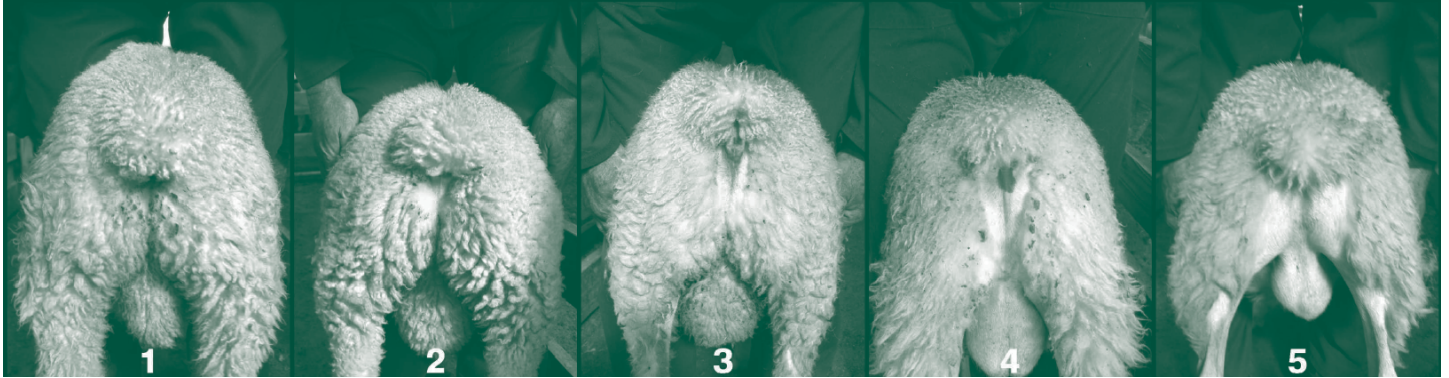




Breeding sheep with bare breech and belly



Breech Bareness Scores (scale 1 to 5)

This R&D Brief covers the pros and cons of farming sheep with less wool on the breech and belly. The information comes from eight years of research work to select and breed sheep with bareness in these areas.

While wool returns are still a significant part of sheep income, some farmers would prefer a sheep with less wool on the breech and belly. They are prepared to have a slightly lower fleece weight in exchange for reduced costs and easier management.

(1) The research

AgResearch, supported by Meat & Wool New Zealand, has established that it is possible to produce short-tailed sheep with bare breeches and bellies from sheep available in New Zealand.

Criteria for assessing breech and belly bareness and tail length have been developed. The bareness scales for both belly and breech go from one to five, with five being the barest.

Since 1997, sheep at AgResearch's Winchmore Research Station have been selectively bred for bare heads, legs, belly and backsides. Border Leicester, Cheviot, East Friesian, Finnish Landrace, Wiltshire and Texel sheep were used as sources for one or more of the traits. They were crossed to combine the traits into one dual-purpose composite flock and then selected regardless of breed.

Other breeds also contain desirable traits, particularly some recent introductions that were not available in 1997.



Photo A: Example of AgResearch composite sheep bred for bare breech and belly

Efforts are currently focused on identifying –

- the range of breed sources for bare breeches and bellies so that breeders can choose the combination that suits them
- the genetic information needed to rapidly and reliably introduce the 'bareness' traits to a flock

The goal is to provide the information needed by breeders who want a sheep that has a genetically short tail, is polled and is bare of wool on parts of the body where it causes problems – on the breech, belly, head, legs and tail.

(2) How heritable are the traits?

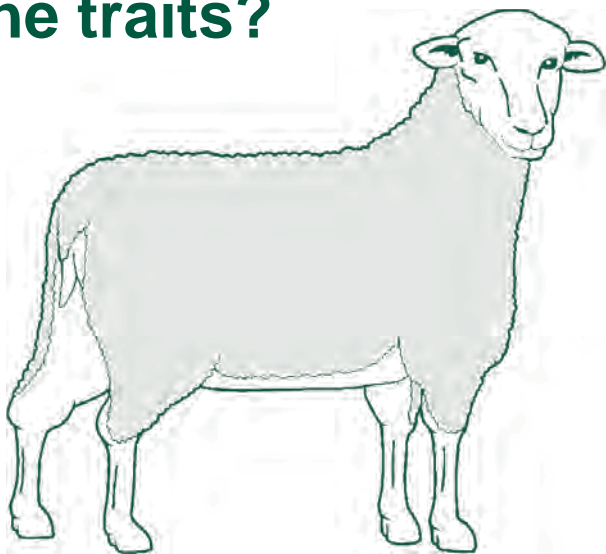


Figure A: Genetic traits making up a 'bare points' sheep.

Research has produced preliminary estimates of heritability.

Short tail

The easiest trait to breed for is a short tail. This is because tail length of groups of offspring is always halfway between that of the sire and dam. Heritability is strong (estimated at 0.84). Finn sheep are the most available source, Gotland Pelts less so and occasionally short tails show up in other breeds.

