

**DrenchSmart®**

Timmy Tim  
Report

Report Date: April 2011

**CATTLE**

## DrenchSmart Protocol Information

### Protocols

- Starting FEC must be a minimum of 100epg, although recommendation is levels of 150epg.
- Starting FEC is validated through the Techion Laboratory
- A sensitivity of 10epg is used for all FEC tests
- DrenchSmart Agreement is signed by all parties involved (Customer, Contractor and Techion)
- All drenches used in trial are within the listed expiry period and batch numbers are provided
- A measured composite mob sample of 10 animals pre drench is used and then 10 individual samples post-drench.
- All treatments are administered orally
- All animals involved in the trial are ear tagged – no exceptions

### Drench Resistance – A Definition

“Drench resistance occurs once a population of a species of worm can survive a dose of a drench that would have previously killed it.”

Source: [www.wormboss.com.au](http://www.wormboss.com.au)

### Detecting drench resistance in cattle

The test used to determine the drench resistance status for cattle drenches on your property is called a Faecal Egg Count Reduction Test (FECRT). This test is based around the fact that when parasites are first ingested by grazing animals, it will take 18 - 21 days before it is able to produce eggs and betray its presence. Put another way, if a fully effective drench treatment has been administered, the earliest we would expect to see eggs in faecal samples is 18 - 21 days later. If we drench accurately and see eggs in samples 14 days post-treatment, this is normally accepted as evidence that some worms have survived the treatment, i.e. the drench is not working properly.

FECRT tests are normally expressed as the percentage reduction in eggs counted between the pre and post-drench (14 days) periods. A treatment that is 100% successful would result in all worms being killed and egg counts at day 14 would be 0. In this case, the reduction would be 100%. In other words the higher the percentage (%) figure the better the drug is performing.



## DrenchSmart – Resistance Levels

Reduction	Resistance Status
99% and Above	No Resistance Detected – drug still effective
95% - 98%	Resistance Developing –the start of resistance has been identified
94% and Below	Drench Resistance Confirmed

### General notes on testing for drench resistance in cattle

- Because cattle and sheep do not generally share the same worms, a drench type that is failing to control cattle worms may still work effectively on sheep worms. I.e. don't extrapolate cattle results to sheep and vice versa.
- There are many different parasite species on each farm and the mix of these species is likely to change through the season. Often when resistance is detected it is to an individual species only. By identifying the times of the year that the species is not present or stock classes the species does not affect, then the use of the drug may still be possible at these times.
- Because DrenchSmart tests work on measuring a percentage reduction, result accuracy is improved when we have a high starting FEC. If the starting FEC is less than 100 eggs per gram (epg) we need to be much more conservative when interpreting results. Sample size is also important. The more valid results we have the more confident we can be with our results.
- A combination of issues such as starting FEC, sample size and other factors are used to assign a level of test confidence.

Confidence Level	Interpretation
HIGH	Can be very confident in results
MEDIUM	Results are good and unlikely to change if we re-tested
LOW	Would need to see a very poor reduction before resistance was declared with confidence. Results indicative only.



# DrenchSmart Agreement - Cattle

## The Parties

**"The Customer"** .....  
 Name ..... Address & Contact Number .....

**"The Contractor"** .....  
 Name ..... Address & Contact Number .....

**"The Service Provider"** Techion Group Limited- 570 Hillside Road, PO Box 5057, Dunedin - Ph: 03) 4777 555

## Drench Selection

I wish to assess the following drench options on my property (minimum of 4 drenches, maximum of 7 drenches to be selected + a control group)

Control

**Oral - Actives**

Benzimidazoles    
  Levamisole    
  Combination BZ/Lev    
  Combination Lev/Aba

**Pour On - Actives**

Abamectin    
  Eprinomectin    
  Doramectin    
  Moxidectin    
  Combination Lev/Aba

**Injectable - Actives**

Abamectin    
  Doramectin    
  Moxidectin

## Report Distribution

I **do not** want a copy of the DrenchSmart Report to be given to the DrenchSmart Contractor.

## Agreement Acceptance

I have read and understood all the conditions overleaf and I wish to proceed with the DrenchSmart Service to assess the above selected drenches. I understand that Techion Group Limited provides the resources and knowledge to produce a Report for the Customer and the Contractor sets up the first sample collection and trains the Customer to complete the second sample collection. All parties recognize the importance of maintaining confidentiality.

