Ministry for Primary Industries
Manatū Ahu Matua

# Options for Defining Monofloral Manuka Honey

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*Growing and Protecting New Zealand*

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# Contents

Page

## OPTIONS FOR DEFINING MONOFLORAL MANUKA HONEY

This discussion paper provides options for the parameters that define monofloral manuka honey, and how these should be measured. The Ministry for Primary Industries (MPI) emphasises that the views and recommendations outlined in the paper are preliminary and are provided as a basis for consultation with stakeholders.

MPI will analyse submissions and develop a draft guideline for further comment or feedback. Once the guideline is finalised it will be issued by MPI and posted on the MPI website. Hard copies will be available on request.

## SUBMISSIONS

MPI welcomes written submissions on the proposals contained in this document. All submissions must be received by MPI no later than 5pm on 30 September 2013.

Written submissions should be sent directly to:

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## RELEASE OF SUBMISSIONS

MPI expects to release all submissions. If you have specific reasons for wanting to have your submission or personal details withheld, please set out your reasons in the submission. All submissions are also subject to the Official Information Act 1982 and can be released (along with the personal details of the submitter) under the Act. MPI will consider those reasons when making any assessment under the Act.

# 1. Introduction

This paper proposes options for defining and labelling monofloral New Zealand manuka honey. MPI is seeking feedback on the options and is calling for evidence to support submissions. The feedback will result in MPI interim guidelines on manuka honey labelling that will cover:

- product definitions; and
- content claims.

The aim is to achieve a clear, scientifically robust definition of manuka honey and to implement this definition so that consumers, in New Zealand and overseas, have confidence in the authenticity of the honey they are buying. This is important to protect both New Zealand's international export reputation and the long-term future of the New Zealand honey industry.

The definition will be based on current knowledge and information. However, manuka honey science is ongoing, with some important research projects due to be completed over the next couple of years. This research will need to be collated and assessed and it may be that there are more sophisticated and accurate ways to define manuka honey in the future.

This discussion paper is specific to manuka honey for food. The options do not extend to other bee products such as royal jelly or bee pollen.

## GUIDELINES WILL BE INTERIM WHILE REGULATORY OPTIONS ARE ASSESSED

The guidelines will be voluntary, they cannot be legally enforced. They will be issued as an interim measure while MPI investigates whether regulatory implementation is necessary. MPI anticipates that this analysis will take several months to work through and will include an assessment of the industry and business impacts of any regulatory option. MPI will continue to discuss options and impacts with the industry and other regulatory bodies.

## NEW ZEALAND LEGISLATION

All food produced in New Zealand is subject to the Food Act 1981 and/or the Animal Products Act 1999. Please see http://www.foodsafety.govt.nz/industry/sectors/honey-bee/ for details. Additionally, all products sold in New Zealand are subject to the Fair Trading Act 1986, which prohibits false or misleading conduct or representations in relation to goods. This can be viewed at www.legislation.govt.nz.

Exported honey may be subject to additional requirements set by the importing country.

## ALL NEW ZEALAND MANUKA HONEY MUST BE TRUE TO LABEL

New Zealand's reputation for food production and export rests on the integrity of our products, the credibility of our systems and the confidence that consumers have in these. Several markets have tested manuka honey recently and the results have indicated that not all products were true to label and some would not meet the authenticity expectations of a reasonable consumer.

In July 2013, the Hong Kong Consumers Council published a report that was critical of honey labelling, including some New Zealand manuka honey. In August 2013 the United Kingdom's

Food Standards Agency issued an alert to trading standards departments about honey that may have been falsely sold as manuka.

## OBJECTIVES

The objective of issuing guidelines for defining and labelling manuka honey is to ensure that all New Zealand manuka honey is true to label and that consumers are not misled.

Meeting this objective requires two matters to be addressed:

1. A robust definition for manuka honey
2. Clear parameters for making content claims

## NEW ZEALAND SHOULD DEFINE ITS OWN HONEY

New Zealand produced over 16,000 tonnes of honey in 2012/13, and the industry has grown significantly over the past decade. In 2012, honey exports were worth $120 million[1] with manuka honey estimated to be 80 to 90 percent of that. Manuka honey is a valuable product and commands a high price compared with other honeys.

New Zealand has the most information and experience with manuka honey. It makes sense for New Zealand to define what can be justifiably called manuka honey.

