

Selective Breeding To Improve The Efficiency Of Breeding Ewes

New Zealand 2013

HCC Scholarship Report

**by
Tom Jones**



Introduction

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Introduction

About Me

Having been brought up on an upland sheep and beef farm near to Lake Vyrnwy in Montgomeryshire farming has always been the career I was going to pursue. On leaving school I spent two years studying for a National Diploma in Agriculture at Walford and North Shropshire college giving me a good basic knowledge of all agricultural sectors. Despite my main interest being in sheep production I felt it was essential to get a good understanding of all sectors.

On leaving education I returned home to the family farm. At this point the 100ha upland unit running 500 breeding ewes and 40 suckler cows was not going to be able to provide me with full time employment. I set about starting a contract shepherding and shearing business. With a shortage of skilled labour in the area work was not hard to come by and I developed a business that at its peak consisted of total management of 3 flocks totalling 2500 ewes, while only lambing 1600 of these. Seasonal routine shepherding work on over 15 flocks within a 50 mile radius of home and a shearing round of 20,000 ewes annually.

While continuing to expand our home farm we have now reached 200ha, and are in the process of expanding our ewe flock which currently stands at 1500 ewes to 2000 ewes by lambing 2016. We are also moving to an outdoor lambing system, with half of the flock lambing outside with little supplementary feeding. With our outdoor flock of North Country Cheviot ewes crossed with Aberfield rams producing replacements that will in turn provide the base for our new outdoor lambing flock. All of our replacements will go through a level of performance recording making full use of EID to ensure we have a history on every animal that is retained for our flock.



When we were looking to changing our sheep system I spent time looking at the way they run their systems there. For UK sheep farmers, New Zealand are our biggest competitors, especially in our domestic market. While there scale is far greater than ours, and their climate at times is more suitable for sheep production there is still much we can learn and incorporate into our system.

My main reason for visiting New Zealand was to study the way they select their breeding ewes. It may seem like an obvious choice for a study tour and possibly could be criticised as being unimaginative, but without being disrespectful to the UK sheep industry we are a long way behind them in terms of efficiency, breeding and research. The New Zealand sheep sector is nowhere near as diverse as in the UK, the wide range of systems we are witness to here does offer a better picture when it comes to deciding which production system could best suit your farm. But with me having already decided on a possible system that will suit our ever expanding farm, New Zealand offered the best insight into slightly different variations of the system that could work here.

While my main reason choosing New Zealand was to look and selection, I was also wanting to look at how their sheep sector was adapting to being forced into the more marginal ground due to the dramatic increase in the dairy sector. This is something we are seeing over here but maybe not as obviously yet it will be an issue in future years. And sadly it doesn't look like we are preparing enough for this.

And finally and perhaps most importantly they are doing all this successfully, without the help of subsidies, something all UK farmers should be aspiring to do.



Selective Breeding To Improve The Efficiency Of Breeding Ewes

Since the introduction of compulsory Eid tagging for breeding stock born after the 31st of December 2009 it has been much publicised of the advantages of using these tags for the recording of data to help improve flock efficiencies and performance. I have often thought that if these new regulations had not been brought in would as many commercial flocks be as open to the idea of recording their performance at this level.

The UK sheep industry is not known for its uptake of new ideas and new technology's. Tradition rather than technology has a greater influence over decision making. This could be partially put down to a high average age of a sheep farmer in the UK, but age cannot take all of the blame. With the safety net of subsidies backing up UK agriculture, farmers have been able to carry on farming in their traditional way.

With almost 80 breeds to choose from UK sheep farmers are spoilt for choice. And with this list continually growing thanks to imported breeds, crossbreds and composites, much of which from New Zealand. Decisions can be complicated, especially with each breed advertising its particular qualities. And with new crossbreds and composites from breeding companies with large marketing budgets things can really get complicated. But this is one area where tradition can play an important part in any sheep enterprise.



Is the breed really the problem?

When looking at the profitability of an enterprise, or lack of it in some cases is it always the breed that is the issue. Questions must be asked of the whole system before pinning the problem directly to breeding.

A major difference between UK and NZ breeding policy is that the majority of NZ are closed flocks, bar rams. Where as in the UK there is still a large % of flocks buying in their breeding females. Moving towards a closed flock as we have found is one of the most efficient ways of reducing production costs and increasing output, not to mention the benefits to flock health. And with purchasers relying totally on looks when sourcing their female stock through auctions, genetic improvement is not going to be easy. There was a clear message whilst discussing this topic with farmers I visited in New Zealand.

Why would you trust someone else to produce your breeding stock when you have no control in any part of its production?