..... Customer Name (Print)	..... Customer Signature	..... Date
..... Contractor Name (Print)	..... Contractor Signature	..... Date
..... Techion Representative Name (Print)	..... Techion Representative Signature	..... Date

## DrenchSmart Agreement Particulars

1. Role of all Parties involved
  - 1.1. The “Service Provider” will deliver the equipment, testing services and analysis of the data collected in order to produce a DrenchSmart Report.
  - 1.2. The “Contractor” will deliver the drench products required for assessment. They will also assist in the initial set up of the first sample collection and train the “Customer” to collect the Day Fourteen samples.
  - 1.3. The “Customer” will provide animals, yards and pens, weigh scales, assistance with the initial collection and will be the sole collector of the 14 day post drench samples.
2. Agreement on Drench Selection
  - 2.1. I, the “Customer”, understand that the selection I make overleaf as to which drench options I would like to assess on my property engages me in an agreement to complete the work outlined and commitment to any associated costs as outlined by the “Contractor”.
3. Confidentiality of DrenchSmart Results
  - 3.1. “Confidential Information” shall mean all information and documentation, which may be disclosed to, or obtained by one party to the other in relation to this agreement.
  - 3.2. Each party agrees to receive, protect and maintain the Confidential Information in confidence and shall only disclose such information to its directors and employees as shall be absolutely necessary for this agreement, and shall otherwise not misuse it in any way without the other parties strict prior written consent. Each party agrees to ensure that any recipient of the Confidential Information is bound by a similar duty of confidentiality as the parties to this agreement.
  - 3.3. Each party shall not disclose any Confidential Information to any third party without the prior written consent of the other party. However, it is agreed that scientific data that does not identify the Customer may be used in any way by Techion Group Limited or third parties for research purposes only.
  - 3.4. The obligations of confidentiality in this agreement shall continue until the Confidential Information enters the public domain (except to breach or default by either party). The obligations of confidentiality shall not apply to Confidential Information which is:
    - a.) already in the public domain,
    - b.) is already in the possession of either party from a source not in breach of confidentiality obligations,
    - c.) is required to be disclosed by law.
4. FECRT Limitations
  - 4.1. The DrenchSmart protocol for the starting FEC is a minimum of 100 epg, with a preferred starting FEC of 150epg. While all endeavors are made to have all animals involved with the evaluation at 100 epg or higher, due to natural composite mob FEC distribution some animals or treatment groups may have FEC’s lower than the optimal 100 epg minimum. A starting FEC of 100 epg or higher is required to be able to deliver the DrenchSmart Reduction Results with a high level of confidence.
  - 4.2. A Larval Culture involves the hatching of parasite eggs in a sample to identify parasite species present. Intentions are to always identify species where resistance has occurred, however there can be difficulties involved with an egg hatching procedure. As a result it is not always possible to identify the species present.
  - 4.3. Sample collection protocols and equipment have been designed to protect the sample from degradation during collection and transportation. Where equipment or procedures have not been followed, or events beyond the parties control occur, no responsibility can be taken for the sample quality prior to reaching the Techion Laboratory.
  - 4.4. All results are based on the conditions and species present at the time of collection. This evaluation will produce a “moment in time” interpretation. Recommendations are that regular monitoring be an integral part of an ongoing parasite management programme.
  - 4.5. Due to known issues regarding the application of some anthelmintics, only the Oral formulations will be provided with a “drench resistance” status. Where anthelmintics were administered via ‘Pour On’ and/or ‘Injection’ the results will be provided based on the “Kill Result” obtained within the assessment.
  - 4.6. The views and interpretations expressed in the DrenchSmart Report are that of Techion Group Limited and are not claimed to be the only interpretation.