# 2. Standards for Honey

## CODEX ALIMENTARIUS

New Zealand is a signatory to Codex Alimentarius (Codex), the international food standards-setting system. Codex standards are the foundation for global trade in honey. The intent is that the MPI interim guidelines will set clear expectations for implementing Codex requirements for manuka honey.[2]

The Codex standard for honey outlines requirements in relation to:

- Organoleptic properties (eg aroma, flavour, colour)
- Physicochemical properties (eg sugars, moisture content)
- Microscopic properties (eg pollen count)

Under Codex, a honey may make a monofloral claim if that honey comes wholly or mainly from a particular source. For such claims, the 'common' or the 'botanical' name of the floral source can be used. Manuka honey is a monofloral claim.

### Implementation in New Zealand

The New Zealand Bee Products Standards Council (BPSC) currently uses the following parameters in terms of the organoleptic and physicochemical properties of manuka honey:

- Colour (Pfund mm): 84 mm, s.d.11.8

[1] Horticulture Monitoring 2012: Apiculture, Ministry for Primary Industries
[2] Countries can depart from Codex Standards if sufficient justification exists. This could for example be where new science becomes available.

- Aroma - damp earth, heather aromatic
- Flavour – mineral, slightly bitter, tangy

It is expected that MPI guidelines for manuka honey will include these parameters in addition to the characteristics outlined in the options below.

> Q1: Are the BPSC parameters for organoleptic and physicochemical properties of manuka honey appropriate? Can they be improved?

In terms of the microscopic properties of manuka honey, some companies classify their product based on a traditional pollen counting method, while others classify based on the methylglyoxal (MG) content. MG is the component of manuka honey which contributes to its non-peroxide antibacterial activity (NPA).

### FOOD STANDARDS CODE

The Food Standards Code requires honey to have a moisture content of not more than 21% and more than 60% reducing sugars to be present.

## 3. Options for Defining Manuka Honey

There are two widely used methods for defining manuka honey in New Zealand: by pollen count and by MG content. There is no consensus within the New Zealand honey industry about which method is best.

To address this issue, MPI has developed three broad options defining what constitutes a monofloral manuka honey.

- Option 1 defines manuka honey based on a specified level of pollen (pollen count).
- Option 2 defines manuka honey based on methylglyoxal activity (MG content).
- Option 3 combines both MG content and pollen count.

MPI is seeking feedback on the three options. In particular, information on the likely impacts on businesses, along with scientific data that supports the robustness of the options. Within both methods, there is a range of levels at which the standard could be set. We are also seeking information on the appropriate parameters.

Please note that any data supplied will be subject to the provisions of the Official Information Act 1982 and can be released under the Act.

### ASSESSMENT CRITERIA

For an option to be credible, and to support the objective of ensuring authentic manuka honey labelling, it must meet the following criteria:

- Minimise the potential for false or misleading label statements.
  The definition should match what a reasonable consumer would understand and accept to be manuka honey, and it should be possible to communicate this definition clearly and unambiguously.

- Minimise fraud.
  It is possible to manipulate honey, both by adding chemicals to increase its apparent MG levels or filtering to boost the appearance of manuka pollen. Any option should minimise the potential and incentives for such fraudulent behaviour to occur.
- Be practical and feasible to implement.
  It should be possible to adopt the definition in a timely manner, using existing technology and, where possible, without undue disruption to existing systems or processes.
- Be backed by robust, evidence-based science.
  To have international credibility, and to address queries about authenticity, the definition must be backed-up by the best available data and evidence. MPI understands science relating to chemical footprinting of manuka honey is developing and, in the future, may provide a better method of distinguishing manuka honey. If this occurs, the definition may need to be revised.
- Reasonable cost and sustainable benefit.
  Each option means cost to some businesses. However, the status quo presents risks in terms of consumer expectations, international credibility and market access restrictions. There are potentially longer-term benefits to exporters and to the New Zealand honey industry from having an agreed, coherent, manuka honey definition.

Q2: Are there alternative options for defining manuka honey (ie not based on MG content or pollen count), and what scientific evidence supports this?

## OPTION 1: DEFINITION BASED ON POLLEN COUNT

This option would define manuka honey as having a specified level of manuka pollen. Honey that did not meet the specified level of could be labelled as a 'manuka blend'.

