humm. optimised honey & hive health testing

Awanui Scientific

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Certificate of Analysis

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SAMPLE NAME

Demonstration Sample [SAMPLE ONLY]

LAB REFERENCE DUTERK00803704

MPI Mānuka Markers (4 chemical + DNA)

DATE RECEIVED 13 Nov 2020 **DATE COMPLETED** 13 Nov 2020

ANALYTE	RESULT	METHOD	AUTHORISED APPROVER
2'-MAP	**9.4** mg/kg	Solvent extraction, LC-MS/MS	**Joe McTestersson KTP**
2-MBA	**4.5** mg/kg	Solvent extraction, LC-MS/MS	
3-PLA	**1567** mg/kg	Solvent extraction, LC-MS/MS	
4-HPLA	**8.3** mg/kg	Solvent extraction, LC-MS/MS	
MPI Manuka Classification	**Monofloral**		
Manuka DNA	**24.3** Cq	qPCR	

Mānuka 3 in 1 (MGO, DHA, HMF, NPA)

DATE RECEIVED 13 Nov 2020 **DATE COMPLETED** 13 Nov 2020

ANALYTE	RESULT	METHOD	AUTHORISED APPROVER
DHA	**893** mg/kg	Solvent extraction, HPLC-UV	**Joe McTestersson KTP**
HMF	**10** mg/kg	Solvent extraction, HPLC-UV	
MGO	**295** mg/kg	Solvent extraction, HPLC-UV	
NPA	**10.7** % ph. eq.	Calculation	

Tutin (Individual Sample)

DATE RECEIVED 13 Nov 2020 **DATE COMPLETED** 13 Nov 2020

ANALYTE	RESULT	METHOD	AUTHORISED APPROVER
Applicable MRL (Tutin)	**0.70** mg/kg	Solvent extraction, LC-MS/MS	**Joe McTestersson KTP**
Compliance with MRL (Tutin)	**Pass**		
Tutin	**0.03** mg/kg	Solvent extraction, LC-MS/MS	

Note: Results apply only to samples received, on an as found basis. Precision data will be supplied upon request. All tests reported herein have been performed in accordance with the laboratory's scope of accreditation with the exception of tests marked ● which are not accredited. This test report shall not be reproduced except in full, without the written permission of Awanui Scientific.

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Method Summaries

MPI Mānuka Markers (4 chemical + DNA) FCHROM	MPI Manuka DNA [SAMPLE ONLY] Following extraction, Manuka pollen DNA is determined using the approved MPI RLP quantitative real time PCR method. Manuka DNA level required is less than Cq 36. The DNA result has been approved for release by David Tisdall Molecular Biologist. MPI Chemical Markers for Manuka Honey 2'-Methoxyacetophenone (2'-MAP), 2-methoxybenzoic acid (2-MBA), 3-phenyllactic acid (3-PLA), and 4-hydroxyphenyllactic acid (4-HPLA) are analysed after solvent extraction and dilution by LC-MS/MS. Chemical markers are an approved MPI RLP test for Manuka honey. According to MPI classification criteria for monofloral (Mono) and multifloral (Multi) Manuka honey, all chemical markers need to be present at the following levels (mg/kg): 2'-MAP Mono greater than or equal to 5 Multi greater than or equal to 1 2-MBA Mono greater than or equal to 1 Multi greater than or equal to 1 3-PLA Mono greater than or equal to 400 Multi greater than or equal to 20 and less than 400 4-HPLA Mono greater than or equal to 1 Multi greater than or equal to 1 Note: the MPI classification criteria for monofloral and multifloral Manuka honey also requires a DNA test for Manuka pollen.
Mānuka 3 in 1 (MGO, DHA, HMF, NPA) FCHROM	Honey 3-in-1 [SAMPLE ONLY] Dihydroxyacetone (DHA), methylglyoxal (MGO), and hydroxymethylfurfural (HMF) are analysed after solvent extraction and derivatisation followed by HPLC. Reporting limits: 5 mg/kg MGO, 30 mg/kg DHA, and 1 mg/kg HMF. NPA Non-Peroxide Activity (NPA) is calculated as % phenol equivalent from the measured methylglyoxal concentration in the honey. The calculation is based on published data. Adams et al. (2008), Carbohydrate Research 343 (4): 651-659 Adams et al. (2009), Carbohydrate Research 344: 2609 (Corrigendum)
Tutin (Individual Sample) FCHROM	Tutin [SAMPLE ONLY] Tutin is analysed after solvent extraction by LC-MS/MS analysis. MRL (maximum residue limit) for tutin in a single sample is 0.7 mg/kg in honey. May Not Comply = Due to the inherent uncertainty of measurement, the sample may not be compliant with the MRL.