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# Avi-Mite / Eradi-Mite / Mitey Stuff

# Agenda

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**Economic Impact & Red Mites**

**Aviform Mite Products: A Unique Solution**

**Trials & Experience:**

- Safety
- Red mite pressure
- Combined strategy
- Hematocrit levels

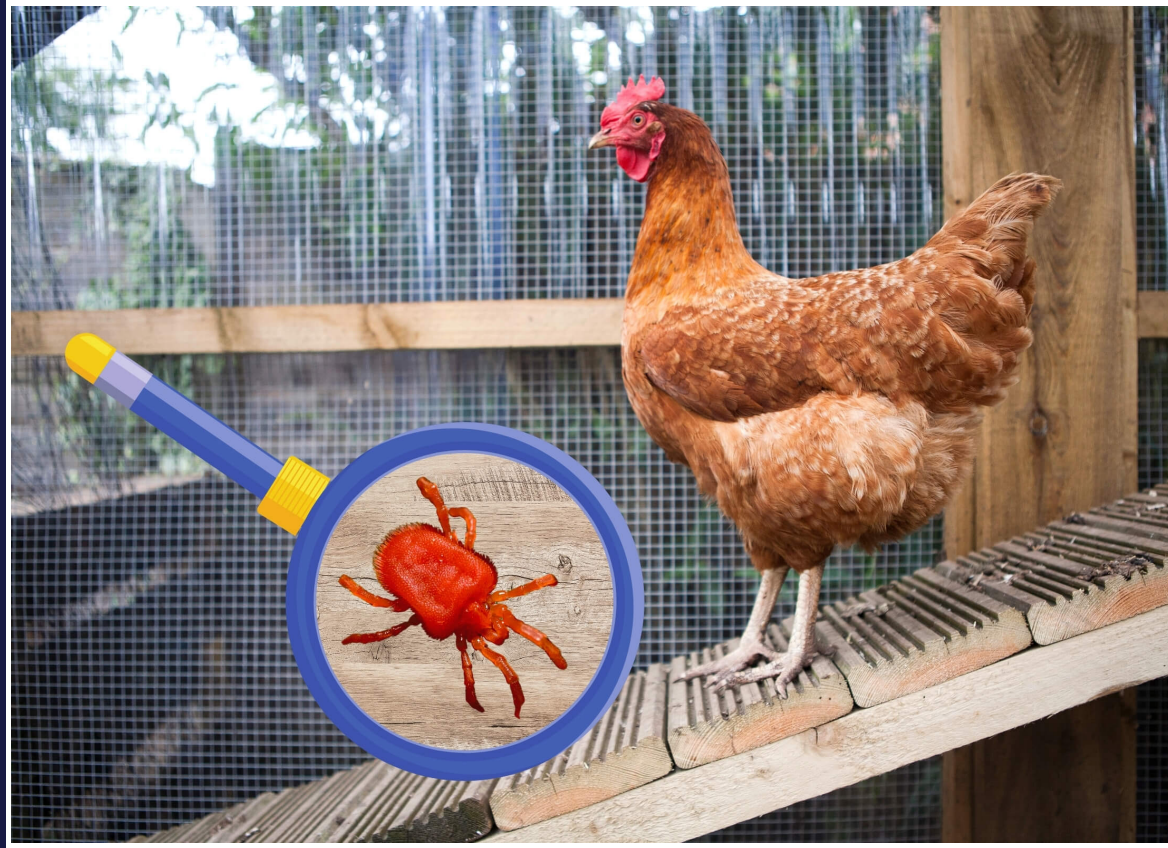
**Aviform Mite Product: Mode of Action**

**Aviform Mite Product: What Makes It Different?**

**Aviform Mite Product: As Part of a Global Approach**

**Key Testimonials**

**Key Take Aways**



# Context : Economic impact for red mites

## Red mites pose a substantial threat to European egg production

An estimate production losses of €360M annually

**LOSSES**

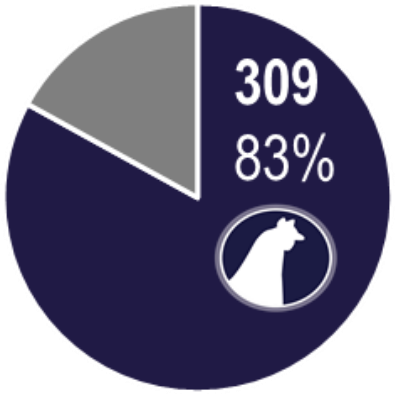
Estimated losses cost per hen/year 60 cents

