

### Sheep NewZ #23 Winter 2021

#### Hello Members,

Yet again, thanks to our contributors of articles and photos. Be nice to have a few more profiles for the Feature Breed series. Remember this is free advertising for your breed and studs.

NZSBA Annual Returns – now due, please get them into the office as soon as possible. Please contact the office if you have not received the forms by email or post.

As I write this, Canterbury from north to south, is under water. If it's not drought, it's floods! Farming can be a hard career choice and between Mother Nature and bureaucrats sometimes it simply sucks. Hopefully, the waters recede quickly and the clean-up can begin. Farming is also about neighbourliness and at times like this everyone should be a good neighbour and assist each other where possible.

Maybe it is time to reinstate the Wool Levy to enable generic advertising for wool and its products. While I think there will always be a place for breeds that don't need shearing remember it does not pay to have all your eggs in one basket. While I don't always agree with the environmentalists I will be very grateful to them if they can get wool in a position to receive its dues as an environmentally sound fibre product, along with hemp as a fibre and a food. Wool can be used for new things such as pharmaceuticals, nutriceuticals and cosmeceuticals as well as the traditional carpets, clothing and fabrics.

As I put together the Feature on Lincoln sheep I was distressed to see that they have now dropped to around 100 registered ewes plus youngstock. I believe that one of the Government owned farms should be dedicated to keeping theses founding breeds of NZ agriculture in physical numbers sufficient to keep a good genetic base, as well as supporting the collection of semen and embryos for the future. Time and again genetics from some of these old breeds have contributed to the formation of the newer breeds eg Polled Wiltshire (Wiltshire Horns), Poll Dorsets (Ryeland & Dorset Horn), Corriedale (Lincoln and English Leicesters).

We have groups wanting to save nearly everything else that breathes in NZ and our historic buildings. What about our historic agricultural breeds?

Helen McKenzie

Editor

(06) 372 7842 or

Email: <u>rosemarkie@wise.net.nz</u>

#### **ASSOCIATION NEWS & VIEWS**

#### From The President

(Written well before the deluge – Ed) Since the summer edition of Sheep Newz we have had approx. 100mm of rain which has turned the countryside around the greater part of Canterbury into a brown/grey colour. This lack of



rainfall and consequently any real growth does not bode well for the winter!

The Covid pandemic still seems to dominate the news - some countries seem to be getting it under control and then countries such as India and Brazil are really struggling. Hopefully, our leaders have our roll-out organised!

That is not the Government's only worry- you would have to wonder how they could roll out some of the legislation that they do. I think they must have some budding bureaucrat beavering away deep in the bowels of the Beehive making up all these ridiculous laws/ideas, to basically annoy the hell out of people. For instance, the sloping ground and time of regressing law they rushed through is a mind-boggling law that simply cannot work. Banning live exports of livestock is a knee jerk reaction not very well thought out! For them to freeze the public servants' wages is astounding. If they do this to their own, then goodness knows what crazy legislation they will dream up next for our industry!

It is reassuring that groups such as Groundswell and Rural Advocacy Network are coming to the fore to challenge the Government on these matters. Do we, as a Society whose members are greatly affected by these stupid rules and regulations, need to put our weight behind the good work these people are achieving?

Further to this theme I have been asked by some of our members who are concerned with the newly introduced regulations regarding lamb tail docking. The main query being made is there any likelihood that we can order a review of this and get this legislation overturned or at the very least see some sort of evidence as to why it was necessary in the first place. I think it is up to individual breed societies to discuss this matter and then make a representation to NZSBA so we can then enter into some sort of dialogue with the appropriate authorities.

It was good to see that the participation in the Autumn shows here in Canterbury (apart from the lockdown weekend!) was good and well attended by the public. By all accounts, the Upper Clutha A & P Show held at Wanaka was well attended by breeders in that part of the country. This show kicked off our 125th celebrations and the Champions of each breed in attendance were awarded a special 125th memento. Here is hoping for a smooth run through the Spring shows as well.

Further to that, we have been advised by the Canterbury A & P Association that they are intending to run the New Zealand Agricultural Show in November. This is positive news and now gives us the certainty that we can celebrate our 125th Anniversary at this venue. Plans are well under way for this, with special prizes to be awarded to breeds within our society, to mark this occasion. We also intend to have displays within the sheep pavilion - if you have any ideas, or would like to have a display pertaining to the sheep industry, please contact the Sheepbreeders' office. It is intended to hold the Anniversary Dinner on the Wednesday night of the show in the members' marquee at the showgrounds. We will keep members in the loop regarding these celebrations as things transpire.

No doubt some ewe pregnancy scanning has, or is about to be, carried out. We can only hope for a positive outcome, bearing in mind a lot of the ewes in the drier parts of the country will not have had much of a flush. I wish breeders, "All the best" through this important part of the sheep calendar and here is hoping for a good smooth run through lambing.

Tom Burrows
President NZSBA



#### CELEBRATE! WOOL IS ON THE WAY BACK

This ad in the Masterton Big Save furniture store. The first time I have seen wool advertised for years!! They even had some fleece wool.

Photo: *Helen, Editor* 

#### From The General Manager

The east coast of New Zealand continues to be dry and I'm told truckloads of stock are crossing the Cook Strait in search of greener pastures.

**Breed Committees** currently are having meetings in May/June. They are meeting by way of audio conferencing, zoom calls, and yes some are meeting in person to discuss issues and having a drink afterwards. Most Breeds have agreed to postpone their intended conferences this year, and hopefully it will be full steam ahead for conferences next year.

**NZSBA Council Meeting** – at this stage hopefully we will be meeting in mid July.

NZ Agricultural Show – tremendous news the show is this year going to proceed, as it is just so important for members who enjoy spending show week in Christchurch. If intending to be in Christchurch during show week, it would be advisable to book your accommodation as with so many hotels are out due to quarantine, and there is a number of motels also out due to having WINZ clients.

Sheep 125 – Sheep Display - Since our last newsletter all breeds have been invited to have a special breed display at the NZ Agricultural Show. All pens will have a standardised template with a picture of their breed. Most breeds have sent in their forms, and to those breeds who haven't please do so.

**All Breeds Dinner** – this is happening on the Wednesday evening of the show in the Presidents Marquee, and we are currently awaiting confirmation of a speaker.

#### Commemorative Jerseys - for sale

Cost of Jerseys – Men's - \$170.00 – Ladies - \$135.00 and these can be posted anywhere in New Zealand. Check out our website for more details.