## General Information

### Customer Details

**Farmer Name:** Timmy Tim  
**Phone:** 03) 333 3333  
**Fax:** 03) 333 3334  
**Email:** [ttim@email.co.nz](mailto:ttim@email.co.nz)  
**Address:** 33 Farmers Road, RD4, Example, 9036

### Collection Details

**Submission Lab Number:** 001420  
**Day 1 Collection Date:** 1 April 2011  
**Day 14 Collection Date:** 14 April 2011  
**Starting FEC:** 200epg  
**Age of Animals:** Calves - 7 Months  
**Last Treatment Date:** N/A  
**Drench Used:** N/A

### Contractor Details

**Contractor Name:** Ted Contractor  
**Certification Number:** DS888  
**Phone:** 03) 555 555  
**Mobile:** 021 111 111  
**Email:** tcontractor@xtra.co.nz

### Drench Selection

**Oral:** Benzimidazoles, Levamisole, Combination (BZ & Lev), Combination (Lev & Aba)  
**Pour On:** Abamectin, Eprinomectin  
**Injectable:** Doramectin

*Customer Farming Operation Information***Farming Type:** (percentage of stock in each group):





<b>Beef</b>	<b>Sheep</b>	<b>Dairy</b>	<b>Goats</b>	<b>Dry Stock</b>	<b>Other -</b>
60 %	40 %	%	%	%	%

**What does the farmer do with their cattle:** Breeder / Store / Fattener**Stock Units** (approx): 10,000**Drenches currently using:** Genesis, Eclipse, Oxfen C**Does the farmer undertake a pre – calving drench:** Yes**Drench Used:** Dectomax, Oxfen C**Which pre - calving Heifer classes are drenched:** Heifers**Other Comments:****Country Type:** High Country / Hill Country / Low Land



EXAMPLE

*Drench Summary (For the Quick Drench Selection guide please view the following page)*


## Oral

Active	Quick Drench Selection	Starting FEC	Percentage Reduction	Resistance Status	Test Confidence
Benzimidazoles		370	100%	No Resistance Detected	High
Levamisole		215	80%	Resistance Confirmed	High
Combination (BZ & Lev)		310	100%	No Resistance Detected	High
Combination (Lev & Aba)		255	100%	No Resistance Detected	High




## Pour On

Active	Quick Drench Selection	Starting FEC	Kill Result	Test Confidence
Abamectin		170	97%	High
Eprinomectin		265	99%	High

## Injectable

Active	Quick Drench Selection	Starting FEC	Kill Result	Test Confidence
Doramectin		300	100%	High

### Quick Drench Selection Guide

-  Available for Use – this active has not demonstrated resistance at this point in time
-  Use Cautiously – this active may be developing resistance and should be used cautiously
-  Do not use – this active is not working effectively on this property and use should be discontinued

For more detailed explanations on drench use please refer to the recommendations section of this report



## Species Resistance Summary Chart

	<i>*Ostertagia/ Teladorsagia</i>		<i>*Trichostrongylus</i>		<i>*Haemonchus</i>		<i>Cooperia</i>		<i>Oesophagostomum / Chabertia</i>		<i>Other</i>	
	Reduc %	Validity	Reduc %	Validity	Reduc %	Validity	Reduc %	Validity	Reduc %	Validity	Reduc %	Validity
<b>Drench Type</b> Benzimidazole Oral	100	Y	100	N	100	N	100	Y	100	N		
Levamisole Oral	55.4	Y	75.8	N	100	N	100	Y	100	N		
Combination (BZ & Lev) – Oral	100	Y	100	N	100	N	100	Y	100	N		
Combination (Lev & Aba) – Oral	100	Y	100	N	100	N	100	Y	100	N		
Abamectin Pour On	100	Y	100	N	100	N	100	Y	100	N		
Eprinomectin Pour On	100	Y	100	N	100	N	100	Y	100	N		
Dormectin Injection	100	Y	100	N	100	N	100	Y	100	N		

\* Species of most significance

### Chart Codes

Reduction % Key:

- 99% and Above – Drench is effective against this species
- 95% - 98% (inclusive) – Resistance is developing
- 94% and below – Drench is NOT effective against this species as resistance has been confirmed

Test Validity:

- Y = Pre-test worm species present at more than 50epg
- N = Pre-test worm species present at less than 50epg

“Where a pre-test/pre-drench worm species is present at less than 50epg for that species – then no validity should be attributed to that result.”