A closed flock is one of the most basic fundamentals of any profitable flock. Understanding that in the UK sheep industry its not going to change quickly. And possibly, opting to purchase your replacements from a trusted source is an easier option. But it cannot be underestimated how important breeding stock is to profitability and more importantly the stock is bred fit for purpose. With an array of different systems in the UK its vital that stock is bred with a system in mind. And taking into consideration location. Otherwise how can we expect it to preform to its full potential.

With so many UK farms reliant on buying in their replacements, and many businesses reliant on selling breeding stock it seems unlikely to see such an extent of closed flocks here as they do in New Zealand, but urging these two parties to work closer together I possibly the best way forward from a breed improvement perspective.

Ewe Selection

Ewe selection is key to a profitable closed flock, and through the use of modern technology and Eid selection can be made easier through the use of performance recording down to an individual ewe level. The biggest factors in selection are as follows.

Selection Criteria

- Twin or Triplet Born
- Lambing Unassisted
- Maternal Ability
- Weaning Weight
- Worm Resistance
- Growth Rate
- Target Topping Weight
- Feet and Mobility
- Sound Constitution
- Wool Cover
- Skin Thickness

The list above may seem lengthy, but adapting your selection criteria for your system is the most important thing. Some of the point may not be of great importance for your system, but for an outdoor lambing, upland, forage based system these are key.



Selection Starts At Lambing

If tagging at birth and recording maternal traits at birth is impractical, or the investment in recording equipment cannot be justified, one of the easiest ways I found of removing problem sheep and their off spring from possible selection was that if an animal needed to be handled for any reason at lambing they should be moved to a separate field away from the unassisted lambs. This removes them immediately for the selection group.

If individual records are required then it is not impractical to use paper records combined with large readable management tags in the ewes. Recording of numbers up to 300–500 lambs is possible.



Mob Pressure

After weaning potential replacement lambs a key practice known as “Mob Pressure” is used for the remaining selection time before tupping. It involves running all possible replacements as a single group so every animal is under the same conditions for this period. This enables us to get a true reflection of their performance, and more importantly daily live-weight gains.

For selection during this period a simple method again was if an an animal needs

treating for any issue i.e. foot trimming. It should be removed from the group. This constant selection to remove any “Problem Sheep” throughout the season avoids the issue of these animals slipping through as replacements. Selection criteria for this is down to individual preferences, but all breeders said that selection pressure should be increased every year to ensure progress is continually improved upon.

When discussing this selection process with ram breeders in New Zealand. It became obvious almost immediately that the lack of UK ram breeders with significant numbers of rams to select from is allowing rams that are not fit for purpose into the sale rings. With small scale ram breeders in the UK, which is what the majority are. They need to sell as many rams as possible to remain profitable. And this is often regardless of whether the ram is suitable for sale or not.

Tupping Criteria

After coming through all the various selection criteria since birth one of the most important factors to consider prior to tupping was the animals live weight. Farmers who tupped there ewe lambs or “hoggets” said that the liveweight of the animal at tupping played a crucial part in not only conception rates but the ability for that animal to mate again in her second year.

Farmers were advising growing their animals as much as possible until they were going back to the ram for the second time. Keeping sheep too “hard” over the first 18

months has shown to have a lasting effect over the rest of their life. Ensuring sheep are gaining enough weight over this period is crucial. They need to be given the better grazing over this period, and supplemented during winter months when quality grazing is not available. This should also be used as a selection criteria, if an animal is not gaining sufficient weight, even when in-lamb it should be noted as a possible animal to be removed from the nucleus flock.

The hoggets being selected for tupping need to meet a minimum weight of 40kg or roughly 60% of their mature weight at tupping. But they also need to be structurally sound, and physically large enough to deal with lambing. This can be an issue with using terminal breeds like the Texel for crossing and keeping the lambs as replacements. While they are heavy enough, their physical size isn't large enough and it results in many lambs needing to be assisted at birth. This is one of the downfalls of having high replacement costs and farmers resort to keeping their terminally sired lambs for replacements, and it is a problem we've seen first hand on our home farm before we had a structured breeding program in place. On farms who were monitoring hogget liveweights and condition scores closely during the period from tupping to lambing had seen that a scanning percentage increase of almost 30% could be seen between the lighter hoggets and the heavier hoggets. And while a high scanning percentage for hoggets can be more of a problem than a low scan we still need to have enough lambs born to justify the extra costs of mating hoggets. As regards condition scoring, an ideal BCS (body condition score) of 3.0–3.5 is required, but you will often see this is easily achieved as animals with a lower BCS will not normally be selected for tupping. And it was shown that 80% of hoggets at the correct BCS mated within the first 17 days unlike animals with a BCS of below 2.0 where only 55% mated.

