

**Annual Report to
Environmental Protection Authority
for**

Activities under ERMA 200223

AgResearch Ltd

For the 12 months ending
30th June 2016

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Summary of Activities for the period 1st July 2015 to 30th June 2016

This summary provides the information required by control 11 (Annual reporting) of the HSNO Act approval ERMA200223.

Outdoor Development Activities

All outdoor development activities being carried out within the Animal Containment Facility at Ruakura comply with the requirements of the ERMA200223 approval.

Cattle, still alive, which were field tested or developed under the GMF98009 or GMD02028 approvals continue to be maintained under the ERMA200223 approval and all new cattle development activities are now only being undertaken under the ERMA200223 approval.

Goat development and maintenance activities now only involve animals developed under the ERMA200223 approval.

Cattle and Goat activities, other than the maintenance or growing of animals, have been the calving of recipient cows, flushing eggs from fertile animals, kidding of recipient goats, milking of transgenic animals (goats) and the transfer of embryos to recipient animals.

These transferred embryos fall within the approved organism description for the ERMA200223 approval and are for either the production of human therapeutic proteins, or for the study of gene function.

All activities have been undertaken with the approval of the Ruakura Animal Ethics Committee and all activity approvals have been renewed during the year.

Further details on development activities are provided within the following Science, Management and Ethics reports.

Unforeseen adverse effects resulting from the genetic modifications

There have been no unforeseen adverse effects identified during this period.

Iwi liaison group relationship development and management activities

The ERMA200223 Liaison Group has still not officially met since December 2011.

As advised in previous annual reports, at the request of a group of Ngati - Wairere elders the Liaison meetings were put on hold, while representation and membership of the Liaison group was discussed within the Hapu.

Following some correspondence and individual contact, this group of Ngati - Wairere elders was invited and did visit Ruakura in October 2012 and a process to progress representation was discussed. Unfortunately due to circumstances outside of AgResearch influence, despite numerous attempts, no progress has been made in resolving this directly to date.

Informal contact with one original monitoring group member and Tainui Group Holdings continues to provide some updating on activities at Ruakura.

AgResearch's Portfolio Leader – Māori Agribusiness who has local affiliations, has been working to build a relationship with Ngati Wairere for Liaison Group and other Ruakura initiatives of interest to Ngati Wairere and Tainui. Unfortunately a bereavement has meant much of the relationship building has had to begin again.

Additional Supporting Information

The following reports are supporting information provided to expand on the previous summary and provide evidence of wider compliance with ERMA200223 Controls and MAF/ERMA New Zealand Standard 'Containment Standard for Field Testing of Farm Animals'.

This additional supporting information is also provided to enable equivalence to the previous annual reporting for the inactive GMF98009 approvals.

Science Report

Overexpression of a testes specific transgene to investigate the process of fertilization

- The transgene expression levels were analysed for six transgenic lines. All transgenic lines expressed the transgene with two characterised as low and four as high expressors.
- All transgenic lines were also assessed for the expected testes-specific expression pattern. All lines showed correct regulation and tissue-specific expression of the transgenes.
- The bucks from the high expressing lines were trained for semen collection.
- Analysis of semen samples for an unequal distribution of transgene-derived recombinant protein are in progress.

Overexpression of recombinant therapeutics in the milk of transgenic goats

- Two existing transgenic females were artificially inseminated. One became pregnant and delivered three kids; two wild type and one transgenic.
- Milk was analysed for the expression of the recombinant antibody. Production levels in the next generation was comparable to the expression levels shown by the founder animal. This confirmed the transgenerational stability of the antibody production characteristics.
- Subsequently the two transgenic females were naturally mated.
- The one existing transgenic female of a second transgenic line was superovulated and artificially inseminated. The resulting embryos were flushed and transferred to recipient animals for development to term.
- Semen from a transgenic buck was collected and analysed to confirm normal semen production.
- The buck was used for natural mating of ten wild type does. All ten females are pregnant.
- Molecular characterisation of the two transgenic lines demonstrated a single chromosomal insertion site for the transgenes.