Source :[www.wormwise.co.nz](http://www.wormwise.co.nz)

*DATA RECORDS*

EXAMPLE

## Pre-FECRT Larval Culture Results - Day One

STRONGYLE GROUP OF PARASITES						
Scientific Name	Common Name	Site	Importance	Percentage Composition	Comments	
<i>Haemonchus contortus</i>	Barbers pole worm	Abomasum	Rare in Otago and Southland	1%		
<i>Ostertagia spp</i>	Small brown stomach worm	Abomasum	Important in spring and summer	36%		
<i>Trichostrongylus axei</i>	Stomach hair worm	Abomasum	Important in late summer and autumn	5%		
<i>Trichostrongylus spp</i>	Black scour worm	Small intestine	Important in late summer and autumn			
<i>Cooperia spp</i>	Small intestinal worm	Small intestine	Common in autumn but rarely important	55%		
<i>Strongyloides papillosus</i>	Threadworm	Small intestine	Common in autumn but rarely important			
<i>Bunostomum trigonocephalum</i>	Hookworm	Small intestine	Rarely important	3%		
<i>Oesophagostomum / Chabertia</i>	Nodule worm	Large intestine				
	Large mouth bowel worm	Large intestine				
<i>Trichuris ovis</i>	Whipworm	Large intestine				

<b>Total %</b>	100%
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*DrenchSmart – Results - Pre Assessment FEC Test:*

**Pre Assessment FEC Test:**

Strongyle	EPG
25	250
26	260

**Pre Test Average FEC's:**

Total
255

EXAMPLE

# DrenchSmart – Results

**Drench tested:** Benzimidazoles

**Colour Code:** White

**Treatment:** Oral

## Day One Result

Strongyle	EPG
36	360
38	380

## Starting Average FEC's:

Total
370

## Day 14 Results

Strongyle	EPG
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

TOTAL

0 0

**Number of Day 14 Samples Collected:**

10

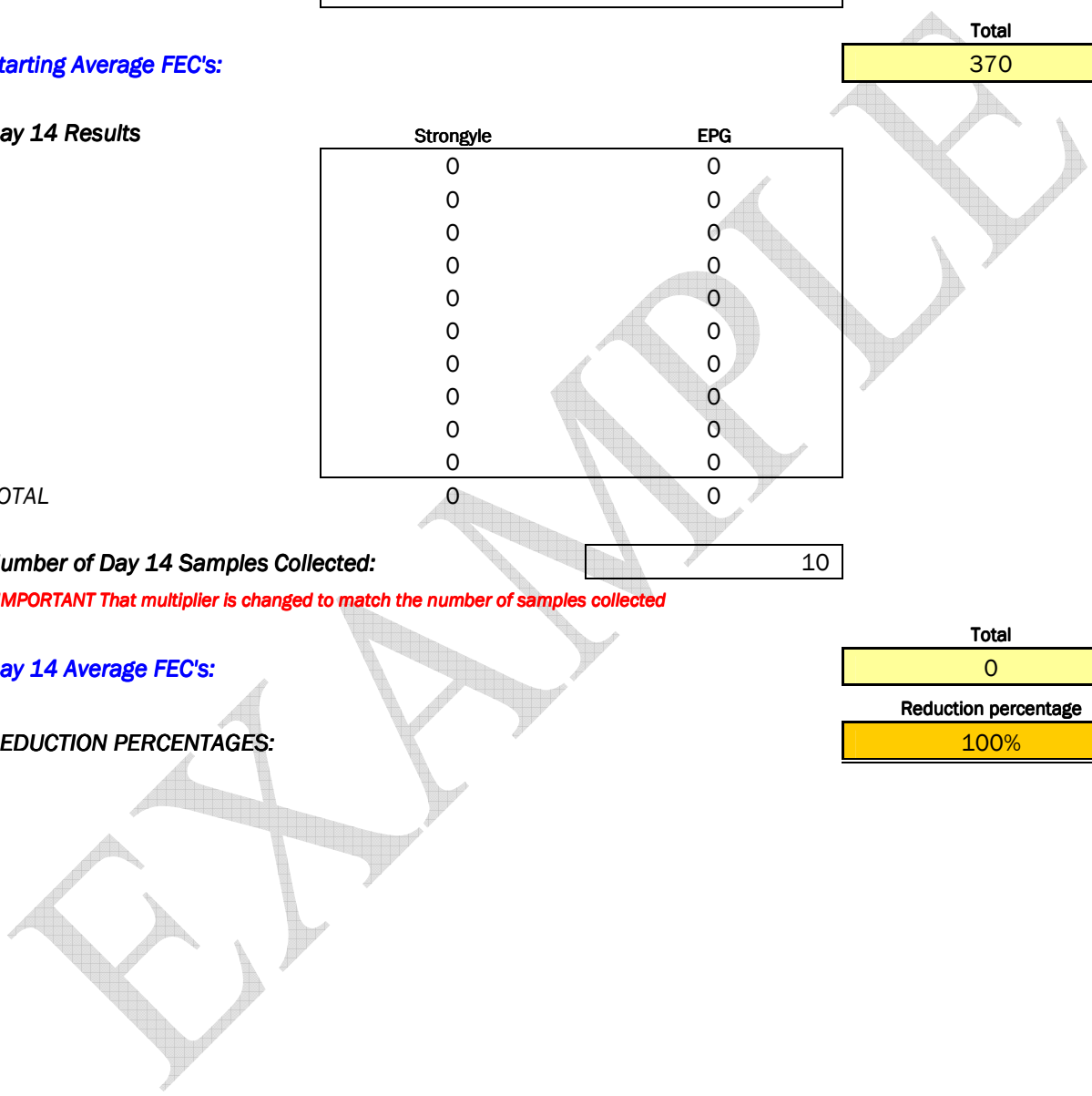
*\*IMPORTANT That multiplier is changed to match the number of samples collected*

