

# BRENTON RURAL SERVICES



**Hill Laboratories**  
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited  
1 Clyde Street  
Private Bag 3205  
Hamilton 3240, New Zealand

Tel +64 7 858 2000  
Fax +64 7 858 2001  
Email mail@hill-labs.co.nz  
Web www.hill-labs.co.nz

## ANALYSIS REPORT

Page 1 of 13

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

**Sample Name:** N8 **Lab Number:** 1555081.1  
**Sample Type:** Mixed Pasture (P1)

Analysis	Level Found	Medium Range	Low	Medium	High
Nitrogen*	%	3.8	4.0 - 5.0		
Nitrogen*	%DM	4.1			
Phosphorus	%	0.47	0.38 - 0.45		
Potassium	%	2.9	2.5 - 3.0		
Sulphur	%	0.48	0.30 - 0.40		
Calcium	%	1.00	0.60 - 1.00		
Magnesium	%	0.28	0.20 - 0.30		
Sodium	%	0.290	0.150 - 0.300		
Iron	mg/kg	133	100 - 250		
Manganese	mg/kg	49	60 - 150		
Zinc	mg/kg	24	30 - 50		
Copper	mg/kg	9	10 - 12		
Boron	mg/kg	11			
Molybdenum	mg/kg	0.62	0.50 - 1.2		
Cobalt	mg/kg	0.09	0.10 - 0.20		
Selenium	mg/kg	0.02	0.08 - 0.15		
Chloride*	%	1.30	0.30 - 2.4		
Dry Matter*	%	16.2	12.0 - 30.0		
Crude Protein*	%DM	25.5	20.0 - 30.0		
Acid Detergent Fibre*	%DM	23.9	20.0 - 30.0		
Neutral Detergent Fibre*	%DM	37.8	30.0 - 45.0		
Ash*	%DM	10.2	7.0 - 14.0		
Organic Matter*	%DM	89.8			
Soluble Sugars*	%DM	7.6			
Starch*	%DM	2.0			
Crude Fat*	%DM	3.5			
Digestibility of Organic Matter in Dry Matter (DOMD)*	%	73.3	65.0 - 80.0		
Metabolisable Energy*	MJ/kgDM	11.7	9.0 - 12.0		
Non Structural Carbohydrate*	%DM	22.9			
OMD in-vivo*	%DM	81.6			
Grass Stagers Index*	me	1.0	(<1.8 recommended, >2.2 increased risk)		
K/Na Ratio*		10	(<10 recommended, >20 increased risk)		
Ca/P Ratio*		2.1	(>1.5 recommended, <1.2 increased risk)		
DCAD*	me/kg	191	(<200 recommended, >200 increased risk)		

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.



**IANZ**  
ACCREDITED LABORATORY

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked \*, which are not accredited.

# BRENTON RURAL SERVICES



**Hill Laboratories**  
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited  
1 Clyde Street  
Private Bag 3205  
Hamilton 3240, New Zealand

Tel +64 7 858 2000  
Fax +64 7 858 2001  
Email mail@hill-labs.co.nz  
Web www.hill-labs.co.nz

