

**APPENDICES****A1 DETAILS OF LABORATORY PROCEDURES****A1.1 Faecal Strongyle Egg Count Method**

1. Weigh 2.5 gms faeces into a 60 ml volume capacity mixing jar.  
To soften faecal pellets add 2.5 ml of tap water to each jar and soak for 1 hour (or refrigerate) overnight.
  2. Add saturated common salt solution (Specific Gravity 1.20) from an automatic dispenser to each jar to make 50 mls solution total.
  3. Mix with a mechanical mixer until the faeces are broken up and well dispersed.
  4. Mix and stir the suspension with a sieve pipette (wire gauge of 12 meshes per cm) to evenly distribute the eggs.
  5. Pipette a random sample from the centre of the suspension into one chamber of the Whitlock Universal counting slide. Fill the chamber in one action without producing bubbles. Allow the eggs one minute to float up under the glass before counting.
  6. Count the eggs in the chamber using a x 40 magnification.
  7. Calculate the eggs per gram of faeces by multiplying the number of the eggs counted by the total volume (50 ml) divided by the volume counted times the weight of the faeces.
- |                                      |           |
|--------------------------------------|-----------|
| Volume of Whitlock Universal chamber | = 0.50 ml |
| Multiplication factor                | = 40      |

Only count one chamber per sample unless numbers are low, in which case two or more may be counted.

**A1.2 Faecal Culture for Identification of Nematode Larvae**

A larval culture will be representative of one whole group of animals, ie not of individual animals.

**1. Setting up the Culture**

- (1) Add approximately equal amounts of faecal material 3-5 gms (if 10 samples, less if more samples in group) from each individual sample a mixing bowl to make a 30 gm sample.
- (2) Mix faecal material in a clean mortar basin. Add 5 gm of vermiculite No 3 (Medium Grade) and some water. Mix with a gloved (plastic) hand to give a crumbly mixture. Transfer to a labelled 500 ml culture bottle. Rinse down the sides of the culture bottle until there is a small amount of free water in the bottom. Don't pack the mixture.
- (3) Place the lid (minus wad if applicable) on the bottle, turn lightly but do not seal.
- (4) Incubate at 27°C for 7 days.
- (5) After incubation, fill the culture bottle with warm water (30°C) and invert in a glass petri dish. Fill the moat thus formed with water. Stand for 3-8 hours until larvae collect in the moat. Pour water out of moat off into 60 ml jar.
- (6) Allow to settle overnight.

**2. Reading the Culture**

- (1) Remove supernatant with vacuum pump, put sediment (about 10 mls) into sedimentation tube.
- (2) Allow larvae to sediment in the sedimentation tube. Discard some supernatant with a vacuum pump. The amount discarded depends on the density of the larvae.
- (3) Mix larvae, pipette a drop of the suspension onto a microscope slide. Add 1 drop of iodine solution. Cover slip (40 x 22 mm) and examine under a microscope on x 100 magnification.
- (4) Count 100 larvae twice, differentiate to genus (as per appendix 5.1 and 5.2). Express results as a percentage for each genus for each sample. If two samples are not in agreement, a further count is done and the mean of the two closest counts taken.

**A1.3 Total Worm Count - Examination of Intestinal Tract****1. Autopsy**

- (1) Deprive animals of food for 24 - 48 hours and water for at least 8 hours before autopsy.
- (2) Isolate the GI tract into its components as soon as possible after death.
- (3) Locate and tie off abomasum and small intestine separately with string before cutting them from the tract to ensure no contents are lost.

## 2. Worm Recovery and Preservation

Worm counts of each organ ie the abomasum and small intestine are done separately.

Abomasum:

- (1) Place the abomasum on a large plastic tray. Remove the mesenteric attachments and associated fat before opening to prevent worms becoming tangled during washing.
- (2) Open the organ along its greater curvature and spill the contents into the tray. Wash out as much material as possible into the tray with a gently jet of water.
- (3) Spread the abomasum on the flat tray, mucosa up, and scrape off attached worms with the gloved hand and a jet of water. Remove worms from both sides of the abomasal folds. Add washings to the jar.
- (4) Add formalin to 5%.

Small intestine:

- (1) Strip the intestine from the mesentery and remove all excess fat. Pour as much as possible of the contents into a 2 L jar. Place the organ in a tray. Examine all of the small intestine.
- (2) Open the intestine longitudinally with scissors. Pull the open intestine between the handles of the scissors to gently scrape the mucosa and contents. Wash the intestinal wall with water. Run the intestines through the fingers to remove any remaining contents.
- (3) Transfer the contents and scrapings to a 2 L jar.
- (4) Total contents made up to 2 litres and formalin added to 5%.

## 3. Worm Counting Technique

- (1) Contents of jar are mixed thoroughly to obtain an even distribution of worms using compressed air and an air line. Mixing is done in a criss-cross pattern and not in a circular motion.
- (2) A number of counts may be done in the following manner. A 10 ml aliquot is taken from the centre of the suspension. This is washed through a sieve (53 $\mu$  mesh size). Backwash material retained by sieve, which includes all worms, into a sedimentation flask to make about 25 ml. Worms are stained using 5 drops of iodine, and swirled gently to mix. Total amount of mixture is placed in a plastic rule counting tray and worms counted using a dissecting microscope. Use x 12 objective to locate worms and x 25 to identify if necessary. Two counts are done and these should correlate to within 10% of each other.
- (3) Identify each species and stage from descriptions by Soulsby (1982) and Whitlock (1960) x 1 Key to Infective Nematode Larvae of Sheep. Calculate the number of species and its stage as a percentage of the total.

## 4. Reagents

- (1) Flotation Solution  
Sodium chloride, saturated solution SG 1.20
- (2) Dissolve commercial grade salt in almost boiling water until no more dissolves.
- (3) Measure the SG with a hydrometer. Cool before using.

## 5. Parasitological Iodine

Iodine	20	g
Potassium iodide	50	g
Water to	100	ml

- (1) Dissolve potassium iodide in water, then add iodine crystals.
- NB: This is a strong aqueous solution so that only a few drops are needed.

## A1.4 Key to Infective Nematode Larvae of Sheep (Adapted From Lyndal-Murphy 1993)

Total length of larva ( $\mu$ )	Length, end of larvae to end of sheath ( $\mu$ )	Species, with range of total length ( $\mu$ )	Key to opposite page	Other differential features
Short 500 - 700	No sheath	Strongyliodes 570 - 700	A	Slender body with long oesophagus, 1/3 to 1/2 total length of larvae.
	Long 85 - 115	Bunostomum 510 - 670	B	Wide body with sudden tapering to long thin tail. "Band" constriction on oesophagus.
Medium 650 - 900	Short 20 - 40	Trichostrongylus 620 - 790	C	Short straight larva, conical tail sheath. Tubercles on tail of larvae. Intestinal cells usually prominent.
		Ostertagia 790 - 910	D	Longer, conical, "finger-like" tail sheath.
	Medium 30 - 60	Cooperia curticei 710 - 850	E	Oval bodies at anterior end of larva. Tail of larva rounded.
		Haemonchus 650 - 750	F	Tail sheath is usually "kinked". Pointed tail of larva.
		Cooperia oncophora 800 - 920	G	Oval bodies anterior end of larvae. Tail of larva rounded.
Long 900 - 1200	Long 60 - 80	Chabertia 710 - 790	H	Stout body with 24 to 32 rectangular intestinal cells.
		Oesophagostomum	I	Usually longer than Chabertia. Has 16 - 24 triangular intestinal cells.
	Extremely long 250 - 290	Nematodirus 922 - 1180	J	Tail of larva is forked.

## A1.5 Assays for Antibody to Parasite Antigens

Extracts of *T. colubriformis* infective larvae (L3) were used as antigen. Larvae were exsheathed using 0.025 percent sodium hypochlorite and then washed 10 times in PBS, pH 7.2. After three cycles of freeze thawing, the exsheathed larvae were homogenised over ice for five minutes. The resulting suspension was centrifuged at 10000 *g* for 45 minutes to remove particulate matter. The supernatant containing solubilised antigen was filter-sterilised, analysed for protein and stored at -20°C until used.

Flat bottomed, microtitre plates were coated with 100  $\mu$ l/well of *T. colubriformis* (L3) antigen (5  $\mu$ g ml<sup>-1</sup>) in 0.05 M carbonate buffer, pH 9.6, by incubating overnight at 4°C. Plates were then washed three times in PBS containing 0.05 percent Tween 20 (PBST) and well drained. Standard serum at various dilutions or test serum at a dilution of 1/500 in PBST were added to wells in a volume of 100  $\mu$ l and incubated for one hour at 37°C. Plates were washed as before and 100  $\mu$ l of peroxidase conjugated donkey anti-sheep immunoglobulin (Silenus Labs) diluted 1/1000 was added to each well. After one hour incubation at 37°C and washing, 100  $\mu$ l/well of freshly prepared substrate (0.34 percent o-phenylenediamine [Sigma] in a citrate phosphate buffer, pH 6.0, containing 0.05 percent hydrogen peroxide) was added. The reaction was allowed to develop for 30 minutes and then stopped by the addition of 50  $\mu$ l/well of 2 M sulphuric acid. The absorbency was read at 492 nm using a Titertek Multiskan reader (Flow Labs).

## A2 SURVEY FORM USED FOR CHAPTER THREE

INVESTIGATION INTO SCOURING SHEEP ON THE  
NEW ENGLAND TABLELANDS REGION OF NSW

## CONDUCTED BY ARMIDALE P P BOARD WITH SYDNEY UNIVERSITY

1. **Owner:** \_\_\_\_\_
- Address:** \_\_\_\_\_
- Manager:** \_\_\_\_\_
- Phone No:** \_\_\_\_\_
- P P Division:** \_\_\_\_\_ **Shire:** \_\_\_\_\_

2. **Stock Nos**
- Total Sheep - June 87 \_\_\_\_\_ Total Cattle - June 87 \_\_\_\_\_

3. **Type of Sheep Enterprise**

Please indicate number and type by ticking where appropriate:

- |     |  |           |          |           |        |
|-----|--|-----------|----------|-----------|--------|
| (A) | Commercial Merino breeding ewes                              | < 500     | 500-1000 | 1001-3000 | 3001+  |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
|     | Wool Type  | Superfine | Fine     | Medium    | Strong |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
| (B) | Commercial Crossbred ewes                                    | < 500     | 500-1000 | 1001-3000 | 3001+  |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
| (C) | Merino wethers   | < 500     | 500-1000 | 1001-3000 | 3001+  |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
|     | Wool Type  | Superfine | Fine     | Medium    | Strong |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
| (D) | Stud ewes  | < 500     | 500-1000 | 1001-3000 | 3001+  |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
|     | Wool Type - Merino   | Superfine | Fine     | Medium    | Strong |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
|     | British meat breeds<br>(ie, Dorset, Suffolk, Southdown, etc) | Superfine | Fine     | Medium    | Strong |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
|     | British wool breeds<br>(ie, Romney, Border Leicester)        | Superfine | Fine     | Medium    | Strong |
|     |  | [ ]       | [ ]      | [ ]       | [ ]    |
|     | Other special breeds - specify type and number:              | _____     |          |           |        |

4. Months in which lambing occurs (if more than one specific lambing date, give details):

Merino ewes - month/s of lambing: \_\_\_\_\_

XB ewes - month/s of lambing: \_\_\_\_\_

Other, specify: \_\_\_\_\_

Further details: \_\_\_\_\_

\_\_\_\_\_

5. Month of main shearing (if multiple shearing practised, give details):

Merino ewes - month/s shearing \_\_\_\_\_

Merino wethers - month/s shearing \_\_\_\_\_

XB ewes - month/s shearing \_\_\_\_\_

Other, - month/s shearing \_\_\_\_\_

Further details \_\_\_\_\_

\_\_\_\_\_

6. (a) Do you purchase any sheep other than rams? Yes  
[ ] No  
[ ]
- If 'Yes' - on a regular basis (ie annually)? Yes  
[ ] No  
[ ]
- (b) Do you accept sheep on agistment? Yes  
[ ] No  
[ ]

7. List the three most important sheep health problems on your farm:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

8. Does scouring in sheep occur on your property? Yes  
[ ] No  
[ ]
- If 'Yes':
- (a) Does it occur on an annual or regular basis? Yes  
[ ] No  
[ ]
- (b) Does it occur on a sporadic or occasional basis? Yes  
[ ] No  
[ ]

9. How important is scouring in sheep on your property relative to other problems?

Unimportant [ ]

Important [ ]

Very important [ ]