Pollen count is a commonly used measure of the purity of monofloral honeys. Manuka honey has been traditionally sold on this basis; not on MG or NPA. However, manuka honey sold on the basis of pollen count will, in many cases, contain kanuka honey in varying proportions. In some instances, it will be purely kanuka in origin. This is because it is currently difficult to differentiate manuka and kanuka pollen.

Manuka and kanuka pollens are indistinguishable under a light microscope and even scanning electron microscopy has not proven successful in differentiating them. "Manuka" is also used (erroneously) as a generic colloquial term for both manuka and kanuka. Manuka (*Leptospermum scoparium*) and kanuka (*Kunzea ericoides*) are both members of the Myrtaceae family. They are morphologically similar and generally co-occur in New Zealand and can have overlapping flowering periods. Until the 1980s they were both classified in the *Leptospermum* genus.

Some manuka honey producers have advised MPI that bees may preferentially collect nectar from manuka and pollen from other floral species (e.g. kanuka) as evidenced by high MG levels in the honey produced. They also claim that kanuka pollens may be over-represented.

MPI seeks examples of honeys in international trade that include multiple, related, genera but that are marketed under a common name.

Analysis

| | |
|---|---|
| Minimises potential for false or misleading label statements | Partially – if manuka definition cannot include kanuka.<br>Fully - if manuka definition includes kanuka provided consumers understand the honey is derived from both plant species. |
| Minimises the potential for fraud | Medium.<br>Manuka pollen grains are small so honey can be filtered to remove larger pollen grains and increase the percentage of the desired pollen. This can be mitigated to some extent by setting a minimum level of pollen to be present in the sample. |
| Implementation | It is feasible, but only moderately practical, to implement.<br>Pollen counts are done in several New Zealand laboratories and numerous overseas laboratories. Limited ring trials performed on behalf of BPSC within New Zealand showed variability in results, which indicates that counting methods need standardization. |
| Evidence-based | Strong if kanuka included, weak if kanuka excluded.<br>Pollen counting is a traditional means of determining whether a honey is monofloral or not. |
| Cost and benefit | Basing a manuka definition on pollen count alone results in kanuka being included in the definition of manuka honey. This effectively continues current practice for some but will prevent the low pollen count honeys being sold as monofloral – they will instead have to be relabelled as being a blend.<br>This may have little impact on business overall. |

Q3: What are the likely impacts of Option 1 for businesses?

Q4: What are the likely impacts of Option 1 for consumers?

Q5: What practical steps are required to effectively implement Option 1?

Q6: If a definition based on pollen count is adopted:

- what is the appropriate percentage of pollen to indicate a monofloral honey?
- what, if any, additional parameters should be included?

Information Sought:

Examples of internationally traded honey that includes multiple genera but is marketed under a common name.

Datasets where both pollen count and MG and dihydroxyacetone (DHA) levels have been measured for the same honey samples.

## OPTION 2: DEFINITION BASED ON METHYLGLYOXAL CONTENT

Under this option honey would be defined based on meeting a minimum specified MG level (and possibly also DHA level). Honey that did not meet the specified MG level could be relabelled as a 'manuka blend'. The manuka honey must meet the defined MG levels throughout its shelf life.

Methylglyoxal content is the main contributor to the non-peroxide activity in manuka honey. It is naturally-occurring only in plants of the *Leptospermum* genus. Manuka is one species of *Leptospermum*, but other species are found in other countries.

The presence of MG in manuka honey comes from the conversion of Dihydroxyacetone (DHA) in manuka nectar. In fresh honey, MG levels are very low. Levels increase over time to end up in a relatively stable equilibrium with DHA and then appear to decrease.

DHA levels have been reported to be variable in manuka nectar. Therefore, basing a manuka honey definition purely on MG content may exclude some high purity manuka honey where the originating plants have low levels of DHA.

Further, it has been demonstrated that using current test methods it is possible to undetectably elevate MG content by adding DHA to fresh honey. This can be done either by adding the substance to feed for bees or by adding it to the honey directly.

Because MG levels initially increase, adopting a definition that has a low MG level will mean high purity manuka honeys with very high levels of MG in them (>1200mg/kg) could be significantly diluted with honeys of another type and still meet the adopted level. This suggests that the 100mg/kg (NPA5+) level currently used by some in the industry would be too low to be labelled as monofloral manuka. Conversely, a honey that has its MG level measured shortly after harvest will likely contain a low level of MG[3].