Cattle engineered for the knockdown of the milk protein beta-lactoglobulin

- From a cross between the beta-lactoglobulin knockdown (BLG-KD) with a human lactoferrin (hLF) overexpressing line we produced thirteen female and two male offspring representing the genotypes BLG-KD; BLG-KD/hLF and hLF.
- Fluorescent in-situ hybridisation (FISH) analyses demonstrated the presence of insertions of the BLG-KD transgenes on three different chromosomes in the founder animal used to produce the calves
- The three insertion sites segregated in the next generation and calves were produced that possess three, two or a single insertion site
- The calves were induced into lactation at approximately 6 months of age. Analysis of the milk proteins demonstrated effective knockdown of BLG comparable to the founder animal with three

insertion sites. Effective knockdown was observed in all cases which was irrespective of the number of insertion sites present.

Cattle engineered for the disruption or deletion of the gene for the milk protein beta-lactoglobulin

- One cell embryos, produced by in vitro fertilization, were co-injected with genome editors and repair templates to introduce specific DNA sequence changes in the beta-lactoglobulin target locus
- Embryos were biopsied, characterised and cryopreserved at the blastocysts stage
- Embryos validated for the presence of the intended disruption or deletion of the beta-lactoglobulin gene were transferred to recipients for development to term
- From the first transfers, three live calves were born with edits for a small deletion to functionally disrupt the beta-lactoglobulin gene. They are presently characterised for the introduced specific sequence change and associated phenotype.
- Additional pregnancies were established with embryos edited for a deletion of the entire beta-lactoglobulin gene.
- Cell clones were isolated with an insertion of the gene for human lysozyme to disrupt the beta-lactoglobulin gene.
- Embryos from three such cell clones were generated and transferred to recipients for development to term.

Overexpression of bovine casein and human myelin basic protein (hMBP) in transgenic (TG) cattle

- Animals were farmed to maintain these transgenic lines.

On Farm Management Summary for year ending 30/06/2016

Animal Numbers 01/07/2015– 30/06/2016 (Births exclude still born or animals which die soon after birth reported in Animal Ethics Reports, Aged In and Out records changes in animal age¹)

Stock Class	Open (1/07/15)	Births	Transfer In	Transfer Out	Aged In	Aged Out	Killed	Deaths	Closing (30/06/16)
Casein (ERMA200223)									
MA Cows	12				1		2		11
R1yr Heifers	1				1	1			1
Heifer Calves	1					1			0
R2yr (+) Bulls	0				3		0		3
Bull Calves	3					3	0		0
Total Casein	17	0	0	0	5	5	2	0	15
MBP (ERMA200223)									
MA Cows	0				1		0		1
R2yr Heifers	1				0	1			0
Total MPB	1	0	0	0	1	1	0	0	1
rhLF (ERMA200223)									
Total rhLF	0	0	0	0	0	0	0	0	0
BLg - (ERMA200223)									
MA Cows	1						1		0
Heifer Calves	0	14							14
Bull Calves	0	3							3
Total BLg -	1	17	0	0	0	0	1	0	17
Erbix (ERMA200223)									
MA Cows	1								1
Total Erbix	1	0	0	0	0	0	0	0	1
Conventional Cattle									
MA Cows	8		0	9	74		8		65
R2yr Heifers	82		30	5	20	74	5		48
Other classes	30	0	2	10		20	0		2
Total Conventional	120	0	32	24	94	94	13	0	115
Cattle Total	140	17	32	24	100	100	16	0	149
Cattle developed under ERMA approvals (Tg and non Tg progeny)									34
Goats									
Erbix & Embrel (ERMA200223)									
Ma Doe	24				4		1		27
R2yr Doe	5				3	4		0	4
R1yr Doe	5				4	3			6
Doe Kid	4	1				4			1
Buck Kid	0	2	0			0		0	2
R1yr Male	3				0		0		3
Total Erbix	41	3	0	0	11	11	1	0	43
non Med inherit (ERMA200223)									
Buck Kid	0	0				0			0
R1yr + Male	23				0		7	2	14
Total TCR	23	0	0	0	0	0	7	2	14
Conventional Goats									
MA Doe	20		0		27		16	2	29
R2yr Doe	28				13	27	1	0	13
R1yr Doe	13				23	13	4	1	18
Male R1yr +	3		2		0		0	1	4
Kids	24	0	0			23	0	1	0
Total Conventional	88	0	2	0	63	63	21	5	64
Goat Total	152	3	2	0	74	74	29	7	121
Goats developed under ERMA approvals (Tg and non Tg progeny)									57

¹ Aligns with normal livestock reconciliation aging practice.

