

Killer Cows: Zooprophyllaxis and Endectocide Use In Mosquito Control



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Symptoms of **Malaria**

Central
- Headache

Systemic
- Fever

Muscular
- Fatigue
- Pain

Back
- Pain

Skin

- Chills
- Sweating

Respiratory
- Dry cough

Spleen
- Enlarge-
ment

Stomach
- Nausea
- Vomiting





ANOPHELES ALIAS MALARIA MOSQUITO

WANTED ... DEAD OR ALIVE

FOR THE SUPPRESSION OF THE MALARIA BY THE
PHYSICIAN SEE TO IT THAT YOU KEEP YOUR DOOR AND WINDOW
SCREENS AND NETS IN THE BEST ORDER WHEN YOU ARE OUTSIDE

WHERE NO MOSQUITOES THERE NO MALARIA

ASK YOUR DOCTOR OR READ THE MALARIA PRIMER

PUBLISHED BY THE
UNITED STATES PUBLIC HEALTH SERVICE
WASHINGTON, D.C.

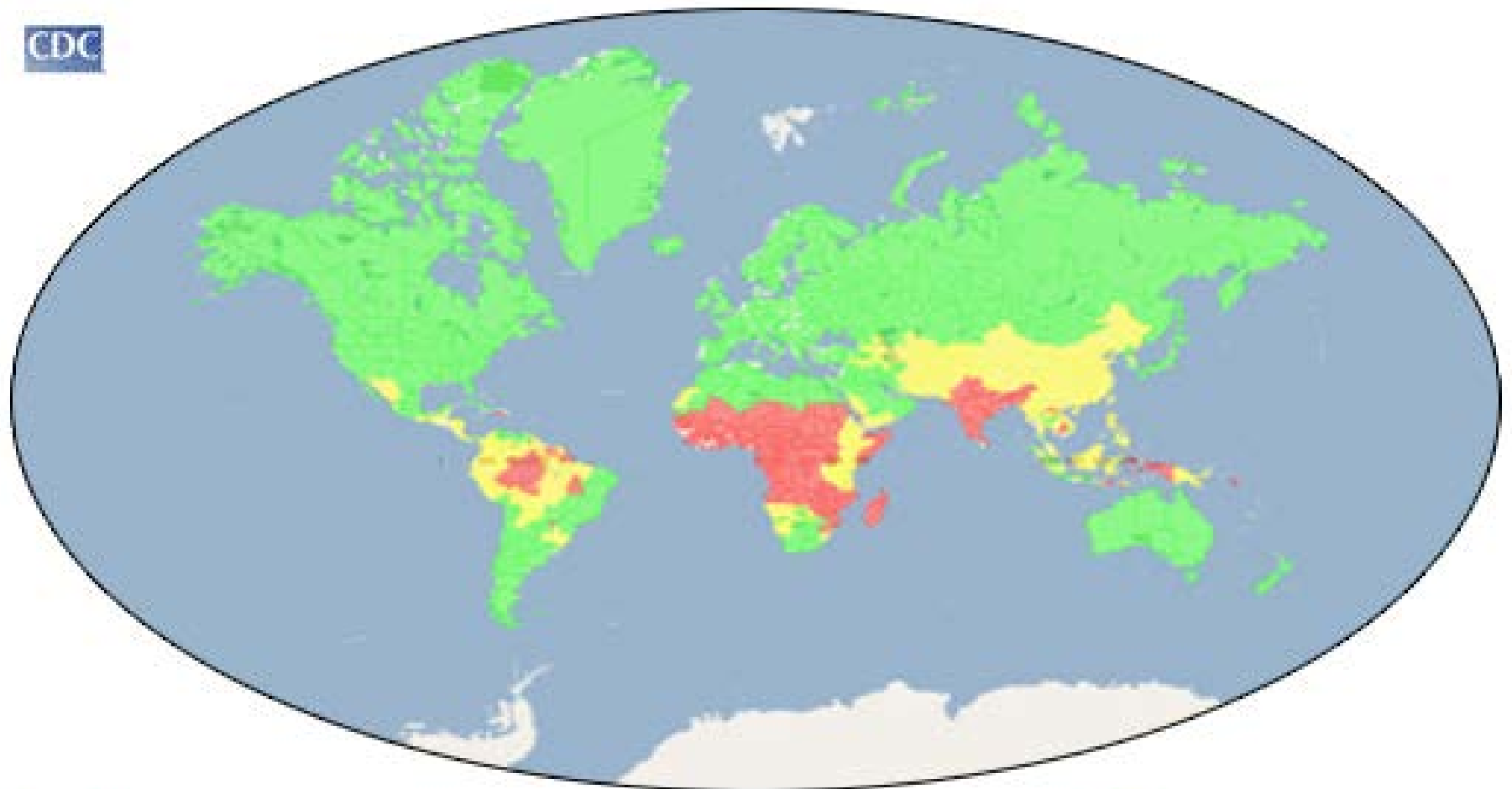
KEEP MOSQUITOES OUT AND AVOID MALARIA


SCREEN ALL YOUR DOORS AND WINDOWS


IT PAYS — ASK THE DOCTOR
SEND FOR THE MALARIA PRIMER
PUBLISHED BY THE
UNITED STATES PUBLIC HEALTH SERVICE
WASHINGTON, D.C.


2016

CDC

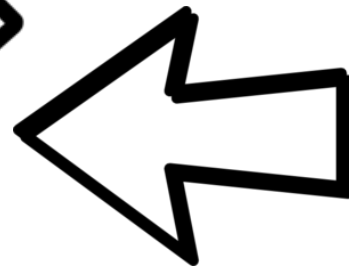
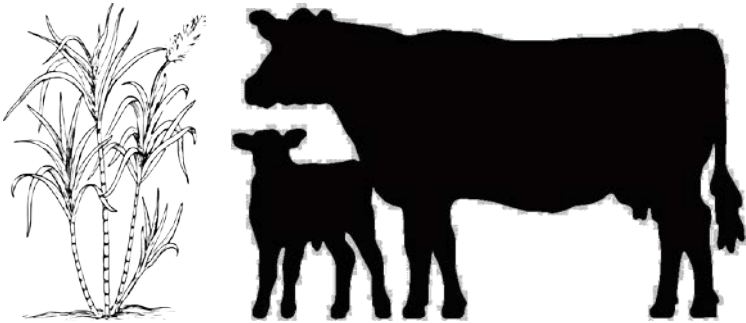