## ANALYSIS REPORT

Page 2 of 13

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

**Sample Name:** N14 **Lab Number:** 1555081.2  
**Sample Type:** Mixed Pasture (P1)

Analysis	Level Found	Medium Range	Low	Medium	High	
Nitrogen*	%	3.2	4.0 - 5.0			
Nitrogen*	%DM	3.4				
Phosphorus	%	0.48	0.38 - 0.45			
Potassium	%	3.3	2.5 - 3.0			
Sulphur	%	0.34	0.30 - 0.40			
Calcium	%	0.76	0.60 - 1.00			
Magnesium	%	0.20	0.20 - 0.30			
Sodium	%	0.160	0.150 - 0.300			
Iron	mg/kg	350	100 - 250			
Manganese	mg/kg	72	60 - 150			
Zinc	mg/kg	22	30 - 50			
Copper	mg/kg	8	10 - 12			
Boron	mg/kg	9				
Molybdenum	mg/kg	0.52	0.50 - 1.2			
Cobalt	mg/kg	0.19	0.10 - 0.20			
Selenium	mg/kg	0.03	0.08 - 0.15			
Chloride*	%	1.73	0.30 - 2.4			
Dry Matter*	%	17.6	12.0 - 30.0			
Crude Protein*	%DM	21.3	20.0 - 30.0			
Acid Detergent Fibre*	%DM	25.4	20.0 - 30.0			
Neutral Detergent Fibre*	%DM	43.3	30.0 - 45.0			
Ash*	%DM	10.7	7.0 - 14.0			
Organic Matter*	%DM	89.3				
Soluble Sugars*	%DM	7.4				
Starch*	%DM	0.9				
Crude Fat*	%DM	3.8				
Digestibility of Organic Matter in Dry Matter (DOMD)*	%	70.0	65.0 - 80.0			
Metabolisable Energy*	MJ/kgDM	11.2	9.0 - 12.0			
Non Structural Carbohydrate*	%DM	20.9				
OMD in-vivo*	%DM	78.4				
Grass Stagers Index*	me	1.6	(<1.8 recommended, >2.2 increased risk)			
K/Na Ratio*		21	(<10 recommended, >20 increased risk)			
Ca/P Ratio*		1.6	(>1.5 recommended, <1.2 increased risk)			
DCAD*	me/kg	215	(<200 recommended, >200 increased risk)			

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.

# BRENTON RURAL SERVICES



**Hill Laboratories**  
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited  
1 Clyde Street  
Private Bag 3205  
Hamilton 3240, New Zealand

Tel +64 7 858 2000  
Fax +64 7 858 2001  
Email mail@hill-labs.co.nz  
Web www.hill-labs.co.nz

## ANALYSIS REPORT

Page 3 of 13

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

**Sample Name:** S17 **Lab Number:** 1555081.3  
**Sample Type:** Mixed Pasture (P1)

Analysis	Level Found	Medium Range	Low	Medium	High
Nitrogen*	%	3.7	4.0 - 5.0		
Nitrogen*	%DM	3.9			
Phosphorus	%	0.48	0.38 - 0.45		
Potassium	%	3.2	2.5 - 3.0		
Sulphur	%	0.57	0.30 - 0.40		
Calcium	%	0.83	0.60 - 1.00		
Magnesium	%	0.24	0.20 - 0.30		
Sodium	%	0.169	0.150 - 0.300		
Iron	mg/kg	173	100 - 250		
Manganese	mg/kg	50	60 - 150		
Zinc	mg/kg	31	30 - 50		
Copper	mg/kg	9	10 - 12		
Boron	mg/kg	15			
Molybdenum	mg/kg	0.55	0.50 - 1.2		
Cobalt	mg/kg	0.12	0.10 - 0.20		
Selenium	mg/kg	0.02	0.08 - 0.15		
Chloride*	%	0.88	0.30 - 2.4		
Dry Matter*	%	18.2	12.0 - 30.0		
Crude Protein*	%DM	24.5	20.0 - 30.0		
Acid Detergent Fibre*	%DM	22.7	20.0 - 30.0		
Neutral Detergent Fibre*	%DM	37.8	30.0 - 45.0		
Ash*	%DM	9.7	7.0 - 14.0		
Organic Matter*	%DM	90.3			
Soluble Sugars*	%DM	9.3			
Starch*	%DM	1.2			
Crude Fat*	%DM	3.7			
Digestibility of Organic Matter in Dry Matter (DOMD)*	%	73.7	65.0 - 80.0		
Metabolisable Energy*	MJ/kgDM	11.8	9.0 - 12.0		
Non Structural Carbohydrate*	%DM	24.4			
OMD in-vivo*	%DM	81.6			
Grass Stagers Index*	me	1.3	(<1.8 recommended, >2.2 increased risk)		
K/Na Ratio*		19	(<10 recommended, >20 increased risk)		
Ca/P Ratio*		1.7	(>1.5 recommended, <1.2 increased risk)		
DCAD*	me/kg	277	(<200 recommended, >200 increased risk)		

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.