Analysis

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|---|---|
| Minimises potential for false or misleading label statements | Partially.<br>The definition would be weak unless a high MG level is selected. High potential for falsification based on ability to undetectably add DHA. |
| Minimises the potential for fraud | Weak.<br>DHA can be added to honey to increase the apparent MG content. |
| Implementation | Easy, practical and feasible to implement.<br>Testing is available for MG in a number of international labs and has been ring-trialed, so the methodology is relatively robust. |
| Evidence-based | Weak.<br>Because DHA converts over time to MG, and then MG progressively declines, there is no constant level in manuka honey upon which to base a definition. |

[3] For this reason, it may be more appropriate to base a definition on both minimum levels of DHA and MG.

| | |
|---|---|
| | Levels of DHA vary significantly between individual manuka plants and subspecies. |
| Cost and benefit | This option will exclude kanuka from the definition. Depending on where the level is set it may either include too much low percentage content manuka or exclude too much high percentage content manuka honey. Depending on the cut-off level, the product classified as monofloral will be more scarce than now and price may rise. The remaining product will need to be relabelled.<br><br>If the definition includes a lesser category of manuka honey "blend", this product would be anticipated to have a lower value than the monofloral product but arguably more than other honey that contains no manuka. This would enable the practice of most of the large honey exporters in testing honey for methylglyoxal content and labeling on that basis to continue. |

Q7: What are the likely impacts of Option 2 for businesses?

Q8: What are the likely impacts of Option 2 for consumers?

Q9: What practical steps are required to effectively implement Option 2?

Q10: If a definition based on methylglyoxal activity is adopted:

- what are the appropriate levels of methylglyoxal to include? (Please provide any available data or scientific evidence to support your submission).
- what, if any, additional parameters should be included? e.g. DHA.

## OPTION 3: DEFINITION BASED ON METHYLGLYOXAL CONTENT AND POLLEN COUNT

This option defines monofloral manuka honey using a combination of pollen count and MG content. The honey would require a pollen count to test whether it is at least manuka and/or kanuka. It would then be tested for MG content to determine whether it contained sufficient MG to make a monofloral claim. Honey that did not meet the MG content requirement could be labelled 'manuka blend', provided it contained a minimum level of both pollen and MG. If this option is used, the honey must meet the specified MG level throughout its shelf life.

### The relationship between pollen count and MG content

If bees collect nectar from manuka flowers that have low levels of DHA (the MG precursor), then the pollen count in the honey would be expected to be relatively high in relation to the MG content. Conversely, if bees collect nectar from manuka flowers that have a high level of DHA and also collect nectar from other flowers, then the resulting honey could have a high MG level and a low pollen count. This highlights that there is no direct correlation between

pollen count and MG levels and suggests that neither method alone is sufficient to determine a monofloral claim.

Limited data MPI has obtained suggests that most manuka honey with a MG level exceeding 300mg/kg will also exceed a 70% pollen count. MPI seeks any datasets where pollen count, MG and DHA levels have been measured for the same honey samples. These need to be supplied in their entirety for incorporation with other datasets to enable a robust analysis.

This option may exclude some honeys with relatively high MG content and low pollen count. However, it will help ensure that honey is not being manufactured by excessive blending of high purity manuka honey and can minimise the risk of fraud through addition of methylglyoxal. This option would also allow honeys sold in offshore markets to be assessed more easily by regulatory bodies for authenticity and New Zealand origin.

Analysis

| | |
|---|---|
| Minimises potential for false or misleading label statements | Partially.<br>Provides a more robust definition than either of the other options. More likely to be accepted by markets because it applies two ways to define the product including the traditional way. Can still lead to product being adulterated with DHA addition but reduces the amount of honey available to do this. |
| Minimises the potential for fraud | Strong.<br>Inclusion of a pollen count criterion together with knowledge of the natural range of DHA/MG content will minimise the risk of DHA being added. |
| Implementation | Moderate difficulty.<br>Pollen counts are done in several New Zealand laboratories and numerous overseas laboratories. Limited ring trials undertaken on behalf of BPSC within New Zealand indicate some variability in results. This indicates counting methods need standardization and further ring trials will be necessary. Testing is available for MG in a number of international labs and this has been ring-trialed so methodology is relatively robust. |
| Evidence-based | Evidence suggests that only manuka produces DHA and only manuka honey will therefore contain MG. Pollen counts are generally used for honey type identification in international trade. Because manuka honey is marketed based on its MG content combining the two approaches is more robust than either in isolation. |
| Cost and benefit | This option provides for the most robust definition but will be the most product restrictive option. It will make authentic manuka honey slightly scarcer than options 1 or 2 and may lead to higher pricing for this product as authenticity will be in less doubt. Other honeys containing significant quantities of manuka, and labelled as manuka blend, could be expected to also fetch high prices for the same reasons. |