## Day 14 Average FEC's:

Total
0

## REDUCTION PERCENTAGES:

Reduction percentage
100%



# DrenchSmart - Results

**Drench tested:** Levamisole

**Colour Code:** Yellow

**Treatment:** Oral

**Day One Result**

Strongyle	EPG
21	210
22	220

**Starting Average FEC's:**

<b>Total</b>	215
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**Day 14 Results**

Strongyle	EPG
4	40
3	30
6	60
2	20
4	40
5	50
9	90
5	50
6	60
0	0

TOTAL

44 440

**Number of Day 14 Samples Collected:**

10

*\*IMPORTANT That multiplier is changed to match the number of samples collected*

**Day 14 Average FEC's:**

<b>Total</b>	44
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**REDUCTION PERCENTAGES:**

<b>Reduction percentage</b>	80%
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## Larval Culture Results - Day 14

**Comments:** Low

Species	Reduction Percentage (%)
Haemonchus	100.0
Ostertagia /Teladorsagia	55.4
Trichostrongylus	75.8
Cooperia	100.0
Chabertia /	
Oesophagostomum	100.0

# DrenchSmart – Results

**Drench tested:**                      **Combination (BZ & Lev)**

**Colour Code:**                      **Red**

**Treatment:**    **Oral**

**Day One Result**

Strongyle	EPG
31	310
31	310

**Starting Average FEC's:**

Total
310

**Day 14 Results**

Strongyle	EPG
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

TOTAL

0                      0

**Number of Day 14 Samples Collected:**

10