A, B & C Flocks

If you have a closed flock then an A and B flock system is an excellent way to ensure only the best performing sheep are producing your replacements. The system consists of an A flock, or nucleus flock of your best sheep, bred with maternal rams to produce your replacements. The B flock can be put to a terminal breed for lamb production. The B flock consists of sheep that are not suitable for producing replacements, animals that have been in the A flock that have had an issue that has resulted in them being demoted or the poorer replacement females bred by the A flock that are meeting the high selection criteria for the nucleus flock but are still capable of efficiently producing

lamb.

This system is obviously most suited to a pure flock, or a flock continually breeding up to eventually be pure. Selection criteria for the A flock is again down to individual preference, and possibly focusing on problems that are reducing the efficiency of the flock. But critically you must continually increase the selection pressure as standards improve.

Some flocks go as far as having a C flock for ewes that are not meeting the standard of the B flock, or have had issues resulting in them having to be culled at the next available time. This does add another level, and it could be more profitable for the farm to put its B flock back to a maternal sire and sell the females for breeding for a premium, and use the C flock for lamb production.

Starting this system can be time consuming and will take at least one season to identify your better performing sheep for the A flock. But once this system is adopted and up and running it can be relatively easy to maintain, and by continually monitoring the ewes in each flock and removing sheep that have fallen below the standard required by the flock it does not require too much labour to maintain. Improvements can also be seen quickly depending on what selection criteria you're focusing on. And as improvements are made, they will be seen filtering down from the A flock to the C flock and the whole farm efficiency and profitability should improve.

Itinerary

Here are the main farmers I visited on my tour of New Zealand

Kate Broadbent, Emily and Sam Welch – Waikaretu

Thursday 7th November 2013

She runs a business with a couple (who both hold world shearing records), they have a ram stud breeding Coopworths (very genetics focused breed pulling in genetics rather than breed specifics) progressive business, integrated with family values.

Robyn and Don Williamson – Oparau

Friday 8th November 2013

They run as a joint business, strive for best practice. Robyn is on the Farmer Council and has just been appointed as our region's research rep to try and integrate our research investment better with farmers. They are passionate about the industry, strive for best practice and are progressive.

Blair and Anna Nelson – Aria

Saturday 9th November 2013

Anna and Blair Nelson are one of four Beef + Lamb New Zealand demonstration farmers in the Northern North Island. They farm 1,100ha at Aria, 45km south of Te Kuiti and their goal is to lift farm profitability 30 per cent over three years. They are aiming to optimise their sheep production system, particularly focused on triplet bearing ewes and twin bearing hoggets and managing multiple priority stock classes. They are using novel forages to do this at the moment and integrating with the more traditional grass systems. Very good farmers and passionate about the industry. Anna is also a vet.

William Morrison – Marton, Palmerston North.

Sunday 10^h November 2013

Morrison Farming have three distinct strains of ewes. They have been developed to fit their personal interests and give options for our differing land types. The numbers in each flock are constantly changing as they try to predict their best market options. These form six mating flocks.

1. 800 Coopworth – Burnbank
2. 1,000 Wiltshire – Woodlands
3. 2,000 Ezicare – Ratanui

4. 400 mixed breed 1 year – Ardo joined terminal sires 8/2/10
5. 1,000 mixed breed – Homewood – joined to terminal sires 25/3/10
6. 1,500 mixed breed hoggets – joined to appropriate sires 10/5/10

Paul Crick, Taratahi College, Masterton

Thursday 14th November 2013

Glenside, Gladstone, Wairarapa

Glenside is 1076 effective hectares and has just under 15,000 stock units. The property is classified as intensive medium hill country and is in a summer dry environment. It has a variety of roles to play for Taratahi. Glenside's policies have also transitioned over the last 24 months from supporting the Taratahi dairy farm, providing grazing for replacement heifers and cows (over winter), to a more robust sheep and beef focused policy where ewe numbers have been increased, the change to a maternal breeding system with hoggets mated, and focusing on finishing in excess of 100 R1 stags on the deer block. Glenside currently carries approximately 5000 ewes and 2 tooth, 950 hoggets, 350 MA cows and R2 heifers and 350 Breeding hinds and associated replacement young stock. Summer cropping is a key component.

Friday 15th November 2013

Koromiko, Gladstone, Wairarapa

Koromiko is the amalgamation of two lease farms that boundary each other between the Kourarau Dam and the Admiral Road. Koromiko is 840ha's consisting of a combination of flat, rolling and steep land crossing over the Maungaraki range and is run as a traditional breeding unit with hoggets and R2 heifers being mated. Koromiko is running approximately 10,000 stock units. Koromiko also has the advantage of neighbouring Glenside, creating a sizeable 2000ha of land situated in the Gladstone District

Saturday 16th November 2013

Tautane Station, Southern Hawke's Bay

The Kahungunu Asset Holding Company, on behalf of its shareholder Ngāi Kahungunu Iwi Incorporated, purchased Tautane Station in May 2013. Taratahi has leased it from Ngāi Kahungunu

utilise the Station for their training. Tautane is located on the East Coast of the North Island, close to Herbertville and approximately 50 minutes from Dannevirke. The farm totals 3,375ha and carries around 30,000 stock units.