Comments on specific details you may wish to add. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. In what type of sheep do you regard it a problem?
- |                        | Yes   | No  |
|------------------------|-------|-----|
| (a) Merino lambs       | [ ]   | [ ] |
| (b) Merino weaners     | [ ]   | [ ] |
| (c) Merino hoggets     | [ ]   | [ ] |
| (d) Adult merino sheep | [ ]   | [ ] |
| (e) Merino rams        | [ ]   | [ ] |
| (f) XB lambs           | [ ]   | [ ] |
| (g) XB weaners         | [ ]   | [ ] |
| (h) XB hoggets         | [ ]   | [ ] |
| (i) Adult XB sheep     | [ ]   | [ ] |
| (j) XB rams            | [ ]   | [ ] |
| (k) Other - specify:   | _____ |     |
11. How long does the outbreak persist?
- |  | Less than 7 days | 7-14 days | More than 14 days |
|--|------------------|-----------|-------------------|
|  | [ ]              | [ ]       | [ ]               |
12. How long does the problem persist in individual sheep on average?
- |  | Less than 7 days | 7-14 days | More than 14 days |
|--|------------------|-----------|-------------------|
|  | [ ]              | [ ]       | [ ]               |
13. What month/s of the year does it occur?
- | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| [ ] | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] |
14. Effects on an annual basis:
- (a) Percentage of sheep that scour \_\_\_\_\_
- (b) Number of sheep that die as a result of scours \_\_\_\_\_
- (c) Number of sheep permanently affected, ie permanently scouring, permanently illthrift, require culling or die. \_\_\_\_\_
- (d) Number of sheep culled specifically as a result of scouring or illthrift due to scouring. \_\_\_\_\_
15. (a) What percentage of scouring sheep get crutch strike?
- |  | Less 1% | 1-4% | 5-7% | 7-10% | >10% |
|--|---------|------|------|-------|------|
|  | [ ]     | [ ]  | [ ]  | [ ]   | [ ]  |
- (b) What percentage of non-scouring sheep get crutch strike?
- |  | Less 1% | 1-4% | 5-7% | 7-10% | >10% |
|--|---------|------|------|-------|------|
|  | [ ]     | [ ]  | [ ]  | [ ]   | [ ]  |
16. (a) Were you required to crutch scouring sheep more frequently than normal?
- |  | Yes | No  |
|--|-----|-----|
|  | [ ] | [ ] |

- (b) Number of extra crutchings. \_\_\_\_\_
17. (a) Were you required to jet scouring sheep more frequently? Yes [ ] No [ ]
- (b) Number of extra jettings. \_\_\_\_\_
18. Type of jetting compound used:
- (a) Vetrazin Yes [ ] No [ ]
- (b) Organophosphate, eg, Diazinon-based Yes [ ] No [ ]
- (c) Ectomort Yes [ ] No [ ]
- (d) Other - please specify \_\_\_\_\_
19. How is the chemical applied?
- (a) Hand jetting (on individual basis) Yes [ ] No [ ]
- (b) Shower dip Yes [ ] No [ ]
- (c) Jetting race Yes [ ] No [ ]
- Type \_\_\_\_\_
- (d) Yard spraying on group basis (ie, fire fighting spray etc) Yes [ ] No [ ]
20. Has the problem of scouring been investigated? Yes [ ] No [ ]
- If 'No' go to Question 22
- If 'Yes'
- (i) Which groups? \_\_\_\_\_
- Age groups in months \_\_\_\_\_
- Number of groups \_\_\_\_\_
- (ii) By whom:
- (a) Private Vet Yes [ ] No [ ]
- (b) P P Board Staff Yes [ ] No [ ]
- (c) Department of Agriculture Yes [ ] No [ ]

- (d) Drug Company Representative Yes  
[ ] No  
[ ]
- (e) Other - please specify \_\_\_\_\_
21. Was the problem resolved satisfactorily? Yes  
[ ] No  
[ ]
- (a) What was the cause or causes? \_\_\_\_\_
- (b) What treatment was adopted? \_\_\_\_\_
- \_\_\_\_\_
- Go to Question 24
22. If the problem was not investigated, was it because:
- (a) You were unable to get anybody to respond to your enquiry? Yes  
[ ] No  
[ ]
- (b) You did not know whom to contact? Yes  
[ ] No  
[ ]
- (c) You had discussed this problem with your neighbour and decided between you the answer to the present situation? Yes  
[ ] No  
[ ]
- (d) This is an annual occurrence and corrects itself eventually anyway? Yes  
[ ] No  
[ ]
23. What treatment did you apply?
- (a) Re-drenched the group with the same chemical drench as last time? Yes  
[ ] No  
[ ]
- (b) Re-drenched the group with a different chemical drench to that used last time? Yes  
[ ] No  
[ ]
- (c) You changed the paddock but did nothing else? Yes  
[ ] No  
[ ]
- (d) You drenched the scouring sheep with a Sulpha drug? Yes  
[ ] No  
[ ]
- (e) Any other specific measures.  
(Give precise details) \_\_\_\_\_
- \_\_\_\_\_
24. How successful were the measures you adopted in eliminating the scouring problem?
- |                      |           |     |
|----------------------|-----------|-----|
| Excellent            | 95-100%   | [ ] |
| Very successful      | 85-95%    | [ ] |
| Partially successful | 50-85%    | [ ] |
| Some improvement     | up to 50% | [ ] |
| No change            |           | [ ] |



25. What is your present drenching strategy?

- (a) Wormkill 1 [ ]
- (b) Wormkill 2 [ ]
- (c) Monthly drenching [ ]
- (d) Drench when required [ ]
- (e) Other - please specify \_\_\_\_\_

26. Do you consider your property is within a fluke area?

- Yes No  
[ ] [ ]

(a) Do you specifically drench for fluke?

- Yes No  
[ ] [ ]

If 'No' go to Question 27.

(b) Indicate all drenches used in 1986-87.

- Fasinex [ ]
- Ranide [ ]
- Nilzan [ ]
- Seponver/Closal [ ]
- Valbazen [ ]
- Other \_\_\_\_\_

(c) How many treatments per year?  
 \_\_\_\_\_

(d) When were these treatments given?

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

27. (a) Do you consider Selenium deficiency to be a problem in your area?

- Yes No  
[ ] [ ]

(b) Has it been confirmed on your property?

- Yes No  
[ ] [ ]

If 'Yes' what specific effect does it have? \_\_\_\_\_

28. Do you administer Selenium to your sheep?

- Yes No  
[ ] [ ]

If 'No' go to Question 29.

In what form do you use Selenium?  
 Indicate all methods used in 1986.

- (a) Pellets [ ]
- (b) Injectable - 5 in 1 + Selenium [ ]
- (c) Orally, (ie: concentrate) mixed with drench [ ]
- (d) Orally, (ie, concentrate) on its own [ ]

29. (a) Do you weigh sheep before drenching to obtain an accurate body weight?

- Yes No  
[ ] [ ]

- (b) Do you regularly check your drenching equipment for accuracy? Yes [ ] No [ ]
- 30. Have you ever had faecal samples (for worm counts) taken on your property? Yes [ ] No [ ]
- 31. (a) Has drench resistance been confirmed on your property? Yes [ ] No [ ]
- (b) If not, do you suspect it has occurred? Yes [ ] No [ ]

32. Estimate of Costs

In this section it would be helpful to have an estimate of costs under the following headings. Please give details if available.

	<u>No. of sheep</u>	<u>Cost per sheep/ Value of sheep</u>	<u>Total \$</u>
(a) Cost due to death or illthrift (Eg, lost wool, fat lambs not good enough to sell etc)			
Deaths & culls:	_____	_____	_____
Illthrift:	_____	_____	_____
(b) Cost due to specific treatment programs	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

(c) Costs due to EXTRA crutching, jettings, flystrike treatment etc

Jetting	No. sheep	_____	Total cost	_____
Extra crutching	No. sheep	_____	Total cost	_____
Flystrike treatment	No. sheep	_____	Total cost	_____
Extra musterings			Total cost	_____

Property details

- 33. Area (in hectares)
 

Under 250	251-500	501-750	751-1000	1000+
[ ]	[ ]	[ ]	[ ]	[ ]
- 34. (a) Annual rainfall (mm) average
 

Less than 600 (24")	600-750 (24"-30")	750-900 (30"-36")	900-1050 (36"-42")	1050-1200 (42"-48")	over 1200 (48" +)
------------------------	----------------------	----------------------	-----------------------	------------------------	----------------------
- (b) Rainfall - 1986
 

Less than 600 (24")	600-750 (24"-30")	750-900 (30"-36")	900-1050 (36"-42")	1050-1200 (42"-48")	over 1200 (48" +)
------------------------	----------------------	----------------------	-----------------------	------------------------	----------------------
- 35. Soil types - Give approximate % of each type - total 100%
  - (a) Granite \_\_\_\_\_
  - (b) Basalt \_\_\_\_\_
  - (c) Trap \_\_\_\_\_

36. % area pasture improved: Nil 0-25% 25-50% 50-75% 75-100% 100%  
 [ ] [ ] [ ] [ ] [ ] [ ]

If 'Nil' go to Question 38.

37. Rank in order the species in improved pasture.

- (a) Clovers Red [ ]  
 White [ ]  
 Sub [ ]
- (b) Grasses Phalaris [ ]  
 Cocksfoot [ ]  
 Rye Grass [ ]  
 Fescue [ ]  
 Other - please specify \_\_\_\_\_

38. (a) Do you ever use supplementary feeds? Yes No  
 [ ] [ ]

If 'No' go to Question 42

- (b) If 'Yes' indicate for what purpose and how often you use them?

For weaner / hogget growth	No [ ]	In adverse seasons [ ]	Every year [ ]	Most seasons [ ]
To finish stock	No [ ]	In adverse seasons [ ]	Every year [ ]	Most seasons [ ]
To assist ewes prior to joining or lambing.	No [ ]	In adverse seasons [ ]	Every year [ ]	Most seasons [ ]
As a supplement during shearing	No [ ]	In adverse seasons [ ]	Every year [ ]	Most seasons [ ]
During show or other non-seasonal occurrences.	No [ ]	In adverse seasons [ ]	Every year [ ]	Most seasons [ ]

Other - please specify. \_\_\_\_\_

39. (a) Number of hectares used for growing supplementary feed in 1986. \_\_\_\_\_

- (b) Average number of hectares grown (over 10 years) \_\_\_\_\_

40. Number of hectares of each type grown in 1986:

- (a) Grown for pasture:

- Oats (as green feed) \_\_\_\_\_  
 Turnips \_\_\_\_\_  
 Chou Moellier / Kale \_\_\_\_\_  
 Millet \_\_\_\_\_  
 Lucerne (as green feed) \_\_\_\_\_

(b) Hay:

Lucerne hay \_\_\_\_\_  
 Pasture hay \_\_\_\_\_  
 Red clover hay \_\_\_\_\_  
 Silage pasture \_\_\_\_\_

(c) Grown for grain:

Oats \_\_\_\_\_  
 Corn \_\_\_\_\_  
 Sorghum \_\_\_\_\_  
 Millet \_\_\_\_\_

(d) Other - please specify \_\_\_\_\_

41. How much supplementary feed do you use for sheep in an average type of season? (Indicate in tonnes)

(a) Grains

Oats \_\_\_\_\_  
 Barley \_\_\_\_\_  
 Lupins \_\_\_\_\_  
 Corn \_\_\_\_\_  
 Wheat \_\_\_\_\_  
 Sorghum \_\_\_\_\_  
 Other - please specify \_\_\_\_\_

(b) Hay

Lucerne \_\_\_\_\_  
 Pasture \_\_\_\_\_  
 Oats \_\_\_\_\_

(c) Commercially prepared:

Sheep nuts \_\_\_\_\_  
 Cottonseed / cottonseed meal \_\_\_\_\_

42. If you never use supplementary feeds do you:

- |   |            |           |
|---|------------|-----------|
| (a) Consciously assess your carrying capacity in relation to your available feed and make the decision to sell surplus stock? | Yes<br>[ ] | No<br>[ ] |
| (b) Retain stock on hand and trust the weather / seasonal conditions will allow you to get through without any feeding?       | Yes<br>[ ] | No<br>[ ] |
| (c) Always stock to a level where adequate paddock feed is available under all conditions?                                    | Yes<br>[ ] | No<br>[ ] |
| (d) Utilise outside feed sources, eg: TSRs, agistment etc.  | Yes<br>[ ] | No<br>[ ] |

43. Average fertilizer usage in the last 10 years:

- |  |                              |                         |                        |
|--|------------------------------|-------------------------|------------------------|
| (a) Has your property ever received any fertilizer in the last 10 years?       |                              | Yes<br>[ ]              | No<br>[ ]              |
| (b) Annual average usage of fertilizer cwt/ac per year over the last 10 years. | Less than<br>½ cwt/ac<br>[ ] | ½ to 1<br>cwt/ac<br>[ ] | 1 cwt/ac >1<br>[ ] [ ] |

(c) What types of fertilizer have you used:

- |                        |     |     |
|------------------------|-----|-----|
|                        | Yes | No  |
| Single super           | [ ] | [ ] |
| Double super           | [ ] | [ ] |
| Mo super               | [ ] | [ ] |
| Sulphur super          | [ ] | [ ] |
| Lime                   | [ ] | [ ] |
| Dolomite               | [ ] | [ ] |
| Gypsum                 | [ ] | [ ] |
| Other - please specify |     |     |

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(d) Apart from commercially prepared fertilizers have you used any of the following:

- |                                    |     |     |
|------------------------------------|-----|-----|
|                                    | Yes | No  |
| Commercial poultry pelleted litter | [ ] | [ ] |
| Bio-dynamic fertilizers            | [ ] | [ ] |
| Other - please specify             |     |     |

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Please add any comments you wish to make:

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\*\*\*\*\*  
 Thank you for your time and co-operation in filling in this survey. We are aware that there are many calls on your time, however, without the information we are requesting we are unable to provide long-term and carefully researched advice to persons such as yourself and your fellow graziers.  
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**A3 DETAILS OF FARMS MONITORED****A3.1 Details of Farms**

Property: "Cairnie", Walcha  
 Size (ha): 1329  
 Average sheep numbers: 5,500  
 Average cattle numbers: 250  
 Description: Improved and native pastures  
 Details on sheep production:

Property: "Miramoona", Walcha  
 Size (ha): 1797  
 Average sheep numbers: 9,000  
 Average cattle numbers: 300  
 Description: Mostly improved pasture, some cropping and native pastures  
 Details on sheep production:

Property: "Nerstane", Woolbrook  
 Size (ha): 2680 ha  
 Average sheep numbers: 9,000  
 Average cattle numbers: 200  
 Description:  
 Details on sheep production:

Property: "Saumarez", Armidale  
 Size (ha): 3262 ha  
 Average sheep numbers: 13,000  
 Average cattle numbers: 1,100  
 Description: Improved pasture  
 Details on sheep production:

Property: "South Winscombe", Bundarra  
 Size (ha): 2186 ha  
 Average sheep numbers: 8,000  
 Average cattle numbers: 250  
 Description: Improved and native pastures  
 Details on sheep production:

**A3.2 Detailed Observations of Farms for Chapter Four****A3.2.1 "Cairnie", Walcha - 1988 Drop Weaners**

<b>DATE</b>	19/4/89	9/6	26/7	2/10	2/10 wool	7/11	5/2/90	28/3
<b>WEIGHT (KG)</b>								
AV	26.8	26.6	30.1	33.6	2.6	36.1	40.7	42.8
LO	21.0	17.0	18.5	22.5	0.6	25.5	31.0	36.0
HI	35.0	33.5	38.0	41.0	3.7	44.0	48.0	49.5
SD	2.6	2.6	2.8	3.0		3.0	3.1	3.0
SE	0.2	0.2	0.2	0.2		0.2	0.3	0.3
<b>NO. SHEEP WEIGHED</b>								
	150	146	148	147	148	143	145	138
<b>NO. DAYS SINCE LAST WEIGHING</b>								
	0	51	47	68	-	36	90	51
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>								
	0	-4	72.3	51.5	-	69.4	45.5	39.2
<b>SCOUR SCORES</b>								
0	129	51	75	148	-	142	146	138
1.1	0	0	0	0	-	0	0	0
1.2	0	1	1	0	-	0	0	0
1.3	5	1	0	0	-	0	0	0
1.4	1	3	0	0	-	0	0	0
<b>Total</b>	<b>19</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.1	10	52	34	0	-	0	0	0
2.2	5	39	39	0	-	0	0	0
2.3	0	0	0	0	-	0	0	0
2.4	0	0	0	0	-	1	0	0
<b>Total</b>	<b>20</b>	<b>130</b>	<b>112</b>	<b>0</b>	<b>-</b>	<b>4</b>	<b>0</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>								
FB	0	0	0	0	-	0	0	0
DM	0	0	0	0	-	0	0	0
LM	0	0	0	0	-	0	0	0
CULL	0	0	0	0	-	0	0	0
DEAD	0	0	0	0	-	2	0	0
<b>LAB RESULTS</b>								
SA No 847	1574	2092	2878		-	3245	349	972
<b>INTERNAL PARASITES - EPG</b>								
AV	104	616	0	0	-	176	152	496
LO	0	280	0	0	-	0	0	40
HI	440	1120	0	0	-	36	360	1680
NEM	0	24	0	0	-	0	4	4
<b>LARVAL DIFFERENTIATION</b>								
TRI	93	542	NC	NC	-	92	73	476
OST	10	12	NC	NC	-	60	0	5
HAEM	0	0	NC	NC	-	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>								
AV	182	NT	128	95	-	80	NT	NT
HI	250	NT	211	128	-	105	NT	NT
LO	123	NT	4	45	-	62	NT	NT

**A3.2.2 "Cairnie", Walcha - 1989 Drop Weaners**

DATE	3/5/90	18/6	8/8	24/9	24/9	24/9	30/11	4/3/91
WEIGHT (KG)				*INCL. FLEECE	EXCL. FLEECE	FLEECE WGHT**		
AV	27.4	30.0	28.6	27.3	24.8	2.49	37.2	40.1
LO	19.5	22.5	24.0	22.0	20.2	1.77	32.5	34.5
HI	34.0	35.5	34.0	33.0	29.7	3.27	45.5	47.5
SD	2.4	2.3	2.2	1.9		0.39		
SE	0.2	0.2	0.2	0.2		0.03		

\* Shedded for 3 days for shearing prior to weighing

\*\* Grow average 7.37 grams wool per day (av age = 338 days); low = 5.24; high = 9.67

**WEIGHT (KG) EXCL. FLEECE (FW = Fleece weight)**

AV	25.96	28.22	26.45	24.80
AV.FW	1.437	.339	.376	.346
LO	18.48	21.48	22.47	20.22
LO.FW	1.022	.241	.267	.246
HI	32.11	33.17	31.18	29.72
HI.FW	1.886	.445	.493	.454

**NO. SHEEP WEIGHED**

150	148	148	148	149	148	148	142
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**NO. DAYS SINCE LAST WEIGHING**

0	46	51	47	N/A	N/A	67	94
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**AVERAGE DAILY WEIGHT GAIN (GMS/DAY)**

0	56.5	-27	-28	N/A	N/A
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**SCOUR SCORES**

0	150	143	148	147	N/A	N/A	96	142
1.1	0	0	0	0	N/A	N/A	0	0
1.2	0	0	0	0	N/A	N/A	0	0
1.3	0	0	0	0	N/A	N/A	1	0
1.4	0	0	0	0	N/A	N/A	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>	<b>N/A</b>	<b>3</b>	<b>0</b>
2.1	0	0	0	0	N/A	N/A	27	0
2.2	0	2	0	0	N/A	N/A	16	0
2.3	0	3	0	1	N/A	N/A	6	0
2.4	0	0	0	0	N/A	N/A	2	0
<b>Total</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>3</b>	<b>N/A</b>	<b>N/A</b>	<b>83</b>	<b>0</b>

**MISCELLANEOUS DISEASES**

FB	0	0	0	0	N/A	N/A	0	0
DM	0	0	0	0	N/A	N/A	0	0
LM	0	0	0	0	N/A	N/A	0	0
CULL	0	0	0	0	N/A	N/A	0	0
DEAD	0	0	0	0	N/A	N/A	0	0

**LAB RESULTS**

SA No 973	1955	2690	3344	N/A	N/A	4062	0602
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**INTERNAL PARASITES - EPG**

AV	640	160	676	148	N/A	N/A	128	60
LO	120	0	280	0	N/A	N/A	0	0
HI	1240	520	880	640	N/A	N/A	240	120
NEM	0	4	24	4	N/A	N/A	12	8

**LARVAL DIFFERENTIATION**

TRI	550	66	250	104	N/A	N/A	61	47
OST	8	11	54	37	N/A	N/A	0	7
OES	19	8	372	4	N/A	N/A	67	7
HAEM	0	0	0	0	N/A	N/A	0	0

**GLUTATHIONE PEROXIDASE - U/g Hb**

AV	NT	72	NT	37	N/A	N/A	38	NT
HI	NT	110	NT	46	N/A	N/A	62	NT
LO	NT	32	NT	32	N/A	N/A	25	NT



**A3.2.3 "Cairnie", Walcha - 1990 Drop Weaners**

DATE	30/1/91	19/2	27/3	4/6	6/8	23/9	6/11	3/3/92
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**WEIGHT (KG)**

AV	19.48		24.96	27.88	27.87	28.64	29.7	34.1
LO	15.00		20.00	23.50	23.00	22.00	24.5	28.5
HI	24.50		31.00	36.50	35.50	36.50	38.5	42.5
SD	1.93		2.17	2.36				
SE	0.16		0.18	0.20				

**NO. SHEEP WEIGHED**

	149		138	143	141	139	139	114
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**NO. DAYS SINCE LAST WEIGHING**

	0		56	69	70	48	44	118
--	---	--	----	----	----	----	----	-----

**AVERAGE DAILY WEIGHT GAIN (GMS/DAY)**

			97.9	42.3	-0.14	16	24.1	37.3
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**SCOUR SCORES**

0	149		137	142	140	139	138	108
1.1	0		0	0	0	0	0	0
1.2	0		0	0	0	0	0	0
1.3	0		0	0	0	0	0	0
1.4	0		0	0	0	0	0	0
<b>Total</b>	<b>0</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.1	0		0	0	0	0	0	5
2.2	0		1	0	0	0	0	1
2.3	0		0	1	0	0	0	0
2.4	0		0	0	1	0	1	0
<b>Total</b>	<b>0</b>		<b>2</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>5</b>

**MISCELLANEOUS DISEASES**

FB	0		0	0	0	0	0	1
DM	0		0	0	0	0	1	0
LM	0		0	0	0	0	0	0
CULL	0		0	0	0	0	1	0
DEAD	0		0	0	0	0	0	0

**LAB RESULTS****INTERNAL PARASITES - EPG**

LAB NO.	306	602	1044	1775	2608	3208	3625	0622
AV	20	132	0	116	340	872	180	176
LO	0	0	0	0	160	80	40	0
HI	80	640	0	320	960	1600	560	440
NEM	36	8	0	0	8	28	686	

**LARVAL DIFFERENTIATION**

TRI	11	120	0	53	129	663	110	172
OST	6	7	0	9	60	78	59	0
OES	3	0	0	54	143	131	2	4
HAEM	0	3	0	0	0	0	2	0

**GLUTATHIONE PEROXIDASE - U/g Hb**

LAB NO.		1045	1774	2608	3280	3625	N/A
AV	80	62	34	27	26	45	N/A
HI	163	116	54	34	43	46	N/A
LO	41	34	11	21	19	35	N/A





**A3.2.6 "Cairnie", Walcha - 1993 Drop Weaners**

<b>DATE</b>	8/3/94	5/4	18/5	22/6	16/8	28/9
<b>WEIGHT (KG)</b>						
AV	24.22	N/A	27.16	N/A	25.21	24.06
LO	18.5	N/A	20.5	N/A	18.5	18.0
HI	30.5	N/A	34.0	N/A	32.0	29.0
SD	2.40	N/A	2.54	N/A	2.60	2.32
SE	0.48	N/A	0.50	N/A	0.52	0.46
<b>NO SHEEP WEIGHED</b>						
	150	N/A	149	N/A	139	149
<b>NO DAYS SINCE LAST WEIGHING</b>						
	-	N/A	71	N/A	89	43
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>						
	-	N/A	41.37	N/A	-21.97	-26.61
<b>SCOUR SCORES</b>						
0	145	N/A	146	N/A	138	149
1.1	0	N/A	0	N/A	0	0
1.2	0	N/A	0	N/A	0	0
1.3	1	N/A	0	N/A	0	0
1.4	0	N/A	0	N/A	0	0
1.5	0	N/A	0	N/A	0	0
<b>Total</b>	<b>3</b>	<b>N/A</b>	<b>0</b>	<b>N/A</b>	<b>0</b>	<b>0</b>
2.1	0	N/A	0	N/A	0	0
2.2	1	N/A	1	N/A	1	0
2.3	3	N/A	1	N/A	0	0
2.4	0	N/A	1	N/A	0	0
2.5	0	N/A	0	N/A	0	0
<b>Total</b>	<b>11</b>	<b>N/A</b>	<b>9</b>	<b>N/A</b>	<b>2</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>						
FB	0	N/A	0	N/A	0	0
DM	0	N/A	0	N/A	0	0
LM	0	N/A	0	N/A	0	0
CULL	0	N/A	0	N/A	0	0
DEATH	0	N/A	0	N/A	0	0
<b>LAB RESULTS</b>						
<b>INTERNAL PARASITES - EPG</b>						
<b>LAB NO</b>	<b>0962</b>	<b>1327</b>	<b>2011</b>	<b>2434</b>	<b>3224</b>	<b>3736</b>
AV	124	204	144	196	380	868
LO	40	0	40	40	200	440
HI	280	360	360	400	640	1480
NEM	84	136	0	16	20	60
TRI	104	146	95	123	326	677
OST	11	16	43	52	26	104
HAEM	0	2	4	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>						
<b>LAB NO</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
AV	N/A	N/A	N/A	N/A	N/A	N/A
HI	N/A	N/A	N/A	N/A	N/A	N/A
LO	N/A	N/A	N/A	N/A	N/A	N/A

