

**Supplementary material for :**

**Fluvalinate accumulation in the beehive environment and its effects on semen quality and gene expression of drones under field conditions.**

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<sup>b</sup> National Agricultural and Food Centre-Research Institute for Animal Production, Institute of Apiculture Liptovský Hrádok, Gašperíkova 599, 033 80 Liptovský Hrádok, Slovak Republic;

<sup>c</sup> Department of Pharmacology and Toxicology, University of Veterinary Medicine and Pharmacy in Košice, Komenského 73, 041 81 Košice, Slovak Republic;

## Analytical report

AR-20-SZ-050112-04



## Testing laboratory:

Eurofins Food Testing Slovakia s.r.o.  
Komjatická 73, 940 02 Nové Zámky  
IČO: 52 601 714  
tel.: +421 908810030, +421 911810531  
MarketingNZ@eurofins.sk, www.eurofins.sk

## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020

Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061894

Sample description: Vosk

Sample Reference: 1.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance             | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,025          | 0,0125                             | GC-MS/MS<br>ASU § 64 LFGB<br>L00.00-115:2018 | - | SA |

## Notes:

E - evaluation

S - satisfied

NS - not satisfied

(A) - accredited sampling

(SA) - accredited sampling executed under the subcontract

SPP - Standard operation procedure

ND - not detected by given method

CFU - Colony forming unit

NM - necessary quantity

m - the highest allowed value at the case of one sample

M, c - "M" highest allowed value for the number "c" at the case of 5 sample's evaluation

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(TM) - testing outside the laboratory at the customer

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 2020112103137687

## Test Certificate approved by

Ladislav Nagy  
Specialist

 Food Testing  
Eurofins Food Testing Slovakia s.r.o.  
Komjatická 73, 940 02 Nové Zámky  
IČO: 52 601 714 DIČ: 2121096252  
IČ DPH: SK2121096252 ①



## Analytical report AR-20-SZ-050113-04



## Testing laboratory:

Eurofins Food Testing Slovakia s.r.o.  
Komjatická 73, 940 02 Nové Zámky  
IČO: 52 601 714  
tel.: +421 908810030, +421 911810531  
MarketingNZ@eurofins.sk, www.eurofins.sk

## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020

Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061895

Sample description: Vosk

Sample Reference: 2.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,196          | 0,098 GC-MS/MS                     | ASU § 64 LFGB L00.00-115:2018    | - | SA |

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 2020112103130436

## Test Certificate approved by

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IČO: 52 601 714 DIČ: 2121096252  
IČ DPH: SK2121096252 ①



## Analytical report AR-20-SZ-050114-04



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Eurofins Food Testing Slovakia s.r.o.  
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IČO: 52 601 714  
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## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020 Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061896

Sample description: Vosk

Sample Reference: 3.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,086          | 0,043 GC-MS/MS                     | ASU § 64 LFGB L00.00-115:2018    | - | SA |

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 2020112103124801

## Test Certificate approved by

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IČ DPH: SK2121096252 ①



## Analytical report AR-20-SZ-050115-04



## Testing laboratory:

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## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020 Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061897

Sample description: Vosk

Sample Reference: 4.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,013          | 0,0065 GC-MS/MS                    | ASU § 64 LFGB L00.00-115:2018    | - | SA |

## Notes:

E - evaluation

S - satisfied

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(A) - accredited sampling

(SA) - accredited sampling executed under the subcontract

SPP - Standard operation procedure

ND - not detected by given method

CFU - Colony forming unit

NM - necessary quantity

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M, c - "M" highest allowed value for the number "c" at the case of 5 sample's evaluation

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 2020112103117162

## Test Certificate approved by

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## Analytical report AR-20-SZ-050116-04



## Testing laboratory:

Eurofins Food Testing Slovakia s.r.o.  
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## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020 Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061898

Sample description: Vosk

Sample Reference: 5.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,01           | 0,005 GC-MS/MS                     | ASU § 64 LFGB L00.00-115:2018    | - | SA |

## Notes:

E - evaluation

S - satisfied

NS - not satisfied

(A) - accredited sampling

(SA) - accredited sampling executed under the subcontract

SPP - Standard operation procedure

ND - not detected by given method

CFU - Colony forming unit

NM - necessary quantity

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 2020112103111437

## Test Certificate approved by

Ladislav Nagy  
Specialist

 Food Testing  
Eurofins Food Testing Slovakia s.r.o.  
Komjatická 73, 940 02 Nové Zámky  
IČO: 52 601 714 DIČ: 2121096252  
IČ DPH: SK2121096252 ①



## Analytical report AR-20-SZ-050117-02



## Testing laboratory:

Eurofins Food Testing Slovakia s.r.o.  
Komjatická 73, 940 02 Nové Zámky  
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tel.: +421 908810030, +421 911810531  
MarketingNZ@eurofins.sk, www.eurofins.sk

## Customer:

Univerzita veterinárneho lekárstva a farmácie v Košiciach  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020

Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 21.09.2020

## Information about Sampling:

Sampler

customer

## Sample information:

147-2020-00061899

Sample description:

Vosk

Sample Reference:

6.

