Several choices can be done □ □ You can choose only one answer

Veterinary medicines in beekeeping around the world: Which active ingredients are in use and do they respond to the needs of beekeepers?

This survey is an initiative of APIMONDIA with the assistance of the TECA Beekeeping Exchange Group (TECA stands for Technologies and practices for smallholder farmers), in collaboration with the Regional Institute for Animal Diseases of Latium and Tuscany (IZSLT - Italy) and is under the supervision of Food and Agriculture Organization (FAO).

From 30th June to 7th August 2015, the attention of TECA will be especially focused on the topic “Veterinary medicines in beekeeping around the world”. Veterinary medicines are considered as any active ingredients/medicines used to cure or prevent diseases. In order to support this discussion, we would appreciate you answer the following survey (open from the 1st of June).

Through this survey beekeepers are asked to provide some information about the disease(s) they have in their hives and how they treat them. It will also help us to learn from beekeepers about their opinion on the impact of different bee diseases on the honey bees’ health and about the veterinary medicines they use. This survey would contribute to increase the global knowledge on beekeeping!

The survey is divided into 3 parts:

Part A: Gather information from participants on their perception of the honey bee diseases and the proper management of the hives.

Part B: Understand the concerns of participants about the main diseases affecting beekeeping in different areas around the world: Varroa, American Foulbrood (AFB) and European Foulbrood (EFB).

Part C: Understand what kind of assistance beekeepers receive to face the honey bee issues.

The survey is completely anonymous (you do not have to give your name) and will only take about 10-15 minutes to fill in.

We warmly invite you to participate!!!

(This survey is ONLY addressed/open to anyone involved in beekeeping)

If you do not have access to good internet connexion and want to participate in the survey, please feel free to complete it on this version or to print a copy of the survey (PDF format). You can also request a paper copy (hard copy) of the survey by sending an email to teca@fao.org and we will send you the number of copies you request to the address you have provided.

How to send us the completed survey?

- If you fill it on your computer, you can send it to us via email to teca@fao.org
- If you have a scanner, you can scan the completed survey and send it via email to teca@fao.org
- If you do not have a scanner, you can send the hard copy to the FAO Office in your country if there is one or send it directly to the TECA Team at the following address:
  Food and Agriculture Organization (FAO)
  TECA Beekeeping Exchange group, DDNR, Room C614
  Viale delle Terme di Caracalla
  00153 Rome, ITALY
Part A: Honey bee diseases – Overview

1. In which region are you located?
Write the name of your country: .................................................................

2. Are you:
- Beekeeper
- Beekeeping inspector/officer
- Beekeeping teacher/trainer
- Beekeeping technician/advisory service provider (extensionist)
- Veterinarian
- Researcher in the beekeeping sector
- Employee of governmental institution involved in beekeeping
- Other (please specify) ..................................................................................

3. How many beehives do you have?
- I don't have any hive
- Beekeeping inspector/officer
- Less than 30 hives (<30)
- Between 30 and 150 hives (30< ... <150)
- More than 150 hives (>150)

4. What diseases have you already heard about?
- Varroa
- American Foulbrood (AFB)
- European Foulbrood (EFB)
- Nosema
- Tracheal mite \((Acarapis woodi)\)
- Small hive beetle \((Aethina tumida)\)
- Tropilaelaps mite
- Myiasis of honey bees \((e.g. Senotainia tricuspis)\)
- Viruses
- Other (please specify) ..................................................................................

5. Can you give a score to each disease according to its impact on the honey bee health in your apiary?

<table>
<thead>
<tr>
<th>Disease</th>
<th>Very severe</th>
<th>Severe</th>
<th>Moderate</th>
<th>Low impact</th>
<th>No impact (you don't have this disease)</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varroa</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>American Foulbrood (AFB)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
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<tr>
<td>European Foulbrood (EFB)</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Nosema</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Tracheal mite ((Acarapis woodi))</td>
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<tr>
<td>Small hive beetle ((Aethina tumida))</td>
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<tr>
<td>Tropilaelaps mite</td>
<td>☐</td>
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<tr>
<td>Myiasis of honey bees ((e.g. Senotainia tricuspis))</td>
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<td>☐</td>
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<tr>
<td>Viruses</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Other (please specify)</td>
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</tbody>
</table>

6. Do you have other information you want to share about diseases affecting beekeeping in your country (personal experience, global impact, evolution on the last years, etc.)? .................................
7. Do you think that observing good beekeeping practices alone, without the use of active ingredients or medicines, could guarantee the health of your hives (regarding the following diseases)?