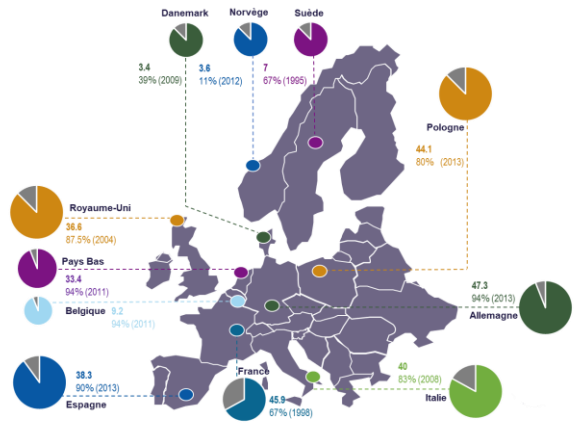
**COST PER HEN**

*Source: Van Emous (2017)*

**+40%**
**cost increase**
in 10 years

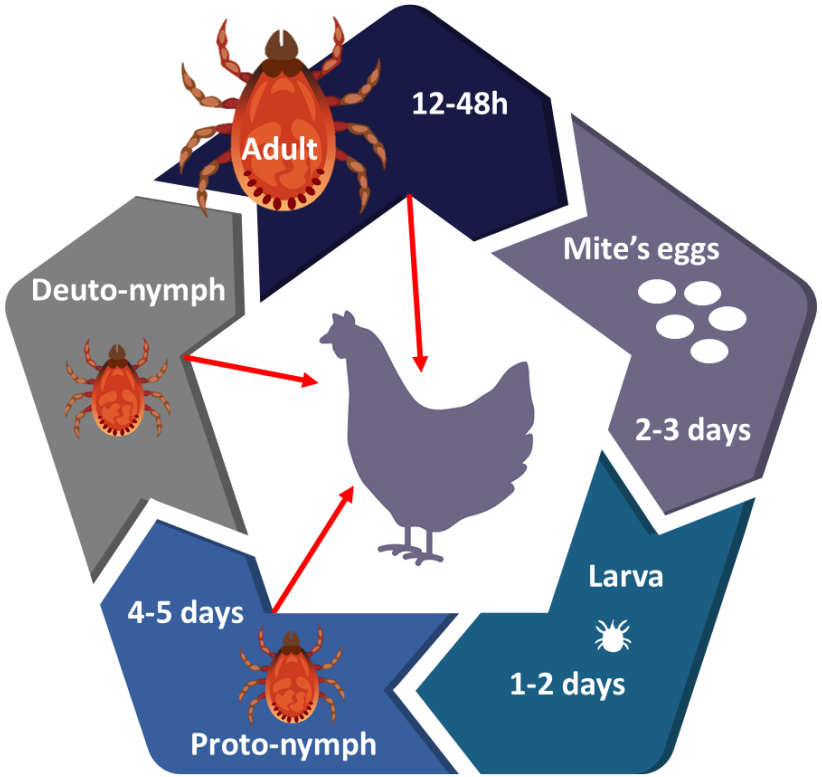
**Number of laying hens per country in millions (2012) and poultry red mites prevalence in percentage**




*Source: Georges et al (2005)*

# Red mites Lifecycle & behavior




**DID YOU KNOW?**

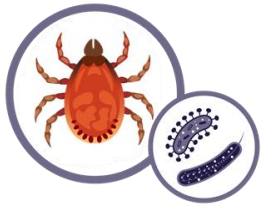
- Fast Lifecycle : **7 to 10 days**
- Adults normally live for **6 to 8 week**. Adult mite can survive for months in a sort of latent condition.
- Mite eggs too can keep for months **without hatching**.
- Sensors capable of detecting heat, CO2 and odors

**Mites don't stay in the hen continuously**, they will approach the hen during night for blood feeding.

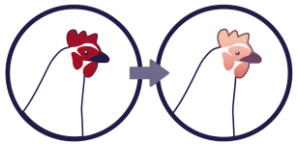
# Effects of red mite infestation

## Welfare

- Spread of poultry pathogens of bacterial and viral origin



- Anaemia



- Weight loss

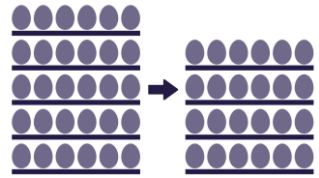
- Agitation & Stress
- Allergic reaction in humans

## Performance

- Poor egg quality through shell-thinning and blood-spotting

- Higher feed conversion

- Decreased egg production



- Pecking

- Mortality

# AVI-MITE / ERADI-MITE / MITEY STUFF

## Support avian species around red mite pressure

# A unique composition...

## Objective

- To support birds during red mite infestation
- To help restore feed intake

## Our solution

To bring a unique mix of natural components

| | |
|---|---|
| Plant, Herb, Spice | Tinctures (100% natural) |
| Aromatics | Essential oils (100% natural) |

# TRIALS & EXPERIENCE

# Trials Introduction

## Safety

**Target**

- Human safety
- Overdosing
- Smell & taste in cooked and raw eggs
- No water and feed intake reduction.

**Nº trials**: 1

**Trials Protocol**

- 4 days➔ 1L/1000L
- 4 days ➔ 2L/1000L
- 6 days ➔ 3L/1000L

## Red Mites

**Target**

- Red mite pressure
- Red mite hotspots
- Red mites movements

**Nº trials**: 18

**Number of hens:** 700.000

**Levels of infestation**
Low, Medium & High

**Farm system**
Cage, Aviary & Organic

**Measurement tool**
Avivet traps

## Combined Strategy

**Target**

- D-Mite OR combined with predators

**Nº trials**: 1

**Number of hens:** 12.000

**Levels of infestation**
Medium

**Farm system**
Organic

**Predator used**
Taurus/Androlis

## Wellbeing

**Target**

- Hematocrit levels

**Nº trials**: 1

**Trials Protocol**
Counting red blood cells before and after the use of Aviform Mite Product

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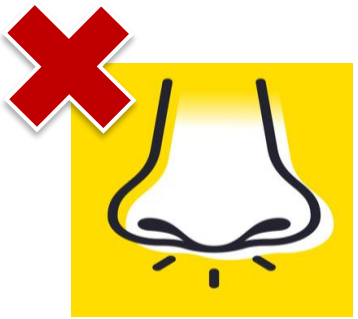
# SAFETY

# Safety trials

## Human safety

**Treatment**

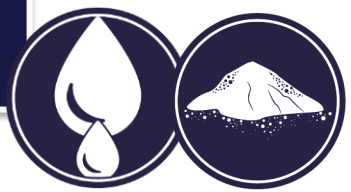
- 4 days➔ 1L/1000L
- 4 days ➔ 2L/1000L
- 6 days ➔ 3L/1000L



Smell

Taste

## Farm



**No water or feed intake reduction**

# R&D Red mites counting tool : AVIVET

**What?** Corrugated cardboard within a 6cm plastic tube

**How many?** 10 traps per farm in a farm of 25.000 hens (max. of 20 traps)

**Where?** Homogeneous distribution (perches, nests, feed system..) for 2 nights

**Analyses :** Measure red mite's movement

- Individual weighing: quantity of red mite per trap
- Infestation level before and after Aviform Mite Product treatment
- Qualification of the type of red mite:
  - small / large
  - white / red / black

| Average red mite's increase per trap / Avivet (mg) | Infestation level |
|---|---|
| 0 | No indication of red mites |
| 1-50 | Low |
| 51-250 | Moderate |
| >250 | High (hotspot) |