| | |
|---|---|
| | This option may have little impact on export values overall and may have some tangible benefit in terms of providing an agreed, coherent manuka honey definition. |

Q11: What are the likely impacts of Option 3 for businesses?

Q12: What are the likely impacts of Option 3 for consumers?

Q13: What practical steps are required to effectively implement Option 3?

# 4. Making Content Claims

MPI anticipates that the interim guideline will contain information regarding content claims for manuka honey. These will be linked to the existing health claims regulation, but may also include further information about peroxide activity claims.

## CONTENTS TO CONFORM WITH LABEL

If any activity, chemical maker or rating statement is made on a manuka honey label, it must meet the stated level throughout its shelf life.

## HEALTH CLAIMS

Health claims are regulated by the Food Standards Code. Honey labels must comply in all respects with the Food Standards Code.

There are no substantiated health claims that can be made on manuka honey[4]. In addition, manuka honey does not meet the nutrient profiling scoring criterion for making health claims. See www.foodstandards.govt.nz for further details.

### Transition period for Standard 1.2.7

Standard 1.2.7 Nutrition, Health and Related Claims sets out new rules to regulate health claims and nutrition content claims. It was introduced earlier this year with a three-year transition period. During the transition period, health claims must comply with Standard 1.2.7 or the Transitional Standard 1.1A.2. Food businesses must comply with Standard 1.2.7 from 18 January 2016.

Standard 1.1A.2 prohibits therapeutic or prophylactic claims and claims that could be interpreted as being advice of a medical nature. Labels and advertisements are not allowed to mention a disease or physical condition.

## CLAIMS RELATING TO PEROXIDE ACTIVITY

A variety of content claims relating to some form of antibacterial activity in honey have been made for manuka honey. Most honey exhibits an antibacterial effect in vitro due in part to its sugar content and also its peroxide activity. Claims relating to peroxide content have been

[4] The Food Standards Code applies to labelling and advertising

often expressed as ‘bioactive’ or ‘activity’ either together with or without numerical values. This peroxide activity is said to be somewhat less stable in honey than MG and it is found in most honey.

Because of the similarity of these claims to MG or NPA claims, and because peroxide activity is a generic feature of most honey, peroxide activity claims may be considered misleading to consumers.

Q14: Are claims related to peroxide activity appropriate for manuka honey? If so, which ones?

# 5. Questions for Submitters

Q1: Are the BPSC parameters for organoleptic and physicochemical properties of manuka honey appropriate? Can they be improved?

Q2: Are there alternative options for defining manuka honey (ie not based on MG content or pollen count), and what scientific evidence supports this?

## Option 1

Q3: What are the likely impacts of Option 1 for businesses?

Q4: What are the likely impacts of Option 1 for consumers?

Q5: What practical steps are required to effectively implement Option 1?

Q6: If a definition based on pollen count is adopted:

- what is the appropriate percentage of pollen to indicate a monofloral honey?
- what, if any, additional parameters should be included?

Information Sought:

Examples of internationally traded honey that includes multiple genera but is marketed under a common name.

Datasets where both pollen count and MG and DHA levels have been measured for the same honey samples.

## Option 2

Q7: What are the likely impacts of Option 2 for businesses?

Q8: What are the likely impacts of Option 2 for consumers?

Q9: What practical steps are required to effectively implement Option 2?

Q10: If a definition based on methylglyoxal activity is adopted:

- what are the appropriate levels of methylglyoxal to include? (Please provide any available data or scientific evidence to support your submission).
- what, if any, additional parameters should be included? e.g. DHA.

## Option 3

Q11: What are the likely impacts of Option 3 for businesses?

Q12: What are the likely impacts of Option 3 for consumers?

Q13: What practical steps are required to effectively implement Option 3?

## Content claims

Q14: Are claims related to peroxide activity appropriate for manuka honey? If so, which ones?