Bare belly

A bare belly is the most difficult trait to select for because it is rare to find sheep with bare bellies.

However, once a source of the genes is located the trait is moderately heritable (0.23).

Wool cover can come and go depending on season i.e. ewes tend to have bare bellies from around lambing time through to mating, then wool cover re-grows in some ewes over the winter. Bare bellies often become more obvious at the hogget and two tooth stage. In one trial flock three percent of lambs born to selected ewes in October had bare bellies at weaning in January. This increased to five percent by April.

Bare breech and tail

Breech bareness has a heritability of 0.31, while the length of bare skin under the tail has a heritability of 0.45.

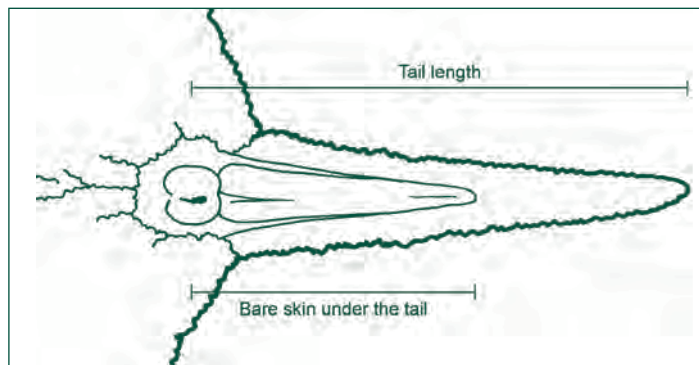


Figure B: Measurement of tail length and bare skin under the tail.

The traits are linked together

There was a genetic correlation between breech bareness at weaning and length of bare skin under the tail at docking (0.41). In other words, if you select for one trait, you will improve the other. Both breech bareness and length of bareness under the tail are associated with fewer dags. Females have more bare skin around the breech than males and have lower dag scores as a result.

These 'bareness' traits are as heritable as some traits for reproduction and growth (between 0.05 to 0.25). Progress will be relatively rapid because of the high heritability.

Scientist David Scobie says that visible progress in breech bareness can be seen in lambs after one generation. Bareness of the belly takes slightly longer to appear because it is less heritable and it becomes more obvious in the hogget and two tooth. This is particularly the case when breeding from a Romney-type base. Some animals may start shedding fleece from the main body if breeds like the Wiltshire or Dorper are used.

(3) The benefits

- less dags and flystrike
- easier shearing and less wool handling
- less contamination of wool
- less work (i.e. fewer yardings required, less time spent dagging, dipping etc)
- less chance of cut teats
- less chance of seed damage
- less wear and tear on combs and cutters by having less mud attached to leg wool

Less dags

Presence of dags doubles the time taken to crutch a lamb. Dagginess is also a heritable trait (0.2) and progress can be made in this trait separately from selection for bare breeches.

Less flystrike

Breech flystrike is the most common form and is a direct result of dagginess. The percentage of struck lambs increases exponentially as dag score increases.

In a 'breech strike' trial, lambs with wool right around the breech had a flystrike rate of 22%. In comparison, lambs with an extensive strike area naturally bare of wool (50cm²) had a 0% strike rate. The lambs were treated for internal parasites but were not crutched or treated with fly-control chemicals. Ewe lambs were more likely to be struck than ram lambs in the early season and ram lambs were more likely to be struck around the onset of puberty in autumn.

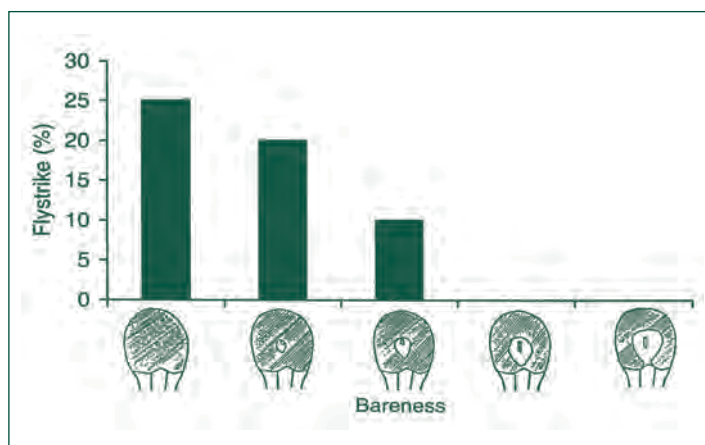


Figure C: The effect of breech bareness on the proportion of lambs that were flystruck, AgResearch trial, 2002.

Easier shearing

Shearing trials between woolly and less-woolled ewes showed bare sheep are considerably faster to shear.

Shearing time was compared between a line of woolly Romney ewes and a line of open-faced Romneys who had legs free of wool. The woolly sheep took 160 seconds to shear, compared to 120 seconds for the less woolled animals. This time was 'hand-piece on' to 'hand-piece off'. The fleece weights were the same. This shows that progress can be made in Romneys.