# BRENTON RURAL SERVICES



**Hill Laboratories**  
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited  
1 Clyde Street  
Private Bag 3205  
Hamilton 3240, New Zealand

Tel +64 7 858 2000  
Fax +64 7 858 2001  
Email mail@hill-labs.co.nz  
Web www.hill-labs.co.nz

## ANALYSIS REPORT

Page 4 of 13

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

**Sample Name:** S19 **Lab Number:** 1555081.4  
**Sample Type:** Mixed Pasture (P1)

Analysis	Level Found	Medium Range	Low	Medium	High	
Nitrogen*	%	3.5	4.0 - 5.0			
Nitrogen*	%DM	3.7				
Phosphorus	%	0.48	0.38 - 0.45			
Potassium	%	2.9	2.5 - 3.0			
Sulphur	%	0.59	0.30 - 0.40			
Calcium	%	0.86	0.60 - 1.00			
Magnesium	%	0.27	0.20 - 0.30			
Sodium	%	0.227	0.150 - 0.300			
Iron	mg/kg	157	100 - 250			
Manganese	mg/kg	48	60 - 150			
Zinc	mg/kg	30	30 - 50			
Copper	mg/kg	9	10 - 12			
Boron	mg/kg	20				
Molybdenum	mg/kg	0.49	0.50 - 1.2			
Cobalt	mg/kg	0.09	0.10 - 0.20			
Selenium	mg/kg	0.11	0.08 - 0.15			
Chloride*	%	1.01	0.30 - 2.4			
Dry Matter*	%	18.2	12.0 - 30.0			
Crude Protein*	%DM	23.2	20.0 - 30.0			
Acid Detergent Fibre*	%DM	24.1	20.0 - 30.0			
Neutral Detergent Fibre*	%DM	41.4	30.0 - 45.0			
Ash*	%DM	9.6	7.0 - 14.0			
Organic Matter*	%DM	90.4				
Soluble Sugars*	%DM	8.6				
Starch*	%DM	0.8				
Crude Fat*	%DM	3.6				
Digestibility of Organic Matter in Dry Matter (DOMD)*	%	70.8	65.0 - 80.0			
Metabolisable Energy*	MJ/kgDM	11.3	9.0 - 12.0			
Non Structural Carbohydrate*	%DM	22.2				
OMD in-vivo*	%DM	78.3				
Grass Stagers Index*	me	1.2	(<1.8 recommended, >2.2 increased risk)			
K/Na Ratio*		13	(<10 recommended, >20 increased risk)			
Ca/P Ratio*		1.8	(>1.5 recommended, <1.2 increased risk)			
DCAD*	me/kg	197	(<200 recommended, >200 increased risk)			

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.



### ANALYSIS REPORT

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

### ANIMAL DIETARY MINERAL BALANCE

**Sample Name:** N8 **Lab Number:** 1555081.1  
**Sample Type:** Mixed Pasture (P1)

Analysis	Daily Intake	Daily Req.	Nutrient Bal.	Deficit	Satisfactory	Surplus
Nitrogen*	457 g	360 g	97 g		N	
Phosphorus	57 g	40 g	17 g		P	
Potassium	343 g	168 g	175 g		K	
Sulphur	58 g	28 g	30 g		S	
Calcium	120 g	61 g	59 g		Ca	
Magnesium	33 g	30 g	3.0 g		Mg	
Sodium	35 g	30 g	5 g		Na	
Iron	1,600 mg	720 mg	880 mg		Fe	
Manganese	590 mg	600 mg	-10 mg		Mn	
Zinc	282 mg	480 mg	-200 mg		Zn	
Copper	112 mg	120 mg	-8.0 mg		Cu	
Boron	131 mg	0.0 mg	131 mg		B	
Molybdenum	7.5 mg	4.2 mg	3.3 mg		Mo	
Cobalt	1.0 mg	1.2 mg	-0.20 mg		Co	
Selenium	0.22 mg	1.2 mg	-0.98 mg		Se	
Chloride*	156 g	120 g	36 g		Cl	
Species*	Dairy					
Live Weight*	kg	400	(Assumed)			
Daily Intake*	kg	12	(Assumed)			
Calving Month*	7 (Assumed)					
Period*	Late Lactation (Assumed)					
Grass Staggers Index*	me	1.0	(<1.8 recommended, >2.2 increased risk)			
K/Na Ratio*	10 (<10 recommended, >20 increased risk)					
Ca/P Ratio*	2.1 (>1.5 recommended, <1.2 increased risk)					
DCAD*	me/kg	191	(<200 recommended, >200 increased risk)			

