



Exploiting the K&D *in vitro* Bioassay System for Evaluating New Mosquito Control Products

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Background

Companies need product testing services

➤ New products

- Proof of concept
- Dose range testing
- Efficacy
- Duration

➤ New formulations of old products

➤ New modes of action

- Feeding deterrents



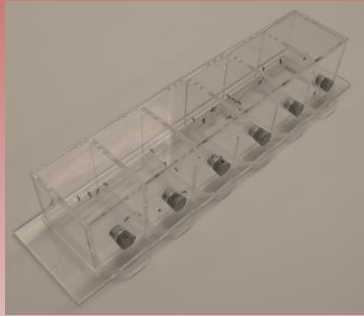
Purpose

Display various deployment strategies for the K&D *in vitro* system



K&D System

- Original method
 - human subjects (*in vivo*)



- Latest method
 - surrogate host (*in vitro*)
 - stored blood
 - blood substitute (CPDA & ATP)



Application



Treated Cloth Attached to Template

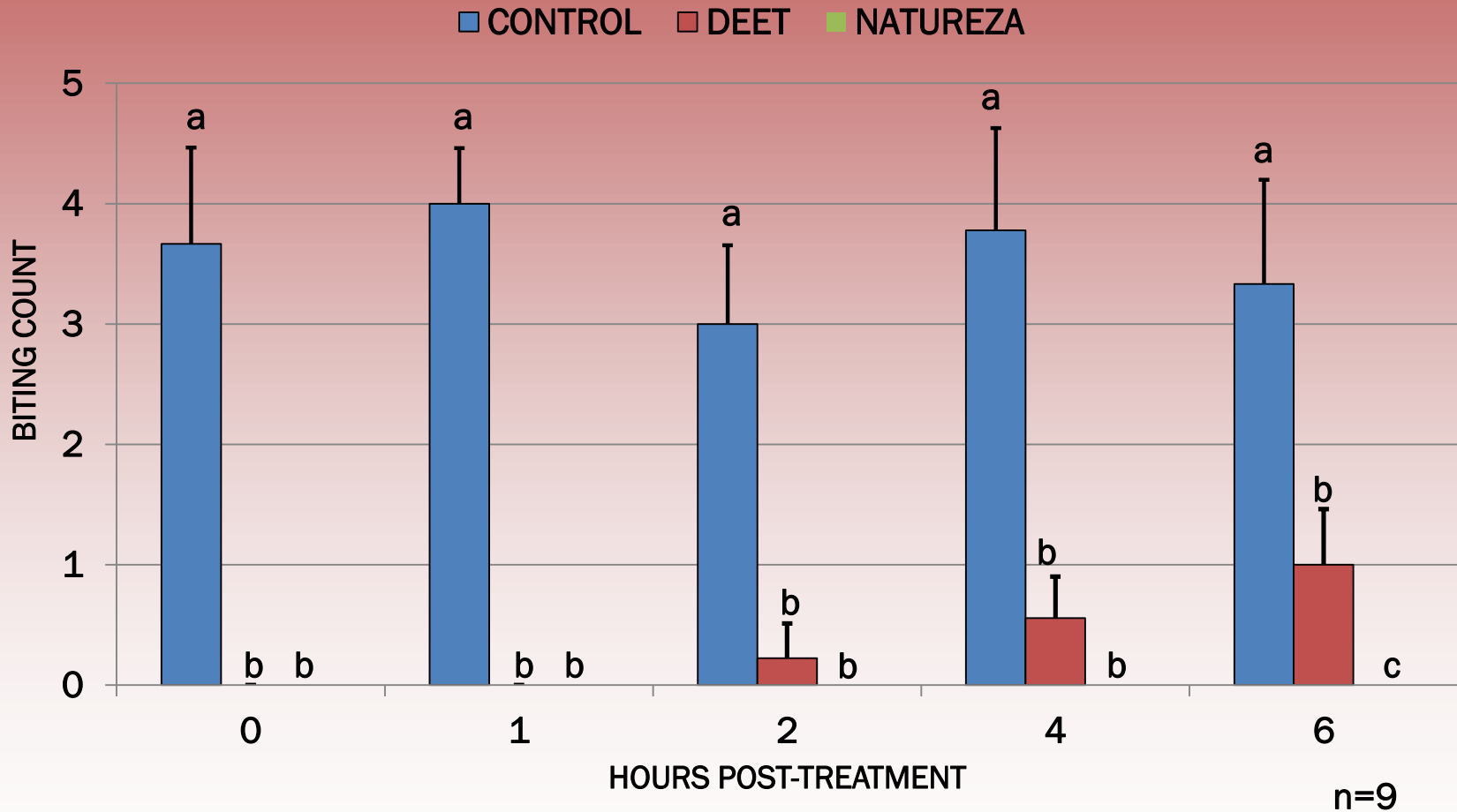


1X3 *In vitro* Bioassays



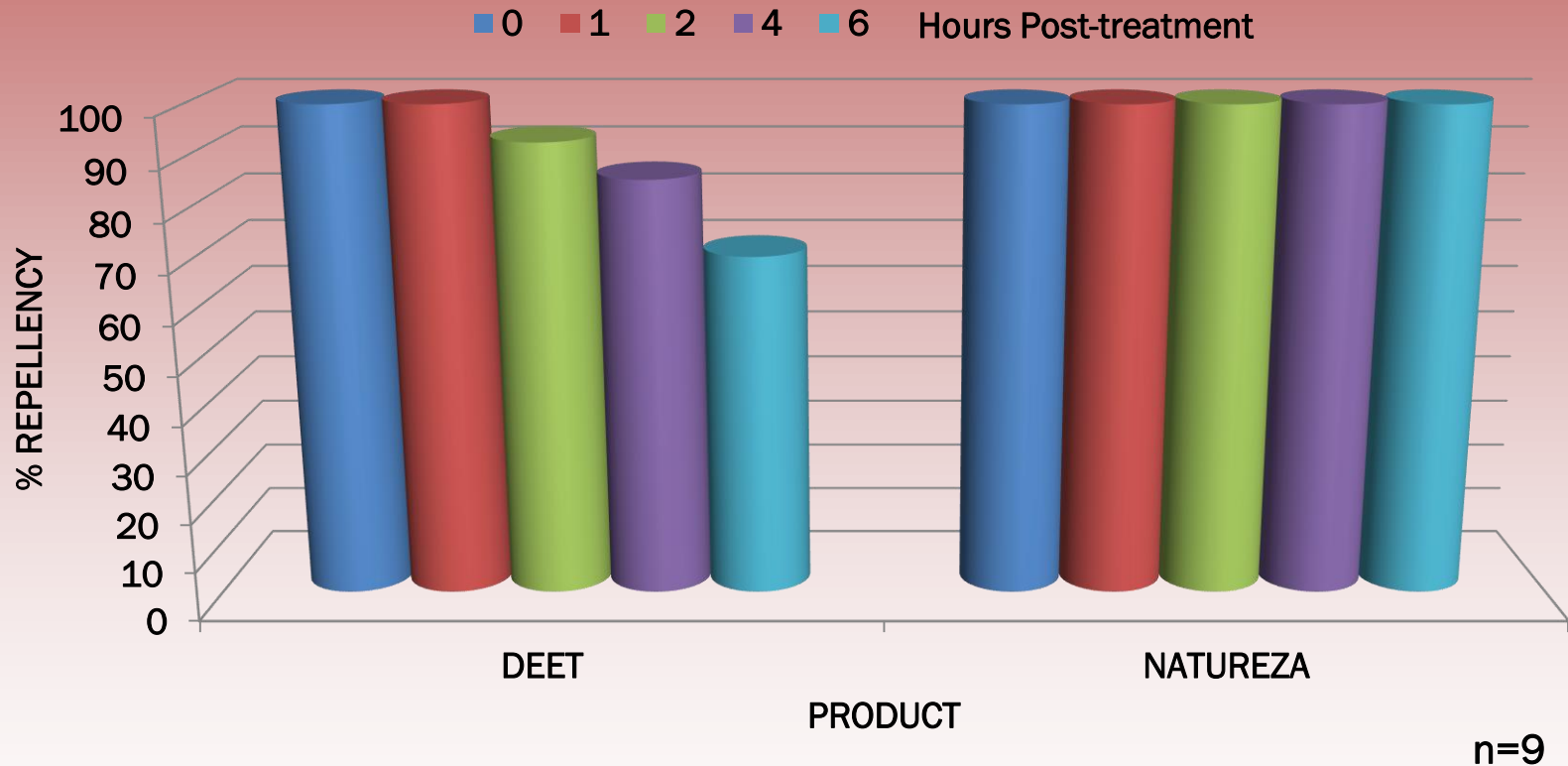
Biting Counts - *Aedes aegypti*

Average 3-Minute *Aedes aegypti* Biting Counts in Control, Off! Active, and Natureza Repellent Treatments