When the specially bred composite sheep were shorn, they took only 71 seconds on average (i.e. half the time of the woolled sheep).

The sheep with bare points were therefore shorn in half the time, while minimising dags, urine stain, socks and belly wool. This means lower wool handling costs.

The project results have relevance for animal welfare and market access. Breeding for genetic bareness of the breech in Merinos is considered a long term strategy to reduce the reliance on mulesing techniques.

The disadvantages

There is an inevitable reduction in wool weight. Adult Romney ewes with woolly bellies produced 3.7 kg of skirted fleece and 900 grams of oddments while the composites with bare bellies produced 2 kg of fleece and only 100 grams of oddments.

Romney x composite hoggets with woolly bellies produced 1.8 kg of fleece and 300 grams of oddments while composite hoggets with moderately bare bellies produced 1.5 kg of fleece and 200 grams of oddments,

The main body regions of Romney sheep produce 80% of the weight and value of wool.

Sheep breeds with greater bareness have a reputation for struggling more. However the shearing trials show that the composites still produced faster shearing times.

Economic benefits of around \$7/head

Lincon University estimate the cost saving to be gained from a genetically bare breech and belly is \$6794 per 1000 ewes. This includes savings of \$55.53 per 100 ewes and \$51.76 per 100 lambs for shearing, and less mustering, daggging, crutching and jetting costs.

(4) Involvement by industry, including ram breeders

The first target of the research project was to show that sheep with bare breeches and bellies can be bred through a selection process. This has been achieved and the information is now being taken out to ram breeders. Breeders will monitor the impact of selecting for bareness on other production traits in their flocks.

The genetic parameters from these flocks will be provided to Sheep Improvement Ltd (SIL). The measured traits can be stored on SIL until such time as a Breeding Value can be developed for bareness.

The plan is for SIL to provide individual breeders with the breeding values they need to design their own composite sheep to suit their own needs.

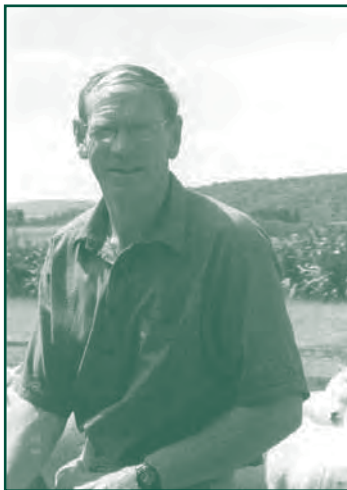
The next step is then for commercial producers to find a ram breeder who has rams with some or all of these traits.

Before SIL Breeding Values are developed the diagrams included here can be used as selection criteria both when buying rams or selecting replacement ewes.

A mentor group, including commercial farmers and a shearing contractor, has helped guide the project.

One farmer who has been selecting for the 'bare skin under the tail' trait is Southland ram breeder Robin Campbell. When selecting hoggets for his TEFRom stud, the amount of skin under the tail is taken into account, along with other production traits.

“ We started doing this in 1998 and now we often see sheep that are open and bare skinned around the breech. ”



“Dagging is the bane of many farmer’s lives so if we can cut back on this it would be good.”

Robin has not changed his whole flock crutching management significantly as the barer sheep are currently run with their woollier colleagues.

“But we have a core number of sheep that are definitely more ‘easy care’ in this trait.”

His 1300 ewes and 600 TEFRom hoggets are composite Texel, East Friesian and Romney.

“They clip 18% to 22% less wool than the straight Romneys they originated from but the wool is two microns finer.”

“Financially the wool income difference is insignificant.”

Robin believes that reduced wool cover will lend itself to mechanically-assisted shearing and is a sensible long-term breeding strategy.

(5) What can you do now?

More work needs to be done before SIL can create Breeding Values for bareness. In the interim ram breeders who want to enter the growing market for 'low labour, easy care' rams can start by selecting within their flock for the high bareness scores (use the photos at the start of this R&D Brief as a guide) The process can be sped up by crossbreeding with sheep from breeds like those used to create the AgResearch composite line discussed above.

Advantages of bareness traits are firstly, the rapid rate at which progress can be made by breeding and secondly, the traits are obvious in the live animal.

(6) Other research

Other Meat & Wool New Zealand research projects are addressing ways to make both the shearing process and wool management easier.

- Upright shearing platforms for easier shearing.
- Fewer dags through better internal parasite management.
- SIL Dagscore. SIL offers ram breeders a simple scoring system combined with an advanced genetic evaluation system to select sheep with a lower incidence of dags.



Photo B: Shearing trials

Acknowledgements & more information

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For more detailed information phone Meat & Wool New Zealand on 0800 647 000 and request:

- Scobie D R (2003) The sheep of the future. Proceedings of the 33rd seminar of the society of sheep and beef cattle veterinarians NZVA 61-69.
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