**A3.3.1 "Miramoona", Walcha - 1988 Drop Weaners**

<b>DATE</b>	30/12/88	11/4/89	15/6	3/8	7/9	7/9	30/10	21/2/90
						<b>WOOL</b>		
<b>WEIGHT (KG)</b>								
AV	22.1	27.4	28.0	28.2	27.6	3.0	36.4	41.0
LO	11.0	16.0	17.0	21.0	21.0	1.9	29.5	35.0
HI	33.5	38.0	38.0	36.0	34.0	4.6	45.0	49.0
SD	4.0	4.0	4.1	3.4	3.0		3.2	3.0
SE	0.3	0.3	0.4	0.3	0.3		0.3	0.4
<b>NO. SHEEP WEIGHED</b>								
	150	137	132	134	128	-	83	54
<b>NO. DAYS SINCE LAST WEIGHING</b>								
	0	71	64	49	35	-	54	114
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>								
	0	74.6	13.7	6.1	-25.7	-	168.5	38.6
<b>SCOUR SCORES</b>								
0	145	115	124	68	178	-	45	53
1.1	0	15	0	0	0	-	0	0
1.2	0	5	0	3	0	-	0	0
1.3	0	2	2	2	0	-	0	0
1.4	0	0	0	1	0	-	0	1
<b>Total</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>
2.1	5	0	2	37	0	-	16	0
2.2	0	0	2	23	0	-	6	0
2.3	0	0	0	0	0	-	11	0
2.4	0	0	0	0	0	-	5	0
<b>Total</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>83</b>	<b>0</b>	<b>0</b>	<b>81</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>								
FB		6	3	4	0	-	0	0
DM		0	1	1	0	-	0	0
LM		0	0	0	0	-	0	0
CULLS		0	0	0	45	-	0	0
DEATHS		0	0	0	0	-	0	0
<b>LAB RESULTS</b>								
<b>SA No 3049</b>	<b>885</b>	<b>1603</b>	<b>2208</b>	-	-	<b>3169</b>	<b>548</b>	
<b>INTERNAL PARASITES - EPG</b>								
AV	196	92	836	3812	-	-	996	534
LO	0	0	40	1920	-	-	0	40
HI	400	240	1520	7120	-	-	1880	1320
NEM	0	36	0	8	-	-	4	8
<b>LARVAL DIFFERENTIATION</b>								
TRI	152	82	652	3545	-	-	777	486
OST	31	7	0	0	-	-	80	21
HAEM	0	0	0	38	-	-	-	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>								
AV	191	NT	187	62	-	-	NT	NA
HI	239	NT	253	80	-	-	NT	NA
LO	121	NT	138	50	-	-	NT	NA

**A3.3.2 "Miramoona", Walcha - 1989 Drop Weaners**

<b>DATE</b>	21/12/89	21/2/90	10/4	18/6	14/8	19/10	5/12
<b>WEIGHT (KG)</b>							
AV	23.2	26.9	26.2	31.0	30.0	33.9	40.2
LO	15.0	19.5	18.0	22.0	20.0	26.0	31.0
HI	30.5	34.5	34.0	40.5	39.0	45.0	50.5
SD	3.5	3.1	3.1	3.6	3.5	3.3	
SE	0.3	0.3	0.3	0.3	0.3	0.3	
<b>NO. SHEEP WEIGHED</b>							
	150	145	146	145	143	100	98
<b>NO. DAYS SINCE LAST WEIGHING</b>							
	0	62	48	69	57	66	47
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>							
	0	6	-15	7	-18	59	134
<b>SCOUR SCORES</b>							
0	150	103	132	100	127	55	68
1.1	0	3	0	13	1	0	5
1.3	0	3	0	10	0	3	7
1.4	0	1	0	4	1	0	0
1.5	0	0	0	5	2	0	0
<b>Total</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>102</b>	<b>17</b>	<b>11</b>	<b>36</b>
2.1	0	18	8	3	0	4	6
2.2	0	4	4	1	1	15	4
2.3	0	7	2	0	4	17	3
2.4	0	4	0	0	4	4	0
2.5	0	0	0	0	2	1	0
<b>Total</b>	<b>0</b>	<b>63</b>	<b>2</b>	<b>5</b>	<b>40</b>	<b>106</b>	<b>23</b>
<b>MISCELLANEOUS DISEASES</b>							
FB	0	1	3	0	0	0	0
F	0	0	0	2	4	0	0
FDM	0	0	0	1	0	0	0
DM	0	0	0	2	0	0	0
LM	0	0	0	1	0	0	1
CULLS	0	0	0	0	0	0	0
DEATHS	0	1	0	0	0	0	0
<b>LAB RESULTS</b>							
<b>SA No.</b>	<b>715</b>	<b>548</b>	<b>1139</b>	<b>1641</b>	<b>N/A</b>	<b>3602</b>	<b>4111</b>
<b>INTERNAL PARASITES - EPG</b>							
AV	624	112	224	1576	N/A	404	532
LO	320	0	0	400	N/A	40	0
HI	1040	560	600	3360	N/A	1040	1880
NEM	184	28	44	12	N/A	0	4
<b>LARVAL DIFFERENTIATION</b>							
TRI	612	91	172	1387	N/A	315	457
OST	6	1	4	79	N/A	32	11
HAEM	0	15	9	16	N/A	0	16
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>							
AV	119	130	NT	NT	NT	222	NT
HI	186	173	NT	NT	NT	276	NT
LO	34	88	NT	NT	NT	125	NT

**A3.3.3 "Miramoona", Walcha - 1990 Drop Weaners**

<b>DATE</b>	5/12/90	26/2/91	16/4	17/6	30/7	26/9	2/12	6/1
<b>WEIGHT (KG)</b>								
AV	22.16	25.63	31.37	30.42	29.50	30.80	33.47	36.31
LO	16.50	18.00	22.00	23.50	21.00	22.50	28.00	29.00
HI	28.00	32.00	39.50	38.50	39.00	37.50	41.00	42.00
SD	2.63	2.77	3.38	3.06	3.06			
SE	0.21	0.23	0.28	0.25	0.25			
<b>NO. SHEEP WEIGHED</b>								
	150	149	146	148	145	143	138	94
<b>NO. DAYS SINCE LAST WEIGHING</b>								
	0	83	49	62	43	58	67	35
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>								
	0	41.8	117.1	-15.2	-21.4	22.4	39.8	81.1
<b>SCOUR SCORES</b>								
0	115	145	135	146	133	134	133	94
1.1	0	0	0	0	0	0	0	0
1.2	0	0	1	0	0	0	0	0
1.3	0	0	0	0	0	0	0	0
1.4	0	0	0	0	1	0	0	0
1.5	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	
2.1	34	2	4	0	4	1	0	0
2.2	1	1	2	0	1	0	3	0
2.3	0	0	3	1	3	4	2	0
2.4	0	1	1	1	3	4	0	0
2.5	0	0	0	0	0	0	0	0
<b>Total</b>	<b>36</b>	<b>8</b>	<b>21</b>	<b>7</b>	<b>27</b>	<b>29</b>	<b>12</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>								
FB	0	0	0	0	0	0	0	0
FL-SH	0	0	0	5	3	3	0	0
DM	0	0	0	0	0	2	2	0
LM	1	0	0	0	0	0	0	0
CULLS	0	0	0	0	0	0	0	0
DEATHS	0	0	0	0	0	0	0	0
<b>LAB RESULTS</b>								
<b>INTERNAL PARASITES - EPG</b>								
<b>LAB</b>	<b>4111</b>	<b>689</b>	<b>1262</b>	<b>1917</b>	<b>2521</b>	<b>3268</b>	<b>3864</b>	<b>0034</b>
AV	884	104	403	88	1584	1088	320	744
LO	120	0	0	40	880	680	80	120
HI	1960	280	200	640	3040	1720	840	2280
NEM	52	0	2	80	16	0	36	8
<b>LARVAL DIFFERENTIATION</b>								
TRI	388	47	33	264	1220	1088	160	565
OST	388	1	0	1	0	0	0	45
HAEM	0	1	2	27	48	0	0	7
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>								
<b>LAB</b>	<b>4115</b>	<b>N/A</b>	<b>1264</b>	<b>1915</b>	<b>2521</b>	<b>3269</b>	<b>3862</b>	<b>0033</b>
AV	152	N/A	140	97	75	160	202	238
HI	226	N/A	180	131	104	187	246	282
LO	94	N/A	83	54	54	134	171	197







**A3.4.1 "Nerstane", Woolbrook - 1988 Drop Weaners**

<b>DATE</b>	15/12/88	23/1/89	1/5	9/6	27/7	26/10	6/2/90
<b>WEIGHT (KG)</b>							
AV	23.0	27.4	29.4	31.8	33.4	37.9	40.7
LO	16.5	19.5	20.0	25.5	23.5	31.0	33.5
HI	30.5	36.0	40.0	40.5	41.5	48.0	49.5
SD	2.5	2.9	3.7	3.0	3.3	3.2	3.4
SE	0.2	0.3	0.3	0.3	0.3	0.3	0.3
<b>NO. SHEEP WEIGHED</b>							
	150	127	141	135	144	107	100
<b>NO. DAYS SINCE LAST WEIGHING</b>							
	0	39	97	39	48	90	103
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>							
	0	112.8	20.6	61.5	33.3	48.9	27.2
<b>SCOUR SCORES</b>							
0	150	123	123	134	77	100	102
1.1	0	0	5	0	0	0	0
1.2	0	2	1	0	0	0	0
1.3	0	0	0	0	3	0	0
1.4	0	0	1	0	0	0	0
1.5	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>4</b>	<b>11</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>
2.1	0	2	1	0	38	7	0
2.2	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>78</b>	<b>7</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>							
FB	0	0	0	0	0	0	0
DM	2	1	0	0	1	0	0
LM	0	0	0	0	0	0	0
CULL	0	0	0	0	0	0	0
DEATH	0	0	0	0	0	0	0
<b>LAB RESULTS</b>							
<b>SA No</b>	<b>2973</b>	<b>188</b>	<b>1118</b>	<b>1501</b>	<b>2110</b>	<b>3115</b>	<b>422</b>
<b>INTERNAL PARASITES - EPG</b>							
AV	42	524	460	240	1748	792	536
LO	0	120	280	0	840	360	160
HI	160	1440	760	1200	3280	1600	840
NEM	4	120	20	0	20	0	4
<b>LARVAL DIFFERENTIATION</b>							
TRI	NA	519	428	238	1730	760	214
OST	NA	5	23	2	0	8	214
HAEM	NA	0	0	0	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>							
AV	43	NT	50	99	106	84	NT
HI	53	NT	78	137	128	97	NT
LO	37	NT	2	62	95	69	NT

**A3.4.2 "Nerstane", Woolbrook - 1989 Drop Weaners**

<b>DATE</b>	17/1/90	4/5	29/6	26/9	11/12
<b>WEIGHT (KG)</b>					
AV	26.4	29.7	33.1	31.5	31.2
LO	20.5	24.0	27.5	25.0	23.5
HI	34.0	39.0	40.5	38.5	38.5
SD	2.7	2.9	2.8	2.5	
SE	0.2	0.2	0.2	0.2	
<b>NO. SHEEP WEIGHED</b>					
	149	151	150	146	116
<b>NO. DAYS SINCE LAST WEIGHING</b>					
	0	107	56	89	76
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>					
	0	22.1	62.5	-18	-4
<b>SCOUR SCORES</b>					
0	149	151	150	117	116
1.1	0	0	0	1	0
1.2	0	0	0	1	0
1.3	0	0	0	1	0
1.4	0	0	0	2	0
1.5	0	0	0	1	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>0</b>
2.1	0	0	1	6	0
2.2	0	0	0	2	0
2.3	0	0	0	2	0
2.4	0	1	1	6	0
2.5	0	1	0	1	0
<b>Total</b>	<b>0</b>	<b>9</b>	<b>5</b>	<b>45</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>					
FB	0	0	0	0	0
DM	0	0	0	0	1
LM	0	0	0	0	0
CULL	0	0	0	7	1
DEATH	0	0	0	0	0
<b>LAB RESULTS</b>					
<b>Lab No</b>	<b>143</b>	<b>1398</b>	<b>2121</b>	<b>3373</b>	<b>4162</b>
<b>INTERNAL PARASITES - EPG</b>					
AV	1112	236	484	464	60
LO	520	120	80	80	0
HI	2040	1400	1200	1200	200
NEM	20	67	4	0	0
<b>LARVAL DIFFERENTIATION</b>					
TRI	1012	198	474	436	60
OST	0	12	10	5	0
HAEM	0	0	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>					
AV	NT	NT	40	63	52
HI	NT	NT	57	92	84
LO	NT	NT	24	27	21

