

## RED POULTRY MITE CONTROL TREATMENT REPORT, PERFORMED IN POULTRY HOUSE IN MAŁOMICE, BOBRZANY 1B.

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This report contains 15 numbered pages including with the title page.

### **Red Poultry Mite – the general information.**

Red poultry mite (*Dermanyssus gallinae* Redi, 1674) is a cosmopolitan, ruthless, temporal ectoparasite of birds and small mammals. (Photo 1). It may also attack people performing poultry house cleaning activities. Red poultry mite is active at night. During the day it stays hidden in cracks and crevices, however, at close proximity to the hosts' bodies. The parasite's life cycle

includes the following stages: an egg – larvae – protonymph – deutonymph – adult. In the optimal environmental conditions, that is, in temperature around 20°C and relative humidity of around 70%, the parasite's life cycle takes from 7 to 10 days. (1). Before every subsequent transformation each developmental stage of the parasite, excluding the larvae, feeds on blood. In case there are no hosts available, red poultry mites can last without food even for a few months. The parasite's bite causes itchiness, anxiety and sleeplessness among animals. Scratching and pecking of the irritated places leads to the feather loss, skin laceration and irritancy. It also increases the possibility of an infection occurrence as well as there is the increased probability of secondary bacterial infections. Anemia and general weakness cause decrease in bird's body weight and laying performance, reduced immunity and even deaths of the attacked birds.(2).

The red poultry mite presence in poultry houses poses considerable risk to health of the staff working there as well as the veterinary doctors. The parasite's bite may be the cause of the skin lesions and secondary bacterial infections. Moreover, inhaling the parasite's allergens may induce the occupational asthma in case of poultry farmers. *D. gallinae* is the reservoir and the carrier of the transmittal diseases causes by numerous viruses, rickettsia and other parasitic protozoa. (3).

The intensive and persistent red poultry mite invasion considerably decreases the welfare of the farmed birds and influences the economic aspect of the whole poultry farming. The annual losses on livestock and the costs of red poultry mite control were estimated for €130 million. (4).



Photo 1. Red poultry mite - *Dermanyssus gallinae*

### **Monitoring of the red poultry mite population size in poultry house number 69 in Małomice.**

The estimation of *D. gallinae*'s invasion's intensity was presented twice, that is before the first treatment and after the second treatment. Three monitoring methods described in professional studies were applied.

1. The evaluation of *D. gallinae* clusters' size present on construction elements of the cages.

Pavličević, J. Yoon and partners (2017) presented the veterinary risk assessment of the farmed animals. Such an assessment was made based on the size of red poultry mites' clusters. The authors indicate that the treatment should be conducted when the aggregations (clusters) are about the size of a thumb and moving parasites are visible on the construction

elements of the cages. Moreover, the anxiety and partial color loss on their cockscombs are clearly visible among the birds. According to the authors even higher level of threat to the bird's health, which requires urgent treatment, appears when there is a considerable number of clusters larger than a thumb in the poultry house. Because of progressive anemia, the major change in cockscomb's color can be noticed. The feather loss, skin damage and the general deterioration in state of birds' health and even the deaths of birds are commonly observed.

## 2. General estimation of red poultry mite population size.

At the upper part of the cages a wide piece of white cloth with a surface area of about 0,5 m<sup>2</sup> should be placed. The number of moving parasites should be estimated on the following day- the red poultry mites are clearly visible on the white cloth. The method is rather imprecise; however, it is very easy to implement and allows to simply assess the number of parasites as well as to make the photographic documentation of the variable number of the *D. gallinae* population. Based on that it is possible to plan the timetable of the treatments. The used cloth and the parasites should be soaked in the container with the acaricide and then utilized.

## 3. Pipe- traps.

This method is based on placing the paper pipe – traps in a poultry house (Photo 2.). *D. gallinae* treats the traps as shelters just after feeding on birds (parasitizing on birds). In pipe-traps the presence of parasites' all active developmental stages, including laid eggs, are noticed and reported. The pipe - traps were fixed to the cages' frames nearby the hens and after 7 days (just before the spraying) they were collected and placed in sealed containers. Afterwards, in the laboratory, the number of *D. gallinae* blood - fed females detected in 100 mg of sediment (residue) present in the pipe- traps was estimated.

The monitoring method described above was developed by K. Romaniuk and R. Sokół. It was also described in Polskie Drobiarstwo Magazine (Polish Poultry number 11, 2015, pages 24- 26). According to the authors the presence of 300 blood - fed females of *D. gallinae* in 100 mg of sediment (residue) poses the veterinary risk for the farmed birds and creates the urgent necessity to perform red poultry mite control treatment.