 Malaria transmission occurs throughout

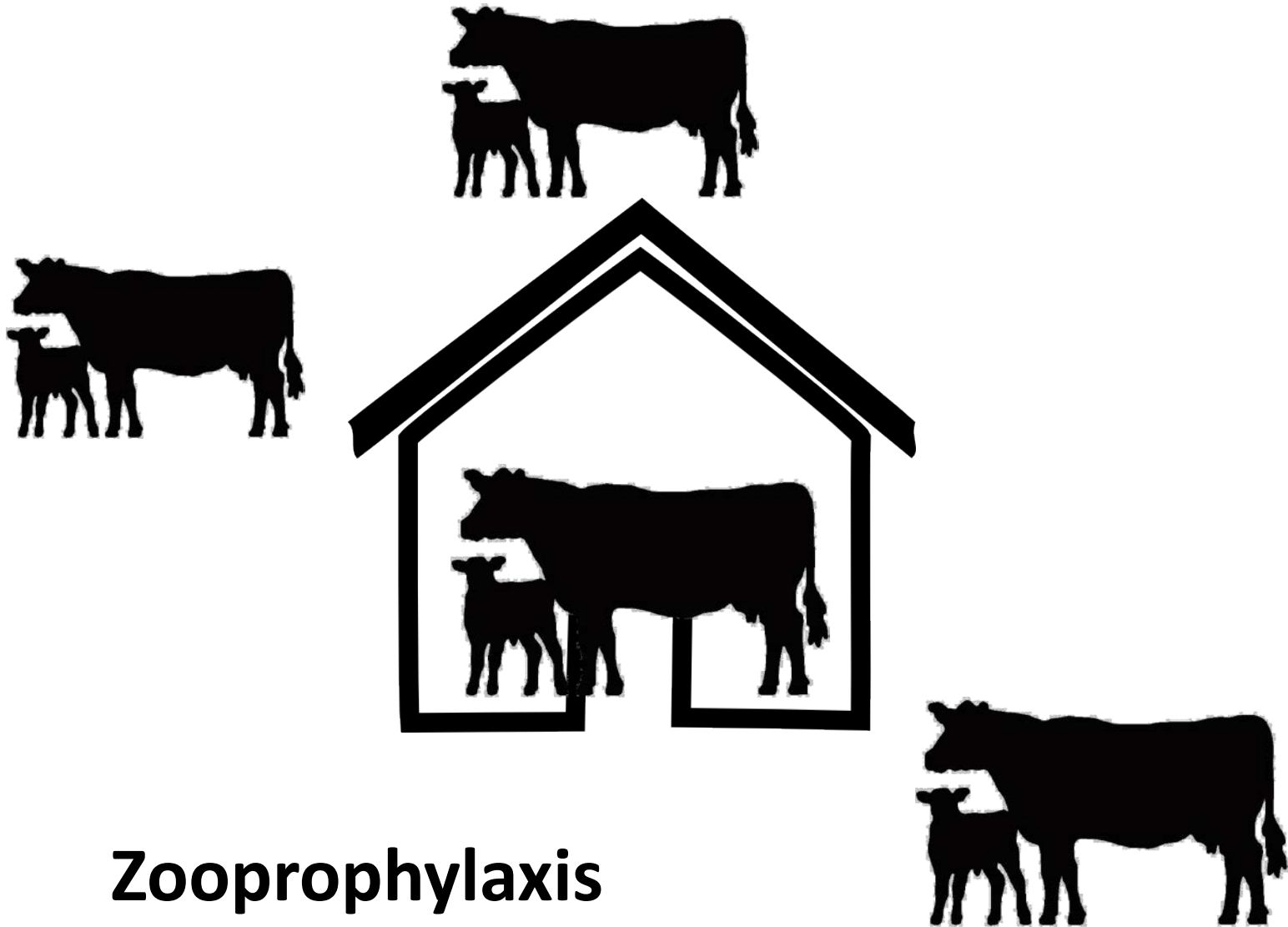
 Malaria transmission occurs in some parts