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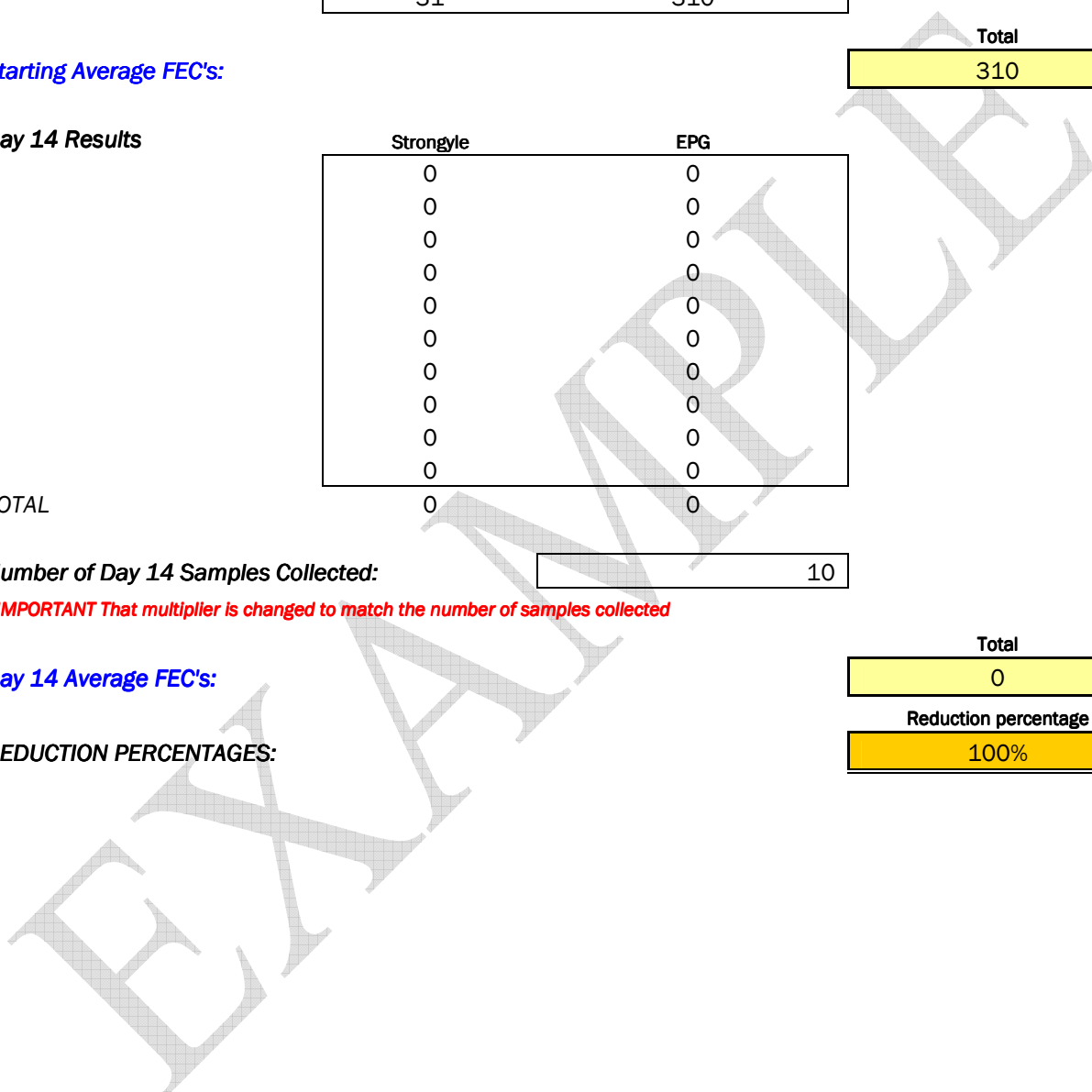
*\*IMPORTANT That multiplier is changed to match the number of samples collected*

**Day 14 Average FEC's:**

Total
0

**REDUCTION PERCENTAGES:**

Reduction percentage
100%



## DrenchSmart – Results

**Drench tested:**                      **Combination (Lev & Aba)**

**Colour Code:**                      **Pink**                                      **Treatment:**   **Oral**

**Day One Result**

Strongyle	EPG
24	240
26	260

**Starting Average FEC's:**

Total
250

**Day 14 Results**

Strongyle	EPG
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

TOTAL

0                      0

**Number of Day 14 Samples Collected:**

10
----

*\*IMPORTANT That multiplier is changed to match the number of samples collected*

**Day 14 Average FEC's:**

Total
0

**REDUCTION PERCENTAGES:**

Reduction percentage
100%

# DrenchSmart – Results

**Drench tested:** Abamectin

**Colour Code:**

Blue

**Treatment:** Pour On

**Day One Result**

Strongyle	EPG
17	170
17	170

**Starting Average FEC's:**

Total
170

**Day 14 Results**

Strongyle	EPG
0	0
4	40
0	0
1	10
0	0
0	0
0	0
0	0
0	0
0	0
0	0
5	50

TOTAL

**Number of Day 14 Samples Collected:**

10
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*\*IMPORTANT That multiplier is changed to match the number of samples collected*

