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Poultry Red Mite Expert Roundtable

Proceedings Booklet

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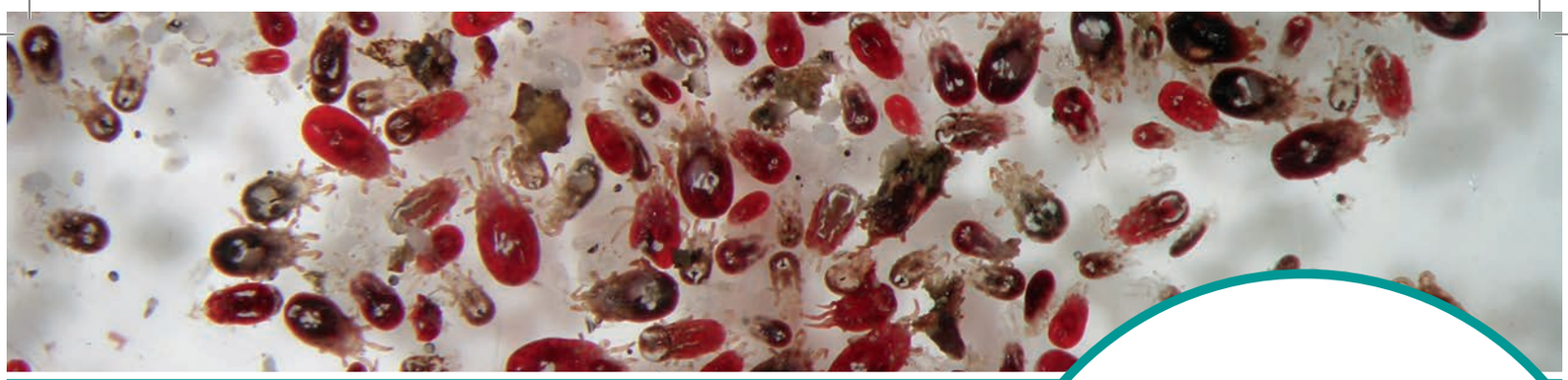

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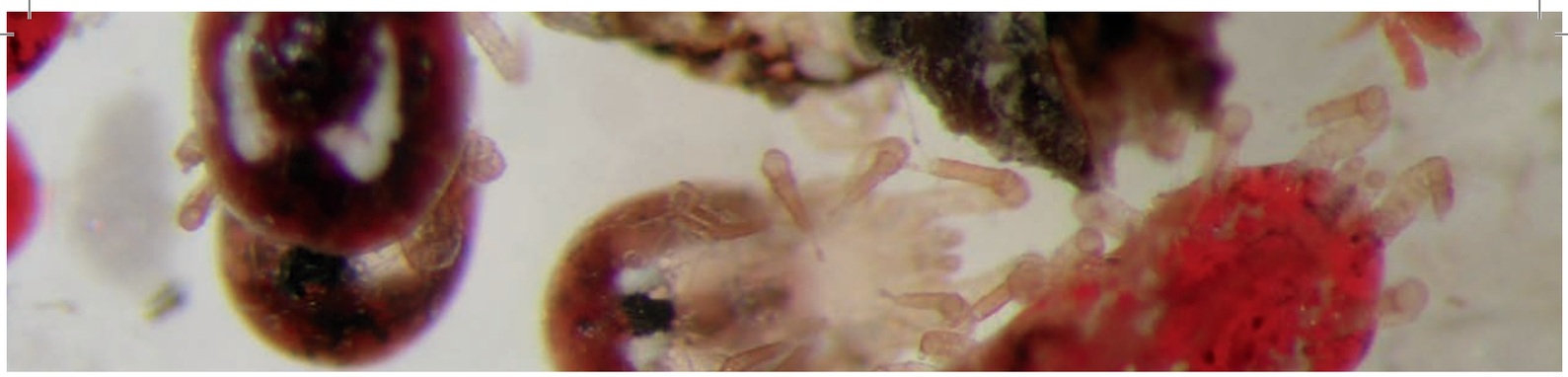
Introduction

The control of *Dermanyssus gallinae*, or the poultry red mite, is an emerging issue of great importance to the global egg production industry. Recently, a significant amount of new research has been occurring both to aid in our understanding of poultry red mites and to develop new treatment methods. In order to facilitate information sharing between members of the full value chain including researchers, egg producers, industry (i.e., egg packers), and pharmaceutical companies, MSD Animal Health organized and sponsored a Poultry Red Mite Expert Roundtable in Amsterdam, Netherlands, on February 21, 2017.