**Commemorative Prizes** - All sheep show classes at the NZ Agricultural Show will receive commemorative prizes for the Champion Ram and Ewe.

**NZ Ewe Hogget Competition** – as mentioned in my last newsletter I am currently asking members throughout New Zealand if they would be interested in helping in their area. The help involved is really ringing up farmers in their area, forwarding entry forms, and helping to organise local judging.

**Youth Initiative** – since we agreed last year to encourage youth into stud breeding with offering then zero fees until they are 10 and over and reach the age of 21, and subject to them having less than 50 ewes, 10 persons have taken up on this offer. Shropshire – 2, Suffolk, - 4, Poll Dorset, - 2, South Suffolk, -1, Dorper, -1.

NZSBA Annual Returns – now due, please get them into the office as soon as possible as I always receive a list of overdue names of members which I then ring up which is time consuming. Interesting usually the same names. Remembering your annual return in short is just number of ewes to what ram(s) used and updating your contact details if required – not too difficult.

**Breed Committee Elections 2022** – to take place early next year. If you want to make a difference throw your name in the hat

**NZSBA Website** – Breeds should continue to check your webpage and make amendments when necessary. Any news/stories about your breed, please contact the office.

NZSBA – Please members if you want your organisational body to lobby government regarding any issues, please contact either the office and/or your breed committee with your concerns. The new laws on docking and live shipments are recent laws which have some members now concerned with the NZSBA lack of support. But the Council needs to be contacted about your concerns, so we can put a document in front of government with objective and scientific reasons why we disagree with any intended law change.

On a personal note, I'm off to Melbourne later this month to visit my daughter whom I haven't seen for 14 months.

To our sponsors thank you for your continued support, and also, to Helen who continues to put this newsletter together.

Greg Burgess General Manager, NZSBA



### Feature Breed #1 Lincoln Sheep



Lithograph from David Low's "Breeds of Domestic Livestock of the British Islands", 1842.

#### **ORIGIN & HISTORY**

Thanks to UK Lincoln Longwool Sheep Breeders Association

Historically, the Lincoln Longwool is one of our most important native breeds of sheep. A large dual-purpose breed developed to carry a heavy fleece of strong, lustrous, lanolin-rich wool combined with a



substantial mutton carcass providing both meat and tallow. Lincolnshire was already famous for its sheep in the Middle Ages when the wool trade was crucial to Britain's economy and Lincoln was one of the seven 'staple' (official exporting) towns of England.

#### **Breed Development 1750-1840**

In 1707 John Mortimer published his book "The Whole Art of Husbandry" commenting that "Lincolnshire in the Salt Marshes breeds the largest sheep". Later that century Robert Bakewell used "Old Lincoln" ewes in the development of his Dishley breed. Dishley rams in turn were used to improve the old long-woolled Lincoln and a society was formed in 1796 when ten leading breeders agreed "that such a society was necessary for the improvement of the breed and the benefit of the public". This society would be later superceded by our modern-day Association established in 1892.

#### **Lincolns in Demand 1840-1940**

At the turn of the century Lincolns were in great demand at home and abroad and a great many numbers were exported all over the world, particularly to South America, Australia and New Zealand, where they were used to improve and develop new breeds.'

#### History in New Zealand

Lincolns were first brought to NZ in 1840 (1 ram & 6 ewes) but the first effective importation was in 1862.

Volume 1 of the NZSBA Flock Book contained the histories of 82 Lincoln flocks.



Photo above from the NZ Farmer Century Book 1984

#### BREED DESCRIPTION

The Lincoln is a large, comparatively long-bodied and heavily built sheep. It is a hardy breed, able to withstand cold, harsh, wet conditions. Being a big framed sheep it needs to be well fed to get the best from it.

#### Bodyweight

**Ra**ms: 90 -110kg **Ewes:** 70 - 90kg

#### Meat

Lean carcase with a long, meaty leg of mutton.

#### Breeding/Lambing

Lambing 100-130%. Lambs medium to late maturing.

#### Numbers

Down to 5 registered studs. Unknown numbers in commercial flocks. Used for crossbreeding with Merinos.

#### Wool

Very weighty and of good strength, showing character, wavy, bright and of intense lustre. Long in the staple, with a broad, firm, handling lock. Micron count 36+. Now popular for handcraft.

医骨髓囊囊

#### **STUD PROFILE #1**

Taunton Stud, Flock #301, Established 1970 Owned by J & T Inkson

The "Taunton" Lincoln Stud was started in 1970 with 35 aged ewes purchased from Guy Wilton in the North Island and a ram bred by Newton Godsiff in the North Island. The aim of the stud was to provide rams for the Lincoln/Merino stud in Omihi, North Canterbury as Lincoln numbers were low. The Lincoln Merino cross was preferred as they produced more and better wool for longer than the Leicester or Romney breeds.

With the addition of other ewes, the stud has been as large as 280 ewes in the year 2000 but is now down to 45 ewes plus replacements, on 9 hectares in Glenavy, south Canterbury.

The flock is culled on constitution, feet, wool quality, flystrike and dagginess. I like them for their easy care, no foot trimming, calmness and the ability to handle poor feed.

The Lincoln was most popular during the wool boom of the 1950's, then in the mid 1980's to mid 1990's when there were over 5,000 stud ewes registered. The NZ flock is now down to four studs in 2021. Total ewe numbers are around 200 including replacements. [There are some unregistered flocks but no census of their numbers has been taken. Editor]

Popularity has fallen as "wool" and "shearing" have become offensive words.

Lincoln ram bred by William Perry. Taken from his book, "Sheep Farming in New Zealand" No date of publication but probably 1930's. ▼





#### **STUD PROFILE #2**

Kyle Hill, Flock #380, Established 1987 Owned by Jean Hamilto

#### Owned by Jean Hamilton, Otama, Southland

All Kyle Hill photos by Angus Hamilton's partner Kayla



'Kyle Hill' Lincoln Stud at Otama in Southland was started in 1986 by Jean and the late Maurice Hamilton. They were high school teachers with a few acres and a sense of history.