 Malaria transmission is not known to occur

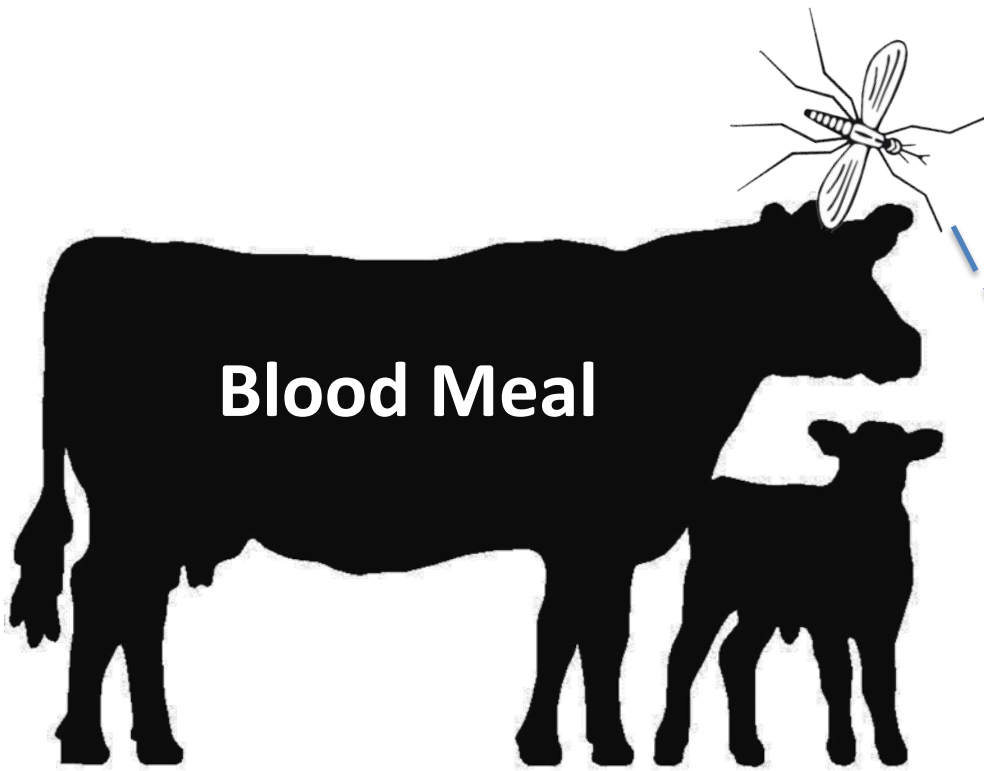
Rural Agriculture



**Open-air doors
and windows**



Zoonophylaxis

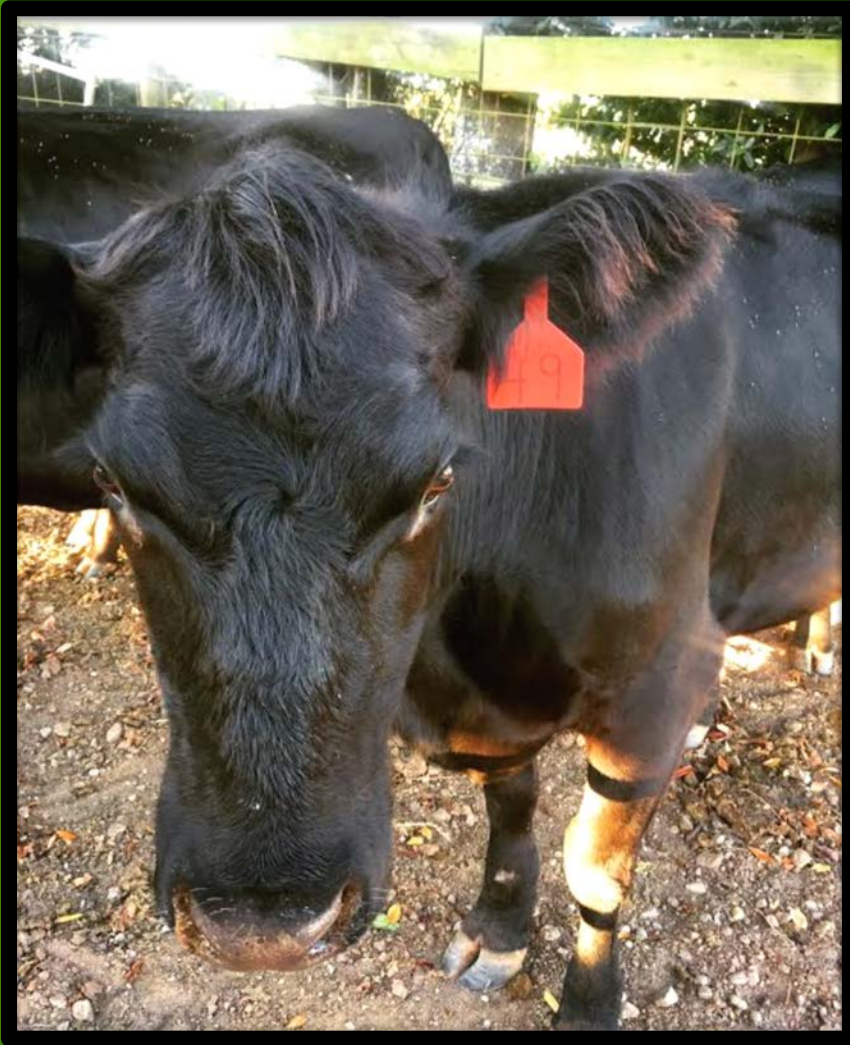


Blood Meal

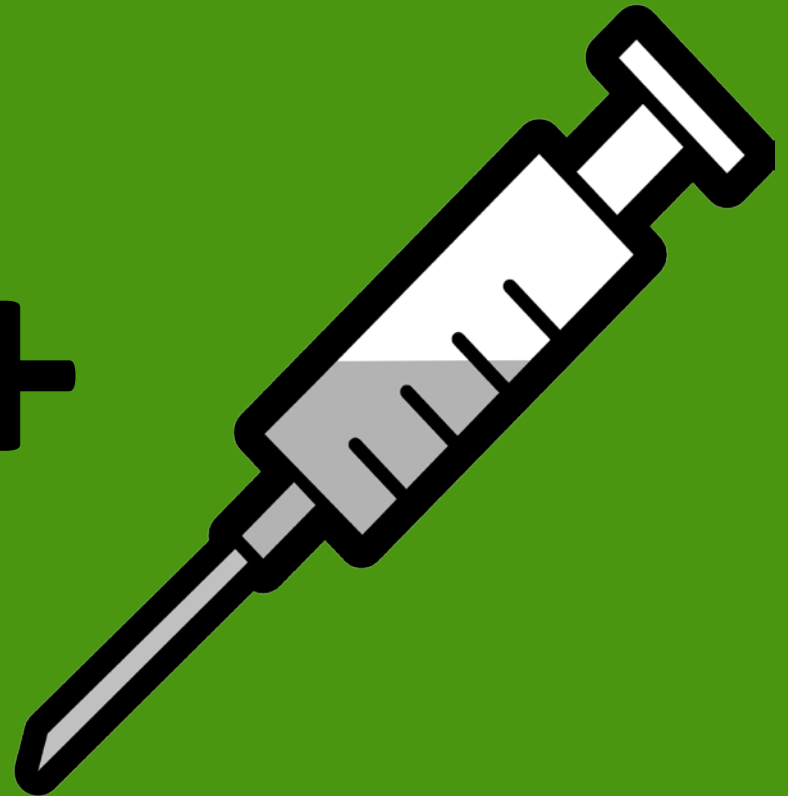


Breeding Site

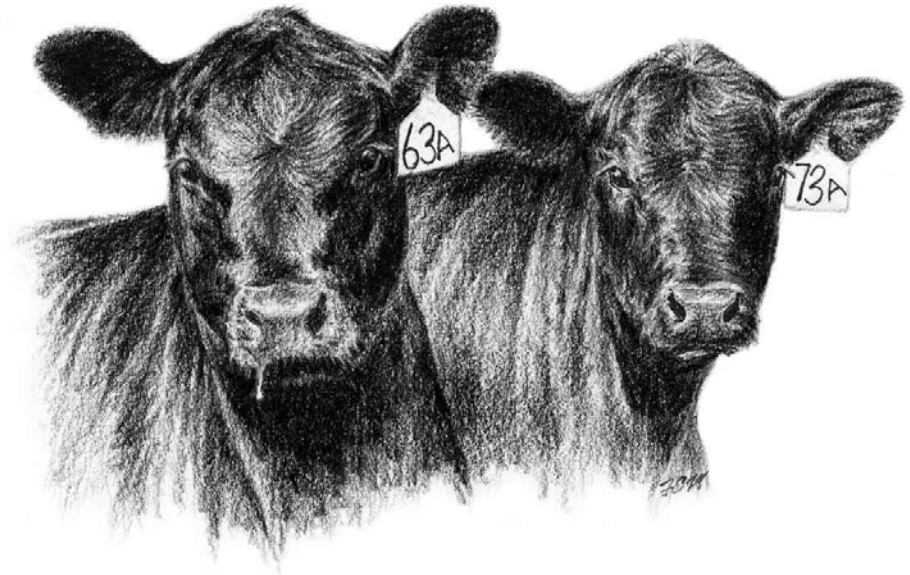
Insecticidal Zooprophylaxis



+