The goal of the Poultry Red Mite Expert Roundtable was to enable information sharing, enhance educational opportunities, and identify solutions and next steps for the poultry egg industry to tackle the issue. The roundtable meeting was facilitated by Dr. Jeff Wilson of Novometrix Research Inc. and attended by seven participants. The participants represented a number of sectors in the poultry value chain including researchers, veterinarians, eggproduction companies and egg packagers. This proceedings book highlights some of the stimulating answers and input received from participants during the roundtable meeting.



Roundtable Participants

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Prof. Olivier Sparagano
PhD

Associate Pro Vice-Chancellor
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United Kingdom

"Red mites are still an underestimated problem by the producer, and they aren't aware of the full impacts of an infestation. A monitoring system, above just looking for the mites with your eyes, is important for identifying an infestation in the early stages."

Dr. Roland Bronneberg
DVM, PhD, Dipl. ECPVS

President, Avivet Veterinary
Service, Research and Solutions
The Netherlands

What is the prevalence of poultry red mites and awareness of the issue?

RB: Red mites are still an underestimated problem by the producer, and they aren't aware of the full impacts of an infestation. A monitoring system, above just looking for the mites with your eyes, is important for identifying an infestation in the early stages.

RG: Due to the structure of our housing systems, it can be difficult to see the mites, and farmers aren't necessarily looking for them. We (as an egg production company) are interested in learning about ways that we can help farmers look for red mites in a structured and helpful way.

KJ: It is a huge problem, and many farmers do not recognize mites early in an infestation. Then they see their hens feather pecking and they don't know why … we need to sensitize farmers to the issue so they are looking for red mites.

AC: Often farmers seem to be alone when it comes to controlling red mites … and the sensitivity of each farmer to the issue also seems to be different. The prevalence of red mites is very high; in Italy we see it in approximately 90% of farms.

OS: There also seems to be a stigma around the red mite issue. Farmers may not want to admit that they have a problem because they fear that the egg packers or retailers might not want to buy their eggs. Therefore, some farmers will deny that they have an issue because they are very fearful of the economic losses that may occur as a result. Need to create a community and allow for open communication with veterinarians so that producers feel comfortable talking about red mite issues.

RB: In order to show farmers the importance of the issue and get the message across, we need to link the red mite issue to performance. It would be very valuable if we could do a simple prevalence study across the EU and link with simple production measures (such as egg production and feed conversion) to show the economic impact of the red mites.

"There is a significant economic impact for farmers through loss of production. We can prove that feed conversion is affected even in early stages when the infestation levels are lower."

Monique Mul
PhD

Researcher, Animal Health
Wageningen Livestock Research

What is the impact of poultry red mites on production, health, welfare and profitability?

RG: On farms, we see variable production, pale combs, feather loss, and increased noise levels because birds are agitated. When it comes to financial performance levels, we tend to focus on egg numbers. For example, in a flock with 16,000 birds, if an egg is worth about 8 pence, that's equal to about £1,280 across the whole flock (the cost of one egg lost in production). If we are experiencing a loss of 10 eggs, that is equal to £12,800 across the whole flock. This is a significant amount of money to the farmer.

MM: There is a significant economic impact for farmers through loss of production. We can prove that feed conversion is affected even in early stages when the infestation levels are lower. We've also all heard that products that are used aren't always legal – as a result these may negatively affect animal health or result in residues in or on the egg. Also potential for an environmental impact through (chemical) residues in the manure.

PB: Cost-wise, it is a big economic issue in Germany and it is affecting producers in terms of feed conversion and other production problems, resulting in the farmer making less profit. As a company, we have seen some problems with second-class eggs due to blood spots; however, this does not appear to be a big issue at the moment.