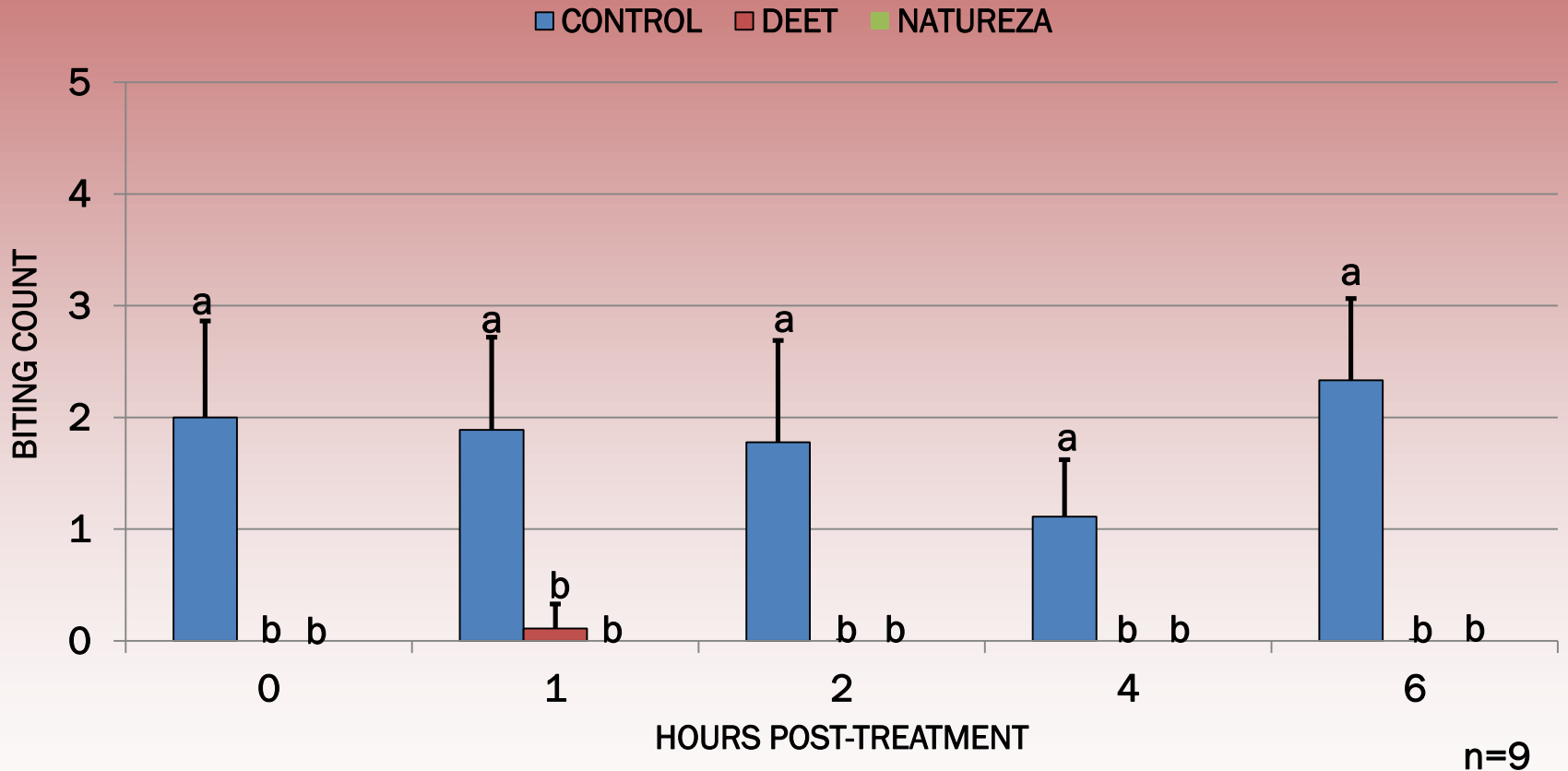
% Repellency – *Aedes aegypti*

Comparative Repellency of Natureza to Off! Active 15% DEET at Five Time Intervals Against *Aedes aegypti*