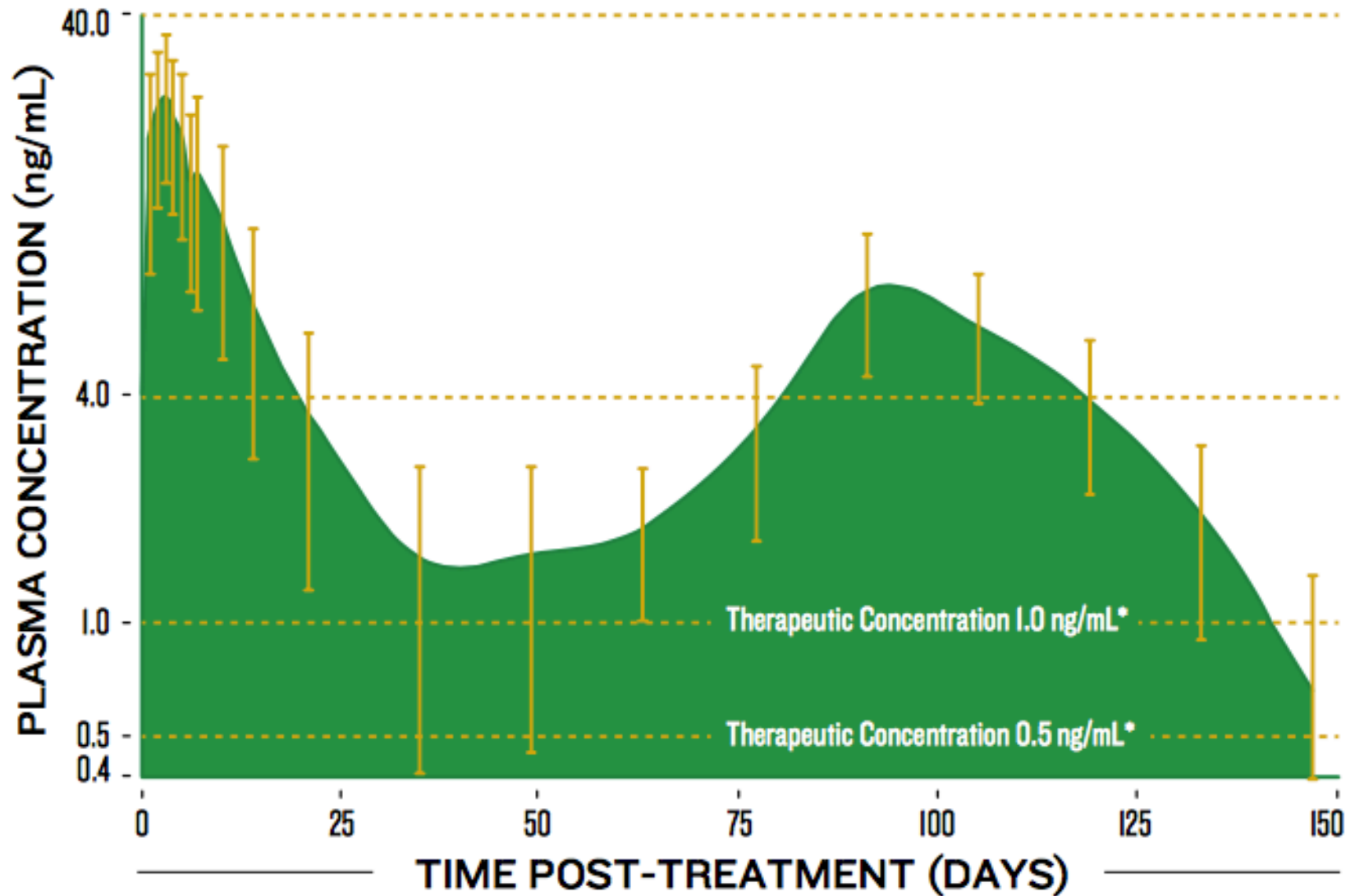


LongRange



Active Ingredient: Eprinomectin

LongRange Concentration



Objectives

- What is the **LC50** for LongRange blood-fed mosquitoes in a controlled lab setting?
- Does LongRange effectively kill blood-fed mosquitoes on live hosts?

Anopheles quadrimaculatus



In-Lab Study

- How much of the drug is in the blood?