RB: For me, the biggest impact is on profitability. It's a direct impact but is caused indirectly, through production losses via stress, impact on immune status, and anemia. All of those things put together have a big impact on productivity.

In terms of egg production, the impact is a decrease of 5-10 eggs for an average infestation. Additionally, we know that some conditions such as Gumboro Disease, Merek's Disease, adenoviruses, etc., cause immunosuppression. I believe a red mite infestation acts in the same way, causing immunosuppression in the hen, making it more sensitive to other diseases such as *Salmonella* or *E. coli.* It is a complex disease.

What is the impact of poultry red mites on production, health, welfare and profitability? *(continued)*

OS: When it comes to human health impacts, it depends if we are talking about the farmers or the poultry workers or general public. With farmers, we are dealing with a population that is very resilient and is unlikely to seek medical attention for a rash … so the issue is likely under-reported. The general public, on the other hand, are more likely to go see their doctor if they see some sort of rash on their skin. We need to educate farmers so that they know to go to their doctor if they have a rash from red mites as some bacteria or viruses may be transmitted by their bites.

MM: We should also consider the potential impact to farmers from red mite treatments.

RB: Yes, farmers using illegal products are not likely aware of the potential impacts on birds, themselves, and potentially consumers. Veterinarians need to be aware of this issue and educate farmers. This is also related to image building for the industry.

MM: A red mite infestation has a large impact on hen welfare. The steps that I've seen, the others may agree or disagree, is that they start off a bit itchy. Then they try to get rid of the mites so you see increased preening. But in the end, when the infestation becomes too much that they can't handle it anymore, they just appear to be depressed.

PB: Consumers are focusing more and more on animal welfare issues. The red mite problem might be the next big consumer issue … not at the moment but it may be the next. We are very aware of consumers and their feelings towards animal welfare related to egg production. Who wants to buy an egg from a depressed bird? ... It is important that we as an industry work together to get ahead of this issue.

"Biosecurity measures take some time to implement and perform but they are necessary to prevent spread between buildings on a farm or to the packing area where the mites could then be sent with the eggs to consumers."

Prof. Olivier Sparagano
PhD

Associate Pro Vice-Chancellor
for Research, Coventry University
United Kingdom

What role does biosecurity play in the fight against poultry red mites?

OS: Biosecurity plays a big role in prevention of the spread of red mites. There are things that we can be doing that are very simple, such as cleaning boots, to try to prevent the proliferation of red mite populations. Often these biosecurity measures take some time to implement and perform but they are necessary to prevent spread between buildings on a farm or to the packing area where the mites could then be sent with the eggs to consumers. A simple change of clothing and cleaning boots can go a long way in preventing spread.

MM: It's about the whole egg production chain, the breeding companies, rearers, farmer, egg packagers, etc. In the Netherlands, we are starting to see the various parts of the value chain acknowledging their role in the issue. In terms of the mites, it's been shown that the same genetic strain is being spread through the whole chain, no proof that the mites are coming from the wild … In terms of biosecurity, we need to consider the role of the egg belt and the manure belt. We can prove with data that if you cleaned the manure belt at least twice per week you saw a huge reduction in red mite numbers.

RB: With prevention alone, including improving biosecurity, it is possible to reduce mite population levels on a farm by 60-70%. This reduction would have a huge impact on productivity measures and economics for the farmer.

"Surveillance and monitoring are often difficult because while we can easily see if the mites are present, we don't know what the infestation level is and whether it is an appropriate time to apply treatment."

Dr. Katharina Johannhörster
DVM

Practice Dr. Pöppel
Germany

What about surveillance and monitoring for poultry red mites?

KJ: Surveillance and monitoring are often difficult because while we can easily see if the mites are present, we don't know what the infestation level is and whether it is an appropriate time to apply treatment. In Germany, we have access to a treatment product that shows good efficacy but are only allowed to treat twice a year so you really have to know when is the best time to treat.

OS: When using mite traps we also have to remember that people are often using different types of traps and this may affect the levels of infestation that they are measuring. Different factors such as the type of trap, how often it is checked, where it is placed in the barn, the materials placed inside the trap will all have an effect on the overall infestation levels recorded.