<table>
<thead>
<tr>
<th>Disease</th>
<th>YES</th>
<th>YES partially</th>
<th>NO</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varroa</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>American Foulbrood (AFB)</td>
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<tr>
<td>Myiasis of honey bees (e.g. Senotainia tricuspid)</td>
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<tr>
<td>Viruses</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

8. Do you think that veterinary medicines are necessary in apiculture to guarantee the health of your hives (regarding the following diseases)? (complete the following statement)

<table>
<thead>
<tr>
<th>Disease</th>
<th>YES</th>
<th>YES partially</th>
<th>NO</th>
<th>I don't know</th>
</tr>
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<tbody>
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<td>European Foulbrood (EFB)</td>
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<td>0</td>
<td>0</td>
</tr>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>Tropilaelaps mite</td>
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<td>0</td>
</tr>
<tr>
<td>Myiasis of honey bees (e.g. Senotainia tricuspid)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Viruses</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>

Part B: Concerning Varroa, AFB and EFB

QUESTIONS ABOUT VARROA

9. Have you ever seen a Varroa mite?
   ○ I don't know
   ○ YES
   ○ NO

10. Which are the active ingredients you normally use in your apiary in the treatment against Varroa?
    □ I don't know
    □ I don't treat against Varroa
    □ I use mechanical methods (splitting of hives, brood removal, queen caging, etc.)
    □ Essential oils (thymol, menthol, eucalyptol, camphor, other: Please specify below in the comment box)
    □ Organic acids (oxalic acid, formic acid, lactic acid, other: Please specify below in the comment box)
    □ Chemical compounds (amitraz, fluvinate, flumethrin, clorfenvinphos, coumaphos, other: Please specify below in the comment box)
    □ A combination of the above (e.g. treatment with thymol or oxalic acid applied in absence of brood induced by caging the queen): Please specify below in the comment box)

If you use other active ingredients that are not mentioned here, please let us know ..................................................
..................................................................................................................................................
11. Before treating your hives against Varroa, do you check the level of infestation (mite count)?
   - Yes, always
   - Sometimes
   - No, I never check it because I don’t know how to do it
   - No, I never check it because it doesn’t matter to me/I don’t think it’s necessary

12. If not yet available, which active ingredients would you like to have in your country as registered and authorized ingredients?
   - Oxalic acid
   - Formic acid
   - Lactic acid
   - Thymol
   - Menthol
   - Eucalyptol
   - Camphor
   - Amitraz
   - Fluvalinate
   - Flumethrin
   - Clorfenvinphos
   - Coumaphos
   - I don’t know
   - Other (please specify) ……………………………………………………………………………………………………………………………

13. Have you ever seen brood affected by AFB?
   - I don’t know
   - YES
   - NO

14. Are you able to diagnose AFB in your hives (i.e. can you recognize the symptoms of AFB in a hive)?
   - YES
   - NO

15. How did you diagnose AFB in your hives?
   - I’m able to recognize visible signs (symptoms)
   - I’m able to use on-field kit for diagnosis
   - I show the sample to a veterinarian
   - I show the sample to a beekeeping expert
   - I send the sample to a laboratory
   - Other (please specify) ……………………………………………………………………………………………………………………………

16. Which methods do you think are the best to manage AFB?
   - I don’t know
   - Shook swarm (Mechanically remove the bees from the frame, and destroy the frame)
   - Antibiotics (oxitetracycline, sulfamidics, tylosine, streptomicine, other….)
   - Shook swarm + antibiotics
   - Other (please specify) ……………………………………………………………………………………………………………………………

17. What product is currently available in your country to treat AFB?
   - I don’t know
   - Antibiotics (oxitetracycline, sulfamidics, tylosine, streptomicine, other….)
   - Probiotics (live bacteria and yeasts that are good for the digestive system)
   - No product against AFB is available
   - Other (please specify) ……………………………………………………………………………………………………………………………
18. Do you think the products currently available in your country to treat AFB are effective?
   - I don't know
   - YES
   - NO