The preceding table provides animal numbers over the reporting period in the development lines and are linked to the EPA approval. This includes transgenic and non-transgenic animals (progeny) and the conventional animals which are used to support the programmes.

For cattle there have been two movements of conventional animals (32 in total) into the facility during the period. 24 conventional animals were moved out of the facility, 14 females who were found to be unsuitable (temperament wise) or which had never been used to hold GM embryos and 10 bulls who were the progeny of cows present on the facility in early 2014 for a milking study under MPI grazing approval.

16 cattle of varying ages have been euthanased (killed); these animals have been disposed of in offal holes on-site, having been identified as surplus or now unsuitable animals, or following veterinary advice during this period.

For goats there has been 1 movement of animals onto the facility – 2 bucks (apart from approved exit and returns for surgery purposes) during the period.

29 goats of varying ages have been euthanased (killed) and 7 goats died during the period; these animals have also been disposed of in offal holes on-site, as now surplus or unsuitable animals, or following veterinary advice.

For management purposes, as previously identified, the facility is treated as a separate small farm within the main Ruakura Farm. It is fully self-contained apart for some machinery requirements and specialist staffing.

Animals on the facility continue to be managed in a way which is considered normal farming practice and is accepted by the majority of farmers in New Zealand.

This consists of daily shifts and restricted intakes depending on the age of the animal and its feed requirements. Examples are stage of pregnancy, lactating or rearing calf or kid, empty, young growing animals, etc.

85 cattle and 20 goat recipients have been used for ET (embryo transfer), with others being mated with artificial insemination or bucks, on a rotational basis during the period. Suitable goats have also been mated using non transgenic bucks to generate additional offspring, female only are normally kept, to be available as future recipients. All animals are regularly monitored for live weight and health status.

All animals have been grazed mainly on pasture, with supplementary feeding of hay or balage when required and been outside in the natural environment.

Goats can at times receive a higher proportion of their daily intake as supplementary feed, as concentrates, to reduce their impact on pasture availability for cattle and have access to covered shelter in inclement weather.

Surplus pasture is conserved when possible for use in periods of low growth, as balage or hay and there was only minimal purchasing of extra supplement (meal) required this season following favourable weather conditions which enabled maintenance of an adequate annual feed supply.

Regular pasture renewal is carried out with at least 10% of the facility receiving some form of renovation annually. Mineral supplementation is carried out using a mineral dispensing system through the water troughs for assisting Facial Eczema control and other normal mineral deficiencies during identified periods of risk, as occurs on many farms.

Maintenance fertiliser applied this season contained no nitrogen and selective additional Nitrogen (Urea) has been used on areas not used for milk/waste irrigation.

Milk Production 15/16 season

No GM cows, calved at full term this season, so no cows were milked in the facility this season.

The milk from the couple of GM goats which were milked was either used to feed kids, for science analysis or frozen on the facility.

This has meant there was no milk stored this year for disposal irrigation.

Ruakura Animal Ethics Committee Reports

RAEC #13509 and 13848 - Production and characterisation of transgenic cattle, generic application

Ruakura Animal Ethics Committee Report: Third Quarter 2015

Summarised below is the status of the various cattle groups and their offspring and any losses that have occurred during the reporting interval July to September 2015 in relation to the conditions for approval of Application 13509 "Production and characterisation of transgenic cattle, generic application".

A) Casein Plus cattle

A.1 Status of transgenic casein cattle

Multiple generations (F0-F3) of the transgenic casein lines have been produced with the founder casein animals (F0) as the oldest, rising 15 years old (born 2001).

A.2 Treatments and activities during reporting interval

3044, 8013 lame, treated and recovered

A.3 Culling and losses during reporting interval

Nil

B) hMBP cattle

B.1. Status of transgenic hMBP cattle

One F1 animal born in 2013 now represents this transgenic line.

B.2 Treatments and activities during reporting interval

Nil

B.3 Culling and Losses during reporting interval

Nil

C) Erbitux cattle

11001 healthy and now 4 years old.

D) Beta-lactoglobulin (BLG) knockdown (kd) cattle

Founder animal, 11014 "Daisy" lame in July and treated with non steroidal antiinflammatories.