1 mL LongRange/110 lb of animal

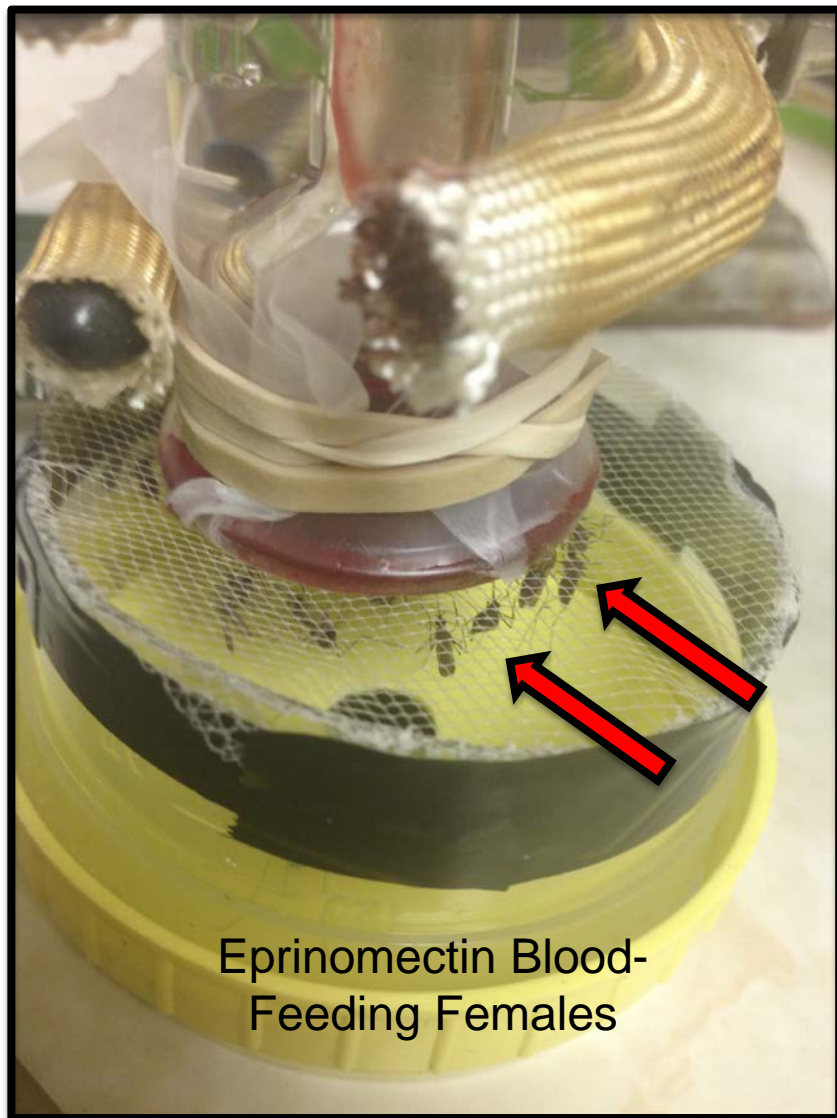
Average Cow Weight: 1300 lbs

~ 40 L of blood/animal

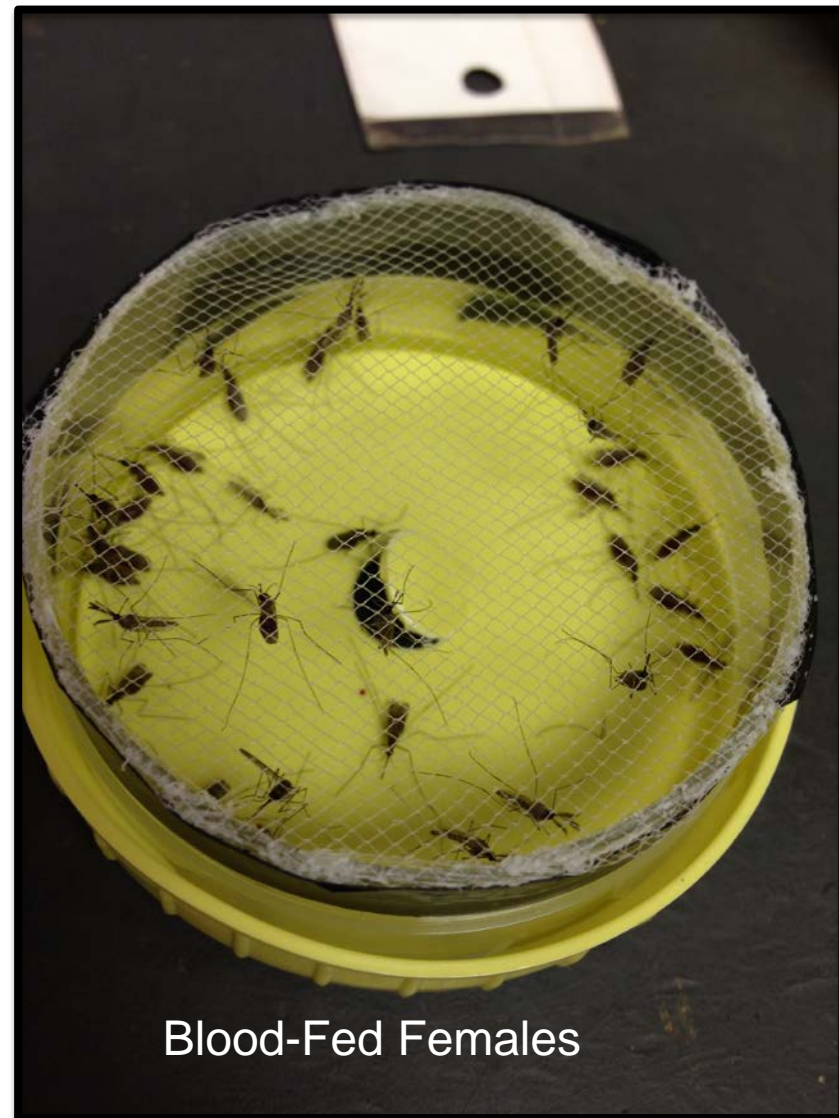
0.3 μ L LongRange/1 mL Bovine Blood



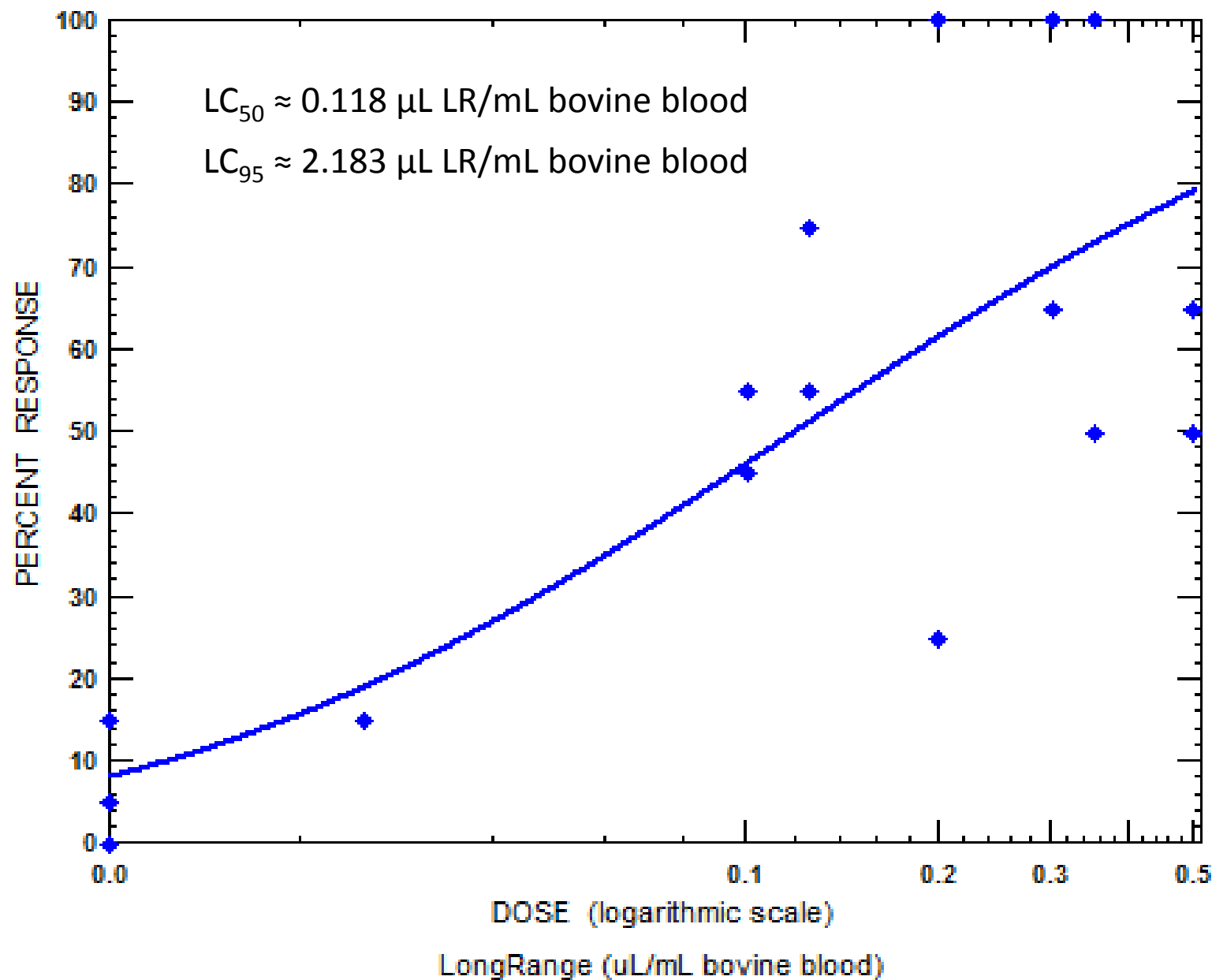