They wanted something different from Romneys. When they had the chance to buy neighbouring properties in the 1980's and again in the 1990's they chose to stock them with a Lincoln - Poll Dorset cross for 'good big sheep' after advice from fellow breeder Arnold Tayles. Other breeders were trying Romlines and

Lincworths and other such crosses When wool breeds fell out of favour, the Hamiltons decided to kept their Lincolns as a heritage breed, a novelty and a hobby rather than a lucrative side-line. It now costs more to shear them than returns from the wool. Lincolns have to be shorn more often as they can grow wool around 2.5 cm a month, hence why they are officially called Lincoln Longwools

Kyle Hill ram lambs March 2020 ¥



Example of lamb fleece wool





From 2016 Jean leased out most of the farm. She farms a few acres without a dog and keeps the small stud going for historical and sentimental reasons. Her Lincoln sheep have become very docile and come when they are called. They let her know when they want moved. Being strip-grazed daily during winter, they know her voice and are very co-operative. They are well-suited to the damp Southland winters and are spoilt with sheep-nuts or grain before lambing in the last week of August.

Wool fibre is protein so a sheep producing a lot of wool needs a lot of feed. Southland is ideal for this breed and the Otama soils are some of the best in the country; the area can certainly grow grass (it also boasts world-record wheat yields). The early settlers called the Otama area "the garden of Southland" and as the farm faces the South towards the Mataura River, it never dries out. It is well above the flood-plain's gravel



"Fostering the improvement of all sheep breeds and providing a unified body whose collective voice has a beneficial effect on the total New Zealand sheep industry."

terraces and has very deep top-soil. It is sheltered from Southerlies by the Hokonui Hills beyond the river and often storms can be seen going up the Catlins coast to Otago, leaving inland Otama alone. So the conditions are similar to Lincolnshire and Leicestershire in England, famous for their wool.

Kyle Hill Lincolns live a long time and still grow good fleeces into old age. Their teeth last well and they are hearty eaters. They are very protective mothers but can be stubborn in mothering-up pens, however they rarely need help during lambing. They are not a prolific breed but their lambs are quite solid with good survivability and they do not run off like the meat breeds do. Tagging lambs at the drop is never a problem as the docile mothers hang about close enough to read their ear-tags. Lambs are also weighed at birth and singles are often around 7kgs. The lambswool is beautiful and by March is lustrous and hangs in long, silky ringlets and is certainly worth shearing.

Only the top ten percent of ram lambs are kept. The first cull is done on physical and visual faults before weights/performance records or parentage. Clients remember visual faults and they want a ram that looks masculine and doesn't look like a Romney.

Since the Hamiltons' son Angus has come home with his partner Kayla, they have found some interest in Lincoln wool on-line from crafters. More recently there has been keen interest from Swiss Valais Blacknose breeders looking for foundation stock to expand their flocks. Lincolns make great foundation ewes for Valais as they are excellent mothers and their wool is very similar.

Kayla has set up a Facebook page "Kyle Hill Lincolns" where she posts her photography & art of the Lincolns, as well as updates on how they are going & information on the breed for interested people.

医医囊性囊



Lincoln ewe.
Photo from "Breeds of Sheep", NZSBA Booklet 1977







#### LINCOLN TROPHY

Ormond Cooper was managing director of the Wairarapa Farmer's Co-Operative Association at Masterton, a popular resident in the district. He had been a prominent footballer in his younger days. He was an old boy of Wanganui College.

He was killed in a car accident

on 13<sup>th</sup> July 1918 when the car he was returning from the races in, skidded and became jammed between a tramcar and a two-horse lorry in Molesworth Street, Wellington. He sustained serious chest injuries and later died. He was about 49 years old.

Mrs Cooper (neé Broad) donated this sumptuous silver trophy in his memory. It was for the Lincoln sheep section at the Masterton A & P Show. It has its own purpose-built wood and glass showcase, about 50cm square.

This item was from a display I organized for the 125<sup>th</sup>
Masterton A & P show in February 2017. Unfortunately, Mr
Cooper's photo has been attacked by silverfish – Helen

医阴茎囊肿

#### LINCOLN SHEEP IN THE UK TODAY

(Photos from the UK LSBA website)

As I sit at my desk on the edge of the Lincolnshire Wolds, with the whole of the county laid out before me, I cannot help but be melancholy at the plight of the Lincoln Longwool; a breed which was once so revered and fruitful in this eastern Yet, in the space of merely two region of Britain. generations, the Lincoln has gone, to use an in-vogue phrase, 'from hero to zero'. It is not uncommon for a local passer-by to enquire as to the origins of this authentic native breed. It is nothing short of astonishing that, even within their indigenous environment, they have become something foreign and in such a short time. Despite this, their undeniable presence and the graceful way in which they blend into their home landscape is still a joy to behold. Their ability to survive through sheer hardiness and human endearment is surely no accident?



Our insatiable appetite for fast fashion and even faster food has rendered this veteran of the sheep world something of a dinosaur in

today's commercial landscape. However, inside that fleece, of great weight and lustre, lies a quality that simply cannot be denied. A fibre which has seen generations of investment and, for many, a life's work of breed maintenance and improvement and not just on these shores. The booming export markets of the early 1900s and again in the 1950s saw Lincolns land on nearly every major continent of the world. Their legacy is still evident across the globe, albeit in smaller numbers. A priceless commodity which we have gratuitously inherited, may actually serve us well in the future, if only we could see beyond that heavy forelock. It is of paramount importance that the Lincoln Longwool is preserved and if it were on my say alone it would be with all the accolade and regalia deserving of such a magnificent ovine specimen.



In the UK, there are now less than 700 registered breeding ewes left. This places the Lincoln uncomfortably at the top of the official UK 'watchlist' in terms of their rarity. Our breed association has just over 100 members, of which only around 50 actively keep flocks and annually breed. The majority of the flocks are small with 6-12 breeding ewes. The price of British wool has plummeted, particularly in the last couple of years, and the shearing costs more than the value of the clip, with the exception of shearling fleeces which still command a premium and are often exported to Europe. No longer are Lincolns the mainstay of large livestock holdings, sadly gone are the days when the wool cheque would pay the year's rent of the farm. Instead, they are now an interest for the hobby farmer, smallholder and in some instances an addon to a commercial farm that simply bears a passion for the breed.

With the loss of appreciation for wool, in favour of synthetic fibres, we are not only in danger of losing the sheep that grow it, we are also losing a valuable skill set. Whilst shepherding can still be considered a stalwart profession of biblical ancestry, shepherding for wool is a fine art, involving careful husbandry and land management. With the lack of commercial interest in wool there is no incentive to tend to the crop which was once hailed as 'the sovereign staple'. UK sheep farming is now firmly centred on meat production, and whilst the Lincoln produces a worthwhile carcass they simply cannot compete in an intensive, purpose-bred system.

