

# MANUKA HONEY QUALITY

**Workshop D: WG Authenticity of Bee Products**

**Meeting of the International Honey Commission, 7<sup>th</sup> May 2019, Malta**

**Ewa Waś, Dariusz Teper, Teresa Szczęsna,  
Katarzyna Jaśkiewicz, Monika Witek**

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**e-mail: [ewa.was@inhort.pl](mailto:ewa.was@inhort.pl)**

**Research Institute of Horticulture  
Apiculture Division in Pulawy, Poland  
Bee Products Quality Testing Laboratory**

# Does manuka honey belong to the group of honeys with low natural enzyme content ???

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**Requirements of Council Directive (2001/110/EC of December 2001) for honeys with low natural enzyme content (e.g. citrus honeys):**

- **Diastase activity (DN) – not less than 3 Schade**
- **HMF content – not more than 15 mg/kg**

# Material and methods

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**69 samples from Polish market (2008-2018) labelled „Manuka honey”**

- **Determination of diastase activity by Phadebas - 58 samples**
- **Determination of 5-hydroxymethylfurfural (HMF) by HPLC-UV - 57 samples**
- **Pollen analysis by microscopic method - 39 samples**
- **All three parameters were tested in 31 samples.**

# RESULTS

**Table 1. Diastase number and HMF content in samples labelled „Manuka honey” and tested in Bee Products Quality Testing Laboratory (2008-2018)**

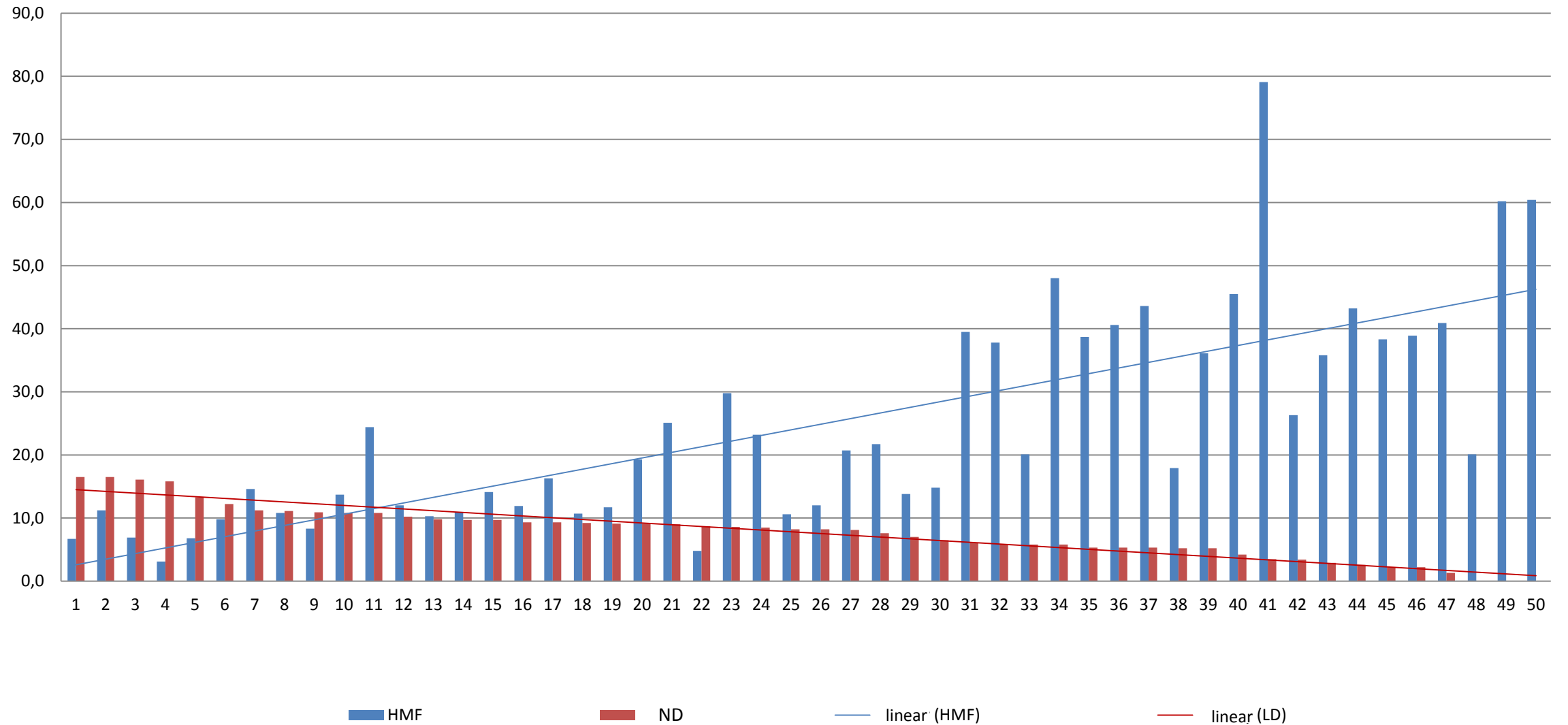
	MIN - MAX	Mean ± SD	Median	Samples in accordance with 2001/110/EC		Requirements of Council Directive (2001/110/EC)
				n	%	
<b>DN (Schade)</b> <b>n = 58</b>	<b>&lt;1.0 – 16.5</b>	<b>7.9 ± 3.8</b>	<b>8.1</b>	<b>30</b>	<b>52</b>	<b>Not less than 8 Schade</b>
<b>HMF (mg/kg)</b> <b>n = 57</b>	<b>3.1 – 221.6</b>	<b>26.7 ± 30.8</b>	<b>17.9</b>	<b>28</b>	<b>49</b>	<b>Not more than 40 mg/kg</b>