# Trial 1 - France– Brittany farm

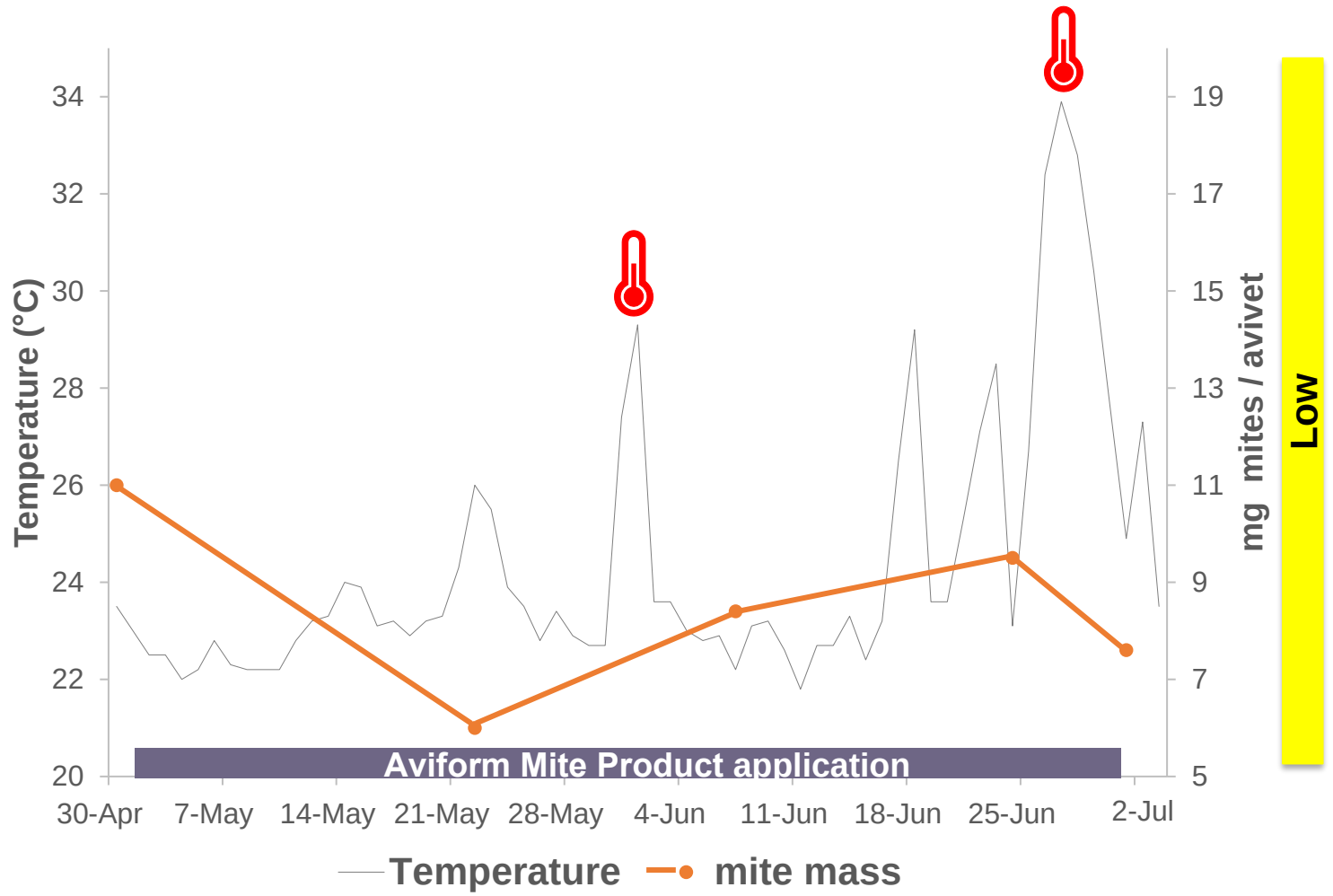
## Protocol

| | | | |
|---|---|---|---|
|  | **Trial Purpose** | Assess the impact of Aviform Mite Products in liquid in a layer farm | |
|  | **Trial design** | **# Animals** → 30.000 layers hens<br>**System** → Cage<br>**Age** → 32 weeks | **Treatment Protocol**<br>**1 month: 1L/1000L** of **Aviform Mite Product**. 3 days of treatment and 4 to 7 days of withdraw.<br>**Next 3 months: 1L/1000L** of **Aviform Mite Product**<br>2 days of treatment and 15 days of withdraw. |
|  | **Level of infestation** | Low | |

# Trial 1 - France– Brittany farm

**No red mite outbreak despite 2 high temperature peaks**

## Results




Low

| Average red mite's increase per trap / Avivet (mg) | Infestation level |
|---|---|
| 0 | No indication of red mites |
| 1-50 | Low |
| 51-250 | Moderate |
| >250 | High (hotspot) |