**Day 14 Average FEC's:**

Total
5

**REDUCTION PERCENTAGES:**

Reduction percentage
97%

**Larval Culture Results - Day 14**

**Comments:**

Larval Culture Unsuccessful

# DrenchSmart – Results

**Drench tested:** Eprinomectin

**Colour Code:**

**Brown**

**Treatment:** Pour On

**Day One Result**

Strongyle	EPG
26	260
27	270

**Starting Average FEC's:**

Total
265

**Day 14 Results**

Strongyle	EPG
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

TOTAL

0 0

**Number of Day 14 Samples Collected:**

10
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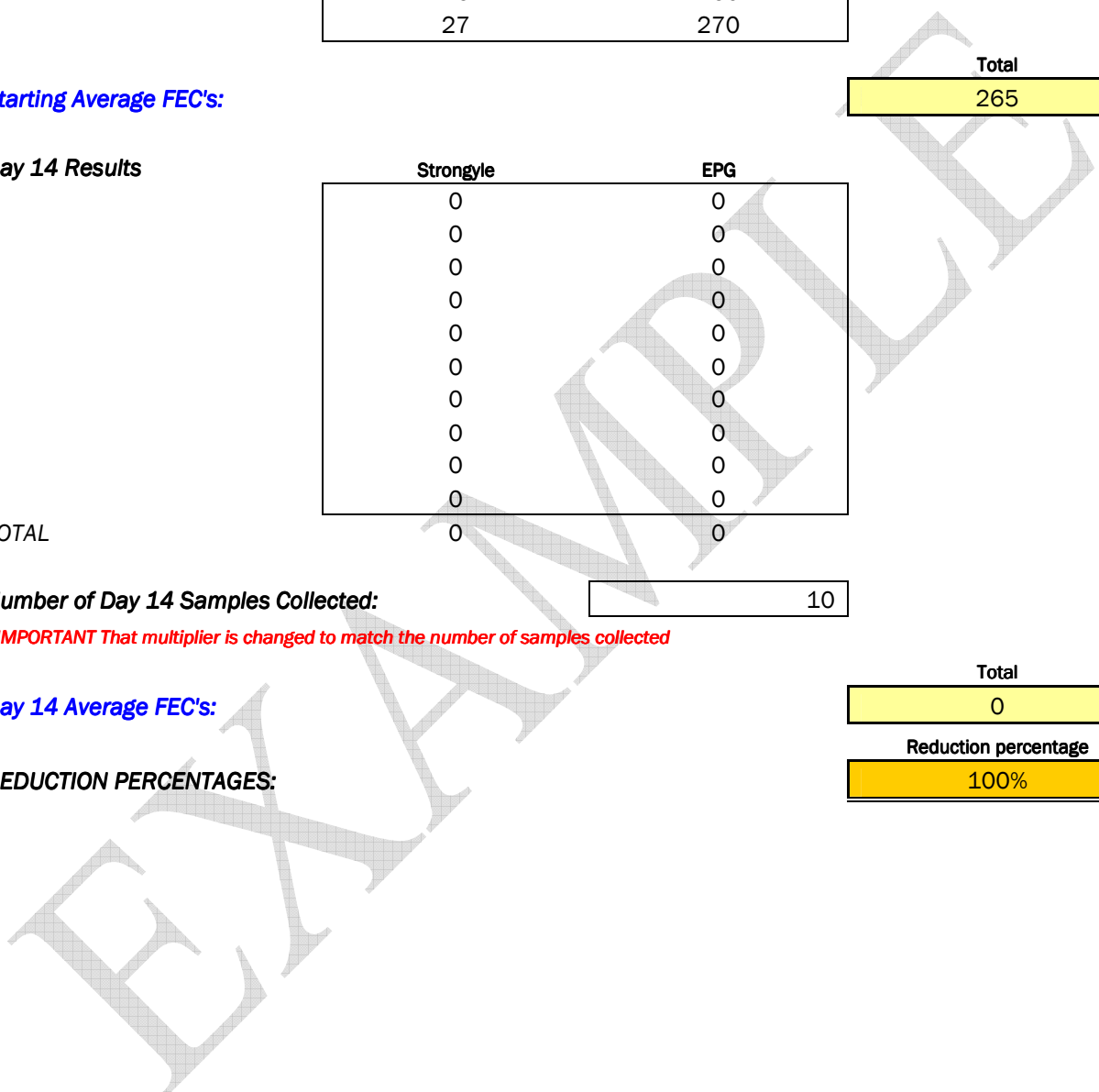
*\*IMPORTANT That multiplier is changed to match the number of samples collected*