**A3.4.3 "Nerstane", Woolbrook - 1990 Drop Weaners**

<b>DATE</b>	20/12/90	5/2/91	16/4	18/6	6/8	19/10	3/12
<b>WEIGHT (KG)</b>							
AV	21.98	26.28	31.13	32.31	30.87	31.39	36.46
LO	17.00	20.50	24.00	24.50	22.00	23.50	18.50
HI	29.50	33.50	38.50	40.00	41.00	38.00	44.00
SD	2.37	2.56	2.89	2.89			
SE	0.19	0.21	0.24	0.25			
<b>NO. SHEEP WEIGHED</b>							
	150	149	147	132	148	86	84
<b>NO. DAYS SINCE LAST WEIGHING</b>							
	0	47	73	63	49	74	44
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>							
	0	91.48	66.44	18.73	-29.39	7.03	115.23
<b>SCOUR SCORES</b>							
0	150	147	147	132	137	8	84
1.1	0	0	0	0	0	0	0
1.2	0	1	0	0	0	0	0
1.3	0	0	0	0	0	0	0
1.4	0	0	0	0	0	0	0
1.5	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.1	0	0	0	0	0	0	0
2.2	0	0	0	0	1	0	0
2.3	0	0	0	0	8	1	0
2.4	0	0	0	0	1	0	0
2.5	0	0	0	0	1	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>3</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>							
FB	0	0	0	0	0	0	0
DM	0	0	0	0	0	0	0
LM	0	0	0	0	0	0	0
CULL	0	0	0	0	0	0	0
DEATH	0	0	0	0	0	0	0
<b><u>LAB RESULTS</u></b>							
<b>INTERNAL PARASITES - EPG</b>							
<b>LAB</b>	<b>4274</b>	<b>421</b>	<b>1248</b>	<b>1941</b>	<b>2606</b>	<b>3478</b>	<b>3905</b>
AV	176	244	136	64	928	1000	204
LO	0	0	0	0	240	280	40
HI	760	1000	400	160	3520	2040	400
NEM	0	76	52	0	16	12	4
<b>LARVAL DIFFERENTIATION</b>							
TRI	165	122	103	37	798	750	126
OST	9	49	26	19	47	60	74
HAEM	0	0	0	0	0	40	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>							
<b>LAB NO</b>	<b>423</b>	<b>1257</b>	<b>N/A</b>	<b>2606</b>	<b>3476</b>	<b>3906</b>	
AV	81	46	33	N/A	37	45	78
HI	164	73	42	N/A	47	70	137
LO	52	17	21	N/A	32	25	56

**A3.4.4 "Nerstane", Woolbrook - 1991 Drop Weaners**

<b>DATE</b>	17/12/91	30/1/92	22/4	9/7	30/9
<b>WEIGHT (KG)</b>					
AV	18.09	23.82	30.81	29.24	27.52
LO	12.5	17.0	23.0	21.0	22.0
HI	26.0	33.0	39.0	40.0	35.5
SD	2.28	2.68	3.25	3.32	2.61
<b>NO SHEEP WEIGHED</b>					
	161	156	148	154	117
<b>NO DAYS SINCE LAST WEIGHING</b>					
	0	44	83	78	83
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>					
	0	130.0	84.2	-20.1	-20.7
<b>SCOUR SCORES</b>					
0	161	150	148	154	112
1.1	0	0	0	0	0
1.2	0	1	0	0	0
1.3	0	0	0	0	0
1.4	0	0	0	0	1
1.5	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>4</b>
2.1	0	0	0	0	0
2.2	0	2	0	0	1
2.3	0	2	0	0	2
2.4	0	0	0	0	1
2.5	0	1	0	0	0
<b>Total</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>12</b>
<b>MISCELLANEOUS DISEASES</b>					
FB	0	0	0	0	0
DM	0	0	0	0	0
LM	0	0	0	0	0
CULL	0	0	0	0	33
DEAD	0	0	0	0	0
<b>LAB RESULTS</b>					
<b>INTERNAL PARASITES - EPG</b>					
<b>LAB NO</b>	<b>4000</b>	<b>0307</b>	<b>1405</b>	<b>2378</b>	<b>3391</b>
AV	12	880	624	280	892
LO	0	360	320	0	360
HI	80	1800	1400	760	1800
NEM	8	164	20	13	48
TRI	7	818	524	179	838
OST	5	44	69	95	35
HAEM	0	0	0	3	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>					
<b>LAB NO</b>	<b>4000</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
AV	59	N/A	N/A	N/A	N/A
HI	72	N/A	N/A	N/A	N/A
LO	38	N/A	N/A	N/A	N/A

**A3.4.4 "Nerstane", Woolbrook - 1992 Drop Weaners**

<b>DATE</b>	17/12/92	19/1/93	5/5	21/7	4/11	?/11 wool
<b>WEIGHT (KG)</b>						
AV	20.59	21.64	26.30	24.00	32.78	3.02
LO	14.5	15.5	19.0	18.5	26.0	2.30
HI	26.0	27.5	32.5	29.5	38.5	3.80
SD	2.08	2.51	2.69	2.40	2.66	0.29
SE	0.41	0.50	0.53	0.48	0.53	0.06
<b>NO SHEEP WEIGHED</b>						
	149	148	150	146	114	115
<b>NO DAYS SINCE LAST WEIGHING</b>						
	0	33	106	77	75	N/A
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>						
	0	31.75	44.00	-29.86	116.97	N/A
<b>SCOUR SCORES</b>						
0	149	145	148	146	113	N/A
1.1	0	0	0	0	0	N/A
1.2	0	1	0	0	0	N/A
1.3	0	0	0	0	0	N/A
1.4	0	1	0	0	0	N/A
1.5	0	0	0	0	0	N/A
<b>Total</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>
2.1	0	0	0	0	0	N/A
2.2	0	1	2	0	0	N/A
2.3	0	0	0	0	1	N/A
2.4	0	0	0	0	0	N/A
2.5	0	0	0	0	0	N/A
<b>Total</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>N/A</b>
<b>MISCELLANEOUS DISEASES</b>						
FB	0	0	0	0	1	N/A
DM	0	0	0	0	0	N/A
LM	0	0	0	0	0	N/A
CULL	0	0	0	0	33	N/A
DEAD	0	0	0	0	0	N/A
<b>LAB RESULTS</b>						
<b>INTERNAL PARASITES - EPG</b>						
<b>LAB NO</b>	<b>4307</b>	<b>0186</b>	<b>1564</b>	<b>2653</b>	<b>4041</b>	<b>N/A</b>
AV	268	1652	828	656	280	N/A
LO	0	280	120	80	0	N/A
HI	520	3280	2680	2080	760	N/A
NEM	12	52	32	0	16	N/A
TRI	227	1354	703	636	246	N/A
OST	40	214	49	0	30	N/A
HAEM	0	0	0	0	0	N/A
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>						
<b>LAB NO</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
AV	N/A	N/A	N/A	N/A	N/A	N/A
HI	N/A	N/A	N/A	N/A	N/A	N/A
LO	N/A	N/A	N/A	N/A	N/A	N/A

**A3.5.1 "Saumarez", Armidale - 1988 Drop Weaners**

<b>DATE</b>	14/3/89	29/6	3/8	29/8	25/10	27/3/90
<b>WEIGHT (KG)</b>						
AV	28.8	33.3	NW	31.6	36.5	44.9
LO	21.0	23.0	NW	25.5	27.5	34.5
HI	38.5	43.5	NW	41.0	46.5	51.5
SD	3.7	3.2		4.1	3.6	3.4
SE	0.3	0.3		0.3	0.3	0.3
<b>NO. SHEEP WEIGHED</b>						
	149	150	NW	148	147	100
<b>NO. DAYS SINCE LAST WEIGHING</b>						
	0	107	-	61	57	153
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>						
	0	43.0	-	-24.5	80.7	56.2
<b>SCOUR SCORES</b>						
0	150	89	-	132	66	99
1.1	0	-	-	0	1	0
1.2	0	9	-	0	0	0
1.3	0	7	-	0	0	1
1.4	0	3	-	0	1	0
1.5	0	0	-	0	0	0
<b>Total</b>	<b>0</b>	<b>51</b>	<b>-</b>	<b>0</b>	<b>5</b>	<b>3</b>
2.1	0	25	-	5	37	1
2.2	0	17	-	11	43	1
2.3	0	0	-	0	0	0
2.4	0	0	-	0	0	0
<b>Total</b>	<b>0</b>	<b>59</b>	<b>-</b>	<b>27</b>	<b>123</b>	<b>3</b>
<b>MISCELLANEOUS DISEASES</b>						
FB	0	1	0	0	0	0
DM	1	1	0	0	0	0
LM	0	0	0	0	0	0
CULL	0	0	2	0	0	0
DEAD	0	0	0	0	0	0
<b>LAB RESULTS</b>						
<b>SA No.</b>	<b>866</b>	<b>1772</b>	<b>2199</b>	<b>2509</b>	<b>3099</b>	<b>961</b>
<b>INTERNAL PARASITES - EPG</b>						
AV	40	740	2312	484	1044	432
LO	0	240	800	80	0	40
HI	120	1080	7640	1440	2120	2240
NEM	52	80	116	0	0	0
<b>LARVAL DIFFERENTIATION</b>						
TRI	38	688	2081	469	929	367
OST	1	0	69	5	10	13
HAEM	1	0	0	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>						
AV	227	NT	NT	NT	271	NT
HI	258	NT	NT	NT	356	NT
LO	189	NT	NT	NT	191	NT

**A3.5.2 "Saumarez", Armidale - 1989 Drop Weaners**

<b>DATE</b>	12/4/90	20/6	16/8	24/10	19/12	13/2/91
<b>WEIGHT (KG)</b>						
AV	29.4	31.1	26.0	36.4	41.3	38.2
LO	21.0	22.0	19.5	26.0	29.5	28.5
HI	36.5	41.5	32.0	44.0	53.0	45.0
SD	3.2	3.4	2.7	3.2		
SE	0.3	0.3	0.2	0.3		
<b>NO. SHEEP WEIGHED</b>						
	150	147	142	139	135	135
<b>NO. DAYS SINCE LAST WEIGHING</b>						
	0	69	57	69	56	56
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>						
	0	24	-89	151	88	-55
<b>SCOUR SCORES</b>						
0	150	141	142	84	119	135
1.1	0	0	0	2	0	0
1.2	0	1	0	5	0	0
1.3	0	0	0	1	0	0
1.4	0	0	0	1	0	0
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>
2.1	0	4	0	17	7	0
2.2	0	0	0	16	5	0
2.3	0	1	0	4	2	0
2.4	0	0	0	8	1	0
2.5	0	0	0	1	1	0
<b>Total</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>98</b>	<b>32</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>						
FB	0	0	0	0	0	0
DM	0	0	0	0	0	0
LM	0	0	0	0	0	0
CULL	0	0	0	0	0	0
DEAD	0	0	0	0	0	0
<b>LAB RESULTS</b>						
<b>SA No.</b>	<b>1182</b>	<b>1985</b>	<b>2804</b>	<b>3641</b>	<b>4254</b>	<b>527</b>
<b>INTERNAL PARASITES - EPG</b>						
AV	1423	0	1488	224	132	232
LO	440	0	240	40	0	0
HI	4120	0	3000	520	480	640
NEM	21	0	68	0	0	20
<b>LARVAL DIFFERENTIATION</b>						
TRI	1323	0	952	175	117	125
OST	43	0	149	2	3	42
HAEM	0	0	0	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>						
AV	NT	293	NT	NT	NT	NT
HI	NT	316	NT	NT	NT	NT
LO	NT	263	NT	NT	NT	NT



