Hill Laboratories
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Client:	Westervelt Honey Limited	**Lab No:**	1734862	SPv1
Contact:	Chris Bowman	**Date Received:**	06-Mar-2017	
	C/- Westervelt Honey Limited	**Date Reported:**	13-Mar-2017	
	PO Box 1941	**Quote No:**	63162	
	Taupo 3351	**Order No:**	SORD1799	
		Client Reference:		
		Submitted By:	Gabriela Dawson	

Sample Type: Honey

		Sample Name:	WHB1208 28-Feb-2017	WHB1209 28-Feb-2017	WHB1210 28-Feb-2017		
		Lab Number:	1734862.1	1734862.2	1734862.3		
Aerobic Plate Count 35°C	cfu / g		190 #1	50 #1	230 #1	-	-
Yeasts	cfu / g		< 50 #1	< 50 #1	< 50 #1	-	-
Moulds	cfu / g		< 50 #1	< 50 #1	< 50 #1	-	-
Yeasts & Moulds	cfu / g		< 50	< 50	< 50	-	-

Analyst's Comments

#1 Statistically estimated count based on the theoretical countable range for the stated method.

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: Honey

Test	Method Description	Default Detection Limit	Sample No
Aerobic Plate Count 35°C	Count on APC Petrifilm, Incubated at 35°C for 48 hours. Analysed at Hill Laboratories - Microbiology; 101C Waterloo Road, Christchurch. APHA 8.82 5th Ed.	10 cfu / g	1-3
Yeasts & Moulds	Spread plate, Count on DRBC agar, Incubated at 22-25°C for 5 days. Analysed at Hill Laboratories - Microbiology; 101C Waterloo Road, Christchurch. APHA 21.5 5th Ed.	50 cfu / g	1-3

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.

Lisa McCabe BAppSc
Team Leader - Microbiology

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Client:	Westervelt Honey Limited	**Lab No:**	1734207	SPv1
Contact:	Chris Bowman	**Date Received:**	03-Mar-2017	
	C/- Westervelt Honey Limited	**Date Reported:**	09-Mar-2017	
	PO Box 1941	**Quote No:**	63162	
	Taupo 3351	**Order No:**	SORD1799	
		Client Reference:		
		Submitted By:	Gabriela Dawson	

Sample Type: Honey

Sample Name:		WHB1208 28-Feb-2017	WHB1209 28-Feb-2017	WHB1210 28-Feb-2017		
Lab Number:		1734207.1	1734207.2	1734207.3		
C-4 Sugars Analysis						
δ ^{13}C Honey (Whole)	‰	-26.0	-25.3	-26.7	-	-
δ ^{13}C Honey (Protein)	‰	-26.6	-26.6	-26.9	-	-
Difference (Whole - Protein)	‰	0.6	1.2	0.2	-	-
C-4 Sugar Content	%	3.6	7.4	0.9	-	-

Analyst's Comments

Samples 1-3 Comment:
C-4 Sugar Content:
As reported in AOAC method 998.12, pure honey (free of corn or cane sugars) with an exception of a few unusual varieties, yields a C-4 Sugar Content value of less than or equal to 7%. Some unusual varieties may slightly exceed this value, but will have a d ^{13}C for honey which is in the normal range (more negative than -24.0‰).

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: Honey

Test	Method Description	Default Detection Limit	Sample No
C-4 Sugars Analysis (AOAC Method)	Methodology was performed in accordance with AOAC Official Method 998.12 (Revised First Edition 2013), C-4 Plant Sugars in Honey, using Internal Standard Stable Carbon Isotope Ratio Analysis (ISCIRA). All isotope ratios are reported as 'per mil' i.e. parts per thousand (‰), relative to the international standard for Carbon, VPDB. Analysis performed at Hill Laboratories - Food & Bioanalytical Division, Waikato Innovation Park, Ruakura Lane, Hamilton.	-	1-3

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Helen McGowan BSc (Tech)
Senior Laboratory Technician - Food & Bioanalytical