Euthanased on 14.9.15 (rising 4 years old) due to ongoing locomotion problems with hind legs which were due to mature anatomical structure, therefore not resolvable with clinical treatment.

Daisy embryos reached end of gestation in August. Two recipients calved prematurely with dead calves, then a further 16 recipients produced live offspring.

Recipients

Treatments: several groups of recipients were synchronised according to standard protocols for ongoing reproductive research.

11 culled during this period

Ruakura Animal Ethics Committee Report: Fourth Quarter 2015

Summarised below is the status of the various cattle groups and their offspring and any losses that have occurred during the reporting interval October to December 2015 in relation to the conditions for approval of Application 13509 "Production and characterisation of transgenic cattle, generic application".

A) Casein Plus cattle

A.1 Status of transgenic casein cattle

Multiple generations (F0-F3) of the transgenic casein lines have been produced with the founder casein animals (F0) as the oldest, rising 15 years old (born 2001).

A.2 Treatments and activities during reporting interval
3044 had bloods collected for laboratory analysis.

A.3 Culling and losses during reporting interval
Nil

B) hMBP cattle

B.1. Status of transgenic hMBP cattle

One F1 animal born in 2013 now represents this transgenic line.

B.2 Treatments and activities during reporting interval
Nil

B.3 Culling and Losses during reporting interval
Nil

C) Erbitux cattle

11001 healthy and now rising 5 years old.

D) Beta-lactoglobulin (BLG) knockdown (kd) cattle

Daisy calves had blood samples taken for genotyping, were disbudded and given routine calf vaccinations for leptospirosis and clostridial disease. Also routine anthelmintics and fly repellent treatment.

Recipients

Treatments: several groups of recipients were synchronised according to standard protocols for ongoing reproductive research.

Ruakura Animal Ethics Committee Report: First Quarter 2016

Summarised below is the status of the various cattle groups and their offspring and any losses that have occurred during the reporting interval January to March 2016 in relation to the conditions for approval of Application 13509 "Production and characterisation of transgenic cattle, generic application". Reporting for this work will pass on to application 13848 for the second quarter of 2016.

A) Casein Plus cattle

A.1 Status of transgenic casein cattle

Multiple generations (F0-F3) of the transgenic casein lines have been produced with the founder casein animals (F0) as the oldest, being or rising 15 years old (born 2001).

A.2 Treatments and activities during reporting interval

A.3 Culling and losses during reporting interval
1007, 3044, culled.

B) hMBP cattle

B.1. Status of transgenic hMBP cattle

One F1 animal born in 2013 now represents this transgenic line.

B.2 Treatments and activities during reporting interval
Nil

B.3 Culling and Losses during reporting interval
Nil

C) Erbitux cattle

11001 healthy and now 5 years old.

D) Beta-lactoglobulin (BLG) knockdown (kd) cattle

Daisy calves received a second vaccination for clostridial disease, and first for bovine viral diarrhoea and leptospirosis.

Three further calves produced for BLG knockdown research. These calves also vaccinated and disbudded.

Recipients

Treatments: several groups of recipients were synchronised according to standard protocols for ongoing reproductive research.

Routine zinc treatment for facial eczema.

1 culled during this period.

Ruakura Animal Ethics Committee Report: Second Quarter 2016

Summarised below is the status of the various cattle groups and their offspring and any losses that have occurred during the reporting interval April to June 2016 in relation to the conditions for approval of Application 13848 "Production and characterisation of transgenic cattle, generic application", formerly application 13509.

A) Casein Plus cattle

A.1 Status of transgenic casein cattle

Multiple generations (F0-F3) of the transgenic casein lines have been produced with the animal born in 2003 being the oldest (rising 13 years).

A.2 Treatments and activities during reporting interval

Nil

A.3 Culling and losses during reporting interval

Nil

B) hMBP cattle

B.1. Status of transgenic hMBP cattle

One F1 animal born in 2013 now represents this transgenic line.

B.2 Treatments and activities during reporting interval

Nil

B.3 Culling and Losses during reporting interval

Nil

C) Erbitux cattle

11001 healthy and now 5 years old.

D) Beta-lactoglobulin (BLG) knockdown (kd) cattle

12 Daisy heifer calves were hormonally induced into lactation and also blood sampled for typing of blood and milk.

2016 born calves were weaned and received second leptospirosis and clostridial vaccinations.