**Day 14 Average FEC's:**

Total
0

**REDUCTION PERCENTAGES:**

Reduction percentage
100%



# DrenchSmart – Results

**Drench tested:** Doramectin

Colour Code: Green Stripe Injection

**Day One Result**

Strongyle	EPG
30	300
30	300

**Starting Average FEC's:**

<b>Total</b>
300

**Day 14 Results**

Strongyle	EPG
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

TOTAL

0 0

**Number of Day 14 Samples Collected:**

10
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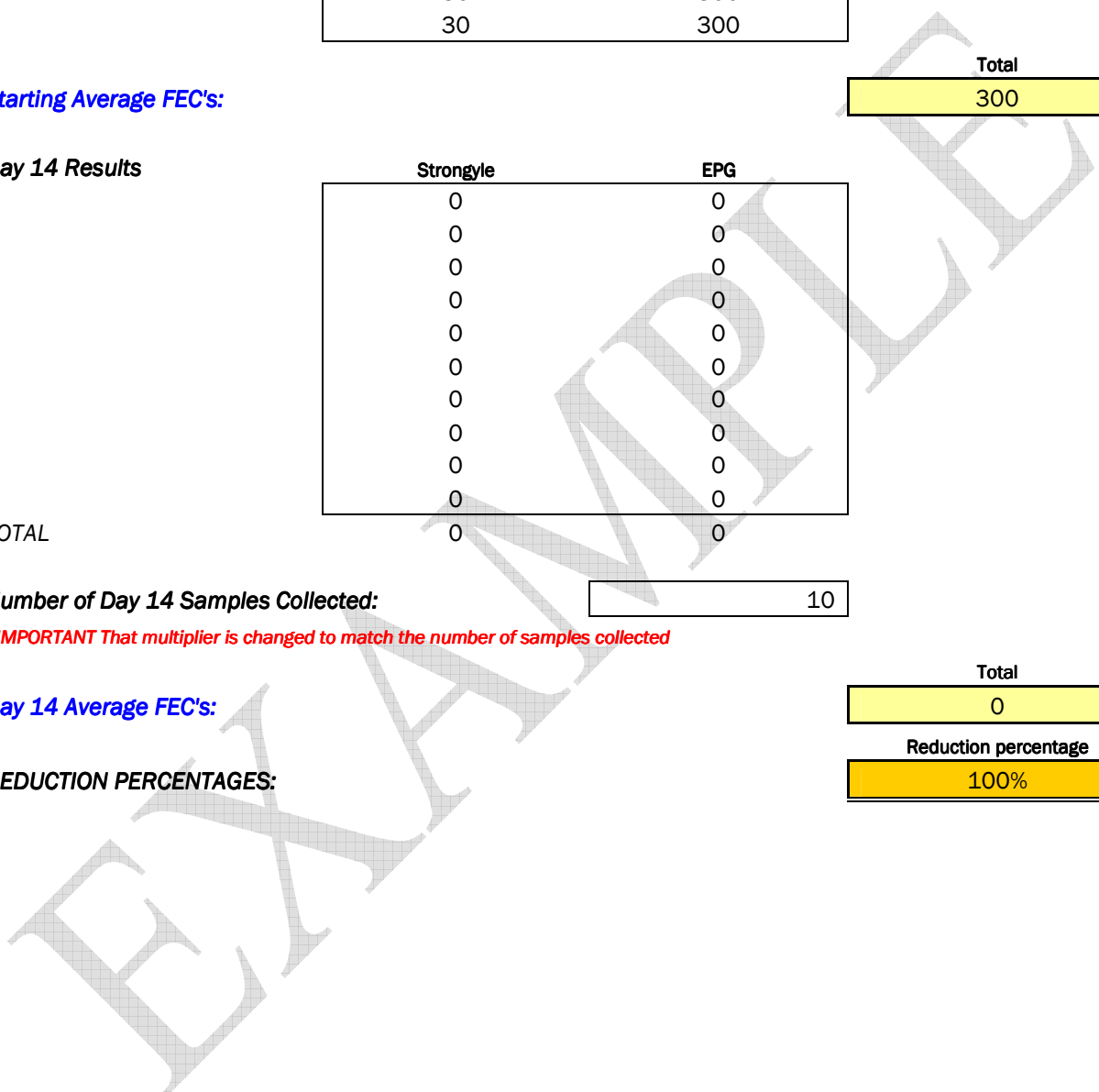
*\*IMPORTANT That multiplier is changed to match the number of samples collected*

**Day 14 Average FEC's:**

<b>Total</b>
0

**REDUCTION PERCENTAGES:**

<b>Reduction percentage</b>
100%



## *Results Interpretation and Recommendations Section*

This DrenchSmart data has been interpreted and recommendations written by  
Dr. Paul Mason – Consultant Parasitologist

If you have any queries regarding the recommendations given please do not hesitate to contact  
Paul directly

**Paul Mason  
Mason Consulting**

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Timmy Tim

12 May 2011

### Faecal Egg Count Reduction Test Recommendations

This test.....

EXAMPLE