**Note 1:** This Mineral Balance Report should be viewed in conjunction with the Hill Laboratories' Analysis Results. Note that the graphs on the Analysis Results account for both plant and animal requirements, whereas this balance report is only for the animal requirements.  
**Note 2:** This report converts the analysis results to daily animal intake levels, and compares these to nominated requirements, providing a basis for determining the mineral balance (deficits or surpluses) of minerals in the sample as received.  
**Note 3:** Dietary copper absorption is significantly affected by nutrient interactions, but no suitable index or ratio calculation is available at this time. High levels of molybdenum, sulphur and iron will all depress copper uptake.



### ANALYSIS REPORT

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

### ANIMAL DIETARY MINERAL BALANCE

**Sample Name:** N14 **Lab Number:** 1555081.2

**Sample Type:** Mixed Pasture (P1)

Analysis	Daily Intake	Daily Req.	Nutrient Bal.	Deficit	Satisfactory	Surplus
Nitrogen*	387 g	360 g	27 g		N	
Phosphorus	57 g	40 g	17 g		P	
Potassium	396 g	168 g	228 g		K	
Sulphur	41 g	28 g	13 g		S	
Calcium	91 g	61 g	30 g		Ca	
Magnesium	24 g	30 g	-6.0 g		Mg	
Sodium	19 g	30 g	-11 g		Na	
Iron	4,200 mg	720 mg	3,480 mg		Fe	
Manganese	869 mg	600 mg	269 mg		Mn	
Zinc	263 mg	480 mg	-220 mg		Zn	
Copper	97 mg	120 mg	-23 mg		Cu	
Boron	103 mg	0.0 mg	103 mg		B	
Molybdenum	6.2 mg	4.2 mg	2.0 mg		Mo	
Cobalt	2.2 mg	1.2 mg	1.0 mg		Co	
Selenium	0.42 mg	1.2 mg	-0.78 mg		Se	
Chloride*	208 g	120 g	88 g		Cl	
Species*		Dairy				
Live Weight*	kg	400	(Assumed)			
Daily Intake*	kg	12	(Assumed)			
Calving Month*		7	(Assumed)			
Period*		Late Lactation	(Assumed)			
Grass Stagers Index*	me	1.6	(<1.8 recommended, >2.2 increased risk)			
K/Na Ratio*		21	(<10 recommended, >20 increased risk)			
Ca/P Ratio*		1.6	(>1.5 recommended, <1.2 increased risk)			
DCAD*	me/kg	215	(<200 recommended, >200 increased risk)			

**Note 1:** This Mineral Balance Report should be viewed in conjunction with the Hill Laboratories' Analysis Results. Note that the graphs on the Analysis Results account for both plant and animal requirements, whereas this balance report is only for the animal requirements.

**Note 2:** This report converts the analysis results to daily animal intake levels, and compares these to nominated requirements, providing a basis for determining the mineral balance (deficits or surpluses) of minerals in the sample as received.

**Note 3:** Dietary copper absorption is significantly affected by nutrient interactions, but no suitable index or ratio calculation is available at this time. High levels of molybdenum, sulphur and iron will all depress copper uptake.