On a more positive note, after nearly twenty years of keeping Lincolns, I suddenly detect a new wave of optimism. The global war on plastics and other eco-incentivised movements are shining a bright light on the need for sustainability. It is a pressing issue in many core areas of our everyday life and it is far-reaching; from energy conservation to waste-management, from food to fashion. Lincoln Longwool is no ordinary fibre, and Lincoln Longwools are no ordinary sheep. They have proved their ability to thrive in many different climates and they abundantly grow an incredible resource. All the development work has been done for us, it is almost our duty to now follow it through. From house insulation to soft furnishings and from intelligent fabrics to fashion embellishment, the Lincoln offers a diverse range of possibilities, surely it is time to embrace their existence?

I do not have any inclination to mourn the passing of a great pastoral era and the Lincoln need not be resigned to the pages of history. With modern day technologies and ecologically minded progress the Lincoln may once again offer a gateway to a better life on earth, a life which is already truly enriched for the handful of privileged shepherds who are devoted to keeping them.

Louise M S Fairburn

Chairman of The Lincoln Longwool Sheepbreeders' Association. UK.



## **Have tunnel vision for** your genetic vision

Beginning this month, PBB has the exciting opportunity to provide you with Sheep DNA services. Making PBB a one stop shop for beef and sheep genomics and data management. PBB are the only company nationwide to provide all these services, under one roof.

Our new GGP Ovine 50K test includes the following tests:

- Parentage
- Yellow fat
- Fecundity
- Booroola
- Loin Muscle
- Meat and Fat Yield
- Increased number of lambs born
- Microphthalmia



PBB's 50k test is 1/6th the price of other similar tests currently on the market.

These test results can then be loaded into SIL giving you very valuable reports, with accuracies, encompassing your investment in genomics.

'if you're already doing parentage then you're already doing the hard yards - sampling the animals - so you may as well get as much out of that sample as possible'.

phone: 06 323 4484 email: charlotte@pbbnz.com

www.pbbnz.com





#### BORDER LEICESTER SHEEP



An NZ Border Leicester Photo: NZSBA B L webpage

#### **Brief History**

(Thanks to UK Society of Border Leicester Sheep Breeders)

The origin of the Border Leicester breed was as a descendant of the Dishley Leicesters which were bred by Robert Bakewell of 18<sup>th</sup> century agricultural innovation fame. He segregated males & females to enable controlled mating and developed a system of breeding termed 'in and in', or line breeding as it's known today. His sheep quickly became popular with surrounding farmers for improved meat quality and production through 'prepotency'.

The improved Leicesters were soon established on both sides of the Border with Scotland. Some breeders were crossing with the local Teeswater sheep whereas others were crossing in some Cheviot blood. The two variations were nicknamed the "Bluecaps' and the 'Redlegs'. Border farmers preferred the hardier Redlegs and by about 1850 this variant became known as the Border Leicester.

#### Arrival in New Zealand

According to the 1902 NZSBA flock book the first Border Leicesters arrived in NZ in 1859, imported by the New Zealand and Australian Land Company, Limited. Their first shipment arrived in the "Cheviot" at Port Chalmers in 1859 and consisted of 9 ewes and a ram. In 1901 flock #1, Clydevale Estate, had a total of 1800 ewes.

The earliest mention of Border Leicesters found on looking in National Library's Papers Past, was in 1873, when the "North Otago Times" of 7<sup>th</sup> January 1873 noted the importation of 2 lots of Border Leicesters.

The Borders became very popular for crossing with Merinos. The Encyclopaedia of New Zealand, 1966 says the Border Leicester was 'the predominant fat lamb sire until 1910'.

The peak of registered ewe numbers was reached in 1980 with 35,933 registered ewes.



Border Leicester ewes

Photo: NZ Border Leicester webpage

#### **BREED DESCRIPTION**

Border Leicesters are a dual-purpose sheep breed.

A large, long-legged sheep, with a pronounced Roman nose. It is a comparatively prolific breeder.

Principally used for cross-breeding to improve the fertility and performance of other breeds.

**Location:** Stud flocks are found throughout New Zealand with the majority being found in the South Island.

#### Bodyweight

**Ra**ms: 70-85kg **Ewes:** 55-65kg

#### Meat

Mainly used for breeding crossbred lambs over white face flock ewes. Progeny at slaughter compare very favourably with the national average for weight and yield in recent trials over Romney ewes.

#### Breeding/Lambing

Very good mothering ability. Lambing 110-160%.

#### Numbers

Approximately 2,000 registered ewes plus female youngstock in 26 registered flocks. Unknown numbers of commercial flocks.

#### Wool

Long, strong and lustrous. Individual staples are easily separated and end in a small curl.

Fibre diameter: 37-40 microns.

Staple length: 150-200 mm (6-8 inches).

Fleece weight: Range 4.5-6 kg.

Average 5.5 kg.

Uses: Upholstery. Hand-knotted and machine-made

carpet yarns.

#### **STUD PROFILE #1**

## Ravah, (previously Mantel Grove) Flock #1139, Established 1968 Owned by John G Campbell, Timaru

Ravah 342-19
Champion Wool
Breeds Ram Hogget,
Sth Canterbury Show,
November 2021.

I started my Border Leicester Stud in 1968, with cast for age ewes



from Billy Kennedy, of Bayswater, Western Southland. In 1969 I bought Haydowns 80-65, from Allan Miller of Outram. He was out of Jim Thompson's top producing ewe, Haydowns 16-59, producing 18 lambs in 8 lambings, including 6 years of a North Otago drought! I bred a ram by him, Mantle Grove 21-70, out of Studleigh 6-60, she was a triplet of a top ram, Studleigh 7-60 used by Owen Ellerm of Feilding. Mantle Grove 21-70 was a very influential ram in my flock. Mantle Grove 21-70 left lambs that had fewer dags than the other sire I used in 1972.

Since then, I have purchased rams from a number of sources including Glenstrae 70-74 (triplet). Neil Scott, from Coldstream, sold rams by Glenstrae 70-74, that twice topped the NZ top priced BL rams at auction. I also bought ewes from John Gunn when he was at Darfield.