*Photo. 2. The set of paper pipe - traps placed in a hard cover protecting the pipe-traps from damage. According to Romaniuk K. and Sokół R.*

### **The treatment with DERGALL.**

Two spraying treatments were performed in the poultry house number 69 in Małomice, Bobrzany 1 B.

Date:

I treatment – 21<sup>st</sup> of November 2017

II treatment – 28<sup>th</sup> of November 2017

The follow – up treatment is essential to eliminate the new generation of the parasites, which after the hatching and transformation to the nymph phase, have already begun the active feeding on birds.

The sprayer type: Spray Team s.n.c. di Bergamini Gianni & C.

(Photo 3 and 4).



*Photo 3. The data plate of the sprayer:*

The number of spraying nozzles: 21 x 2

The spraying angle of the working solution: 110°

Pressure: 20 Bars

The consumption of 1% Dergall spraying solution during both treatments: 2 000 l





*Photo 4. The sprayer used for Dergall spraying.*

### **The procedure used during red poultry mite control treatment.**

The successful and effective elimination of red poultry mite requires strict compliance with the procedure, which takes into account the parasite specific life cycle and its physical rhythm of activity. The treatments should be conducted at night, about 60 minutes after switching off the lights and when the birds are calm. A weak source of light is recommended to be used during the treatment e.g. the headlamp. As in cracks and crevices there may remain the parasite's eggs capable of evolving into subsequent developmental stage, the treatment should be repeated just after noticing the larvae and nymphs of the parasite's next generation.

In summertime the new generation of nymphs appears very quickly, therefore, the follow-up treatment should be conducted 4 days after the initial treatment. In autumn and winter, when the temperature is lower – after 7 days.

### **Dergall. 3D – IPNS Technology.**

Dergall is a modern product with a physical mode of action. The basis of its effectiveness is the spontaneous cross – linking of silanes and siloxanes in the combination with water (3D-IPNS Technology). The three-dimensional net covers and immobilizes the target arthropods. The product does not contain the aggressive pesticides, which may be dangerous not only to the health of the animals, but also to the food and environment, therefore Dergall can be used safely at any stage of the production cycle. Moreover, the physical mode of action eliminates the risk of the target parasites may become resistant to the product. What is more, Dergall also indicates remarkable, non-specific antibacterial properties. When Dergall is applied in the presence of the animals weakened by the parasites' attacks that stay in places regarded to be microbiologically contaminated, it also protects the animals against infections.

## **THE RESULTS OF RED POULTRY MITE MONITORING AND TREATMENT.**

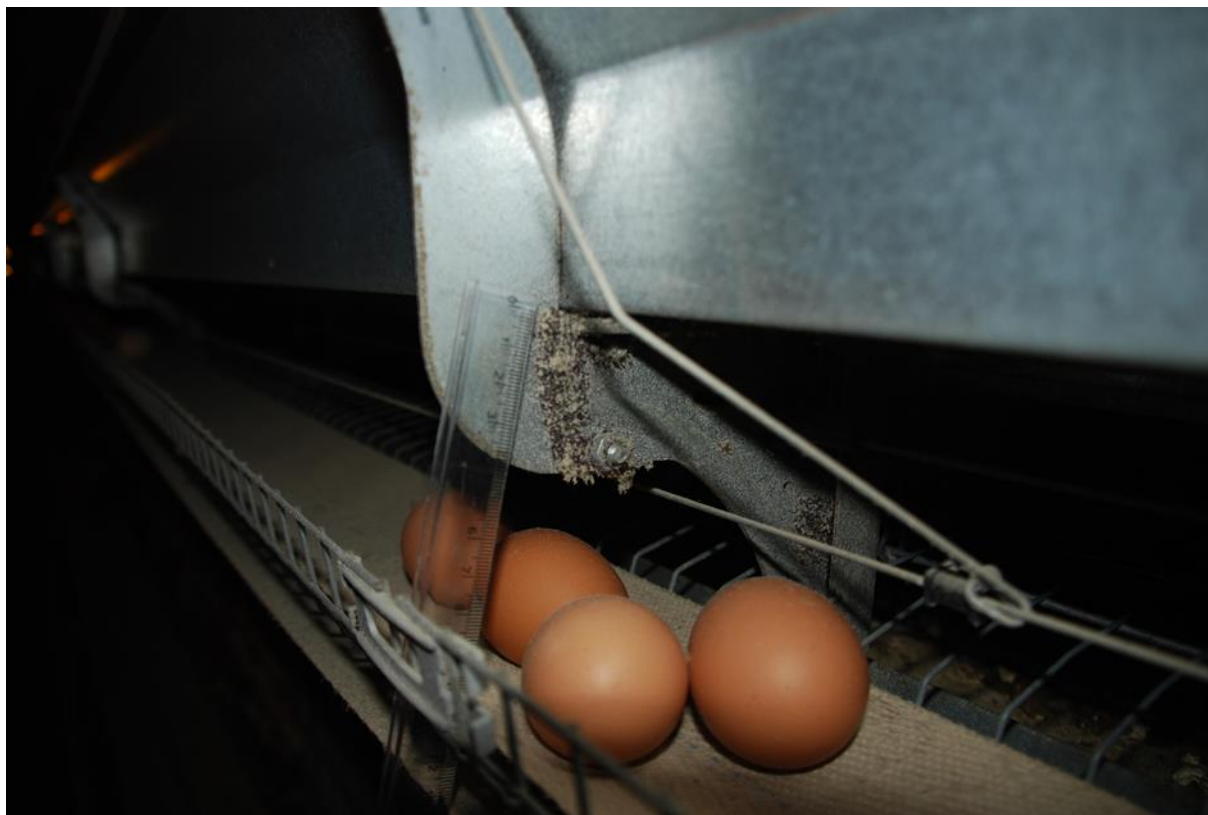
### **1. The size of parasites' clusters.**