### ANALYSIS REPORT

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

### ANIMAL DIETARY MINERAL BALANCE

**Sample Name:** S17 **Lab Number:** 1555081.3

**Sample Type:** Mixed Pasture (P1)

Analysis	Daily Intake	Daily Req.	Nutrient Bal.	Deficit	Satisfactory	Surplus
Nitrogen*	439 g	360 g	79 g		N	
Phosphorus	58 g	40 g	18 g		P	
Potassium	379 g	168 g	211 g		K	
Sulphur	69 g	28 g	41 g		S	
Calcium	99 g	61 g	38 g		Ca	
Magnesium	29 g	30 g	-1 g		Mg	
Sodium	20 g	30 g	-10 g		Na	
Iron	2,080 mg	720 mg	1,360 mg		Fe	
Manganese	595 mg	600 mg	-5.0 mg		Mn	
Zinc	370 mg	480 mg	-110 mg		Zn	
Copper	114 mg	120 mg	-6.0 mg		Cu	
Boron	181 mg	0.0 mg	181 mg		B	
Molybdenum	6.6 mg	4.2 mg	2.4 mg		Mo	
Cobalt	1.4 mg	1.2 mg	0.20 mg		Co	
Selenium	0.19 mg	1.2 mg	-1.0 mg		Se	
Chloride*	105 g	120 g	-15 g		Cl	
Species*	Dairy					
Live Weight*	kg	400	(Assumed)			
Daily Intake*	kg	12	(Assumed)			
Calving Month*	7 (Assumed)					
Period*	Late Lactation (Assumed)					
Grass Staggers Index*	me	1.3	(<1.8 recommended, >2.2 increased risk)			
K/Na Ratio*		19	(<10 recommended, >20 increased risk)			
Ca/P Ratio*		1.7	(>1.5 recommended, <1.2 increased risk)			
DCAD*	me/kg	277	(<200 recommended, >200 increased risk)			

**Note 1:** This Mineral Balance Report should be viewed in conjunction with the Hill Laboratories' Analysis Results. Note that the graphs on the Analysis Results account for both plant and animal requirements, whereas this balance report is only for the animal requirements.

**Note 2:** This report converts the analysis results to daily animal intake levels, and compares these to nominated requirements, providing a basis for determining the mineral balance (deficits or surpluses) of minerals in the sample as received.

**Note 3:** Dietary copper absorption is significantly affected by nutrient interactions, but no suitable index or ratio calculation is available at this time. High levels of molybdenum, sulphur and iron will all depress copper uptake.



### ANALYSIS REPORT

<b>Client:</b> Casey & Solly Limited	<b>Lab No:</b> 1555081	shvpv1
<b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b> 21-Mar-2016	
	<b>Date Reported:</b> 23-Mar-2016	
	<b>Quote No:</b> 58132	
	<b>Order No:</b>	
	<b>Client Reference:</b>	
	<b>Submitted By:</b> M Brenton	

### ANIMAL DIETARY MINERAL BALANCE

**Sample Name:** S19 **Lab Number:** 1555081.4

**Sample Type:** Mixed Pasture (P1)

Analysis	Daily Intake	Daily Req.	Nutrient Bal.	Deficit	Satisfactory	Surplus
Nitrogen*	417 g	360 g	57 g		N	
Phosphorus	58 g	40 g	18 g		P	
Potassium	352 g	168 g	184 g		K	
Sulphur	71 g	28 g	43 g		S	
Calcium	104 g	61 g	43 g		Ca	
Magnesium	32 g	30 g	2.0 g		Mg	
Sodium	27 g	30 g	-3.0 g		Na	
Iron	1,880 mg	720 mg	1,160 mg		Fe	
Manganese	574 mg	600 mg	-26 mg		Mn	
Zinc	358 mg	480 mg	-120 mg		Zn	
Copper	110 mg	120 mg	-10 mg		Cu	
Boron	239 mg	0.0 mg	239 mg		B	
Molybdenum	5.9 mg	4.2 mg	1.7 mg		Mo	
Cobalt	1.1 mg	1.2 mg	-0.10 mg		Co	
Selenium	1.3 mg	1.2 mg	0.10 mg		Se	
Chloride*	121 g	120 g	1.0 g		Cl	
Species*		Dairy				
Live Weight*	kg	400	(Assumed)			
Daily Intake*	kg	12	(Assumed)			
Calving Month*		7	(Assumed)			
Period*		Late Lactation	(Assumed)			
Grass Staggers Index*	me	1.2	(<1.8 recommended, >2.2 increased risk)			
K/Na Ratio*		13	(<10 recommended, >20 increased risk)			
Ca/P Ratio*		1.8	(>1.5 recommended, <1.2 increased risk)			
DCAD*	me/kg	197	(<200 recommended, >200 increased risk)			

**Note 1:** This Mineral Balance Report should be viewed in conjunction with the Hill Laboratories' Analysis Results. Note that the graphs on the Analysis Results account for both plant and animal requirements, whereas this balance report is only for the animal requirements.

**Note 2:** This report converts the analysis results to daily animal intake levels, and compares these to nominated requirements, providing a basis for determining the mineral balance (deficits or surpluses) of minerals in the sample as received.