Rutledge Feeder



Feeding Cage



Lab-Fed Mosquito Mortality 48 Hrs



In-Lab Study

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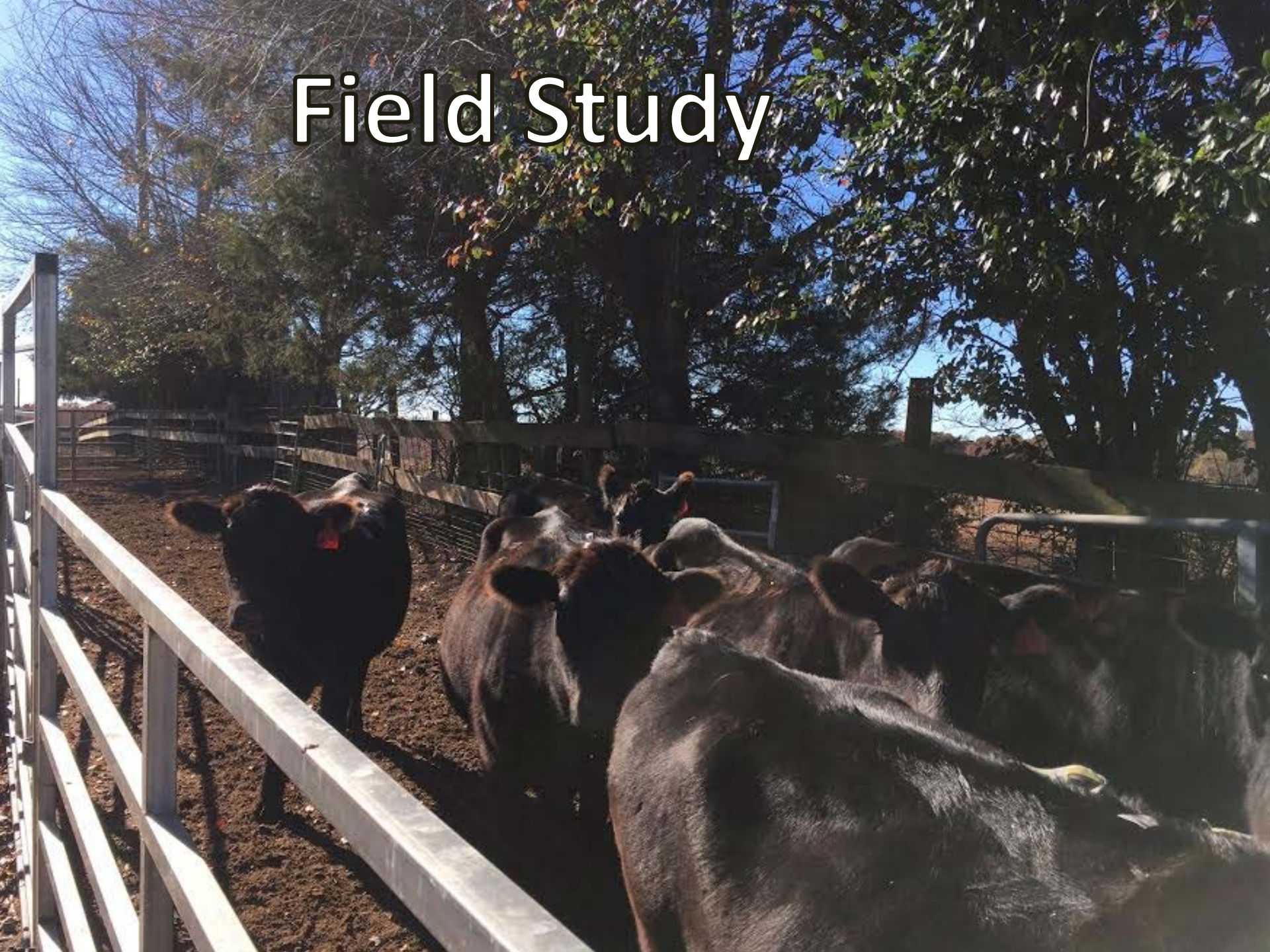
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