**A3.5.3 "Saumarez", Armidale - 1990 Drop Weaners**

<b>DATE</b>	17/4/91	12/6	7/8	20/9	4/11	7/2/92
<b>WEIGHT (KG)</b>						
AV	28.01	29.22	25.29	27.54	31.35	39.00
LO	21.00	22.00	17.50	17.50	24.00	31.50
HI	37.00	37.50	32.00	34.00	38.50	46.00
SD	2.86	2.65				
SE	0.23	0.22				
<b>NO. SHEEP WEIGHED</b>						
	159	159	159	156	155	154
<b>NO. DAYS SINCE LAST WEIGHING</b>						
	0	56	56	44	45	64
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>						
	0	21.61	-70.18	51.14	84.67	119.53
<b>SCOUR SCORES</b>						
0	158	158	158	150	155	115
1.1	0	1	0	0	0	1
1.2	0	0	0	0	0	
1.3	1	0	0	0	0	0
1.4	0	0	0	0	0	0
1.5	0	0	1	1	0	0
<b>Total</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>1</b>
2.1	0	0	0	4	0	19
2.2	0	0	0	0	0	9
2.3	0	0	0	1	0	10
2.4	0	0	0	0	0	0
2.5	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>67</b>
<b>MISCELLANEOUS DISEASES</b>						
FB	0	0	0	0	0	0
DM	0	1	0	0	0	0
LM	0	0	0	0	0	0
CULL	0	0	0	0	0	0
DEAD	0	0	0	1	1	0
<b>LAB RESULTS</b>						
<b>INTERNAL PARASITES - EPG</b>						
<b>LAB NO. 1093</b>	<b>1884</b>	<b>2616</b>	<b>3196</b>	<b>3603</b>	<b>399</b>	
AV	64	80	3232	172	136	696
LO	0	0	360	40	0	120
HI	160	240	2400	600	360	2000
NEM	4	72	36	16	8	12
<b>LARVAL DIFFERENTIATION</b>						
TRI	50	60	2133	167	111	696
OST	14	10	129	2	14	0
HAEM	0	2	582	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>						
<b>LAB N. 1265</b>	<b>1880</b>	<b>N/A</b>	<b>3235</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
AV	177	315	N/A	378	N/A	N/A
HI	227	363	N/A	433	N/A	N/A
LO	124	218	N/A	336	N/A	N/A

**A3.5.4 "Saumarez", Armidale - 1991 Drop Weaners**

<b>DATE</b>	9/3/92	24/6	30/7	7/10	2/12	15/2/93
<b>WEIGHT (KG)</b>						
AV	24.86	29.99	27.35	25.79	35.94	36.99
LO	18.0	21.5	20.5	14.5	26.5	22.0
HI	31.5	37.0	34.5	33.0	47.0	45.0
SD	2.86	2.97	2.66	2.98	3.84	
<b>NO SHEEP WEIGHED</b>						
	150	148	149	149	147	145
<b>NO DAYS SINCE LAST WEIGHING</b>						
	-	106	36	39	56	75
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>						
	-	48.3	-73.4	-40.0	181.2	14.0
<b>SCOUR SCORES</b>						
0	91	140	0	120	58	143
1.1	7	0	0	0	0	0
1.2	13	0	0	4	1	0
1.3	10	2	0	4	1	1
1.4	0	0	0	3	0	1
1.5	1	0	0	2	0	0
<b>Total</b>	<b>68</b>	<b>6</b>	<b>0</b>	<b>42</b>	<b>5</b>	<b>7</b>
2.1	6	2	0	2	35	0
2.2	10	1	0	9	23	0
2.3	2	1	0	4	23	0
2.4	5	0	0	1	4	0
2.5	5	2	0	0	2	0
<b>Total</b>	<b>77</b>	<b>17</b>	<b>0</b>	<b>36</b>	<b>176</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>						
FB	0	1	0	0	1	1
DM	0	0	1	0	1	0
LM	0	0	0	0	0	0
CULL	0	0	0	1	0	0
DEAD	0	0	0	1	0	1
<b>LAB RESULTS</b>						
<b>INTERNAL PARASITES - EPG</b>						
<b>LAB NO</b>	<b>780</b>	<b>2195</b>	<b>2635</b>	<b>3452</b>	<b>4133</b>	<b>0544</b>
AV	288	472	600	828	49	640
LO	40	280	120	200	0	160
HI	1680	1160	2280	2560	200	1360
NEM	48	32	8	16	0	8
TRI	236	392	522	521	44	595
OST	52	71	72	57	4	25
HAEM	0	0	0	0	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>						
<b>LAB NO</b>	<b>781</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
AV	49.6	N/A	N/A	N/A	N/A	N/A
HI	68	N/A	N/A	N/A	N/A	N/A
LO	33	N/A	N/A	N/A	N/A	N/A

**A3.5.5 "Saumarez", Armidale - 1992 Drop Weaners**

<b>DATE</b>	1/4/93	23/6	30/7	29/10	11/2/94
<b>WEIGHT (KG)</b>					
AV	26.28	24.38	20.29	33.18	37.28
LO	18.0	17.5	15.0	25.0	31.0
HI	35.0	31.5	25.0	41.5	46.5
SD	2.82	2.38	2.01	2.99	2.89
SE	0.56	0.47	0.40	0.59	0.57
<b>NO. SHEEP WEIGHED</b>					
	151	149	149	144	143
<b>NO. DAYS SINCE LAST WEIGHING</b>					
	0	84	37	91	105
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>					
	0	-22.83	-110.55	141.59	39.03
<b>SCOUR SCORES</b>					
0	142	149	150	123	135
1.1	0	0	0	0	0
1.2	0	0	0	0	0
1.3	0	0	0	0	0
1.4	0	0	0	0	0
1.5	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.1	2	0	0	10	0
2.2	4	0	0	8	5
2.3	3	0	0	2	2
2.4	0	0	0	1	1
2.5	0	0	0	0	0
<b>Total</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>20</b>
<b>MISCELLANEOUS DISEASES</b>					
FB	0	0	0	0	2
DM	0	0	1	0	0
LM	0	0	0	0	0
CULL	0	0	1	0	0
DEATH	0	0	0	0	0
<b>LAB RESULTS</b>					
<b>INTERNAL PARASITES - EPG</b>					
<b>LAB NO</b>	<b>1182</b>	<b>2234</b>	<b>2813</b>	<b>3956</b>	<b>0554</b>
AV	1408	316	2944	100	416
LO	240	80	1640	0	200
HI	2440	800	4400	360	1240
NEM	12	56	64	0	16
TRI	1351	297	2472	90	299
OST	28	3	29	5	45
HAEM	0	3	58	0	0
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>					
<b>LAB NO</b>					
AV	N/A	N/A	N/A	N/A	N/A
HI	N/A	N/A	N/A	N/A	N/A
LO	N/A	N/A	N/A	N/A	N/A

**A3.6.1 "South Winscombe", Bundarra - 1990 Drop Weaners**

<b>DATE</b>	24/12/90	28/2/91	18/4	6/6	17/7	20/9	7/11	13/12	3/2/92
<b>WEIGHT (KG)</b>									
AV	21.34	26.13	26.25	25.23	26.36	28.54	30.57	33.10	38.56
LO	12.50	19.50	19.00	18.00	19.50	21.50	22.50	25.00	26.00
HI	29.50	35.50	33.50	34.50	36.50	39.50?	39.50	43.50	50.50
SD	3.07	3.19	3.19	3.12	3.36				
SE	0.25	0.26	0.27	0.26	0.28				
<b>NO. SHEEP WEIGHED</b>									
	147	146	139	140	144	148	146	139	140
<b>NO. DAYS SINCE LAST WEIGHING</b>									
	0	66	49	49	41	65	48	36	52
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>									
	0	72.6	2.5	-20.8	27.6	33.5	42.3	70.3	105
<b>SCOUR SCORES</b>									
0	0	40	145	137	139	143	136	82	97
1.1	0	0		0	0	0	1	0	0
1.2	1	0	0	0	0	0	0	0	1
1.3	0	0	0	0	0	0	0	0	0
1.4	0	0	0	0	0	0	0	0	1
1.5	0	0	0	0	1	0	0	0	0
<b>Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>6</b>
2.1	2	0	0	1	0	1	16	14	4
2.2	3	1	1	0	0	0	16	11	6
2.3	0	0	1	0	0	4	18	9	3
2.4	0	0	0	0	0	1	12	7	2
2.5	0	0	0	0	0	1	1	1	0
<b>Total</b>	<b>8</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>22</b>	<b>155</b>	<b>96</b>	<b>33</b>
<b>MISCELLANEOUS DISEASES</b>									
FB	0	3	1	0	0	0	0	0	0
FR	0	0	0	4	0	0	0	0	0
DM	0	1	2	4	1	0	2	0	0
LM	1	0	0	0	0	0	0	0	0
CULLS	0	1	0	0	0	0	0	1	0
DEATHS	0	0	0	0	0	0	0	0	0
IN	0	0	0	0	0	0	1	0	0
<b>LAB RESULTS</b>									
<b>INTERNAL PARASITES - EPG</b>									
<b>LAB 0067</b>	<b>725</b>	<b>1151</b>	<b>1810</b>	<b>2331</b>	<b>3234</b>	<b>3546</b>	<b>3970</b>	<b>326</b>	
AV	0	264	36	144	768	576	2233	440	1200
LO	0	80	0	0	240	40	720	40	400
HI	0	720	120	520	1600	1840	6200	840	2360
NEM	0	78	0	0	68	60	60	20	4
<b>LARVAL DIFFERENTIATION</b>									
HAEM	0	18	0	0	8	305	1362	0	0
TRI	0	216	35	102	722	219	737	400	1044
OST	0	11	1	12	31	35	22	40	60
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>									
<b>LAB 067</b>	<b>726</b>	<b>1812</b>	<b>1881</b>	<b>2331</b>	<b>3236</b>	<b>3643</b>	<b>3971</b>	<b>N/A</b>	
AV	167	76	23	55	44	26	28	37	N/A
HI	230	94	42	91	57	42	37	47	N/A
LO	132	64	3	32	35	17	18	26	N/A

**A3.6.2 "South Winscombe", Bundarra - 1991 Drop Weaners**

<b>DATE</b>	19/12/91	3/2	16/3	4/5	1/6	16/6	17/8	9/10	30/11	16/2/92
<b>WEIGHT (KG)</b>										
AV	17.92	22.86	26.33	24.46	N/A	24.71	25.50	27.35	32.54	35.70
LO	11.0	17.0	19.5	18.0	N/A	17.0	19.5	21.0	26.0	28.0
HI	27.5	30.5	36.0	34.0	N/A	33.5	35.0	35.0	40.0	45.5
SD	2.53	2.54	2.91	2.77	N/A	2.95	2.99	2.87	3.13	
<b>NO SHEEP WEIGHED</b>										
	150	149	150	150	N/A	149	150	149	149	145
<b>NO DAYS SINCE LAST WEIGHING</b>										
	0	46	42	49	N/A	42	62	53	51	47
<b>AVERAGE DAILY WEIGHT GAIN (GMS/DAY)</b>										
	-	107.2	82.6	-38.0	N/A	5.9	12.8	34.6	101.9	67.1
<b>SCOUR SCORES</b>										
0	146	142	122	147	N/A	138	134	149	149	145
1.1	0	0	2	0	N/A	0	1	0	0	0
1.2	1	1	4	0	N/A	1	2	0	0	0
1.3	0	0	2	0	N/A	1	0	0	0	0
1.4	0	0	0	0	N/A	0	4	0	0	0
1.5	0	0	0	0	N/A	0	0	0	0	0
<b>Total</b>	<b>2</b>	<b>2</b>	<b>16</b>	<b>0</b>	<b>N/A</b>	<b>5</b>	<b>21</b>	<b>0</b>	<b>0</b>	<b>0</b>
2.1	1	2	11	0	N/A	5	3	0	0	0
2.2	2	2	6	3	N/A	4	3	0	0	0
2.3	0	2	3	0	N/A	0	3	0	0	0
2.4	0	0	0	0	N/A	0	0	0	0	0
2.5	0	0	0	0	N/A	0	0	0	0	0
<b>Total</b>	<b>5</b>	<b>11</b>	<b>32</b>	<b>6</b>	<b>N/A</b>	<b>13</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>MISCELLANEOUS DISEASES</b>										
FB	0	0	0	0	N/A	0	0	0	0	0
FR	0	0	0	0	N/A	0	0	0	0	0
DM	0	0	0	1	N/A	0	0	0	0	0
LM	0	0	0	0	N/A	0	0	0	0	0
CULLS	0	0	0	0	N/A	0	0	0	0	0
DEATH	0	0	0	0	N/A	0	0	0	0	0
IN	0	0	0	0	N/A	0	0	0	0	0
<b>LAB RESULTS</b>										
<b>INTERNAL PARASITES - EPG</b>										
<b>LAB3942</b>	<b>0326</b>	<b>0892</b>	<b>1568</b>	<b>1890</b>	<b>2091</b>	<b>2882</b>	<b>3432</b>	<b>4102</b>	<b>0569</b>	
AV	8	312	612	44	204	408	240	1072	232	336
LO	0	40	200	0	0	40	0	160	0	80
HI	40	760	1320	200	480	1000	480	1560	520	960
NEM	32	128	36	20	24	104	20	16	8	0
HAEM	0	172	0	37	153	208	192	1007	64	0
TRI	4	134	520	6	49	175	33	64	162	315
OST	3	3	92	1	2	25	14	0	4	16
<b>GLUTATHIONE PEROXIDASE - U/g Hb</b>										
<b>LAB0049</b>	<b>0327</b>	<b>887</b>	<b>1571</b>	<b>N/A</b>	<b>2094</b>	<b>2884</b>	<b>3579</b>	<b>4098</b>	<b>0571</b>	
AV	72	79.8	151.4	127.8	N/A	153.6	300.2	259.2	271.4	201.2
HI	156	113	199	225	N/A	201	338	290	250	285
LO	20	44	82	63	N/A	59	277	218	302	140