**Note 3:** Dietary copper absorption is significantly affected by nutrient interactions, but no suitable index or ratio calculation is available at this time. High levels of molybdenum, sulphur and iron will all depress copper uptake.



# BRENTON RURAL SERVICES



**Hill Laboratories**  
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited  
1 Clyde Street  
Private Bag 3205  
Hamilton 3240, New Zealand

Tel +64 7 858 2000  
Fax +64 7 858 2001  
Email mail@hill-labs.co.nz  
Web www.hill-labs.co.nz

## ANALYSIS REPORT

Page 9 of 13

<b>Client:</b>	Casey & Solly Limited	<b>Lab No:</b>	1555081	shvpv1
<b>Address:</b>	815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b>	21-Mar-2016	
		<b>Date Reported:</b>	23-Mar-2016	
		<b>Quote No:</b>	58132	
		<b>Order No:</b>		
		<b>Client Reference:</b>		
		<b>Submitted By:</b>	M Brenton	

### Plant Analysis Results

Sample Name:	N8	N14	S17	S19		
<b>Lab Number:</b>	1555081.1	1555081.2	1555081.3	1555081.4		
<b>Sample Type:</b>	Mixed Pasture	Mixed Pasture	Mixed Pasture	Mixed Pasture		
<b>Sample Type Code:</b>	P1	P1	P1	P1		
Nitrogen* %	3.8	3.2	3.7	3.5	-	-
Nitrogen* %DM	4.1	3.4	3.9	3.7	-	-
Phosphorus %	0.47	0.48	0.48	0.48	-	-
Potassium %	2.9	3.3	3.2	2.9	-	-
Sulphur %	0.48	0.34	0.57	0.59	-	-
Calcium %	1.00	0.76	0.83	0.86	-	-
Magnesium %	0.28	0.20	0.24	0.27	-	-
Sodium %	0.290	0.160	0.169	0.227	-	-
Iron mg/kg	133	350	173	157	-	-
Manganese mg/kg	49	72	50	48	-	-
Zinc mg/kg	24	22	31	30	-	-
Copper mg/kg	9	8	9	9	-	-
Boron mg/kg	11	9	15	20	-	-
Molybdenum mg/kg	0.62	0.52	0.55	0.49	-	-
Cobalt mg/kg	0.09	0.19	0.12	0.09	-	-
Selenium mg/kg	0.02	0.03	0.02	0.11	-	-
Chloride* %	1.30	1.73	0.88	1.01	-	-
Dry Matter* %	16.2	17.6	18.2	18.2	-	-
Crude Protein* %DM	25.5	21.3	24.5	23.2	-	-
Acid Detergent Fibre* %DM	23.9	25.4	22.7	24.1	-	-
Neutral Detergent Fibre* %DM	37.8	43.3	37.8	41.4	-	-
Ash* %DM	10.2	10.7	9.7	9.6	-	-
Organic Matter* %DM	89.8	89.3	90.3	90.4	-	-
Soluble Sugars* %DM	7.6	7.4	9.3	8.6	-	-
Starch* %DM	2.0	0.9	1.2	0.8	-	-
Crude Fat* %DM	3.5	3.8	3.7	3.6	-	-
Digestibility of Organic Matter in Dry Matter (DOMD)* %	73.3	70.0	73.7	70.8	-	-
Metabolisable Energy* MJ/kgDM	11.7	11.2	11.8	11.3	-	-
Non Structural Carbohydrate* %DM	22.9	20.9	24.4	22.2	-	-
OMD in-vivo* %DM	81.6	78.4	81.6	78.3	-	-
Grass Stagers Index* me	1.0	1.6	1.3	1.2	-	-

# BRENTON RURAL SERVICES



**Hill Laboratories**  
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited  
1 Clyde Street  
Private Bag 3205  
Hamilton 3240, New Zealand

Tel +64 7 858 2000  
Fax +64 7 858 2001  
Email [mail@hill-labs.co.nz](mailto:mail@hill-labs.co.nz)  
Web [www.hill-labs.co.nz](http://www.hill-labs.co.nz)

## ANALYSIS REPORT Page 10 of 13

<b>Client:</b>	Casey & Solly Limited	<b>Lab No:</b>	1555081	shvpv1
<b>Address:</b>	815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b>	21-Mar-2016	
		<b>Date Reported:</b>	23-Mar-2016	
		<b>Quote No:</b>	58132	
		<b>Order No:</b>		
		<b>Client Reference:</b>		
		<b>Submitted By:</b>	M Brenton	