# Results

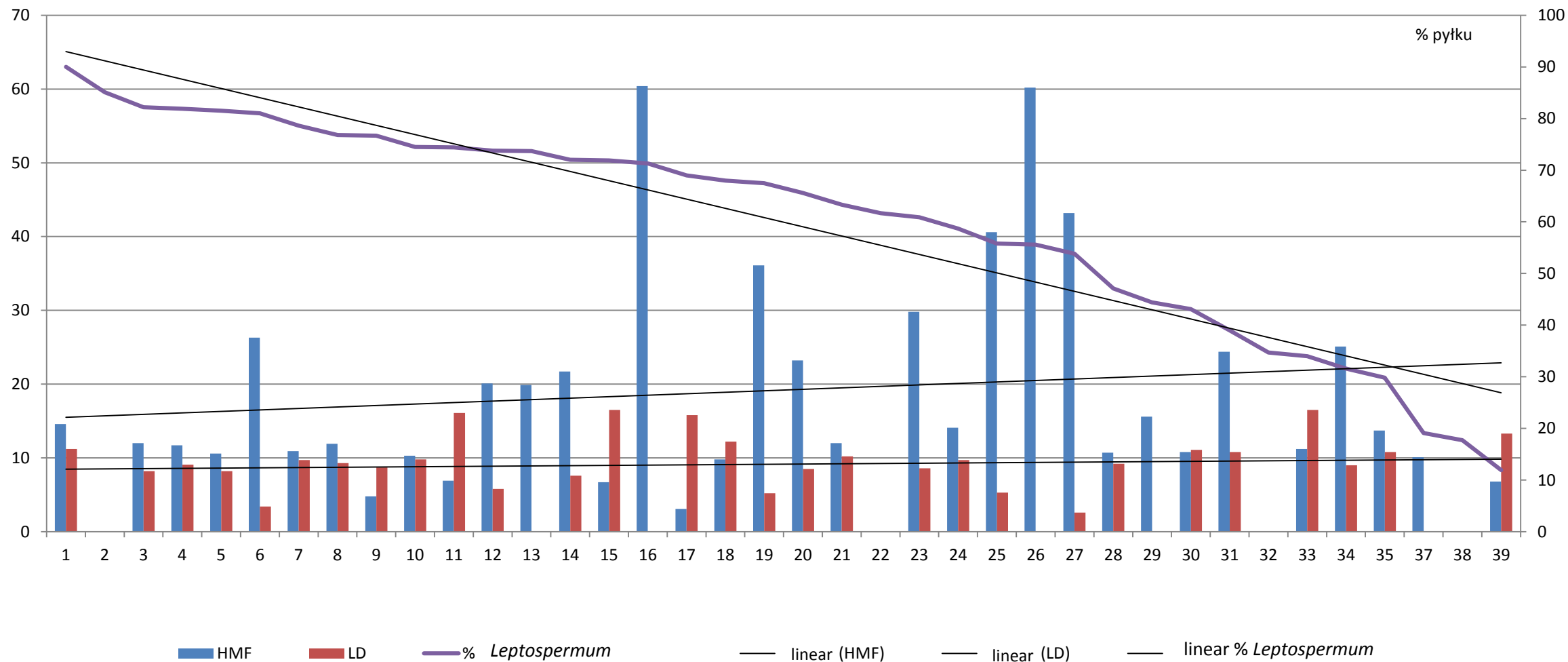
***If we assume that manuka honey belongs to honeys with "naturally low enzymatic activity" and we will accept the criteria for such a kind of honey (DN - not less than 3 Schade and HMF content - no more than 15 mg/kg):***