## A4 DETAILS OF METHODS AND RESULTS FOR CHAPTER FIVE

## A4.1 Table of Weights and Faecal Samples Over Period 10/1/92 -7/1/98

## Supplemented Group

	10/1 1992	5/2	4/3	1/4	29/4	27/5	24/6	22/7	19/8	15/9	13/10	11/11	7/12
<b>NUMBER</b>	75	75	68	69	66	63	62	57	56	53	50	47	44
<b>WEIGHT (KG)</b>													
Av	19.32	22.42	23.30	23.94	23.96	25.84	26.80	25.10	25.48	28.84	29.72	33.12	36.32
SD	3.33	3.73	3.78	3.68	3.63	3.40	3.24	3.09	2.96	3.23	3.28	3.53	3.75
<b>FAECAL EGG COUNTS</b>													
Av	0	110	131	416	304	211	337	469	576	90	200	208	204
<b>LARVAL DIFFERENTIATION RESULTS</b>													
Nem	0	0	1	5	5	8	22	40	42	0	19	21	16
Haem	0	36	7	79	0	0	0	19	23	0	2	2	0
Trich	0	47	82	208	219	152	276	384	420	83	166	145	175
Ost	0	27	26	129	46	49	27	28	46	6	28	49	8

	13/1 1992	17/2	14/4	9/6	4/8	29/9	24/11	17/12	24/6 1994	15/2 1995	7/12 1996	7/1 1998
<b>NUMBER</b>	42	42	42	42	40	41	40	41	41	37	19	16
<b>WEIGHT (KG)</b>												
Av	33.78	34.88	37.22	35.65	36.98	40.57	15.76	48.06	44.56	51.36	52.54	56.51
SD	3.95	4.25	4.72	4.26	4.03	3.81	4.39	4.76	5.06	5.41	4.51	2.83
<b>FAECAL EGG COUNTS</b>												
Av	N/A	N/A	1244	504	296	212	N/A	N/A	N/A	N/A	N/A	N/A
<b>LARVAL DIFFERENTIATION RESULTS</b>												
Nem	N/A	N/A	16	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Haem	N/A	N/A	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Trich	N/A	N/A	1194	498	293	195	N/A	N/A	N/A	N/A	N/A	N/A
Ost	N/A	N/A	0	5	0	16	N/A	N/A	N/A	N/A	N/A	N/A

## Non-Supplemented Group

	10/1 1992	5/2	4/3	1/4	29/4	27/5	24/6	22/7	19/8	15/9	13/10	11/11	7/12
<b>NUMBER</b>	75	75	72	68	65	62	59	56	53	50	47	44	41
<b>WEIGHT (KG)</b>													
Av	19.36	22.28	23.00	23.46	23.70	22.64	22.60	21.66	20.90	23.42	25.62	28.94	31.64
SD	3.52	3.72	3.78	3.20	3.29	3.01	2.60	2.49	2.46	2.49	2.80	3.09	3.23
<b>FAECAL</b>													
Av	0	136	179	485	544	443	590	910	1208	153	211	234	258
<b>LARVAL DIFFERENTIATION RESULTS</b>													
Nem	0	0	0	5	10	22	44	78	66	10	24	10	12
Haem	0	53	0	0	0	0	0	36	97	0	0	2	0
Trich	0	65	120	369	370	363	478	792	761	139	181	138	198
Ost	0	18	48	107	54	66	65	36	36	13	27	63	33

	13/1 1992	17/2	14/4	9/6	4/8	29/9	24/11	17/12	24/6 1994	15/2 1995	7/12 1996	7/1 1998
<b>NUMBER</b>	41	41	41	36	36	35	34	37	37	36	22	20
<b>WEIGHT (KG)</b>												
Av	30.76	30.80	32.56	32.67	34.79	37.73	44.38	45.50	43.68	48.63	49.47	56.42
SD	3.38	3.79	4.68	3.89	3.80	3.91	4.33	4.55	4.92	5.35	5.08	6.7
<b>FAECAL EGG COUNTS</b>												
Av	N/A	N/A	1244	344	296	248	N/A	N/A	N/A	N/A	N/A	N/A
<b>LARVAL DIFFERENTIATION RESULTS</b>												
Nem	N/A	N/A	40	40	0	40	N/A	N/A	N/A	N/A	N/A	N/A
Haem	N/A	N/A	16	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Trich	N/A	N/A	1194	340	293	124	N/A	N/A	N/A	N/A	N/A	N/A
Ost	N/A	N/A	0	3	0	9	N/A	N/A	N/A	N/A	N/A	N/A





**A4.3 Table of Faecal Egg Counts and Total Worm Counts for Average of 3 Post Mortem Sheep - Non-Supplemented Group**

Non-Supplemented Group											
Date	5/2/92	4/3/93	1/4/92	29/4/92	27/5/92	24/6/92	22/7/92	19/8/92	15/9/92	13/10/92	11/11/92
<b>Egg Counts for Marker Group</b>											
Total											
Trich	65	120	369	370	363	478	792	761	139	181	138
Ost	18	48	107	54	66	65	36	36	13	27	63
Haem	53	0	0	0	0	0	36	97	0	0	2
Other											
<b>Total Worm Count (Av of 3 PM sheep)</b>	433	1450	1883	1400	1317	3917	6500	3227	4450	22683	33800
Trich Ab Ad								*			
Ab Imm											
Trich S1 Ad	600	1500	1500	900	1600	4600	5600	25100	1000	11900	3000
S1 Imm	0	0	0	0	0	0	100	3000	0	2600	0
Total Ad Trich											
Imm											
Ost Ad	400	1800	2950	2800	1400	2500	5550	35100	5850	11700	11150
Imm	0	100	0	0	250	200	750	6700	400	3050	4050
Haem Ad	200	150	100	0	0	500	2400	3700	0	0	0
Imm	0	250	0	0	0	250	500	250	0	0	0
Other Ad											
Imm											

\* Date drenched

**A4.4 Table Showing Summary of Post Mortem Results**

Supplemented Group											
Date	5/2/92	4/3/93	1/4/92	29/4/92	27/5/92	24/6/92	22/7/92	19/8/92	15/9/92	13/10/92	11/11/92
Egg Counts											
Trich	47	82	208	219	152	276	384	420	83	166	145
Ost	27	26	129	46	49	27	28	46	6	28	49
TWC	1150	1350	2700	3900	5400	16800	11600	11100	6400	10000	116650
Trich Total Adult	100	400	300	1100	2000	4200	4300	3100	300	1800	4800
Ost Total Adult	550	450	1700	2250	2700	5900	1700	4350	3500	2000	5250

Non-Supplemented Group											
Date	5/2/92	4/3/93	1/4/92	29/4/92	27/5/92	24/6/92	22/7/92	19/8/92	15/9/92	13/10/92	11/11/92
Egg Counts											
Trich	65	120	369	370	363	478	792	761	139	181	138
Ost	18	48	107	54	66	65	36	36	13	27	63
TWC	1300	4350	5650	4200	3950	11750	19500	96800	13350	68050	101400
Trich Total Adult	600	1500	1500	900	1600	4600	5600	25100	1000	11900	3000
Ost Total Adult	400	1800	2950	2800	1400	2500	5550	35100	5850	11700	11150

**A4.5 Pasture Availability/Supplementary Feeding****A4.5.1 Description Of Trial Paddock Used For First 12 Months**

The trial paddock is located on the TSR on Platform Road, Armidale.

Latitude:

Longitude:

Altitude: 1040 m

Area: 24 HA

Slope (out of 10): 3

Sandy clay loam with red basalt ridges (20% of paddock). The pasture is natural - predominantly native species. The paddock has never been fertilised.

**A4.5.2 Description Of Trial Animals**

The sheep are fine wool Merino, mixed strains. The estimated mature weight is 55 kg, with a score condition of 3. They originated from CSIRO Armidale. The sheep were born September/October and weaned in December. They were vaccinated twice. On their arrival on the trial paddock they were vaccinated with 6:1 and drenched with Ivomec™ and Closantel.

**A4.5.3 Weather Details Over Past 12 Months**

Weather for Saumarez 1992												
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rain (mm)	28.0	140.5	9.0	48.0	30.0	28.5	30.5	53.0	27.5	63.5	96.0	99.0
Temp °												
Max	33.7	31.1	27.8	25.4	21.2	19.8	18.6	19.8	25.3	24.7	30.1	30.0
Min	8.0	10.8	5.7	2.9	-1.7	-4.4	-4.7	-4.4	-3.1	-0.6	3.4	5.4

**A4.5.4 Table of Pasture Estimates for Period (based on the method of Archer, Bell and Rose 1991).**

	% Green	% Dead	Total Pasture DM/kg Mass	Total DM kg/HA Green	Total DM kg/HA Dead
1/92	44	56	3600	1584	2016
2/92	34	66	4000	1360	2640
3/92	28	72	3800	1064	2736
4/92	22	78	3900	858	3042
5/92	15	85	3500	525	2975
6/92	12	88	3400	408	2992
7/92	9	91	2900	261	2639
8/92	11	89	3100	341	2759
9/92	14	86	3300	462	2838
10/92	23	77	3300	759	2541
11/92	31	69	3600	1116	2484
12/92	37	63	3600	1332	2268

**A4.5.5 Description of Supplementary Feed Used - Millmaster Feeds '28% Rumen Bypass Pellets'.**

Manufacturers listed contents:-

Feed used: Millmaster Feeds '28% Rumen Bypass Pellets'

Minimum crude protein	28.0%
Crude fat	2.0%
Urea	2.0%
Maximum crude fibre	9.0%
Sodium chloride	1.0%

Further information from Millmaster

Composition                    70% cotton seed meal  
 Added 2% urea, 1% oil, 1% salt made up with Barley, Bran, Pollard

Estimate of Values	Total Crude protein	31.0%
	Total oil content	2.5%
	Dry matter	90.0%
	ME	10.3%

**A4.5.6 Summary of Supplementary Feeding**

Date	Total Number of Sheep	Total Feed (kg) Per Day	Feed Per Sheep (grams) Per Day
10/1/92	75	0	0
5/2/92	75	0	0
4/3/92	75	0	0
1/4/92	69	4	58
30/4/92	66	6	91
27/5/92	63	13.7	217
24/6/92	60	13.7	228
22/7/92	57	13.7	240
19/8/92	54	10.3	190
15/9/92	51	10.3	200
13/10/92	48	5.15	108

**A4.5.7 Calculations for Feed Intake and Production for July - Copy of Grazfeed Printout (Relevant Sections Only)****(i) Non-Supplemented Group**

Animal Class: Wether Weaners  
Weight of Supplement: 0.00 kg

Table 1 Diet Composition

	Intake Limit	Herbage on Offer	Herbage Eaten	Suppl Eaten	Total Solid	Milk	Total Diet
Weight of DM (kg)	1.15		0.83	0.00	0.83		
Digestibility (%)		45	55	75	55		
Crude protein (%)		6	10	28	10		
Percentage degradable		65	71	70			
ME intake (MJ)			6.11	0.00	6.11		
ME/DM (MJ/kg)					7.32		
Maint efficiency					0.65		
Gain efficiency					0.81		

Table 2 Energy and Protein Partition and Protein Requirements

	Intake	Maint	Wool	Wt Gain	Total Used	Surplus
ME partition (MJ)	6.11	6.65				
NE stored (MJ)			0.09	-0.45		
Protein (g)	82.3	19.6	2.5	-2.9	19.2	
Rum degr prot (g)	58.1				52.8	5.3
Undegr prot (g)	24.2				0.0	24.2

Table 3 Animal Measurements

	Shorn Body	Clean Wool	Greasy Wool	Supplement Cost (c/head)
New weight (kg)	23.97			
Daily gain (g)	-26	2.5	3.6	0.0

**(ii) Supplemented Group**

Animal Class: Wether Weaners

Weight of Supplement: 0.24 kg

Table 1 Diet Composition

	Intake Limit	Herbage on Offer	Herbage Eaten	Suppl Eaten	Total Solid	Milk	Total Diet
Weight of DM (kg)	1.15		0.72	0.22	0.93		
Digestibility (%)		45	55	75	60		
Crude protein (%)		6	10	28	14		
Percentage degradable		65	68	68			
ME intake (MJ)			7.69	0.00	7.69		
ME/DM (MJ/kg)					8.25		
Maint efficiency			0.67				
Gain efficiency			0.31				

Table 2 Energy and Protein Partition and Protein Requirements

	Intake	Maint	Wool	Wt Gain	Total Used	Surplus
ME partition (MJ)	7.69	6.07				
NE stored (MJ)			0.14	0.43		
Protein (g)	132.2	21.1	4.0	2.7	27.8	
Rum degr prot (g)	89.8				67.7	22.0
Undegr prot (g)	42.4				0.9	41.5

Table 3 Animal Measurements

	Shorn Body	Clean Wool	Greasy Wool	Supplement Cost (c/head)
New weight (kg)	24.02			
Daily gain (g)	26	4.0	5.8	4.8

## A5 DETAILS OF METHODS AND RESULTS FOR CHAPTER SIX

### A5.1 Details of Field Testing for Immunity Development

This method measures the egg output that occurs at specified times after a known dose of infective third larvae of *Haemonchus contortus* are administered.