On the 14<sup>th</sup> of November 2017 the size of *D. gallinae* clusters present on the construction elements of the cages in the poultry house in Małomice were measured. The observed clusters were colonized by living and moving parasites and reached 2,5 cm in width and 5 cm in length. (Photo 5.)

On the 21<sup>st</sup> of November 2017, that is after the first treatment, the size of *D. gallinae* clusters were examined again. At that moment there was no change observed in terms of the clusters' size, but there were no living, moving parasites.

Similar observations were performed on the 28<sup>th</sup> of November 2017, after conducting the follow - up treatment. Once again there was no change observed in terms of the clusters' size and there were no living, moving parasites.





*Photo 5. The cluster of red poultry mite.*

## **2. Monitoring of the red poultry mite population gathered on the white cloth.**

To estimate the state of red poultry mite invasion in poultry house number 69 in Małomice on the 14<sup>th</sup> of November 2017 (before the first treatment) and on 28<sup>th</sup> of November 2017 (after the second treatment), pieces of white cloth of 0,5 x 0,5 meters (marked with number 69) were placed on the top of the cages. On the next day the cloths were collected and based on visual judgement of parasites' quantity, the size of invasion was estimated. (Photo 6).

To compare the effectiveness of the parasite treatment with the use of different control methods in two other breeding enclosures, on 28<sup>th</sup> of November 2017, the pieces of white cloth were placed there as well.

**Probable, accidental and unintentional change of the white cloths, that were placed in the breeding enclosures, allowed neither to estimate the efficacy of the treatment nor to make the reliable comparison of the control methods used in other breeding enclosures.**