- **only 1 out of 28 samples meet both requirements for honey with low natural enzyme content**
- **in 8 „manuka” samples (29%) we determined diastase number below 3 Schade**
- **13 „manuka” samples (46%), which passed DN requirement, failed because of the high content of HMF (from 17.9 to 79.1 mg/kg; on average 39.4 mg/kg HMF)**
- **in 6 „manuka” samples, which diastase number was from 3.5 to 5.9 Schade, we didn't determined HMF.**

**Fig. 1. Correlation between HMF content (mg/kg) and DN (Schade) in „manuka” honey**



**Fig. 2. DN (Schade) and HMF (mg/kg) content in reference to *Leptospermum* (%) in „manuka” honey**



**Table 2. Results for samples classified as a manuka honey**

Lp.	MGO	UMF	HMF (mg/kg)	DN (Schade)	% <i>Leptospermum</i>
1 <sup>1</sup>	550		60.4	<1.0	71
2			14.6	11.2	90
3	570	16	6.7	16.5	72
4	820	20	6.9	16.1	74
5	400		10.6	8.2	82
6	400		10.3	9.8	75
7	400		11.9	9.3	77
8	400		10.9	9.7	79
9	550		12.0	8.2	82
10	550		11.7	9.1	82
11	200		4.8	8.7	77
12 <sup>1</sup>	300		20.1	5.8	74
13 <sup>1</sup>	400		36.1	5.2	68±5 <sup>3</sup>
14	322		9.8	12.2	68±5 <sup>3</sup>
15	400		23.2	8.5	66±5 <sup>3</sup>
16	400		21.7	7.6±1.1 <sup>2</sup>	72
17		15	3.1	15.8	69±5 <sup>3</sup>
18 <sup>1</sup>		18	26.3	3.4	81
min - max			3.1 – 23.2	7.6 – 16.5	66 - 90
Mean±SD			11.3±5.7	10.8±3.1	75±6

<sup>1</sup> The results were not included in the statistical analysis of the results for DN and HMF

<sup>2</sup> uncertainty of Phadebas method estimated at 15%

<sup>3</sup> uncertainty of pollen analysis estimated at 5%



# SUMMARY

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**According to our experience manuka honey does not belong to the group of enzyme poor honeys:**

- 1) 52% manuka samples represented  $DN \geq 8$  Schade.**
- 2) The problem with low diastase number was mainly observed in the samples with low percentage of *Leptospermum*.**
- 3) „Manuka” samples with low DN had also very high HMF (above 15 mg/kg).**
- 4) It can be assumed that a low DN in commercial „manuka” honey is the result of long-term storage in hightened temperature in order to obtain higher concentration of MGO.**

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***Thank you for your  
very kind attention***

***ewa.was@inhort.pl***