The details of this experiment are:

Day 1	(5/9/94)	All sheep boxed, drenched with Ivermectin (IVOMEC, Ivermectin MSD Registered TM) and held overnight.
Day 2	(6/9/94)	Sheep all moved to Martins Gully Reserve, on which no sheep had been pastured for a number of years. Placed in paddock 1. Random sample faecal samples collected and egg counts done to ensure no eggs remain, ie all parasites removed.
Day 9	(13/9/94)	All sheep drenched with a dose of 10000 <i>Haemonchus contortus</i> third stage larvae as supplied by Animal Science, UNE Parasitology Laboratory. Sheep moved to paddock 2.
Day 26	(30/9/94)	All sheep moved to paddock 3.
Day 30	(3/10/94)	All sheep weighed, faecal samples and moved to paddock 4.
Day 33	(7/10/94)	All sheep moved to paddock 5.
Day 37	(11/10/94)	All sheep weighed, faecal samples and moved to paddock 6.
Day 40	(14/10/94)	All sheep moved into paddock 1.
Day 44	(18/10/94)	All sheep weighed and faecal sampled. Drenched with Ivermectin.

### A5.2 Table of Weights of 4 Groups of Weaners Over the Period of Supplementation

Group	Date of Weighing									
	18/1	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8	
<b>Resistant Fed</b>	18/1	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8	
	1994									
Av (kg)	21.59	20.70	22.03	24.60	23.85	24.95	24.43	26.88		
27.30										
S Deviation	±	2.56	3.17	3.48	2.78	2.85	3.10	4.04	3.14	2.85
<b>Resistant Non-Fed</b>	18/1	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8	
	1994									
Av (kg)	21.14	20.92	20.34	22.00	21.95	22.42	21.21	20.00		
19.39										
S Deviation	±	2.52	2.38	2.07	2.50	2.27	2.16	1.90	2.03	2.45
<b>Random-Bred Fed</b>	18/1	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8	
	1994									
Av (kg)	22.54	21.38	22.95	24.58	24.63	25.32	24.53	27.03		
27.11										
S Deviation	±	3.58	4.18	3.70	3.14	3.29	3.54	3.98	3.50	3.67
<b>Random-Bred Non-Fed</b>	18/1	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8	
	1994									
Av (kg)	22.75	21.97	22.24	23.11	23.34	23.92	23.31	22.16		
22.32										
S Deviation	±	3.21	3.36	3.20	3.50	3.37	3.21	2.46	3.35	3.28

**A5.3 Details of Results of Faecal Egg Counts That Developed in the 4 Groups of Weaners Over the Period of Supplementation**

Group	Date of Testing								
	18/1 1994	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8
<b>Resistant Fed</b>									
Av (epg)	202	214	308	472	28	147	112	240	240
High	720	600	600	760	240	440	200	680	520
Low	0	40	40	200	0	0	0	80	80
Haem	0	0	0	0	0	0	0	1	2
Trich	78	88	92	94	95	72	75	77	72
Ost	20	12	3	4	5	28	25	21	22
Other	2	0	5	2	0	0	0	1	4
<b>Resistant Non-Fed</b>									
Av (epg)	165	253	368	677	24	218	340	568	728
High	560	520	720	1280	80	360	680	1280	1440
Low	0	0	0	160	0	40	80	80	200
Haem	0	0	0	0	0	0	0	0	0
Trich	78	80	90	96	90	91	80	88	75
Ost	20	12	3	4	10	8	13	11	21
Other	2	8	7	0	0	1	7	1	4
<b>Random-Bred Fed</b>									
Av (epg)	430	497	608	1096	180	461	472	500	440
High	1200	1160	960	1520	1600	2000	960	1720	920
Low	40	80	200	280	0	120	120	120	240
Haem	0	0	1	0	0	0	0	1	2
Trich	76	76	92	97	89	85	80	84	66
Ost	20	18	4	1	11	15	18	10	25
Other	4	6	3	2	0	0	2	5	7
<b>Random-Bred Non-Fed</b>									
Av (epg)	402	512	852	1524	27	738	672	1172	1208
High	1320	1200	1480	2480	80	120	1160	2000	1960
Low	120	200	320	640	0	1200	40	400	640
Haem	0	0	0	0	0	0	0	0	0
Trich	76	76	92	88	87	76	86	87	80
Ost	20	18	4	6	13	23	10	11	18
Other	4	6	4	6	0	1	4	2	2

The faecal egg count (in arithmetic means) and larval differentiation results of bulk cultures of the 4 experimental groups during the period of supplementation.



**A5.4 Table of Weight and Faecal Egg Counts That Developed in the Supplemented and Non-Supplemented Sheep Over the Period of Supplementation (ie, Resistance and Random-Bred Groups Pooled)**

Group	Date of Testing								
	18/1 1994	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8
<b>Fed</b>									
Av (epg)	316	356	458	784	104	312	292	370	340
High	1200	1160	960	1520	1600	2000	960	1720	920
Low	0	40	40	200	0	0	0	80	80
<b>Non-Fed</b>									
Av (epg)	283	382	610	1101	25	478	506	870	968
High	1320	1200	1480	2480	80	1200	1160	2000	1960
Low	0	0	0	160	0	40	40	80	200

**A5.5 Table of Weights and Faecal Egg Counts That Developed in the Resistant and Non-Supplemented Sheep over the Period of Supplementation (ie, Fed and Non-Fed Groups Pooled)**

Resistant	Date of Testing								
	18/1 1994	16/2	16/3	13/4	11/5	8/6	7/7	3/8	31/8
Av (epg)	184	233	338	575	26	182	226	404	484
High	720	600	720	1280	240	440	680	1280	1440
Low	0	0	0	160	0	0	0	80	80
<b>Random-Bred</b>									
Av (epg)	416	504	730	1310	107	592	572	836	824
High	1320	1200	1480	2480	1600	2000	1160	2000	1960
Low	40	80	200	280	0	120	40	120	240

**A5.6 Printout from Statistix Analytical Program Using Transformed Data on FECs That Developed After Artificial Challenge With Infective *H. contortus* Larvae**

STATISTIX FOR WINDOWS

GRAY, 04/18/98, 10:46

ANALYSIS OF VARIANCE TABLE FOR SQFEC

SOURCE	DF	SS	MS	F	P
TRT (A)	3	31246.8	10415.6	19.88	0.0000
REP (B)	2	13286.3	6643.14	12.68	0.0000
A*B	6	2304.35	384.059	0.73	0.6254
RESIDUAL	207	108443	523.877		
TOTAL	218	155280			

CASES INCLUDED 219 MISSING CASES 21

CAUTION: The sums of squares, mean squares, and F-tests are approximate for analyses with missing values. See the manual for details and instructions for constructing exact F-tests.

STATISTIX FOR WINDOWS

GRAY, 04/18/98, 10:47

TUKEY (HSD) COMPARISON OF MEANS OF SQFEC BY TRT

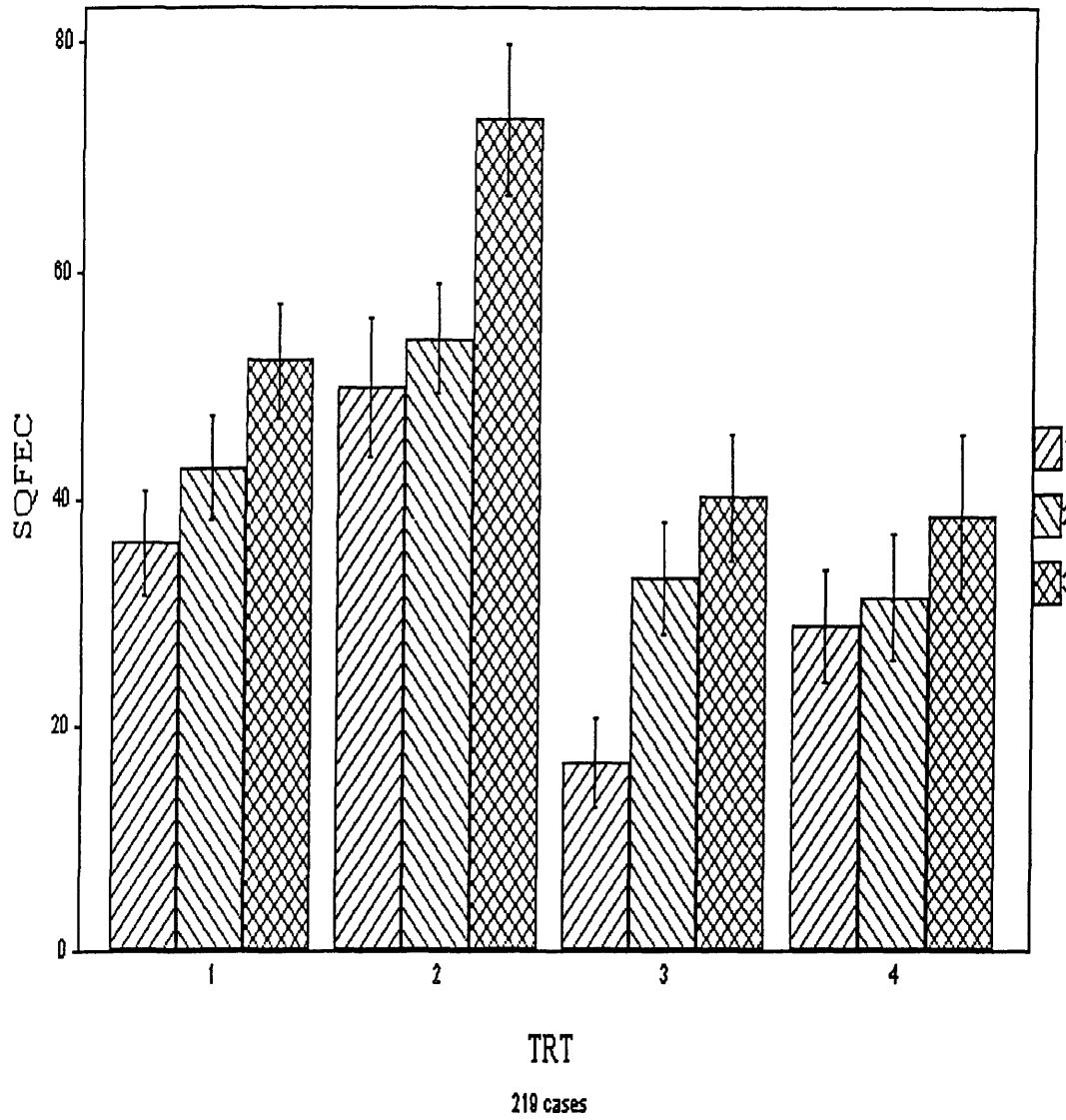
TRT	MEAN	HOMOGENEOUS GROUPS
2	59.131	I
1	43.785	.. I
4	32.990	.... I
3	29.999	.... I

THERE ARE 3 GROUPS IN WHICH THE MEANS ARE NOT SIGNIFICANTLY DIFFERENT FROM ONE ANOTHER.

CRITICAL Q VALUE 3.632 REJECTION LEVEL 0.050  
 CRITICAL VALUE FOR COMPARISON 10.732  
 STANDARD ERROR FOR COMPARISON 4.1788

ERROR TERM USED: RESIDUAL, 207 DF

Error Bar Chart With SE



Legend Y axis: 1 = Week 1, 2 = Week 2, 3 = Week 3  
 Legend X axis: 1 = Random-Bred Fed, 2 = Random-Bred Non-Fed,  
 3 = Resistant Fed, 4 = Resistant Non-Fed