Landcorp, Wellington.

Monday 18th November 2013

New Zealand's largest farming company. Actively farming 376,942ha, a mixture of owned and lease land. With over 1.6 million stock units consisting of 561,667 sheep, 82,090 beef cattle, 67,304 dairy cows and 109,768 deer. All animals are predominantly pasture fed on perennial ryegrass and clover species. Other legumes, brassicas and fodder crops are grown as a part of pasture renewal programmes and to meet supplementary winter feed requirements. The geographical spread of properties enables Landcorp to integrate their management during periods of drought, with livestock transferred between farms to mitigate losses in production.

Robert & Alex Peacock, Orari Gorge, Geraldine

Tuesday 19th November 2013

Orari Gorge Station is set in the South Canterbury foothills just north of Geraldine. It consists of river flats at 750ft above sea level, rolling clay downs at 1000–1500ft and tussock country rising up to 3,500ft. As well as the Orari Gorge Romneys and Orari Gorge Herefords we also run 7000 commercial ewes, 400 commercial cows and 1500 hinds. They breed stock that are capable of looking after themselves through tough winters on the hill and then giving high levels of production in terms of lambing and calving.

Blair & Jane Smith, Newhaven Farm, Omaru

Thursday 21st November 2013

Newhaven is a substantial and diverse 10,000 stock unit commercial sheep and beef operation in challenging North Otago hill country and its the base of nearly 2000 Stud Perendale ewes are run under genuine commercial conditions at altitude. Newhaven sires must be in the top 10% for SIL overall breeding index and at the same time they must also be in the top 5% bracket for growth and EMA statistics. Across flock analysis (taking into account all registered Perendale animals within the country), in flock analysis with the same data and industry scrutiny (such as the Alliance Central Progeny Test) combine to achieve this overall result.

Trevor Peters, Peters Genetics, Roxburgh

Saturday 23rd November 2013 2013

Karen and Trevor Peters own the Peters Genetics Romney stud on five farms in West and Central Otago under Peters Farms Ltd. Sons Morgan & Clayton run two of the five farms in partnership with their parents. The large-scale operation amongst other things has been a partner in New Zealand's number one ram breeding operation Wairere, and Trevor has farmed Wairere based stock since 1986. Recently Trevor & Karen made the decision to go it alone and have re branded there operation under the name Peters Genetics. In 1993 Trevor made his first foray into ram selling, and sold 230 rams. Since then Trevor has steadily built on those numbers, and now boasts one of the most successful ram breeding operations in the country. Trevor & Karen have also proven themselves to be more than just one trick ponies, with the development of their Hotshot terminals, Dorper breeding, and Peters Angus Bull stud, they have successfully adapted to operating a diverse range of farming ventures. Currently Peters

Farms sell stock to clients from Tokanui in the south to Farewell spit at the top of the South Island.

Ceri Lewis, Mount Linton Station, Invercargill

Tuesday 26th November 2013

Mount Linton is one of the iconic New Zealand stations. It is also one of the largest privately owned stations in New Zealand and its size at 13,365ha. The key advantages of Mount Linton is its size and determination to be a leader in genetics. Recording the Angus herd began in 1991, followed by the Texel flock in 1995, and more recently the Suftex. The Suftex flock is a stabilised breed of terminal genetics and purebred Texels have underpinned the terminal lamb performance on Mount Linton for many years.

Reflection

On returning home from New Zealand, I was left with a lot to reflect on. Main thoughts were on how to move our business forward to be even more efficient and more importantly to increase profitability. Whilst already adopting the basics of the “New Zealand” system before going one of the biggest changes we will be doing for the coming season is introducing New Zealand genetics into our expanding Cheviot flock. We will be using a NZ Romney over half of our Cheviot flock to produce a hardy prolific breeding ewe. We will also be importing NZ Perendale genetics to use on the flock. The Perendale is a stabilised Cheviot x Romney, so our plan is to use the imported Perendales on these crossbred females to simplify our closed flock system. The other half of our Cheviot flock will be put to Lleyr rams to produce a more prolific ewe that will be more suited to our lowland pasture. All surplus ewes will be sold as replacements and ewes not intended for breeding replacements will be put to terminal sires.

We have also decided that we need to work closer with our ram breeders of the various breeds we will be using. We have been lucky so far in finding breeders who are

willing to work with us to improve production.

Whilst we will be placing greater emphasis on selection and as numbers increase will be increasing efficiency by make better use of EID technology. This will ensure we are continually selecting stock based on performance. We will also increasing selection pressure year on year as targets are reached.