MM: There are lots of monitoring methods. We have asked researchers what method is preferred and why. The feedback we heard was that the automated traps were easiest: They need something that is validated, and something that is comparable. But then we came to the question of where to put the traps and how many? We don't know the answers to these questions. We've been trying for a number of years to create a monitoring plan to evaluate all of these things, but this is still a work in progress as we do not know enough to make a universal plan.

RB: From our experience with research and in the field, we have been able to develop a tube trap that we've been using in many hundreds of flocks. With this monitoring system we can get an estimate, if we check the traps often – every 2 days of how the mite population is changing. Using this process, we can almost create a 3D picture of how the mites are moving in the barn. If you monitor in fixed locations and check the traps regularly, you can also start to get an idea of when you need to treat. In order to get information about how mites move through the house, you need a monitoring system – we currently have two validated systems, Monique's automated counter and then the traps that we are using. But you have to put them in more farms if you're going to get more information. Once you have good tools, you can get good information on prevalence, when to treat, and analyze the effect of a treatment. We have good tools, now we just need more use of them so we can get the information we need to answer these questions and make informed decisions.

"In some cases, farmers will choose to use less expensive products that may be banned without understanding the effect of the product on eggs and the potential of harmful residues for customers."

Dr. Antonio Camarda,
DVM, Dipl. ECPVS

Professor of Avian Diseases,
University of Bari

What are some prevention and treatment considerations?

AC: In terms of prophylaxis or preventative treatments – while the barn is empty, it is possible to treat all the points in the cage that are difficult to reach. For example, it's known that the perches are an area where mites tend to survive while the barn is empty. Also in older cages the ventilation tubes between cages are another area where mites tend to survive.

OS: There has been ongoing research into vaccine development for the past 8 years. In the lab we can see 80-90% reduction in red mite populations, but this doesn't always translate into the field setting … There has been a lot of progress in the past 5 years: I expect that there will be a vaccine on the market in the next 10 years.

RB: Good treatment effect studies are not available for a lot of the products available in the field … We also need to consider issues of resistance, withdrawal times, and potential for residues on the eggs.

KJ: In Germany, there are only about 2-3 products that show good efficacy and sometimes we need to change the products because of resistance issues. We do a lot with silica dust for prevention but may use the chemicals as well, trying to save them for as late as possible. But the big gap is that there are only 2-3 products with good efficacy.

AC: In some cases, farmers will choose to use less expensive products that may be banned without understanding the effect of the product on eggs and the potential of harmful residues for customers.

PB: We, as an egg packaging company, are very concerned about the illegal treatments that farmers might be using to deal with the red mite issue. In our contracts with producers, we have rules about only using legal products, including for pest control. We do some research on residues on eggs, and have not found problems in the past.

What are some prevention and treatment considerations? *(continued)*

KJ: Farmers are often not aware of the red mite life cycle and how it relates to treatment protocols. They do not know that the treatments do not impact the mite eggs; therefore, they need to apply the second dose of treatment to kill the next generation of mites. This is a huge problem.

OS: If the treatments do not occur at the right interval then it allows the next generation of mites to 'hide' from the second treatment in a life-stage that is not susceptible to the chemical. Depending on the conditions at the farm, the timing of the life cycle may vary slightly. The veterinarian needs to work closely with the farmer to establish proper timing of treatments.

“There is a need to educate farmers about the importance of proper application of treatments.”

Roger Gill,

Head of Agriculture,
The Lakes Free Range Egg Company Ltd.

What about poultry red mite resistance to treatments?

OS: Development of resistance to chemical products, in general, is almost inevitable. We (as researchers and pharmaceutical companies) need to think in advance about resistance and how to tackle it when it happens. By considering this now and having a planned solution, we can help to keep products effective into the future.

RG: There is a need to educate farmers about the importance of proper application of treatments. Sometimes we see that producers are using products incorrectly, not because they don't know how to use it, but because they are trying to cut costs by diluting a product or using a lower dose. But, they are not aware of the dangers in doing that – what the real cost is.