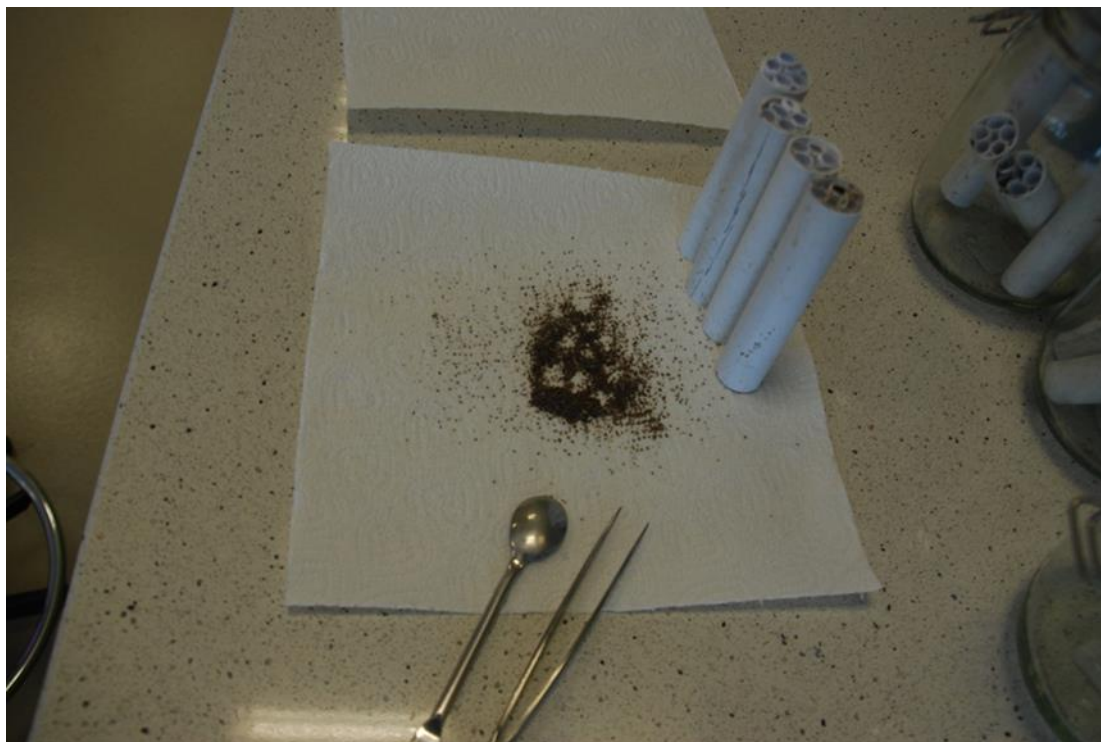


*Photo 6. The parasites' cluster visible on a white cloth placed on the top of the cage in poultry house number 69. This observation was made on 15<sup>th</sup> of November 2017, that is before the first treatment.*

### **3. Monitoring of the number of *D. gallinae* by means of pipe - traps.**

Fourteen sets of pipe – traps (two of them in each of 7 rows) were fixed to the metal elements of the cages. The pipe - traps were placed at the closest proximity to the hens. After 7 days the pipe - traps sets were removed. Then the content of the pipe – traps was examined, however, separately for each of 7 rows. For that purpose, 100 mg sample of gathered sediment (residue) was measured and the number of blood-fed red poultry mite females was counted.

In the week preceding the first treatment, that is between the dates: the 14<sup>th</sup> of November and 21<sup>st</sup> of November, in 100 mg of sediment there were from 382 to 712 of blood-fed *D. gallinae* females found (*D. gallinae* / 100 mg of sediment. (Table. 1)). In the examined sediment there were also other parasite's active development stages and numerous eggs found.



*Photo 5. The sediment gathered by means of pipe - traps in the period between 14<sup>th</sup> of November and 21<sup>st</sup> of November – before the first treatment.*

After the second treatment conducted in the time period between 28<sup>th</sup> of November and 5<sup>th</sup> of December, the pipe – traps were fixed to the cages one more time. All 14 sets of pipe - traps contained only 20 mg of sediment (Photo 6.) with 16 blood-fed females of *D. gallinae*. (Table 1.)



Photo 6. The sediment containing the Red Poultry Mite gathered by means of pipe-traps in the period between 28<sup>th</sup> of November to 5<sup>th</sup> of December after the second treatment.

Table 1. The number of blood-fed *D. gallinae* females present in the sediment gathered from pipe-traps.

Cage row number	Poultry House number 69	
	The number of <i>D. gallinae</i> blood-fed females present in 100 mg of sediment.	
	Date 21 <sup>st</sup> of November 2017 (before the first treatment)	Date 5 <sup>th</sup> of December 2017 (after the second treatment)
I	611	0

II	671	3
III	457	5
IV	382	1
V	712	3
VI	586	2
VII	642	2
TOTAL	4.061 (on average: 580)	16

### CONCLUSIONS:

1. The double application of 1% spraying solution of Dergall caused the complete elimination of *D. gallinae* population in the poultry house number 69 in Małomice.
2. The presence of few blood - fed *D. gallinae* females after the second treatment, does not pose any risk to health of the farmed birds.
3. The examination of the pipe - traps contents performed just after the second treatment showed a small amount of dust present inside the pipes. Such a state of matters may have a major influence on the reduction of the threat caused by pathogens that spread by aerogenic way, e.g. *Aspergillus* fungal spores.



4. The pipe-traps have been proven to be useful in monitoring the red poultry mite infestations in comparison with two other monitoring methods.
5. The high quality and efficacy of Dergall application by means of Spray Team s.n.c. sprayer has been proven.

#### RECOMMENDATION:

There is a necessity of continuous monitoring of the state of red poultry mite's invasion. When there are 300 blood-fed *D. gallinae* females present in 100 mg of sediment gathered from the pipe-trap, it is essential to conduct the red poultry mite control treatment.

#### FINAL REMARK:

This study has confirmed the effectiveness of Dergall, previously proved in the tests performed by: Hat – Agro (Hungary, 2015), DDD Servis (The Czech Republic, 2015), St. David's Poultry Vets (The Great Britain, 2016). During the observations the decline of hens' deaths, the 5% increase of laying performance (noticed 10 days after the treatments), as well as the significant improvement of hens' skin condition and the color of the cockscomb were stated.

(The results of the above-mentioned studies are available in the archives of ICB Pharma).

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