In 1987 I shifted from Wyndham, Southland to a dry land farm at Pleasant Point, South Canterbury. The farm operation includes mixed cropping and dairy support. The last fifteen years, I have been getting my rams blood tested for DNA footrot scores. This season all 6 sires used have 1-1 footrot scores. Last season 6 out 7 sires, had 1-1 footrot scores and the other ram, a 1-3. A number of rams are used to maintain genetic diversity in the flock. This season 246 ewes were mated, which makes it one of the largest flocks in the country.

Ravah 353-17 was used in 2019 & 2020 then sold to Brent & Heather Busby's Cromarty Stud of Southland.





Ravah ewes after mating

#### **STUD PROFILE #2**

Hermiston Flock #1483, Established 1994 Owned by G Letham, Ashburton

The Letham Family has been breeding Border Leicester's in Mid Canterbury for 90 years. Guy Letham founded the stud in 1931 when he purchased 30 ewe lambs from J. Connolly (F. 5.11)

Three generations later Border Leicester genetics still play a big part in the farming system at 'Hermiston' where Cameron, his brother Andrew and father, Guy Letham Jnr, farm. Purebred Border Leicester rams are bred and sold alongside Dorset Downs and Romneys at their annual onfarm ram sale.

There is also a commercial mob of first cross Border x Romney ewes run on the farm producing terminal lambs.

#### NEW BORDER LEICESTER CHAIRMAN

After a stringent selection process, Cameron has recently taken over as Chairperson of the Border Leicester breed after a healthy stint from the Honorable Mark Copland (Honorary member - 2019).

Cameron is excited about getting the highly contested role and believes the Border Leicester breed still has a lot to offer the sheep industry of New Zealand, mainly with the unsurpassed production gains Border genetics bring when crossed with Merino and Romney flocks.



△2021 McWilliam Stud Stock's *Te Taumata* 2 tooth Border Leicester rams

¥2019 Te Taumata 2 tooth rams



#### AUSTRALIAN BORDER LEICESTER STUD



*Talkook* Border Leicester stud was founded in 1968 by Bob Anderson.

The stud was established for the purpose of both meeting the high demand for 1st cross ewe clients, as well as the purpose of production & stocking for the family farm enterprise, trading as Mount Pleasant Pastoral Company.

Mount Pleasant is located 20 kms southwest of the township of Crookwell NSW, in the Southern Tablelands, Australia. It is a very cold climate with snowfalls and frosts in Winter. Winter conditions quite often last 6 months of the year. The property has been in the family for over 110 years. Its primary source of income is based on the merino wool industry, with approximately 3000 breeding ewes joined annually.

As well as the wool industry, approximately 800 merino ewes are joined to Talkook Border Leicester Sires annually, with all progeny sold as lambs in both the meat market & annual 1st cross ewe sales.

Talkook Stud has been, & remains, dedicated to its clients' requirements. Genetic traits such as wool, structure, carcass, fertility & performance are of the utmost importance, and we continue to strive after these to provide our clients with the confidence of their purchase of a Talkook Sire.

There are currently 148 Border Leicester Studs in Australia. The Border Leicester sires in 2020 and 2021 are in the highest demand they have ever been in with record prices being paid for both flock and Stud Sires. This is due to Australian sheep numbers being down to the lowest they have been in decades.











### THE NORTHERN SOUTH ISLAND SUFFOLK BREEDERS' ANNUAL FIELD DAY

This was hosted by Annabel Tripp & Roy Veronese, with an interesting trip around Snowdon Station and some fantastic Suffolks and Perendales.





Bill & Nicky Stevenson's **Upcot Station Awatere Valley** ewe muster for tupping







#### **Obituary**

#### Jack Kirk Walden Poll Dorset Stud

Contributed by Ken Haywood

Jack established his Dorset Horn flock in 1957 with ewes purchased from an S. Fabish who farmed at the base of Mt Taranaki. According to Jack, he had done a good job & they had adjusted to the wet climate.

In 1963 he imported 5 in lamb ewes from L A Stuart in Tasmania and



established the Walden Poll Dorset Stud, flock 21. He got a usable ram lamb out of these ewes, which he mated to his Dorset Horns. He told me he worked closely with another Poll Dorset breeder Bruce Jenner, who farmed at Wairoa. He said in those early days they paid \$400 for a ram, going halves. He said that selection priorities were carcase quality and growth rates, which you can see in his stock today.

Jack was an early adopter of performance recording, often in the early days buying semen from older proven sires with good figures. He told me that he thinks he got "loinmax" in his flock in the early 90's.

With increasing age, Jack decided to downsize his flock in 2014, ewes and ewe hoggets were sold to a number of breeders. He was nearly 96 when he died, still farming approximately 30 ewes.







### EID tags can increase livestock productivity and profitability!

Shearwell's electronic tags (EID) can be of great benefit in removing any possible guesswork and assisting you to make better informed livestock management decisions.

When paired with Shearwell EID scanning equipment, the EID tags enable you to accurately collect and examine the specific information (such as weight, pedigree, etc) of an individual animal, this recorded data can then be used to selectively enhance the overall quality of your livestock.

Both our Shearwell tags and EID equipment (equipment including but not limited to: stick readers, panel readers & weigh crates) have been designed, developed and trailled on our own farms, in the effort to provide farmers with innovative, practical, reliable and easy-to-use animal



Ph: 0800 79 99 89

www.shearwell.co.nz



#### A Bit of History

### COUNTING SHEEP, THE TRADITIONAL LINCOLNSHIRE METHOD

Each area of the United Kingdom had their own dialectal words for counting sheep. Apparently, the ones below were used in Lincolnshire. There are several sites on the Internet which give many variations. I found these ones on "The History Jar" site along with a good synopsis of the wool trade over the centuries in the UK.

"There is also a theory that sheep counting, which is rhythmic, is the reason that counting sheep is supposed to send you to sleep: yan, tan, tethera, methera, pimp, sethera, lethera, hovera, dovera, dick, yan-a-dick, tyan-a-dick, tethera-dick, methera-dick, bumfit, yan-abumfit, tyan-a-bumfit, methera bumfit, giggot. It's also hugely repetitive with only the light relief of number fifteen as a diversion."