Plant Analysis Results						
Sample Name:	N8	N14	S17	S19		
Lab Number:	1555081.1	1555081.2	1555081.3	1555081.4		
Sample Type:	Mixed Pasture	Mixed Pasture	Mixed Pasture	Mixed Pasture		
Sample Type Code:	P1	P1	P1	P1		
K/Na Ratio*	10	21	19	13	-	-
Ca/P Ratio*	2.1	1.6	1.7	1.8	-	-
DCAD* me/kg	191	215	277	197	-	-



## ANALYSIS REPORT

<b>Client:</b>	Casey & Solly Limited	<b>Lab No:</b>	1555081	shvpv1
<b>Address:</b>	815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b>	21-Mar-2016	
		<b>Date Reported:</b>	23-Mar-2016	
		<b>Quote No:</b>	58132	
		<b>Order No:</b>		
		<b>Client Reference:</b>		
		<b>Submitted By:</b>	M Brenton	

### Analyst's Comments

#### Samples 1-4 Comment:

The nutrient ratio indices have been calculated to assist in evaluating the suitability of this sample as a dairy feed. Although based on published calculations, they should be used with caution, as metabolic disorders can be induced by a multitude of factors, and not just these nutrient ratios alone. For further details of the calculations, please contact this laboratory. Note that the nutrient balances and indices are calculated on the basis that the pasture/forage tested is the total animal diet. These may not be appropriate where additional supplements are included in the animal diet.

#### Samples 1-4 Comment:

Typical DM% values range from: 12-15% (spring); 15-20% (summer); 20-30% (summer dry); 13-18% (aut/winter); above 30% (wilted herbage for silage/balage).

#### Samples 1-4 Comment:

The medium ranges shown are the higher of either the minimum requirement for lush grass growth or animal nutritional requirements fed on an 'ad-lib' basis.

#### Samples 1-4 Comment:

The boron level in mixed herbage is especially difficult to interpret. This is because grasses typically have 5 - 10 mg/kg and clover 18 - 25 mg/kg, making the mixed herbage B level very dependent upon the relative proportions of grass and clover in the sample. It is further complicated by the natural seasonal trend of low levels of boron during winter/spring c.f. higher levels in summer/autumn. As a consequence, we no longer provide a graphical interpretation for B in mixed herbage. A clover-only sample is recommended for monitoring boron status in pasture.

#### Samples 1-4 Comment:

The starch analysis is not a precise test at low levels (0 - 10%). Low levels of starch reported are therefore not reliable and must be interpreted with caution.

#### Samples 1-4 Comment:

The medium range guidelines shown in the histogram report relate to sampling protocols as per Hill Laboratories' crop guides and are based on reference values where these are published. Results for samples collected at different growth stages or from different plant parts than those described in the crop guide should be interpreted with caution.

#### Samples 1-4 Comment:

Iron levels greater than 350 mg/kg indicate some soil contamination is present on the herbage sample. This may result in an elevated cobalt level due to soil containing significantly higher levels of cobalt than herbage.

## SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Plant			
Test	Method Description	Default Detection Limit	Sample No
Sample Registration*	Samples were registered according to instructions received.	-	1-4
Plant Prep (Dry & Grind)*	Oven dried at 62°C overnight and ground to pass through a 1.0mm screen. Analytical results are reported from this sample fraction and are not corrected for residual moisture (typically 5%), unless units denoted as %DM.	-	1-4



## ANALYSIS REPORT

<b>Client:</b>	Casey & Solly Limited	<b>Lab No:</b>	1555081	shvpv1
<b>Address:</b>	815 Back Track Road RD 12 Rakaia 7782	<b>Date Registered:</b>	21-Mar-2016	
		<b>Date Reported:</b>	23-Mar-2016	
		<b>Quote No:</b>	58132	
		<b>Order No:</b>		
		<b>Client Reference:</b>		
		<b>Submitted By:</b>	M Brenton	