Recipients

Treatments: Routine zinc treatment for facial eczema was carried on into June due to warm and wetter autumn. All animals received routine anthelmintic treatment.

1 culled during this period.

RAEC #13585, 13433, 13787 and 13561 - Development of transgenic goats in containment

Ruakura Animal Ethics Committee Report: Third Quarter 2015

Summarised below is the status of the various goat groups and their offspring and any losses that have occurred during the reporting interval July to September 2015 in relation to the conditions for approval of Applications 13585 and 13433 "Development of transgenic goats for production of biosimilars" and "Development of transgenic goats showing non-Mendelian inheritance".

A) Erbitux Goats

A.1 Status of transgenic Erbitux Goats

Two generations (F0-F1) of the transgenic Erbitux lines have been produced with the founder Erbitux animals (F0) as the oldest, rising 4 years old (born 2011).

A.2 Treatments and activities during reporting interval

1201, lame, treated and recovered

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

A.3 Culling and losses during reporting interval

Nil

B) Enbrel Goats

B.1. Status of transgenic Enbrel Goats

Two generations (F0-F1) of the transgenic Enbrel lines have been produced with the founder Enbrel animals (F0) as the oldest, rising 3 years old (born 2012).

B.2 Treatments and activities during reporting interval

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

B.3 Culling and Losses during reporting interval

Nil

C) non-Mendelian inheritance Goats

C.1. Status of transgenic non-Mendelian inheritance (TCR) Goats

One generation (F0) of the transgenic TCR lines have been produced with the oldest, 1 years old (born 2014).

C.2 Treatments and activities during reporting interval

5 bucks were hemicastrated and 1428 and 1429 were lame and treated.

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary. Routine vaccinations for leptospirosis and clostridia.

C.3 Culling and Losses during reporting interval

1418, 1429 culled and 1434 found dead, post mortem examination findings supported a peracute septicaemia due to clostridial organisms.

D) Recipients

No reproductive work in this reporting period.

Treatments: All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

1 May born kid died suddenly. Post mortem examination showed a torsion of the intestines (acute abdominal catastrophe).

Ruakura Animal Ethics Committee Report: Fourth Quarter 2015

Summarised below is the status of the various goat groups and their offspring and any losses that have occurred during the reporting interval October to December 2015 in relation to the conditions for approval of Applications 13585 and 13433 "Development of transgenic goats for production of biosimilars" and "Development of transgenic goats showing non-Mendelian inheritance".

A) Erbitux Goats

A.1 Status of transgenic Erbitux Goats

Two generations (F0-F1) of the transgenic Erbitux lines have been produced with the founder Erbitux animals (F0) as the oldest, rising 4 years old (born 2011).

A.2 Treatments and activities during reporting interval

1227 and 1310, lame, treated and recovered

1227, 1310 and 1446 synchronised, mated (AI) and flushed

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

A.3 Culling and losses during reporting interval

Nil

B) Enbrel Goats

B.1. Status of transgenic Enbrel Goats

Two generations (F0-F1) of the transgenic Enbrel lines have been produced with the founder Enbrel animals (F0) as the oldest, rising 3 years old (born 2012).

B.2 Treatments and activities during reporting interval

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

B.3 Culling and Losses during reporting interval

Nil

C) non-Mendelian inheritance Goats

C.1. Status of transgenic non-Mendelian inheritance (TCR) Goats

One generation (F0) of the transgenic TCR lines have been produced with the oldest, 1 years old (born 2014).

C.2 Treatments and activities during reporting interval

Semen sampling from various bucks

1427, 1435 and 1440 dehorned

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

C.3 Culling and Losses during reporting interval

Nil

D) Recipients

Suitable goats were synchronised for potential ET during this period.

One yearling died suddenly during this period, post mortem suggested a high worm burden and faecal counts supported this conclusion. All other animals were treated with anthelmintic immediately .

Treatments: All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

Ruakura Animal Ethics Committee Report: First Quarter 2016

Summarised below is the status of the various goat groups and their offspring and any losses that have occurred during the reporting interval January to March 2016 in relation to the conditions for approval of Applications 13585 and 13433 "Development of transgenic goats for production of Biosimilars" and "Development of transgenic goats showing non-Mendelian inheritance".