RB: That's right. We also need to educate on how improper treatment application can lead to resistance development. If farmers try to use a lower dose to save money, then we might not have effective remedies anymore.

AC: Resistance to chemical acaricides (correctly or wrongly applied) has been reported in the field. To support farmers and veterinarians in choosing the most effective treatment, we can test the sensitivity of the mite population to be treated against specific molecules *in vitro*. This approach provides data that is useful when it comes to estimating expected results in the field, and at the same time, to support the choice of the best treatment.

"I agree about the need to increase awareness about prevention. We need to build up communication with farmers."

Petro Boon

Director of Purchasing
Van Beek Group
The Netherlands

How can we solve the poultry red mite problem?

AC: We need tools and monitoring programs that are specific to the conditions on individual farms. Also we need a way to determine when it is economically most effective to start treatment. But before that, we also need to be working to develop prevention and prophylaxis methods, not just focusing on a chemical treatment approach. For example, considering the design of farms and cages, this is especially important with new regulations (in some countries) regarding cages.

RG: Looking forward, data collection is very important. If you ask a farmer what their production levels are, they will often 'correct' this in a way that alters the information. If we are able to collect data in an automated way, we get more accurate information on the effect of an infestation.

KJ: I think it is important to have more interaction between veterinarians and the producers. Sharing information on how to treat effectively, it is important to stress the importance of repeating the treatment every 7-10 days. Also important to discuss housing design, for example – design of the manure belt, something that is easy to change but needs to be considered before building the barn. Farther in the future, we need to develop new treatments, vaccines or chemical products with proven efficacy.

OS: Prevention is the area where we could make the biggest 'win.' There is an opportunity to increase education for the producers by giving simple recommendations of what to do and what not to do. This will minimize the frequency and number of outbreaks. Also, we need to make sure that the producers and veterinarians are on the same side and that the stigma around red mites is reduced. We need to increase trust with producers so that we can get more data and more cooperation to work together. For this, we need the entire sector on-board.

PB: I also agree about the need to increase awareness about prevention. We need to build up communication with farmers. This could occur through producer newsletters and other publications. For example, our company shares information using newsletters and direct letters. Also, there are a lot of people visiting farms. We need the feed representatives and veterinarians, etc. – all the people (involved at the farm) – to be part of the awareness and prevention plan. This is quick and easy and cheap to implement.

How can we solve the poultry red mite problem? *(continued)*

RB: It is important to visualize in a quantitative way, what the population level is in the house … to do this we need a sound, objective and validated method. This would also allow for comparisons between farms. Next step would be to find the threshold for when to treat. Then you can model to predict the population growth and when the next treatment will be required. You can also add the economic side to it – what is the cost-benefit of treating now versus waiting. In the longer term, we need to look at the multifactorial control and prevention aspects of red mites … there is more education needed on the prevention part of it through biosecurity. And we need this along the whole value chain.

MM: When it comes to gaps to be closed – the monitoring plan is very important but may be more of a long-term goal. More automatic data collection using mite traps will be very helpful in learning more about what treatments are effective and how they impact red mite populations. There is not so much research on management, for example – the effect of temperature, there's something in those tiny management effects that we need more information on. In terms of housing design – we have a lot of information on this and could be applying it. We also need to consider improving knowledge of general practitioners, i.e. what does a mite bite look like? How to treat it? Etcetera.

AC: I am confident that we have some of the important tools to control, not solve the problem. Biosecurity will help us to reduce the circulation of infection – but our aim should be to reduce the prevalence within farms as the infestation is already diffuse across the EU. So the objective should be to control the population inside the farm and to reduce the transmission between farms. At the moment, we don't have something that will remove all the mites from all farms. We need to focus on avoiding the negative effects of mites on animals and people.

MM: It is all about integrated pest management (IPM). We start with prevention, then follow up with monitoring, and set a threshold for treatment. When it comes to treatment, we should start with strategies to prevent development of resistance and to reduce residues. This approach is better for the environment. Currently, we are working with producers on IPM to make it practical for them. If we work on all these factors together then we will have a system that is effective in the producer's hands.

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