**FARMER FEEDBACK**

Infestation under control

# Trial 2 - France– Brittany farm

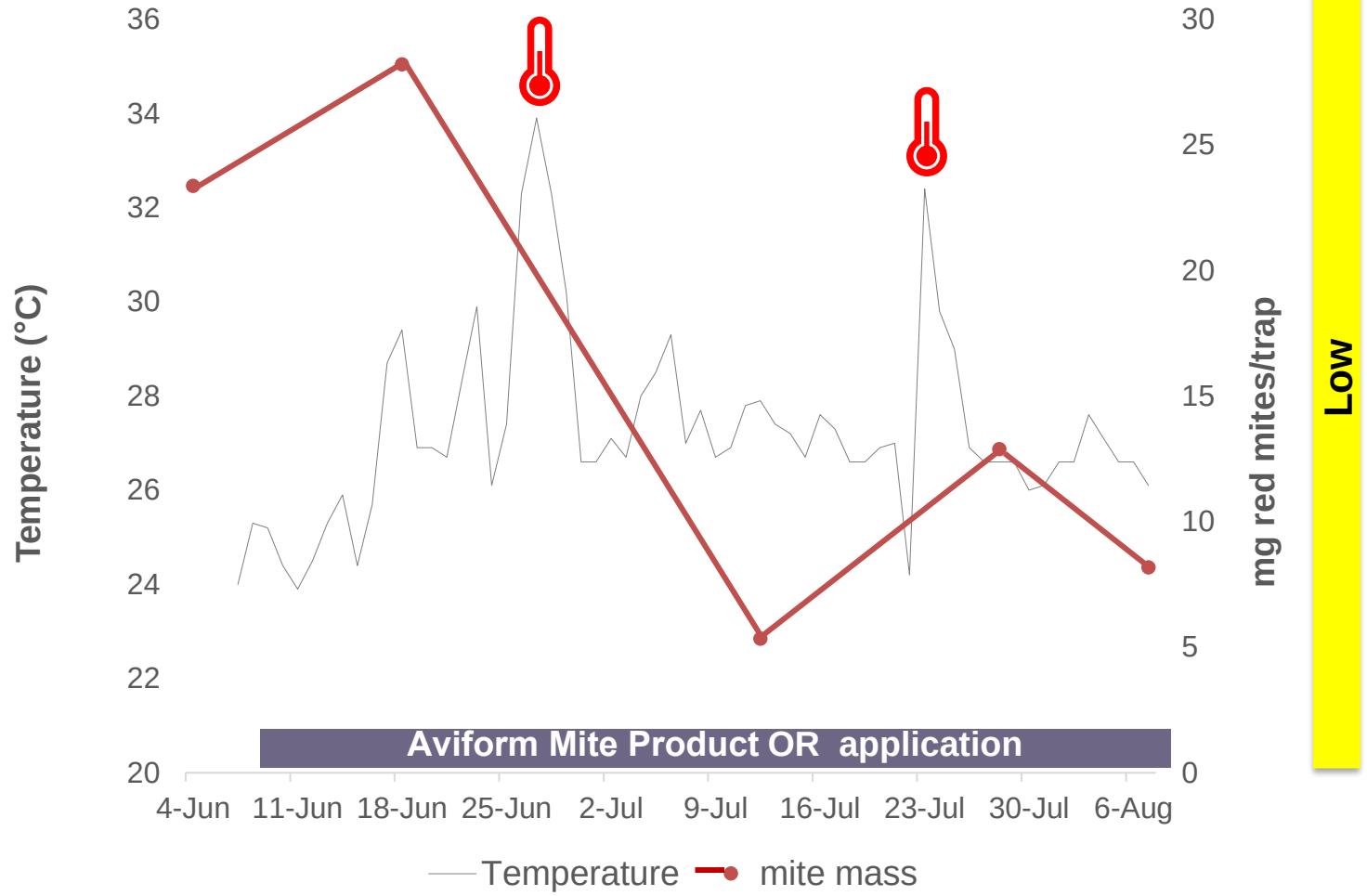
## Protocol

| | | |
|---|---|---|
|  | **Trial Purpose** | Assess the impact of Aviform Mite Products OR powder in a layer farm |
|  | **Trial design** | **#Animal** → 40.000 layers hens<br>**System** → Cages<br>**Age** → 42 weeks<br><br>**<u>Treatment Protocol</u> 4kg/T** of **Aviform Mite Product OR** |
|  | **Level of infestation** | Low |

# Trial 2 - France– Brittany farm

**Decrease on Mites pressure despite 2 high temperature peaks**

## Results




| Average red mite's increase per trap / Avivet (mg) | Infestation level |
|---|---|
| 0 | No indication of red mites |
| 1-50 | Low |
| 51-250 | Moderate |
| >250 | High (hotspot) |

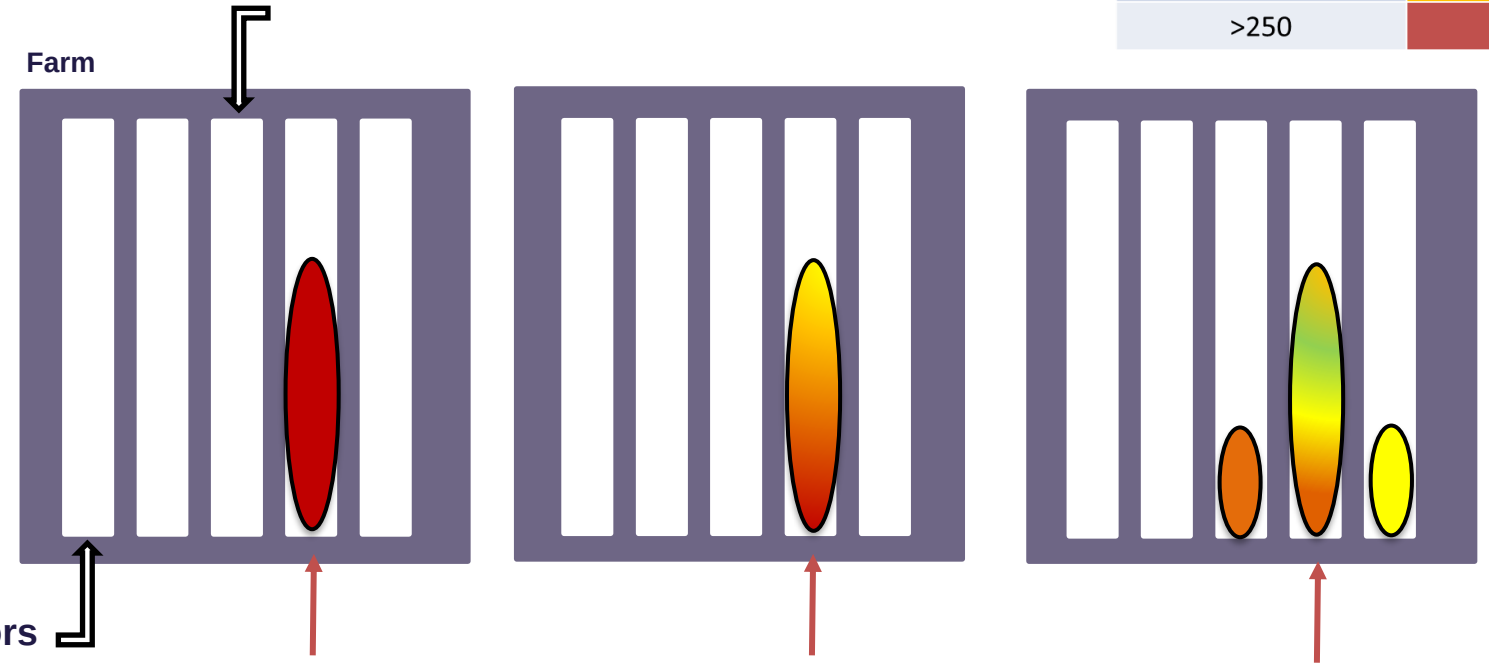
**FARMER FEEDBACK**

Plan to use Aviform Mite Products OR for other barns ☺

# Trial 2 – France – Brittany farm

## Evolution of the mites repartition

Let 's enter the barn!