A) Erbitux Goats

A.1 Status of transgenic Erbitux Goats

Two generations (F0-F1) of the transgenic Erbitux lines have been produced with the founder Erbitux animals (F0) as the oldest, rising 5 years old (born 2011).

A.2 Treatments and activities during reporting interval

1310 and 1446 scanned and pregnant to AI in last reporting period.

Buck 1414 (aka 1447), brother to 1446, put with 10 does to mate naturally.

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

A.3 Culling and losses during reporting interval

1201 culled (feet and udder problems)

B) Enbrel Goats

B.1. Status of transgenic Enbrel Goats

Two generations (F0-F1) of the transgenic Enbrel lines have been produced with the founder Enbrel animals (F0) as the oldest, being or rising 4 years old (born 2012).

B.2 Treatments and activities during reporting interval

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

B.3 Culling and Losses during reporting interval

Nil

C) non-Mendelian inheritance Goats

C.1. Status of transgenic non-Mendelian inheritance (TCR) Goats

One generation (F0) of the transgenic TCR lines have been produced with the oldest, being or rising 2 years old (born 2014).

C.2 Treatments and activities during reporting interval

Semen sampling from various bucks

1425, 1437, horn infections, treated.

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

C.3 Culling and Losses during reporting interval

Nil

D) Recipients

16 goats were culled (age, feet, udder problems).

2 does died suddenly (a month apart), both had acute pneumonia. No clinical signs observed in other animals.

Two high quality dairy genetics Saanen bucks were health tested and transferred into the containment facility, put with recipients 1.3.16.

Treatments: All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

Ruakura Animal Ethics Committee Report: Second Quarter 2016

RAEC Approval 13585 renewed during this period to 13561

RAEC Approval 13433 renewed during this period to 13787

Summarised below is the status of the various goat groups and their offspring and any losses that have occurred during the reporting interval April to June 2016 in relation to the conditions for approval of Applications 13561 previously (13585) and 13787 previously (13433) "Development of transgenic goats for production of Biosimilars" and "Development of transgenic goats showing non-Mendelian inheritance".

A) Erbitux Goats

A.1 Status of transgenic Erbitux Goats

Two generations (F0-F1) of the transgenic Erbitux lines have been produced with the founder Erbitux animals (F0) as the oldest, rising 5 years old (born 2011).

A.2 Treatments and activities during reporting interval

1446 kidded triplets, kids hand reared and doe's milk collected daily for milk yield and typing.

1310 no longer pregnant (? Resorbed foetus).

Founder doe, 1227, synchronised and started on super ovulation programme for June.

Buck 1414 (aka 1447), brother to 1446, removed from 10 does after one month of mating and kept separate with one non transgenic buck in preparation for semen collection, also trained for semen collection.

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

A.3 Culling and losses during reporting interval

Nil

B) Enbrel Goats

B.1. Status of transgenic Enbrel Goats

Two generations (F0-F1) of the transgenic Enbrel lines have been produced with the founder Enbrel animals (F0) as the oldest, rising 4 years old (born 2012).

B.2 Treatments and activities during reporting interval

All drenched at required intervals dependant on worm counts and feet checked and trimmed if necessary.

B.3 Culling and Losses during reporting interval

Nil

C) non-Mendelian inheritance Goats

C.1. Status of transgenic non-Mendelian inheritance (TCR) Goats

One generation (F0) of the transgenic TCR lines have been produced with the oldest, being or rising 2 years old (born 2014).

C.2 Treatments and activities during reporting interval

1425, 1437, horn infections again, retreated.

1425 died suddenly, postmortem revealed an acute strongyle infection.

1430, 1431, 1432, 1442, 1443 culled as surplus to requirements.

All animals drenched and faecal worm cultures performed to show which drench to use. Fly control applied regularly and feet checked and trimmed if necessary.

C.3 Culling and Losses during reporting interval

Nil

D) Recipients

10 does prepared for embryo transfer in June with oestrus synchrony.

Bucks with recipients 1.3.16. One of bucks with recipients (Hunter) was sick and died due to ongoing illness from an acute strongyle infection.

Treatments: All had fly control, and drenched at required intervals dependant on worm counts, also feet checked and trimmed if necessary.