# TRACEMOL LIFT

A MINERAL AND VITAMIN ENRICHED FOOD SUPPLEMENT FOR LIVESTOCK



#### WHAT IS TRACEMOL LIFT?

- Tracemol Lift is an animal supplement formulated to provide the full range of minerals and vitamins required for healthy growth and optimum production.
- Tracemol Lift is a unique formulation of essential minerals, trace elements, electrolytes, protein, carbohydrates and vitamins.
- Tracemol Lift is blended into a rich seaweed base. The seaweed type used is ascophyllum nodosum. This type has the highest level of minerals, vitamins and amino acids.
- Tracemol Lift is one of the most cost effective livestock supplements on the market.

#### HOW IS TRACEMOL LIFT USED?

- Oral drench
- Added to water troughs
- Poured on hay or grain
- In milk used to rear calves
- Available in 20 litres, 200 litres and 1000 litres



#### TYPICAL CHEMICAL ANALYSIS

Element	g/Litre	Element	g / Litre
Nitrogen	30.0	Zinc	0.350
Potassium	30.0	Boron	0.060
Phosphorus	24.0	Copper	0.375
Calcium	0,3	lodine	0.150
Magnesium	0.3	Cobalt	0.090
Sodium	4.5	Selenium	0.075
Sulphur	2.3	Sucrose	22.250
Chlorine	T.2	Vitamin A	150000 (U
Iron	0.600	Vitamin D	15000 IU
Manganese	0.090	Vitamin E	90 IU

#### WHEN IS TRACEMOL LIFT USED?

- Ideal in times of stress such as docking, calving and weaning when the animal's demand for minerals and vitamins is high.
- Pre-mating when higher levels of minerals such as selenium or iodine are beneficial.
- Whenever pasture or supplements provide less than a complete diet
- Where soils, and consequently pasture, is deficient in minerals required by stock.
- On hay and silage which are normally deficient in essential minerals even when those minerals were available at cutting time.
- When seasonal variations in pasture quality could result in less than optimal animal performance.

#### THE REACTION™ RANGE TAILORED SOLUTIONS, PROVEN RESULTS

Tracemol Lift is part of the Reaction™ Range. The Reaction™ Range can be tailored to your farms requirements and include a combination of proven products which focuses on improving your soils, pasture and animal health. The range includes lime, solid and soluble fertilizers as well as our extensive range of multiblend liquids, soil conditioners and superior range of minor elements.

Give us a call for more information (09) 257 4030

#### RECOMMENDED DOSE RATES

Livestock	Daily	21 Days
Sheeps		
Lambs	I ml	6 ml
Hoggets	1 ml	10 ml
Rams/Ewes	2 ml	10 ml
Dairy Cows:	3 ml	25 ml
Cattle:		
150-300kgs	2 ml	20 ml
300kgs plus	3 ml	25 ml
Calves	2 ml	15 ml
Deer:		
Fawns	3 ml	10 ml
Hinds	2 ml	20 ml
Stags	3 ml	25 mi

Livestock	Daily	21 Days
Goats:		
Milking	2 ml	15 ml
Kids	Lml	6 ml
Adults	2 ml	10 ml
Horses:		
Foals	2 ml	15 ml
Yearlings	2 ml	20 ml
Adults	3 ml	30 ml
Pigs:		
Adults	2 ml	15 ml
Working Dogs:	1 ml	10 ml

Tracemol is not for human consumption. Please shake well before use.





(09) 257 4030

CARE IN ALL WE DO

www.chengeta.co.nz

#### STUD PROFILE

Streamland Suffolks, Flock #992 Established 2007 Owned by Susan Meszaros & Karen Maddren, Warkworth



Streamland Suffolks, just west of Warkworth, breeding not only for classical Suffolk traits (growth, muscling, Suffolk character and appearance) but also for traits important to smaller flocks. We DNA test all rams that we would consider selecting for our own use and

only use those with DNA test result of footscore 1, 2 or 3, and with DNA test result of AA for Cold Tolerance. All lambs, regardless of whether purebred or crossbred will inherit an "A" for cold tolerance and this should result in improved lamb survival in the first hour after birth. Feet are also important so selecting for decreased susceptibility to footrot has been a part of our breeding program for several years. We do this DNA testing through the Gene Marker Laboratory at Lincoln University.

\*\*Taking blood for DNA testing\*\*



We also select for good mothering, which may not be of value in a lamb going to market but does give tremendous value in a stud or lifestyle flock, where the goal is to have every lamb stay alive and thrive. Adding to improvement of lamb survival is easy lambing without compromising on birthweight. A lamb that is torpedo-shaped is lambed easier than one with a blocky head and shoulders. We monitor our lambing ewes so that we can score them on mothering, tag, weigh and tail everything at birth, and clearly identify lambs to ewes and singles, twins, and triplets. We lamb early,

generally starting around July 1, and for only 1 cycle. We use a good, registered ram as a teaser ram wearing a no-mate harness (just in case the harness slips) so that we can gauge how well the ewes are cycling and start our main breeding when we see about 1/2 marked by the teaser ram. We generally get 85% of the ewes bred in that first cycle. The rest are bred in a backup mating a month or so later.

Covid hit us a bit hard as we were halfway through ramselling season when the first lockdown occurred, and we were



in drought, so feeding out. We ended up having to carry half of our sale rams through to this past season and ended up feeding baleage for a full year. But in the scheme of things, we are so lucky in New Zealand!!





#### Come and join us for this 'Four Day Tag-along Tour'

Drive your own 4WD vehicle in convoy style through the Marlborough high country on private farms, Stations and Mailings Pass, that many are unable to access. Our licensed and experienced 4WD driver & guide will be keeping you up to date along the route via two-way radio contact, ensuring you are informed and having fun along the way.

## NEW 2022 DATES RELEASED!!!

#### MOLESWORTH 4WD Tag-along Tour Dates

January	9-12	2022	March	20-23	2022
February	5-8	2022	March	27-30	2022
February	20-23	2022	April	3-6	2022
March	13-16	2022	April	24-27	2022

For full tour details please contact, South Island Tours NZ
Phone 0274351955
info@southislandtoursnz.com
www.southislandtoursnz.com

South Island Tours NZ SMALL GROUP TOURS

#### Time to Explore Unique Areas of the South Island...

On this magnificent journey of a lifetime, your guide will give you a full understanding of life and land in this region, with the bonus of meeting Merino sheep and beef station owners. Naturally, the farmers have wonderful stories to share, as farm life here is quite different with rugged terrain, extreme scorching summers to snowy, freezing cold winters. At the majority of these Stations the farm couples will host lunch or morning tea.