**QUESTIONS ABOUT EFB (European Foulbrood)**

19. Have you ever seen brood affected by EFB?
   - I don't know
   - YES
   - NO

20. Are you able to diagnose EFB in your hives (i.e. can you recognize the symptoms of EFB in a hive)?
   - YES
   - NO

21. How did you diagnose EFB in your hives?
   - I'm able to recognize visible signs (symptoms)
   - I'm able to use on-field kit for diagnosis
   - I show the sample to a veterinarian
   - I show the sample to a beekeeping expert
   - I send the sample to a laboratory
   - Other (please specify) ..............................................................

22. Which methods do you think are the best to manage EFB?
   - I don't know
   - Shook swarm (Mechanically remove the bees from the frame, and destroy the frame)
   - Antibiotics (oxitetracycline, sulfamidics, tylosine, streptomicine, other….)
   - Shook swarm + antibiotics
   - Other (please specify) ........................................................................

23. What product is currently available in your country to treat EFB?
   - I don't know
   - Antibiotics (oxitetracycline, sulfamidics, tylosine, streptomicine, other….)
   - Probiotics (live bacteria and yeasts that are good for the digestive system)
   - No product against EFB is available
   - Other (please specify) ........................................................................

24. Do you think the products currently available in your country to treat EFB are effective?
   - I don't know
   - YES
   - NO

**Part C: Training and Assistance**

25. How did you develop your beekeeping skills?
   - Other beekeepers
   - Through Beekeeping Associations (e.g. courses, visits in apiaries, technical assistance, etc.)
   - Friends
   - Family
   - Beekeeping course
   - Government (leaflets, guidelines, technical assistance, etc.)
   - Self-study (websites, books, forum, etc.)
   - TECA techniques
   - Other (please specify) ...........................................................................
26. Are you well informed about the organization of beekeeping courses/meetings held in your region?

<table>
<thead>
<tr>
<th>I am well informed:</th>
<th>Completely disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Completely agree</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Any comments? ..........................................................
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27. Do you think you receive appropriate technical assistance for your needs in the apiary treatments?

<table>
<thead>
<tr>
<th>I receive appropriate technical assistance:</th>
<th>Completely disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Completely agree</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

Any comments? ..........................................................
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28. What amount of assistance **would you NEED** in your apiary for:

<table>
<thead>
<tr>
<th>Technical assistance (apiary/beekeeping management)</th>
<th>Full</th>
<th>A lot</th>
<th>Moderate</th>
<th>Little</th>
<th>No assistance</th>
<th>I don't know</th>
</tr>
</thead>
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</tbody>
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<table>
<thead>
<tr>
<th>Veterinary assistance (bee diseases)</th>
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<th>A lot</th>
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</tr>
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</tbody>
</table>

Any comments? ..........................................................
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29. What amount of assistance do you **actually GET** in your apiary for:

<table>
<thead>
<tr>
<th>Technical assistance (apiary/beekeeping management)</th>
<th>Full</th>
<th>A lot</th>
<th>Moderate</th>
<th>Little</th>
<th>No assistance</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Any comments? ..........................................................
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...........................................................................
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30. Where do you get assistance about apiary treatments?

- ☐ I don't have assistance
- ☐ Beekeeping technician/advisory service provider
- ☐ Beekeeping inspector/officer
- ☐ Veterinary
- ☐ Expert beekeepers
- ☐ Association/Cooperative
- ☐ Other (please specify) ..........................................................
31. Do you think veterinarians are sufficiently informed on the honey bee diseases and the related treatments?

<table>
<thead>
<tr>
<th>Veterinarians are sufficiently informed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely disagree</td>
</tr>
<tr>
<td>0</td>
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</tbody>
</table>

Any comments? ……………………………………………………………………………………………………………………………
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32. Do you think you are well informed about the good beekeeping practices to apply at the apiary level?