Row

| Average red mite's increase per trap / Avivet (mg) | Infestation level |
|---|---|
| 0 | No indication of red mites |
| 1-50 | Low |
| 51-250 | Moderate |
| >250 | High (hotspot) |

**Conclusion**:
Lower pressure on row 4.
Slight development at the beginning of row 3 & 5.

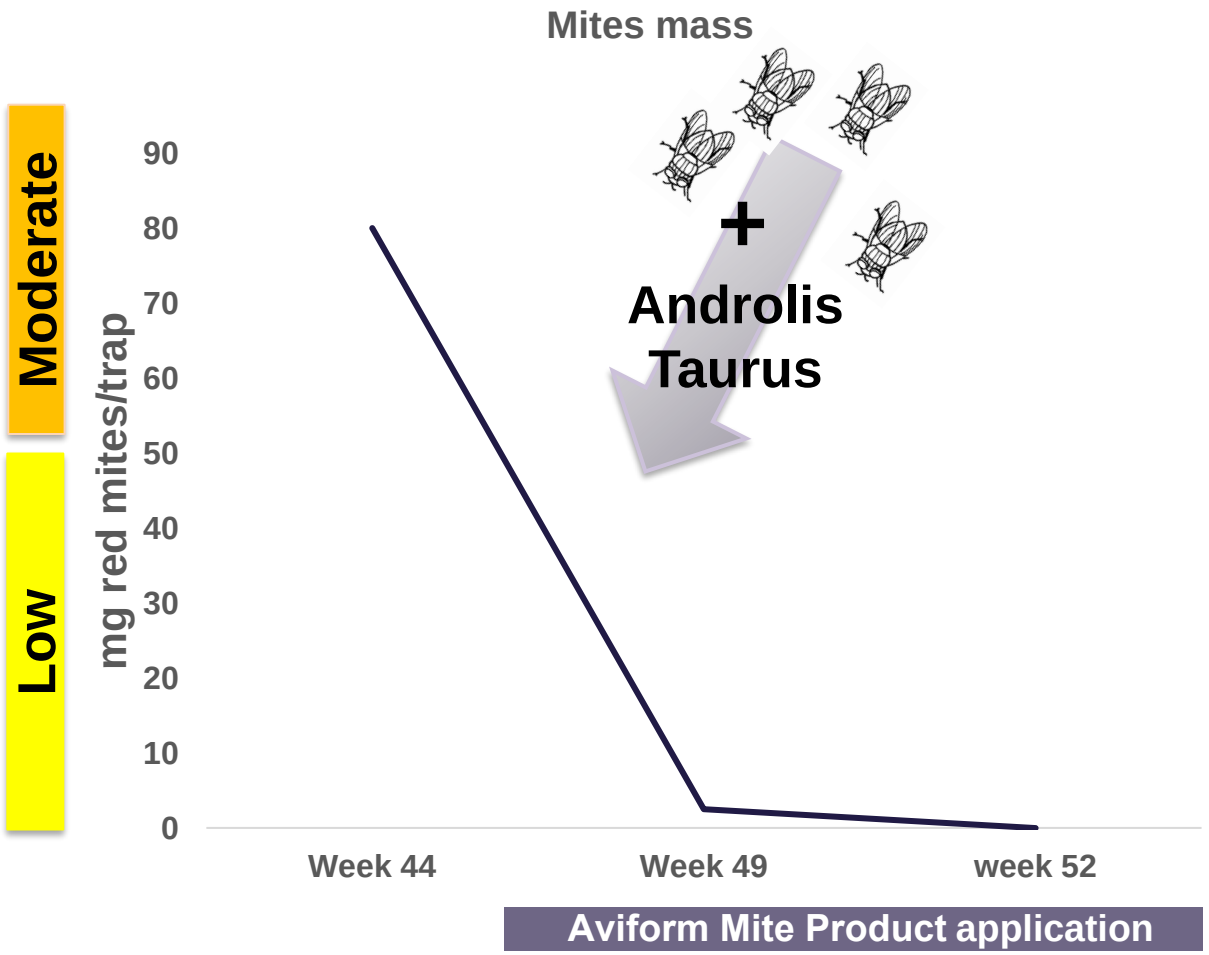
# Trial 3 – France – South West

## Protocol

| | | |
|---|---|---|
|  | **Trial Purpose** | Assess the impact of Aviform Mite Product OR **combined with predators** in an organic layer farm |
|  | **Trial design** | **#Animal** → 12.000 layers hens<br>**System** → Organic<br>**Age** → 44 weeks<br><br>**<u>Treatment Protocol</u>**<br>**4kg/T** of **D-Mite OR** |
|  | **Level of infestation** | Medium |

# Trial 3 – France – South West

## Trials combining Aviform Mite Product with Taurus/Androlis use




| Average red mite's increase per trap / Avivet (mg) | Infestation level |
|---|---|
| 0 | No indication of red mites |
| 1-50 | Low |
| 51-250 | Moderate |
| >250 | High (hotspot) |

**FARMER FEEDBACK**

- No red mite in the barn
- satisfied with combined approach : Aviform Mite Product + predators