At South Island Tours NZ, Geoff and Lee Swift are tour experts, they have 28 years of South Island tour knowledge and are hands on owner/operators. Over the years Geoff and Lee have made many friends and contacts which enables them to provide you with an extra special tour experience. Smaller groups allow them to offer a more personalised, off the beaten track tour, with a varied selection of accommodation to suit each individual group. On this tour, you have an option of individual rooms in the shearer's quarters or a higher level of accommodation within a new farmhouse.

Molesworth Tag a-long tours have existing itineraries that work well; however, they also create bespoke tours on request. For further information on the 'Molesworth Four Day Tag-along Tour' or other exciting South Island tours, please contact Geoff and Lee.

"We did the 4WD Tag Along Tour in October 2019. We would highly recommend this tour for its mix of magnificent scenery, challenging 4WD tracks, highly entertaining commentary, hospitality and good fun. It is one thing to look at great scenery and marvel at it; but this tour also gets you right in the middle of it to enjoy all it has to offer. Our tour guide Geoff Swift was extremely knowledgeable about the areas covered, its history, people and highlights. The accommodation and food were of very good standard too. We came away with a real understanding of the area and its people; as well as dozens of great photographs to help us re-live the days.

Our trip will live long in the memory and we wouldn't hesitate to book another tour with this company".

Kind Regards, Graham and Joyce Bell - October 2019

## The Lincoln University Footrot Gene Marker Test – 20 years on.

By Jon Hickford and Sandy Slow

It isn't often you have the benefit of looking back and knowing that something you did, sort of worked. It actually goes back to the start of my research career, which is 35 years ago, and my investigation of what are called the MHC genes. The name is too complex to spell out here, but the genes are often called the most complex genes known to science too. They are certainly the most variable. In short, they control and coordinate the immune response to infection and they are variable because when animal disease challenges occur (such as a pandemic) diversity across a population is a good thing. It means that while some animals might die or be debilitated with severe disease, others will be able to launch an appropriate immune response that is able to defeat the disease challenge and will be largely unaffected or only mildly affected, and thus go on to breed and repopulate.

In the case of the MHC, there are also compelling arguments to suggest that mate preference is driven by these genes, and that it involves the intrinsic smell of your mate (so perfume, aftershave and deodorants aside). If your mate smells "good", it means that they are more likely to have different variants of MHC genes than you and as such, successful procreation is more likely, which can enhance the variation in your progeny's MHC genes, and so, in short, this mating preference is driven by you potentially creating greater MHC diversity in your offspring. I am not kidding!

What is it about the MHC and footrot? It is intuitively sensible that if a sheep can mount an effective immune response to the infecting organism, then it is less likely to get the disease or at the least prolonged, or severe disease. There is complexity in this though, because if a sheep doesn't get exposed to footrot, which is a contagious disease, then it is not going to get it in the first place, so we don't know how susceptible the animal is to it. Most people in NZ now understand this argument in the context of COVID-19. The closed borders have stopped the disease from establishing here, but it means we don't know who in our population will be mostly likely to develop severe disease or succumb to it, and I for one don't want to run the 'experiment' of letting this particular coronavirus into the country to see whether I am susceptible, or not – MHC or otherwise. So, the trick becomes how do we identify those that are less likely to get the disease?

Back to footrot in sheep. It is a complex disease, and our research suggests that a series of events involving two microorganisms occur. The first is infection by an environmental bacterial pathogen called *Fusobacterium necrophorum*. It is a 'nasty' organism, for want of a less than

scientific word, and it causes 'scald' or 'ovine interdigital dermatitis' (OID). This is typically seen in heavier sheep during the spring flush of growth, and while causing lameness, it typically resolves. If it doesn't resolve, then it can move upwards through the hoof into lower leg joints causing abscesses and permanent damage. It is not to be taken lightly, especially as the organism produces a powerful immunosuppressant called leukotoxin, which affects the sheep's immune response.

The other organism is the true footrot organism: Dichelobacter nodosus. This is a contagious bacterium. Our research has illustrated that Dichelobacter infections are typically multi-strain infections, and the strains are probably dependent on each other, and Fusobacterium to provide a 'safe' environment free from patrolling leukocytes or white blood cells (that is what the leukotoxins target). However, if the immune system of the sheep does and can recognise the Dichelobacter, then an immune response can occur and this is where variation in the MHC comes in. If the immune response is effective, then the bacterium can be defeated and the footrot can resolve.

If we go back to 1997, we found links between the sheep MHC and footrot. We weren't the first: they had been reported in 1989 in Australia, but we were the first to use DNA-based MHC typing systems. It took about 10 years to refine these, but the pattern that came through quite quickly is that certain forms or alleles of two of the MHC genes (called DQA2 and DQA2-like) were associated with increased susceptibility to footrot. Similar associations have now been reported in sheep in Greece, Germany and most recently Spain, so this association is consistent across other populations and breeds. From this we can conclude that the presence of these 'bad' forms of the MHC genes in some way diminish or compromise the immune response and allow the development of footrot, albeit we don't know how.

That might sound reasonable, and so we have worked on identifying the 'bad' alleles of the genes and removing them from the sheep population (here and in 11 other countries). In short, sheep have two alleles of each gene, reflecting that they inherit one allele from each parent and can pass each allele on to their progeny in approximately a 50:50 ratio. The flow of alleles can be followed through extended pedigrees of sheep. From our research, individual alleles are placed on a scale based on the relative risk of getting footrot. Rather than detail the immense diversity of the alleles (we know of at least 36), they have instead been codified into a '1' (least likely to get footrot) to '5' (most likely to get footrot) scale. Sheep with a '1' or '2' score are considered less likely to get footrot than average, and sheep with a '4' or '5' score are considered much more likely to get footrot than average. Sheep with a '3' score are average. There is about a 10-fold difference in susceptibility between the 1's and the 5's.

How is the test used by breeders? In breeding, the test will improve both the accuracy of selecting sheep that are considered less likely to get footrot, without them ever having had the disease (as would be the case in conventional selective breeding programs) and also speed up the rate of genetic gain, as sheep can be DNA typed at birth and therefore preferentially selected at an earlier age.