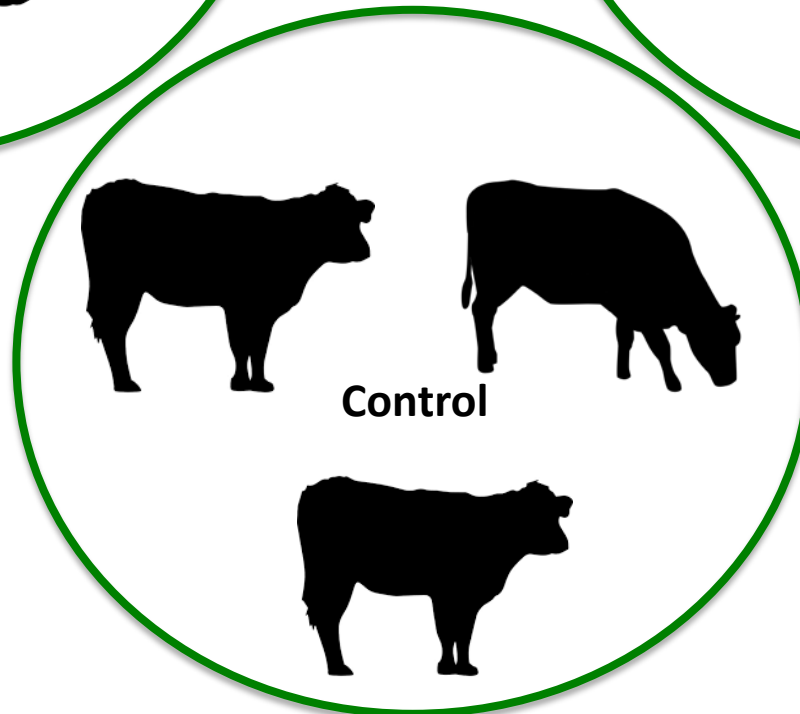
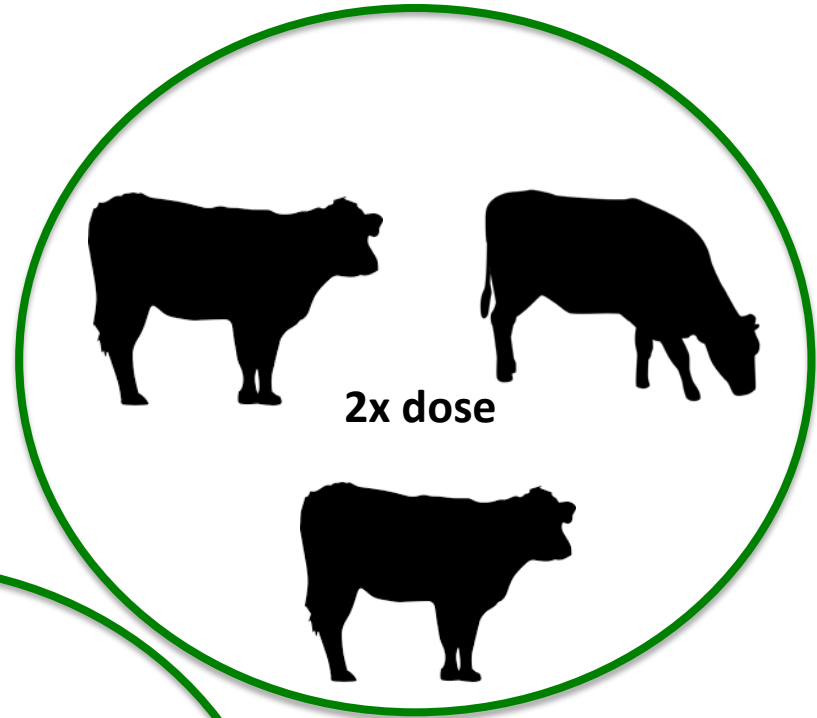
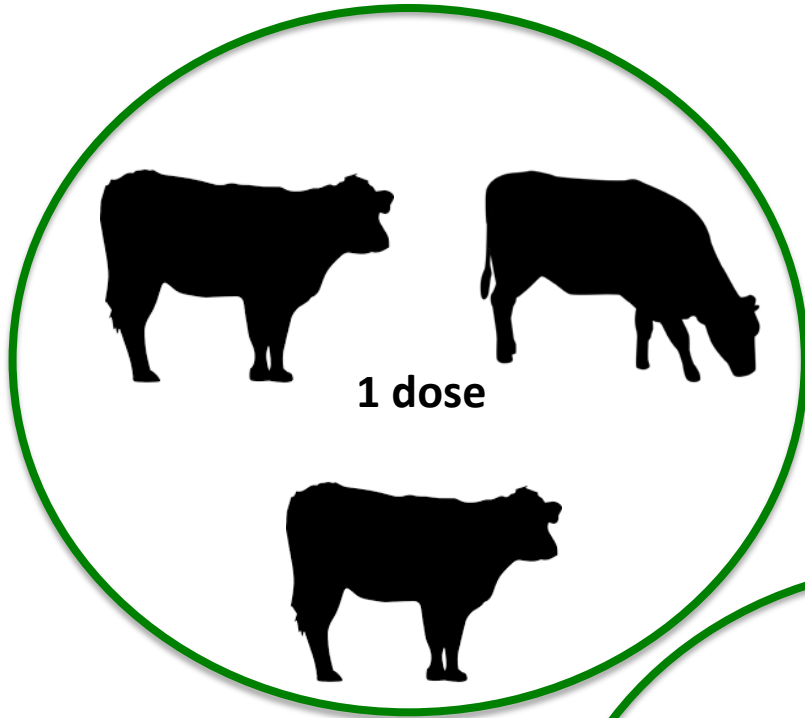
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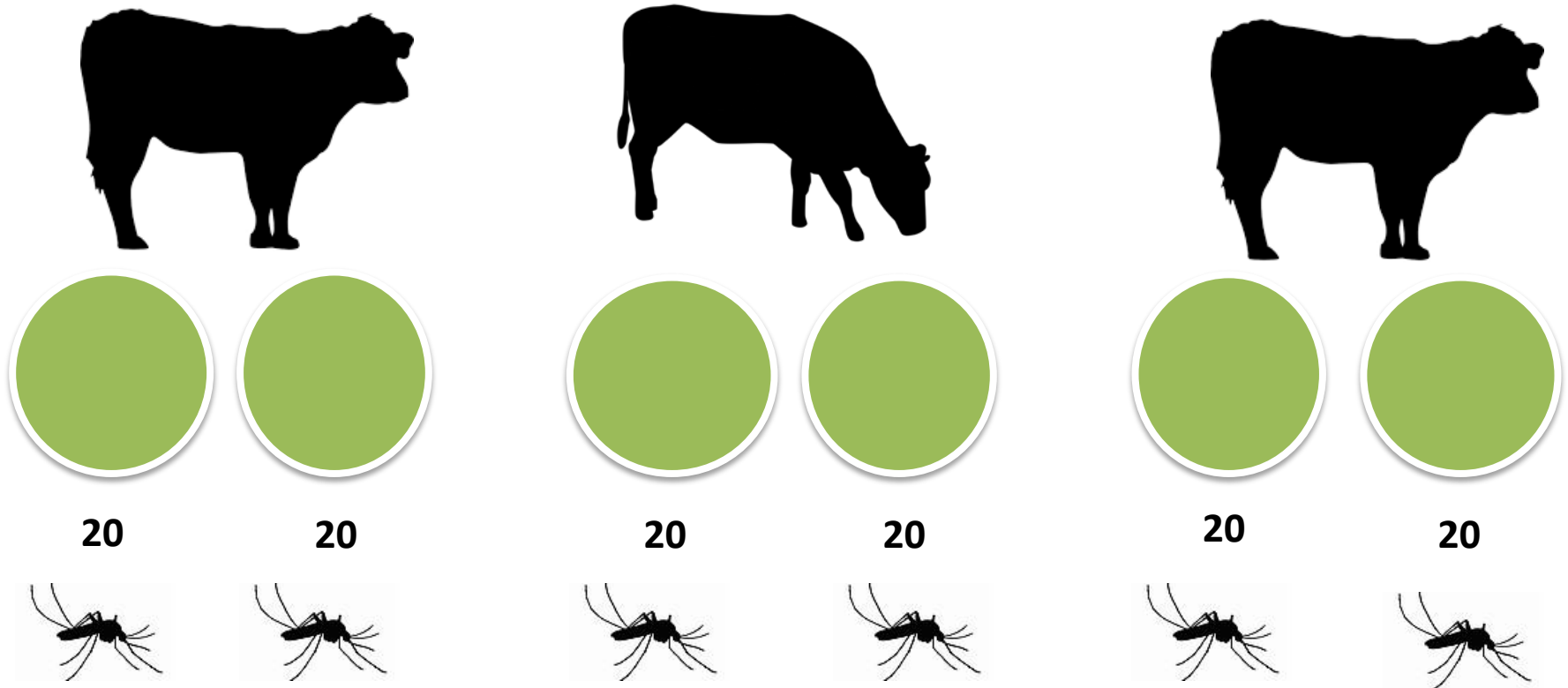
Field Study