☺

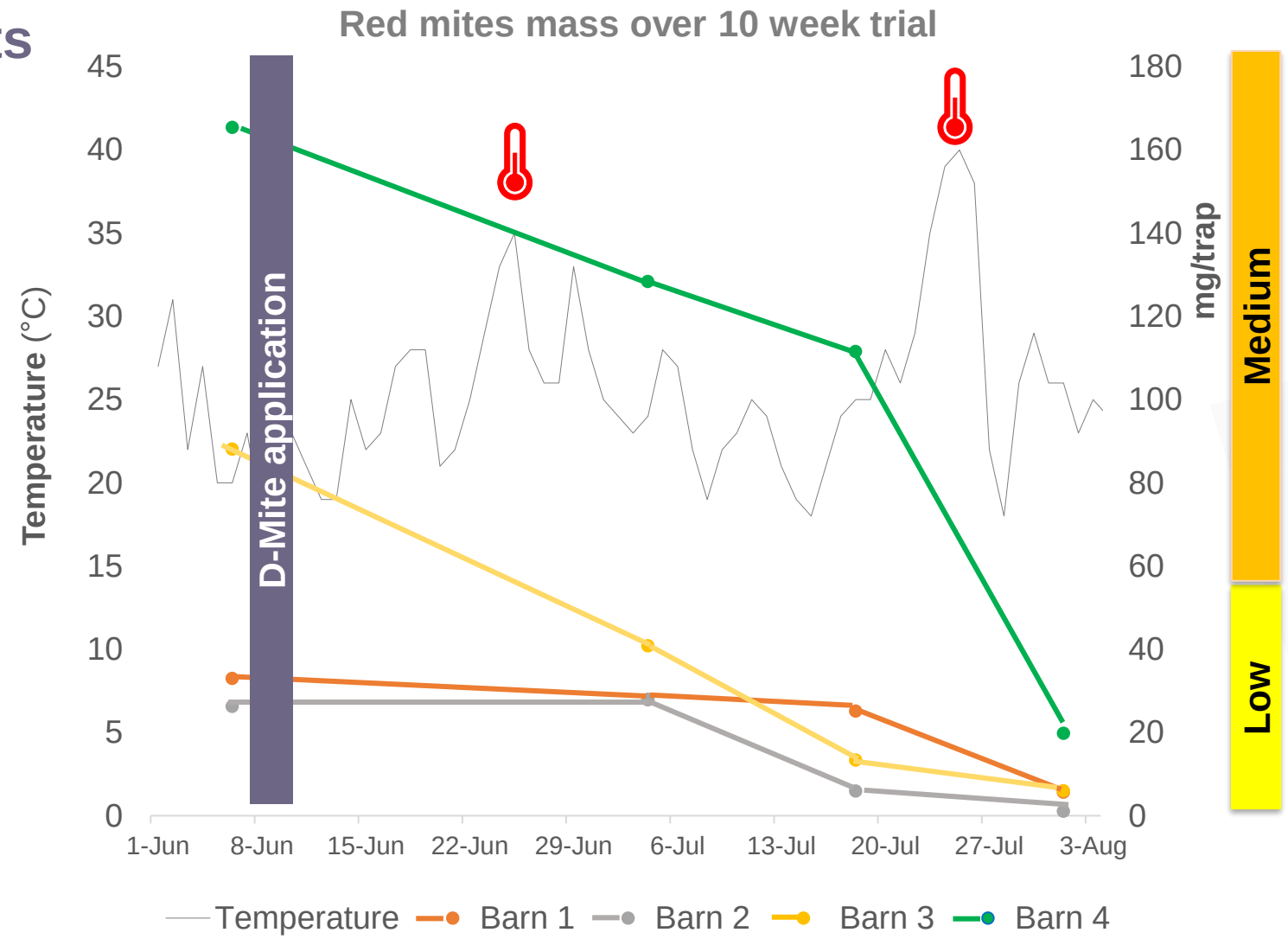
# Trial 4 – The Netherlands

## Protocol

| | |
|---|---|
| **Trial Purpose** | Assess the impact of **Aviform Mite Product OR** in powder in a layer farm |
| **Trial design** | **Barn 1** → 5.500 layers hens<br>**Barns 2, 3 & 4** → 16.000 layers hens<br>**System** → Aviary<br>**Age** → 64 weeks<br><br>**Treatment Protocol**<br>**4kg/T** of **Mite Product OR** the first month<br>**2kg/T** of **Mite Product OR** next 2 months |
| **Level of infestation** | **Barns 1 & 2** → Low<br>**Barns 3 & 4** → Moderate |

# Trial 4 – The Netherlands/ Mila - Farmer

## Results




| Average red mite's increase per trap / Avivet (mg) | Infestation level |
|---|---|
| 0 | No indication of red mites |
| 1-50 | Low |
| 51-250 | Moderate |
| >250 | High (hotspot) |