Sample Type: Plant			
Test	Method Description	Default Detection Limit	Sample No
Nitrogen*	Either estimated by NIR (calibration based on N by Dumas combustion) or Dumas combustion. Reported on DM basis.	0.1 %DM	1-4
Nitrogen*	Estimated by NIR, calibration based on N by Dumas combustion. Result not corrected for residual moisture (typically 5%).	0.1 %	1-4
Phosphorus	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	1-4
Potassium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.1 %	1-4
Sulphur	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	1-4
Calcium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	1-4
Magnesium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	1-4
Sodium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.002 %	1-4
Iron	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	5 mg/kg	1-4
Manganese	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	3 mg/kg	1-4
Zinc	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	2 mg/kg	1-4
Copper	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	1 mg/kg	1-4
Boron	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	1 mg/kg	1-4
Molybdenum	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-MS.	0.02 mg/kg	1-4
Cobalt	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-MS.	0.01 mg/kg	1-4
Selenium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-MS.	0.01 mg/kg	1-4
Chloride*	Estimated by NIR, calibration based on 2% acetic acid extraction, potentiometric titration.	0.05 %	1-4
Dry Matter*	Weight Loss on drying at 105°C for 24 hours. (Silage corrected for loss of volatiles) Analysed at Hill Laboratories - 25 Te Aroha Street, Hamilton.	0.5 %	1-4
Crude Protein*	Nitrogen multiplied by 6.25. Reported on DM basis.	0.5 %DM	1-4
Acid Detergent Fibre*	Estimated by NIR (calibration based on ADF by a modified NFTA method). Reported on DM basis.	1.5 %	1-4
Neutral Detergent Fibre*	Estimated by NIR, calibration based on NDF by NFTA method. Reported on DM basis.	1.5 %	1-4
Ash*	Estimated by NIR, calibration based on weight loss after ashing at 600°C for two hours. Reported on DM basis.	0.5 %	1-4
Organic Matter*	Organic Matter is 100 - Ash. Reported on DM basis.	0.5 %DM	1-4
Organic Matter Digestibility (in-vitro)*	Organic Matter Digestibility (OMD) estimated by NIR, calibration based on AFIA (Australian Fodder Industry Association) Pepsin-Cellulase procedure.	1.0 %	1-4
Digestibility of Organic Matter in Dry Matter (DOMD)*	Calculated from Organic Matter Digestibility (OMD) using AFIA (Australian Fodder Industry Association) Standard Equation.	0.5 %	1-4
Metabolisable Energy*	Calculated from Dry Organic Matter Digestibility (DOMD) using AFRC and Lincoln University standard formulae.	0.5 MJ/kgDM	1-4
Soluble Sugars*	Estimated by NIR, calibration based on an 80:20 ethanol:water extraction and colorimetric determination. Reported on DM basis.	0.5 %	1-4



## ANALYSIS REPORT

Page 13 of 13

<b>Client:</b> Casey & Solly Limited <b>Address:</b> 815 Back Track Road RD 12 Rakaia 7782	<b>Lab No:</b> 1555081 <b>Date Registered:</b> 21-Mar-2016 <b>Date Reported:</b> 23-Mar-2016 <b>Quote No:</b> 58132 <b>Order No:</b> <b>Client Reference:</b> <b>Submitted By:</b> M Brenton	shvpv1
-----------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------

Sample Type: Plant			
Test	Method Description	Default Detection Limit	Sample No
Starch*	Estimated by NIR, calibration based on Enzymic Hydrolysis of Starch. Reported on DM basis.	0.5 %	1-4
Crude Fat*	Estimated by NIR, calibration based on Petroleum Spirit extraction by Ankom auto analyser, AOCS Official Procedure AM-5-04. Reported on a Dry Matter basis.	0.5 %	1-4
OMD in-vivo*	Organic Matter Digestibility in-vivo (OMD in-vivo) determined using AFIA (Australian Fodder Industry Association) in vitro Pepsin-Cellulase procedure and derived as in-vivo using a linear regression based on calibration samples from Lincoln University. Reported on DM basis.	1.0 %DM	1-4
Non Structural Carbohydrate*	NSC = 100 - (CP + Ash + CFat + NDF). Reported on DM basis.	0.5 %DM	1-4

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Shelley Edhouse  
Quality Assurance Coordinator - Agriculture Division