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Client:	Westervelt Honey Limited	**Lab No:**	1734181	SPv1
Contact:	Chris Bowman	**Date Received:**	03-Mar-2017	
	C/- Westervelt Honey Limited	**Date Reported:**	07-Mar-2017	
	PO Box 1941	**Quote No:**	63162	
	Taupo 3351	**Order No:**	SORD1799	
		Client Reference:		
		Submitted By:	Gabriela Dawson	

Sample Type: Honey

Sample Name:		WHB1208 28-Feb-2017	WHB1209 28-Feb-2017	WHB1210 28-Feb-2017		
Lab Number:		1734181.1	1734181.2	1734181.3		
Individual Tests						
Leptosperin*	mg/kg	540	710	-	-	-
NPA (Non Peroxide Activity)	% Phenol Equivalent	9.9	13.0	3.0	-	-
3-in-1 Honey Analysis						
Dihydroxyacetone	mg/kg	1,070	1,340	84	-	-
5-hydroxymethylfurfural (HMF)	mg/kg	14.8	25	22	-	-
Methylglyoxal	mg/kg	256	405	36	-	-
Tutin Analysis in Honey (Individual Samples)						
Tutin	mg/kg	0.36	0.024	< 0.010	-	-
MRL as per Tutin in Honey Food Standard 2016	mg/kg	0.70	0.70	0.70	-	-
Tutin Result Evaluation	Pass/Fail	PASS	PASS	PASS	-	-

Analyst's Comments

Sample 3 Comment:
NPA results less than 5 are estimated from extrapolation of the correlation curve and are indicative only.

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: Honey

Test	Method Description	Default Detection Limit	Sample No
3-in-1 Honey Analysis	Water extraction, derivatisation, UPLC-UV analysis (dihydroxyacetone, 5-hydroxymethylfurfural, methylglyoxal). Analysis performed at Hill Laboratories - Food & Bioanalytical Division, Waikato Innovation Park, Ruakura Lane, Hamilton.	1.0 - 10 mg/kg	1-3
Leptosperin*	Aqueous extraction, dilution, analysis by LC-MS/MS.	15 mg/kg	1-2
NPA (Non Peroxide Activity)	NPA is calculated from methylglyoxal using a correlation curve based on published data for NPA and the primary active ingredient, methylglyoxal. (1,2) Analysis performed at Hill Laboratories - Food & Bioanalytical Division, Waikato Innovation Park, Ruakura Lane, Hamilton. (1) Isolation by HPLC and characterisation of the bioactive fraction of New Zealand manuka (Leptospermum scoparium) honey. C. J. Adams, et al. Carbohydrate Research 343 (2008) 651-659. (2) Corrigendum to "Isolation by HPLC and characterization of the bioactive fraction of New Zealand manuka (Leptospermum scoparium) honey" [Carbohydr. Res. 343 (2008) 651]. C. J. Adams, et al. Carbohydrate Research 344 (2009) 2609.	1.0 % Phenol Equivalent	1-3

Sample Type: Honey			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Tutin Analysis in Honey	Acidified acetonitrile/water extraction, analysis by LCMSMS. Analysis performed at Hill Laboratories - Food & Bioanalytical Division, Waikato Innovation Park, Ruakura Lane, Hamilton. **RLP Official Test 8.42** Tutin Result Evaluation (PASS/FAIL) The PASS/FAIL result is based on comparison of the tutin result with the "Food Standard: Tutin in Honey (2016)". A result that falls at or BELOW the maximum permitted tutin level will give a PASS result. A result that falls ABOVE the maximum permitted tutin level will give a FAIL result. Individual Sample Testing Recommended? Where a tutin result for a composited sample is above the maximum permitted level, it is recommended that the individual samples are retested. Please contact the laboratory to arrange for individual sample retesting.	-	1-3

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S.R Clay

Shaun Clay BSc
Senior Technologist - Food and Bioanalytical