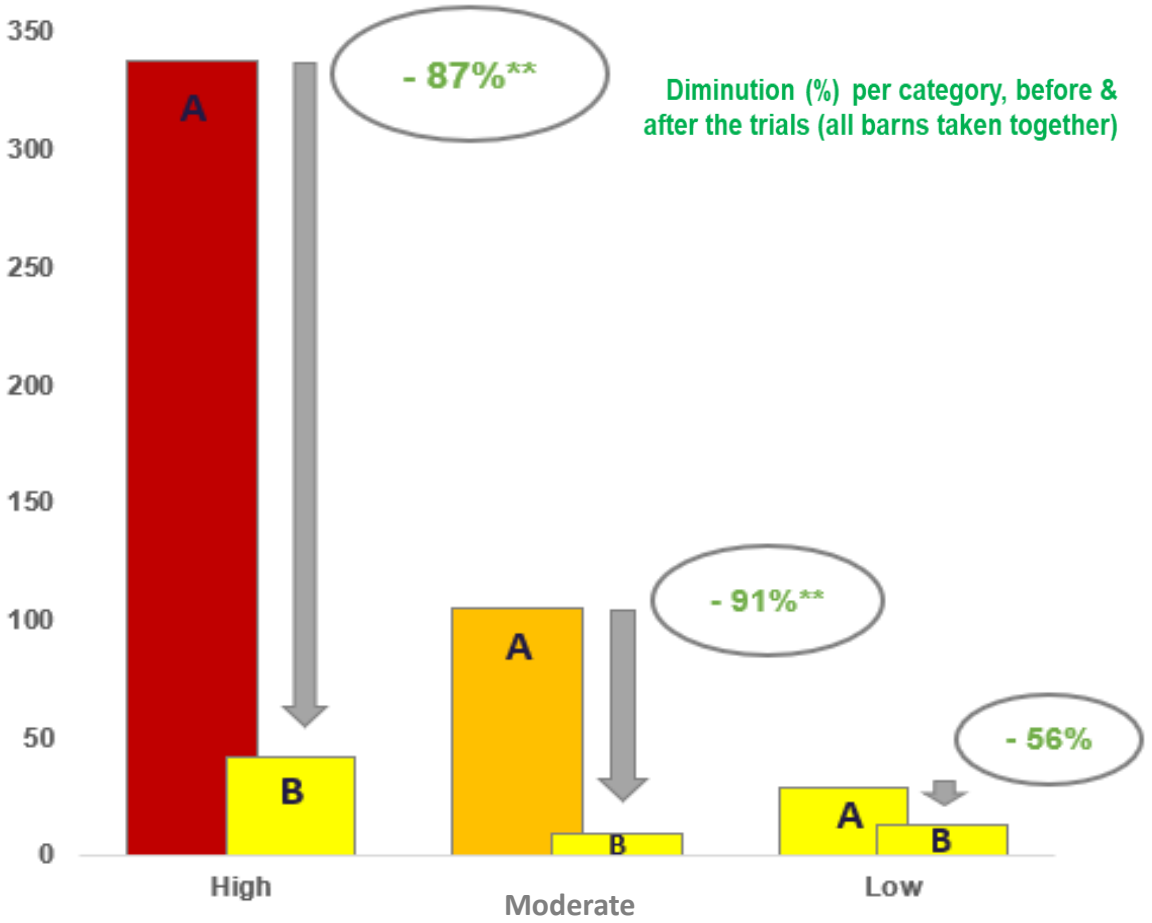
**FARMER FEEDBACK**

Plan to use Aviform Mite Product for new flock

☺

# Trial 4 – The Netherlands

## Results




**A:** before D-Mite
**B:** after 60 days with D-Mite

**FARMER FEEDBACK**

Plan to use Aviform Mite Product for new flock

☺

# Trial on hematocrit levels

## Protocol

**Trial Purpose**

**Measurement of hematocrit = % of red cells in blood in laying hens, for cage and aviary farming system, while using Aviform Mite Product**

**Trial design**

**System** → Aviary & Cages
**Age** → 50 weeks

**Measurement Protocol**

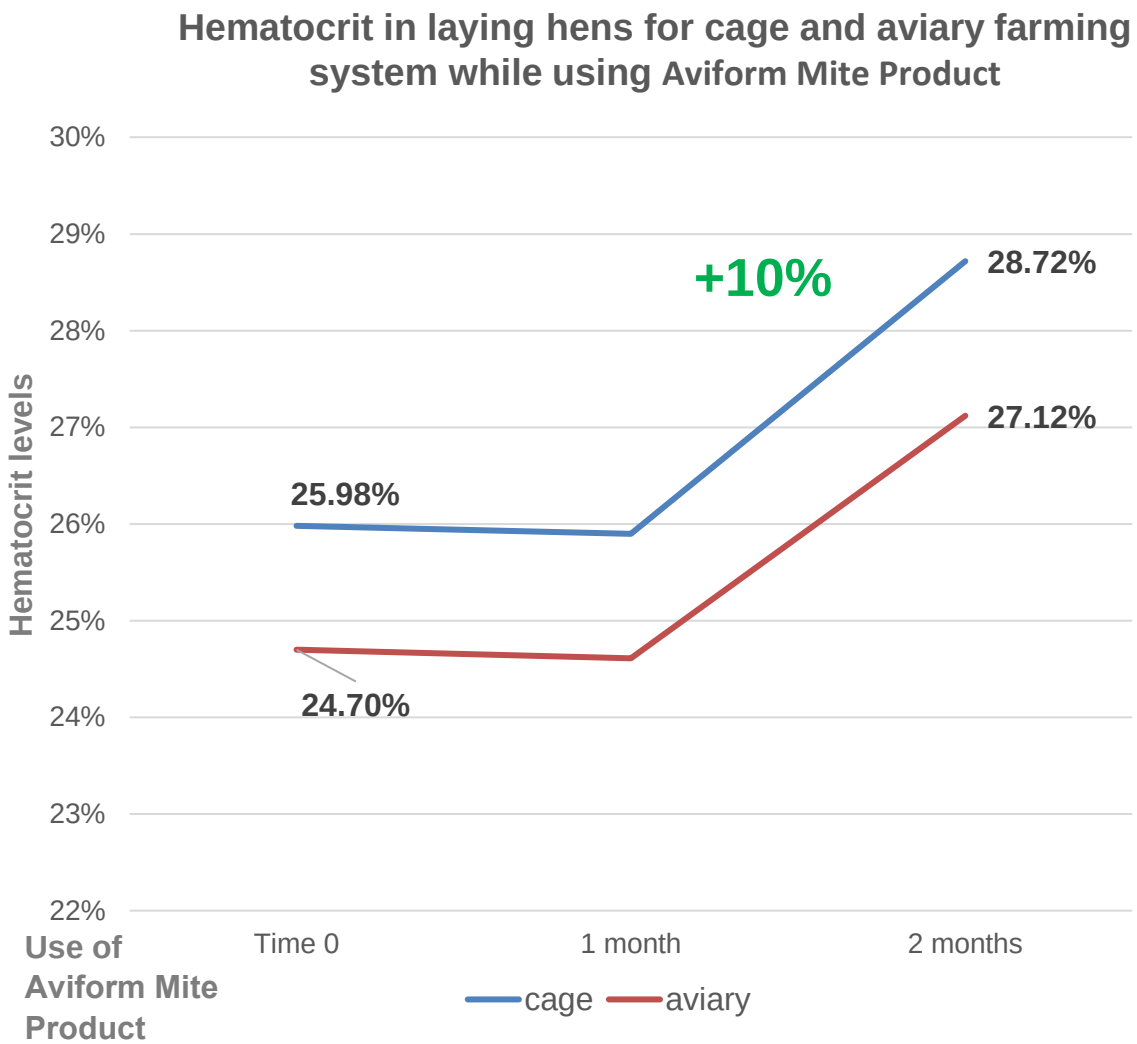
Blood samples of 15 birds each time

- At the start of trial
- After 4 weeks of Aviform Mite Product application
- After 8 weeks of Aviform Mite Product application

**Visible facts**

- High red mite pressure on oldest hens
- Red mites on eggs, workers bothered
- Laying performance below standard 2-5%
- Birds weakened with pale combs

# Trials on hematocrit levels




# Results

- No more red mites on eggs, but still in dark places and cracks
- Easier to work in the barns
- Egg production back to normal
- Use continues

**Farmer Feedback**

No more visible red mites

No more discomfort from red mites in laying hens

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# Mode of Action

# Results – Safety / Mode of Action

## Protocol

**Assess mode d'action of Aviform Mite Product**

**Treatment**

- **4 days ➔ 1L/1000L**
- **4 days➔ 2L/1000L**
- **6 days ➔ 3L/1000L**

**Prélèvements :**

- Blood serum
- Under skin fat
- Abdominal fat

## Mode of Action

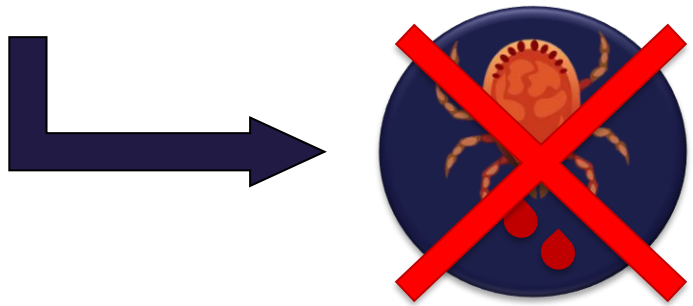
- EOs entering he body via drinking water has been confirmed.
- EOs don't stay in blood but migrate to fat tissues as they are fat soluble.
- Some EOs can be transformed/combined/metabolized and are not anymore detectable.