<table>
<thead>
<tr>
<th>I am well informed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely disagree</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Any comments? ……………………………………………………………………………………………………………………………
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33. Do you consider that the veterinary products available in your country are effective to treat hive diseases? (complete the following statement)

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>YES partially</th>
<th>NO</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varroa</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Viruses</td>
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<td>0</td>
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<td>0</td>
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<tr>
<td>Other (please specify)</td>
<td>0</td>
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</table>

Any comments? ……………………………………………………………………………………………………………………………
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34. Do you buy veterinary medicines, to treat:

- Varroa
- American Foulbrood (AFB)
- European Foulbrood (EFB)
- Nosema
- Tracheal mite (Acarapis woodi)
- Small hive beetle (Aethina tumida)
- Tropilaelaps mite
- Myiasis of honey bees (e.g. Senotainia tricuspis)
- Viruses
- I don't buy veterinary products
- Other (please specify) ……………………………………………………………………………………………………………

35. Do you use home-made medicines, to treat:

- Varroa
- American Foulbrood (AFB)
- European Foulbrood (EFB)
- Nosema
- Tracheal mite (Acarapis woodi)
- Small hive beetle (Aethina tumida)
- Tropilaelaps mite
- Myiasis of honey bees (e.g. Senotainia tricuspis)
- Viruses
- I don't use home-made medicines
- Other (please specify) ……………………………………………………………………………………………………………
36. Do you already notice lack of efficacy of treatments?
- I don’t know (Go directly to question 38., don’t answer question 37.)
- I have never observed lack of efficacy of my treatments (Go directly to question 38., don’t answer question 37.)
- I have observed lack of efficacy of the treatment applied with some active ingredients (Please answer question 37.)

37. Which active ingredients do you think are no longer effective (e.g. because of resistance)?
- Oxalic acid
- Formic acid
- Lactic acid
- Thymol
- Menthol
- Eucalyptol
- Camphor
- Amitraz
- Fluvalinate
- Flumethrin
- Clorfenvinphos
- Coumaphos
- Oxitetracycline
- Sulfamidics
- Tylosine
- Streptomycine
- I don’t know
- Other (please specify).................................

38. What do you think could be done to improve the efficacy of the available treatments?
- I don’t know
- Specify for which disease and how: ...................................................................................................

39. Do you think you need new active ingredients against honey bee diseases?
- I don’t know (You can stop the survey here – Thank you for your participation)
- YES (Please answer the following questions)
- NO (You can stop the survey here – Thank you for your participation)

40. Which new active ingredients would you need against Varroa?
- Oxalic acid
- Formic acid
- Lactic acid
- Thymol
- Menthol
- Eucalyptol
- Camphor
- Amitraz
- Fluvalinate
- Flumethrin
- Coumaphos
- I don’t know
- Other (please specify):.................................

41. Which new active ingredients would you need against AFB?
- Oxitetracycline
- Sulfamidics
- Tylosine
- Streptomycine
- I don’t know
- Other (please specify below)

42. Which new active ingredients would you need against EFB?
- Sulfamidics
- Tylosine
- Streptomycine
- Probiotics
- I don’t know
- Other (please specify below)
43. Which new active ingredients would you need against **Nosema**?
   - Fumagilline
   - Vitamins
   - Molasses
   - Herbs/Phytotherapy
   - I don't know
   - Other (please specify below)

44. Which new active ingredients would you need against **Tracheal mite** (Acarapis woodi)?
   - Menthol
   - I don't know
   - Other (please specify below)

45. Which new active ingredients would you need against **Small hive beetle** (Aethina tumida)?
   - Coumaphos
   - Fypronil
   - I don't know
   - Other (please specify below)

46. Which new active ingredients would you need against **Tropilaelaps**?
   - Oxalic acid
   - Formic acid
   - Lactic acid
   - Thymol
   - Menthol
   - Eucalyptol
   - Camphor
   - Amitraz
   - Fluvalinate
   - Flumethrin
   - Coumaphos
   - I don't know
   - Other (please specify below)

47. Which new active ingredients would you need against Myiasis of honey bees (e.g. *Senotainia tricuspis*)?
   - Entomologic glue
   - I don't know
   - Other (please specify below)

48. Which new active ingredients would you need against any other diseases that were not mentioned in this survey?
   …………………………………………………………………………………………………………………………………………………………………………………………

**Thank you for completing our survey!**

We will publish on TECA the results of the survey in September/October 2015.