A number of breeding strategies can be employed, but we recommend that:

- Current footrot infections, especially those that are virulent, are treated immediately by recognised methods and with veterinary assistance if necessary. This will limit the impact of the disease on both animal welfare and animal production.
- Those sheep that have severe footrot should be identified clearly for isolation and/or treatment.
- The test is used conservatively in the context of a 'golden rule' of genetics, whereby selection for multiple traits limits genetic gain for any given trait. In this context, we recommend that breeders focus on removing sheep with '4' or '5' scores from breeding programmes. We DO NOT recommend breeders focus solely on breeding for sheep with '1' scores as there is little difference between a '1' or '2' score and, therefore, little advantage in going to this extreme when trying to increase footrot tolerance. Additionally, breeders should always be very cautious about overly narrowing their genetic base, as this will reduce diversity and may reduce their ability to make genetic gain in other traits.

• The test is used predominantly on sires and rams, as these have greater genetic influence on flocks than ewes.

Finally, I am routinely asked why other scientists have not been able to replicate our study using SNP chips. The SNP technology has been pushed strongly in the last few years, but anyone who works on the MHC realises that SNP chips cannot resolve the immense diversity found in the MHC genes. You actually have to DNA sequence to do that, and that is what we do with our test. What is more, our technology allows us to easily identify new alleles of the MHC genes we type. It is surprising how often this actually occurs; only in the last few weeks we have identified further MHC variation in cattle. The more you look, the more you find!

So back to my opening sentence. Our footrot gene test has been used for over 20 years and has most certainly transformed breeding for increased tolerance to footrot. It isn't perfect and it can't be, because there is still so much we don't understand about the MHC. That is not why I say that it 'sort of worked' however. What I am referring to there is that we have just appointed a new lecturer in animal science at Lincoln. Her name is Dr Sandy Slow, and if we go right back to when we ascertained how the MHC was important for footrot, we find her name and her PhD research. That is a good thing, and Sandy has helped me write this article to welcome her back!



#### WANAKA A & P SHOW by George Fletcher (Sorry no names given for exhibitors – Ed)

The New Zealand Sheepbreeders' 125 Celebrations got off to a great start by supporting the Wanaka A & P Show recently.

Special prizes were presented to the Champion Ram and Ewe. Excellent entries were received in most classes with over 100 in the Merino classes, all pens were full. This year the show introduced 4 SIL Classes for mutton breeds, Ram and Ewe lambs,2th ewe and 2th ram. Judges allocated 50% phenotype and 50% on figures. This section was very well supported with over \$1000 of donated products supplied by Pala Mountains, Specialists in Animal Food Supplements, to the winners of each class.

The day concluded with a barbeque for exhibitors and Judges, along with the presentation of special prizes.

With over 45,000 attending the show it was a great way for exhibitors to present their animals to the public.

A special thankyou to all the helped to make this day a memorable occasion.







Doug Croy has been involved in the Stud Industry for over 50 years. Doug has vast experience, from running his own successful "Spring Creek" stud and is prepared to pass on his knowledge to you, the stud breeder.



## MENTORING SERVICES CAN:



HELP BREEDERS WITH EWE **PURCHASES AND SELECTIONS** FOR THEIR FLOCK.



HELD BREEDERS WITH RAM MATING SELECTIONS FOR EWES.



PROVIDING SELECTION ADVISE AND HELP IN PURCHASING STUD SIRES.



HELP BREEDERS WITH PROMOTION STRATEGIES FOR SELLING RAMS.



GIVE INDEPENDENT ADVISE TO BREEDERS WISHING TO USE RECORDING SYSTEMS.

027 300 0230 | **CROY**.co.nz

#### Special NZSBA Men's and Women's Commemorative Sheep125 Jerseys For Sale



Both styles made in NZ

#### ✓ Men's Awakino –

Heavy weight merino quarter zip – this textured boucle knit merino jersey — with nylon for extra strength is just what you need in the cooler months. This garment has rugged style – wear it to the game or to the pub with your mates. A very versatile style and a firm Wild South favourite.

#### Women's Merino ➤

Wild South product specifically designed for NZ Sheep Breeders, we have used our mid weight Merino fabric utilised by the NZ Defence force to create a durable, versatile merino pullover to keep the ladies warm without any compromise in style.

			A
	WEN STALAND WEN STALAND ASSOCIATION	Sheep125 2021	
H			

Μe	961	ure	m	en	t
TATE	ası	uı v	111	u	u

in CM

III CIVI						
WS213A Women's Merino	8	10	12	14	16	18
½ Chest	42	44.5	47	49.5	52	54.5
Centre Back	63	64	65	66	67	68
MM047 Men's Awakino Pullover		M	L	XL	XXL	3XL
½ Chest		56	58.5	61	63.5	66
Centre Back		69.4	71.4	73.4	75.4	77.4

#### **COST**

Men's Jersey - \$170.00 (gst inclusive) Women's Jersey - \$135.00 (gst inclusive)

Email form to NZSBA – greg@nzsheep.co.nz

Name		Email	
I require:	Men's Jersey	Size:	Number:
	Women's Jersey	Size:	Number:
	Men's Jersey	Size:	Number:
	Women's Jersey	Size:	Number:
	Men's Jersey	Size:	Number:
	Women's Jersey	Size:	Number:

Please pay NZSBA bank account: NZ Sheepbreeders' Assn 03-1702-0107771-00 stating JERSEY in Code



#### FOR SALE, ETC

Sheep Breeds posters are available at the Office.

Contact: greg@nzsheep.co.nz



海海海海滨



#### **Note: CLASSIFIED ADVERTISEMENTS**

FREE advertisements are available for member breeders with surplus stud sheep for sale.

Full or half page ads may have a charge. Talk to Greg!

Remember the "Sheep NewZ" goes up on the website, available to be read by anyone with an interest in sheep!!!

Email adverts to the Editor or <a href="mailto:greg@nzsheep.co.nz">greg@nzsheep.co.nz</a>

The Closing Date for next issue of the newsletter will be <u>August 20<sup>th</sup> for the September 2021</u> newsletter.

Please get items in well before the deadline!!!

## "FEATURE BREED" Dorset Downs

If you would like to be part of this section or the newsletter, **photos and stud histories of All**Breeds are accepted at any time for next issue.

**EMAIL OR POST TO THE EDITOR** – see front page for address details.

#### Published by NZ Sheepbreeders' Association

Email: <u>greg@nzsheep.co.nz</u> Phone: (03) 358 9412

The Association accepts no responsibility for the accuracy of any published opinion, nor information, supplied by individuals or reprinted from other sources. Items may be abridged or edited.