# Mode of Action

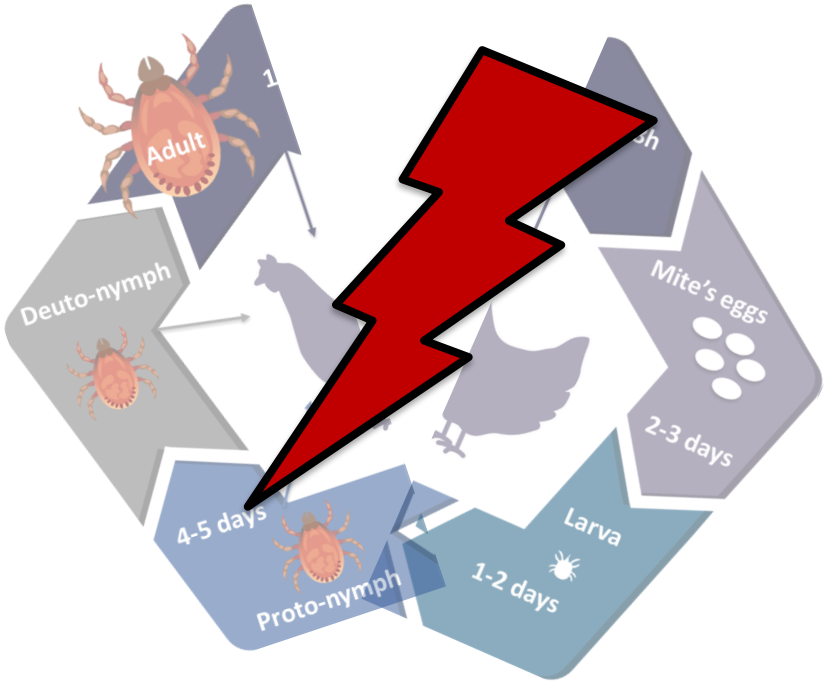
**Smell/taste**

**Disorientation**

**Blood coagulation**



**Breaks the life cycle**



# What makes Avi-Mite / Eradi-Mite / Mitey Stuff different?

# Why Aviform Mite Products?

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## Proof of Performance

Developing continuous work to prove and show the efficacy in specific situations in laying production (pullets, moulting, breeders…) for both, liquid and powder format.

## Challenging Conditions

Aviform Mite Product has been developed during 2 years with trials in real conditions, multi production systems, under challenging hot weather with over half a million layers – it has shown a great efficacy with statistical analysisand is proven to be safe for animals and eggs.

**Aviform Mite Product**

## Approved by Farmers

Tested in more than half a million layers in different systems/breeds/countries Aviform Mite Product has been approved by farmers around EU.

## Proven Data & Trusted Advisor

Aviform Mite Product has the most solid technical file in the market with more than 20 trials, 700.000 hens tested and full recommendations program for farm management and combined strategy.

# Avi-Mite / Eradi-Mite / Mitey Stuff as part of a global approach

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## Key points in management

- Ventilation (Lower humidity temperature → longer development cycle)
- Importance disinfection (including droppings building)

→ aviary cleaning difficulties

- Pullet surveillance, Aviform Mite Product application (if possible)
- Integrated Pest Management (IPM)
- Change of clothing (farmers, technicians), and hand cleaning

# Combine approaches with Aviform Mite products

| | + | - | Recommendation |
|---|---|---|---|
| **Living predators** | Excellent synergy with Aviform Mite products (trial)<br>No risk on resistance | Cost (0,25€/hens), labour time, limited effect as predators don't colonize the entire barn. | Use Aviform Mite products continuously with predators |
| **Spraying silica** | Cheap<br>No risk on resistance | Labour time, difficult to hit all (hiding) places in the barn.<br>Unhealthy for bird and farmer (fine dust) risk clogging. | Spraying silica in the barn before the new flock comes, then use Aviform Mite products during the flock. |
| **Black soap + water** | Cheap<br>No risk on resistance | Labour time, risk clogging, efficacity? | Spray 2% black soap with water on hot spots. Use Aviform Mite products continuously. |
| **Thermokill** | Impacts red mites as well as eggs (drying out at Relative Humidity <15%) | Energy costs, Labour and equipment cost, High temperatures might harm equipment. | Use Thermokill System between two flocks then use Aviform Mite products continuously during the flock. |

# Recommendations of use – internal

## Recommendations on dose

- Low infestation
  - 4kg/mt for 2 weeks
  - 2kg/mt following months
- Medium infestation
  - 4kg/mt for first month
  - 2kg/mt following months
- High infestation/mid cycle flock
  - Treat with insecticide/other intervention
  - Follow medium infestation treatment advice

# Recommendations of use – summary

**4Kg**/t CFE  first month (ES first 2 weeks)

**2kg** /t CFE following months

## Recommendations

- Be clear – will not kill but will over time suppress pressure and control
- Use at least 3 months – full cycle/longer preferable
- Whole farm use
- Use from start new flock
- Consider farm history – have they experienced high infestation in previous flock
- If starting to use mid cycle only treat low and medium infestation
- If high infestation seen on farm – use insecticide first
  - Otherwise can expect to see increased mite on equipment/eggs as they leave bird
- Avivet trap use
  - Measure before use of Aviform mite products & after 1st month of use
  - Long term use – measure over time

# Key take aways…

1. **Strong decrease of red mite pressure**
   - In farms with high level of infestation
   - Decreases the probability of red mite outbreak

2. **Safe to use in egg production farms**
   - Safe for poultry
   - Safe for eggs
   - Safe for humans

3. **Performance & Welfare**
   - Restore performance & wellbeing
   - Natural solution
   - Improve of work environment

4. **Global approach**
   - Farm management
   - Combine strategy

5. **Easy to use**
   - Liquid AND Powder (organic)

# Aviform