LongRange Dose



Field Study







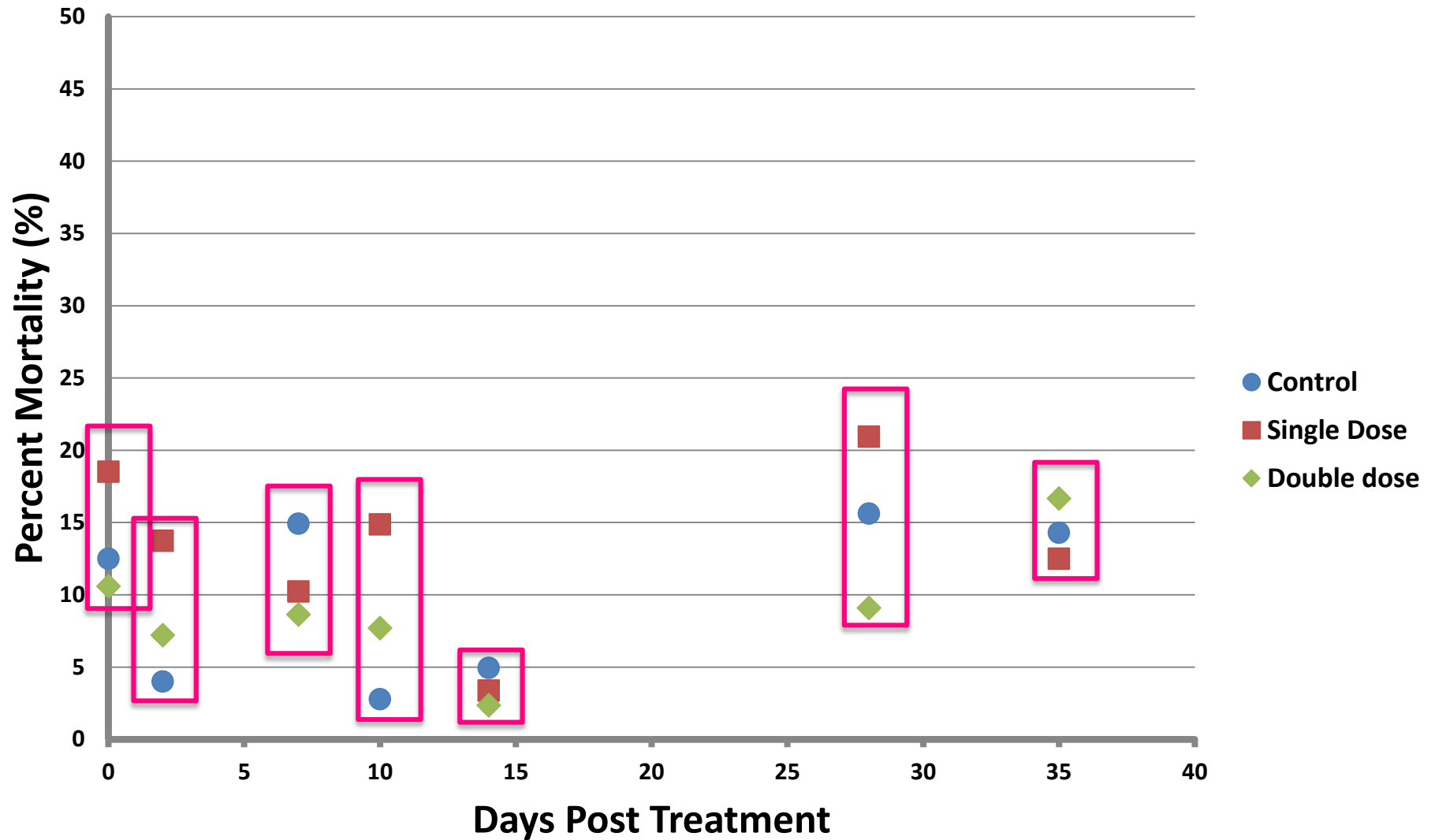






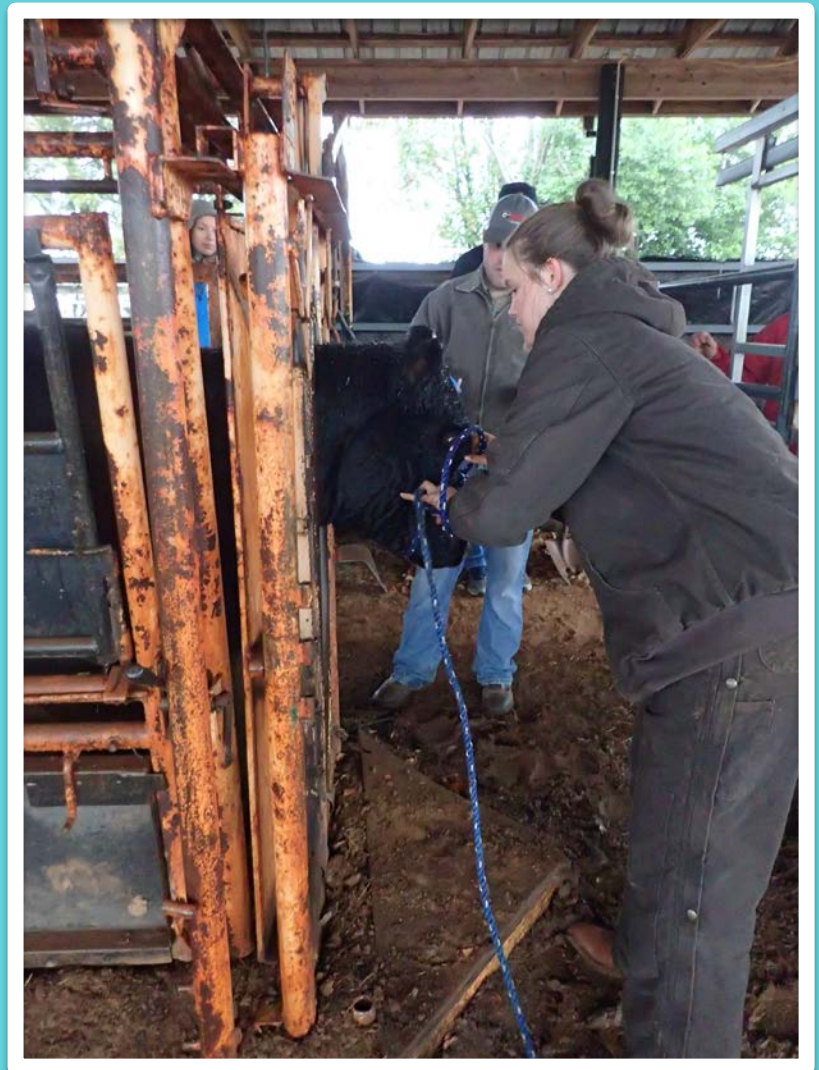


Percent Mortality at 48 Hours Post-Feeding



Discussion

- At these rates, not enough eprinomectin was reaching our mosquitoes to cause meaningful mortality.
- Moving forward, a higher rate or different formulation may be tested in attempt to achieve our goals.
- Reasons for negative results may be metabolism, gradual release reducing amount of the drug in the host at one time, etc.



Next Steps

1. Testing for an LC_{50} for technical grade eprinomectin in lab-fed mosquitoes for comparison
2. Plasma Analysis via HPLC



Malaria Is Still Here!



Research
Combined Tactics
Innovation

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Questions?

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