Biting Counts – *Culex quinquefasciatus*

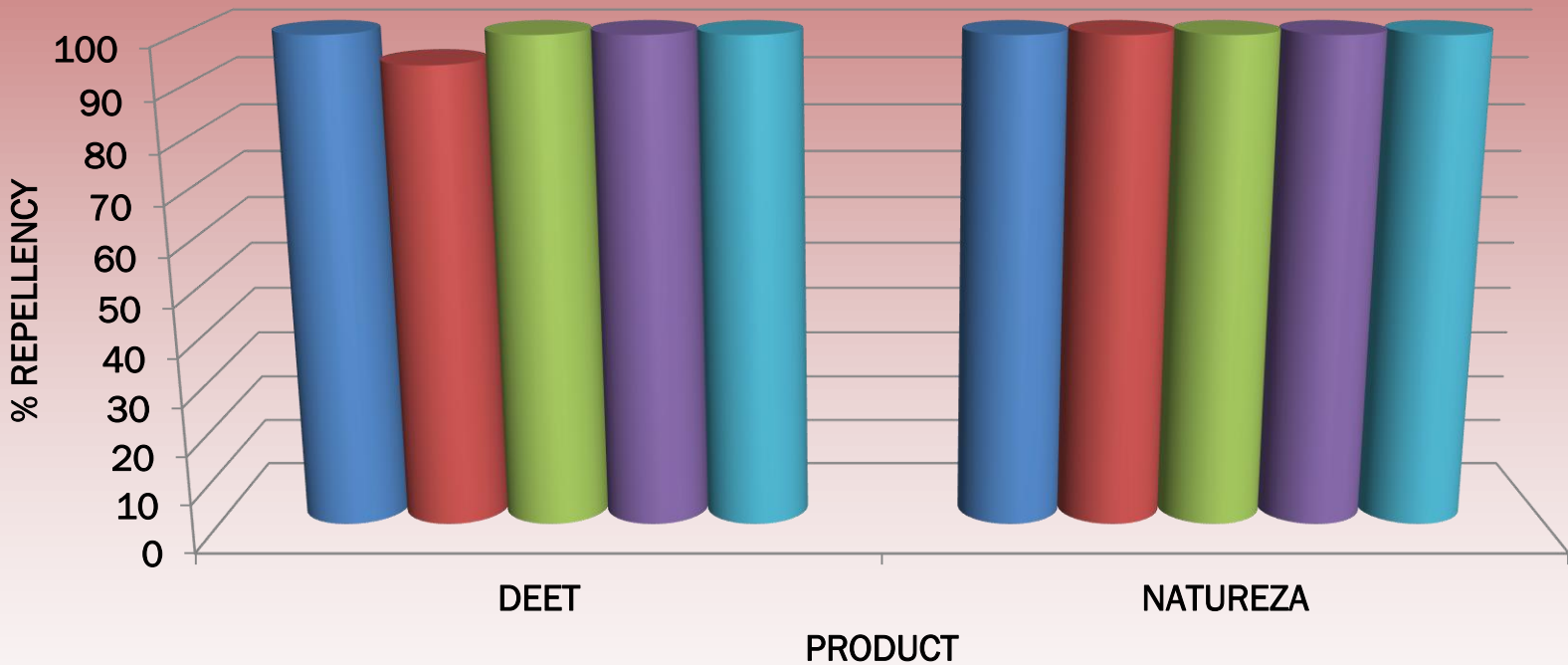
Average 3-Minute *Culex quinquefasciatus* Biting Counts in Control, Off! Active, and Natureza Repellent Treatments



% Repellency – *Culex quinquefasciatus*

Comparative Repellency of Natureza to Off! Active 15% DEET at Five Time Intervals Against *Culex quinquefasciatus*