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty* | Method   | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|--------------|----------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | not detected   | -            | GC-MS/MS | ASU § 64 LFGB<br>L00.00-115:2018 | - | SA |

## Notes:

E - evaluation

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(SA) - accredited sampling executed under the subcontract

SPP - Standard operation procedure

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 202092115127194

## Test Certificate approved by

Ladislav Nagy  
Specialist

 Food Testing  
Eurofins Food Testing Slovakia s.r.o.  
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IČO: 52 601 714 DIČ: 2121096252  
IČ DPH: SK2121096252 



## Analytical report AR-20-SZ-050118-04



## Testing laboratory:

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Komjatická 73, 940 02 Nové Zámky  
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tel.: +421 908810030, +421 911810531  
MarketingNZ@eurofins.sk, www.eurofins.sk

## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020 Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061900

Sample description: Vosk

Sample Reference: 7.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,123          | 0,0615 GC-MS/MS                    | ASU § 64 LFGB L00.00-115:2018    | - | SA |

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 202011210314465

## Test Certificate approved by

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IČ DPH: SK2121096252 ①



## Analytical report AR-20-SZ-050119-02



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Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020

Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 21.09.2020

## Information about Sampling:

Sampler

customer

## Sample information:

147-2020-00061901

Sample description:

Vosk

Sample Reference:

8.

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty* | Method   | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|--------------|----------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | not detected   | -            | GC-MS/MS | ASU § 64 LFGB<br>L00.00-115:2018 | - | SA |

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 202092115139895

## Test Certificate approved by

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IČ DPH: SK2121096252 



## Analytical report AR-20-SZ-050120-02



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SLOVAKIA

Date of Sample Receipt: 10.09.2020

Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 21.09.2020

## Information about Sampling:

Sampler

customer

## Sample information:

147-2020-00061902

Sample description:

Vosk

Sample Reference:

9.

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty* | Method   | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|--------------|----------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | not detected   | -            | GC-MS/MS | ASU § 64 LFGB<br>L00.00-115:2018 | - | SA |

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 202092115145588

## Test Certificate approved by

Ladislav Nagy  
Specialist

 Food Testing  
Eurofins Food Testing Slovakia s.r.o.  
Komjatická 73, 940 02 Nové Zámky  
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## Analytical report

AR-20-SZ-050121-04



## Testing laboratory:

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MarketingNZ@eurofins.sk, www.eurofins.sk

## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020

Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061903

Sample description: Vosk

Sample Reference: 10.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance             | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,022          | 0,011                              | GC-MS/MS<br>ASU § 64 LFGB<br>L00.00-115:2018 | - | SA |

## Notes:

E - evaluation

S - satisfied

NS - not satisfied

(A) - accredited sampling

(SA) - accredited sampling executed under the subcontract

SPP - Standard operation procedure

ND - not detected by given method

CFU - Colony forming unit

NM - necessary quantity

m - the highest allowed value at the case of one sample

M, c - "M" highest allowed value for the number "c" at the case of 5 sample's evaluation

\* - uncertainty determined by extension coefficient k=2 (with probability of 95%) does not include the uncertainty of sampling.

- uncertainty given in % reflects the uncertainty from the result of measurement.

TT - type of test

A - accredited test executed at the own test laboratory

N - non accredited test executed at the own test laboratory

SA - accredited test executed under the subcontract

SN - unaccredited test executed under the subcontract

(TM) - testing outside the laboratory at the customer

## Disclaimer:

Laboratory is a disclaimer when the information is supplied by the customer and can affect the validity of results.

If the sample has been provided by the customer, the results refer to the sample as it was received.

Gauges and measuring equipment used for testing were calibrated or attested in accordance with the valid metrological instructions.

The above mentioned test results refer to the tested sample only!

The result given in this Test Certificate and marked as non accredited test shall not be a subject of accreditation.

The result given in this Test Certificate and marked as sub- delivery is the result of a Subcontractors gauging made under the terms and conditions of a contract concluded with him.

It's not possible reproduce or incorporate the test certificate into promotional materials without laboratory written authorization!

Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 2020112103058818

## Test Certificate approved by

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## Analytical report AR-20-SZ-050122-04



## Testing laboratory:

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MarketingNZ@eurofins.sk, www.eurofins.sk

## Customer:

Univerzita veterinárneho lekárstva a farmácie v Ko  
Komenského 68/73  
041 81 Košice  
SLOVAKIA

Date of Sample Receipt: 10.09.2020 Date of Testing: 10.09.2020 - 21.09.2020

Issue date: 02.11.2020

## Information about Sampling:

Sampler: customer

Sample information: 147-2020-00061904

Sample description: Vosk

Sample Reference: 11.

## Physical and chemical tests

| Parameter       | Unit  | Allowed Value | Measured Value | Uncertainty of Method measurement* | Testing method /Process variance | E | TT |
|-----------------|-------|---------------|----------------|------------------------------------|----------------------------------|---|----|
| tau-Fluvalinate | mg/kg | -             | 0,115          | 0,0575 GC-MS/MS                    | ASU § 64 LFGB L00.00-115:2018    | - | SA |

## Notes:

E - evaluation

S - satisfied

NS - not satisfied

(A) - accredited sampling

(SA) - accredited sampling executed under the subcontract

SPP - Standard operation procedure

ND - not detected by given method

CFU - Colony forming unit

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- uncertainty given in % reflects the uncertainty from the result of measurement.

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Responsible for correctness:

Worked out by: Ladislav Nagy

No. of document: 202011210305258

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