

Client:

**Impumelelo Agribusiness Solutions**  
**5 Bauhinia street**  
**Cambridge Office Park**  
**Unit 1, Ground floor**  
**Centurion**  
**South Africa**



**Your order no. Order 10475**

<b>Our reference no.</b>	: <b>PI2105210227</b>		
Product	: Honey		
Sample description / Batch	: <b>AGR 05/21/0138-11 (HIGHVELD HONEY FARMS)</b>		
Sample received on / transported by	: 21.05.2021 via Parcel service	Seal	: none
Sample temp. when received / stored	: RT	Sampling	: Client
Packaging / Quantity	: Plastic container / 560 g	Start / End of analysis	: 28.05.2021 / 31.05.2021

**ANALYSIS REQUESTED: 13C Isotope Analysis by EA/LC-IRMS (C4/C3-Sugars) (101158)**

Parameter	Result	Unit	Method
Protein	-24.18	d13C(‰)	PM DE01.026:2019-05 (a) <sup>1</sup>
Honey	-24.92	d13C(‰)	PM DE01.026:2019-05 (a) <sup>1</sup>
Fructose (F)	-24.87	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
Glucose (G)	-24.93	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
Disaccharides	-25.39	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
Trisaccharides	n.a.	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
Oligosaccharides	n.a.	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
Delta d13C (F-G)	0.06	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
Delta d13C (max.) abs.	1.21	d13C(‰)	PM DE01.094:2019-05 (a) <sup>2</sup>
C4-Sugar Content	0.00	%	PM DE01.026:2019-05 (a) <sup>1</sup>
F/G Ratio	1.17		PM DE01.094:2019-05 (a) <sup>2</sup>
Portion of Disaccharides	5.05	%	PM DE01.094:2019-05 (a) <sup>3</sup>
Portion of Trisaccharides	n.d.	%	PM DE01.094:2019-05 (a) <sup>3</sup>
Portion of Oligosaccharides	n.d.	%	PM DE01.094:2019-05 (a) <sup>3</sup>
LC-IRMS is not an official method for F/G ratio; n.a.: not analyzed; n.d.: not detected < 1.0 %; d13C value in permil. vs. V-PDB standard  SPECIFICATIONS OF PURE HONEY: Delta d13C (F-G): not more than +/- 1.0 ‰ Delta d13C (max.) of individual d13C values: not more than 2.1 ‰ abs C4-sugar content: <= 7.0 %; portion of oligosaccharides: n.d.			
(a) : accredited method. (na) : not accredited method. (1) AOAC 998.12:2013 (2) Apidologie 39/5 (2008) 574-587 (3) Apidologie 39/5 (2008) 574-587; % related to total sugars. This document may only be reproduced in full. The results given herein apply to the submitted sample only.			

**Interpretation:**

Foreign sugars were not detected. Regarding the examined parameters, the sample meets the requirements for unadulterated honey (Council Directive 2001/110/EC of 20 Dec 2001).



**Marvin Wellkamp**  
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