■ 0 ■ 1 ■ 2 ■ 4 ■ 6 Hours Post-treatment



n=9

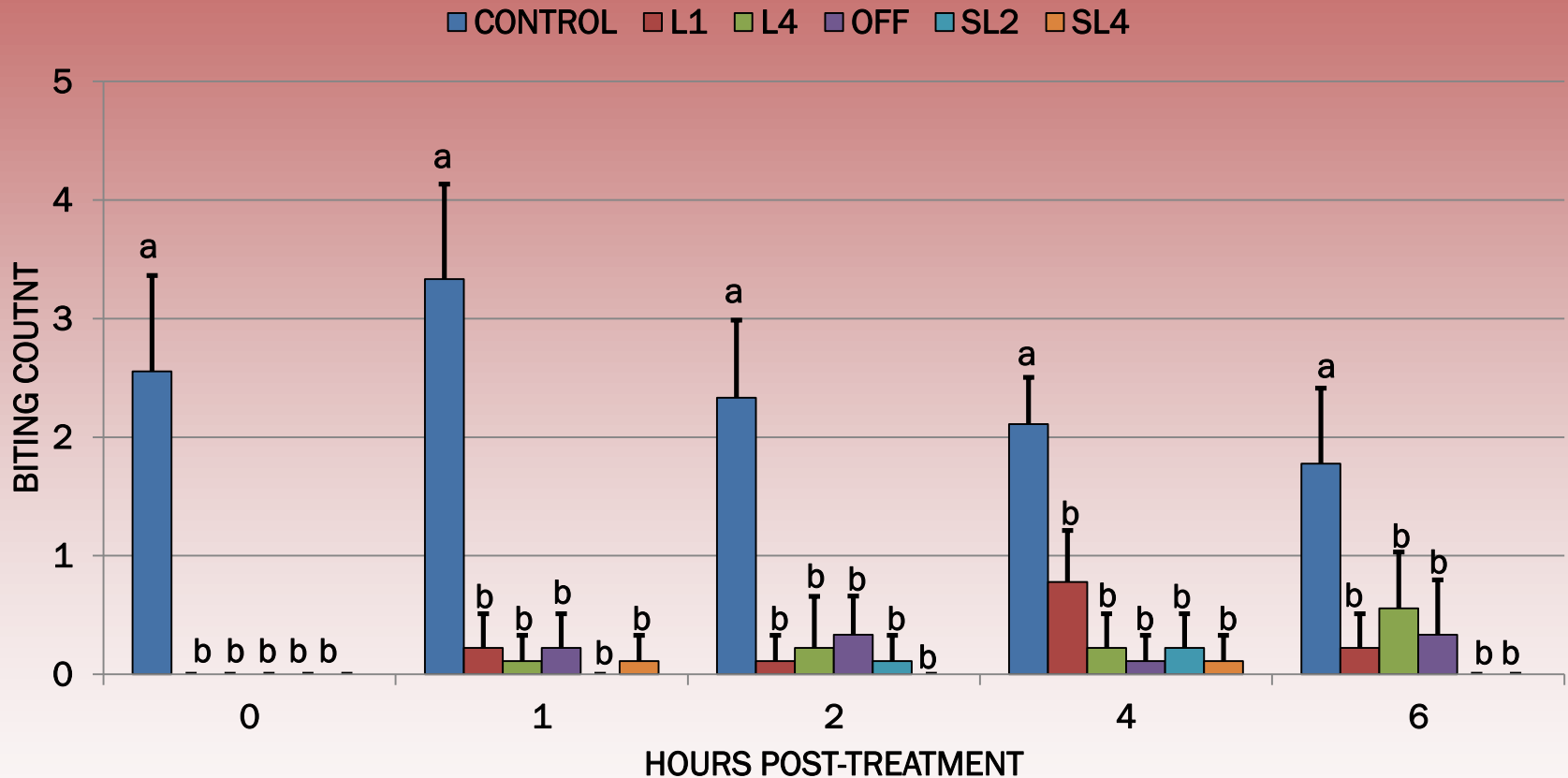


2X3 Bioassays



Biting Counts – *Aedes aegypti*

Average 3-Minute *Aedes aegypti* Biting Counts by Treatment

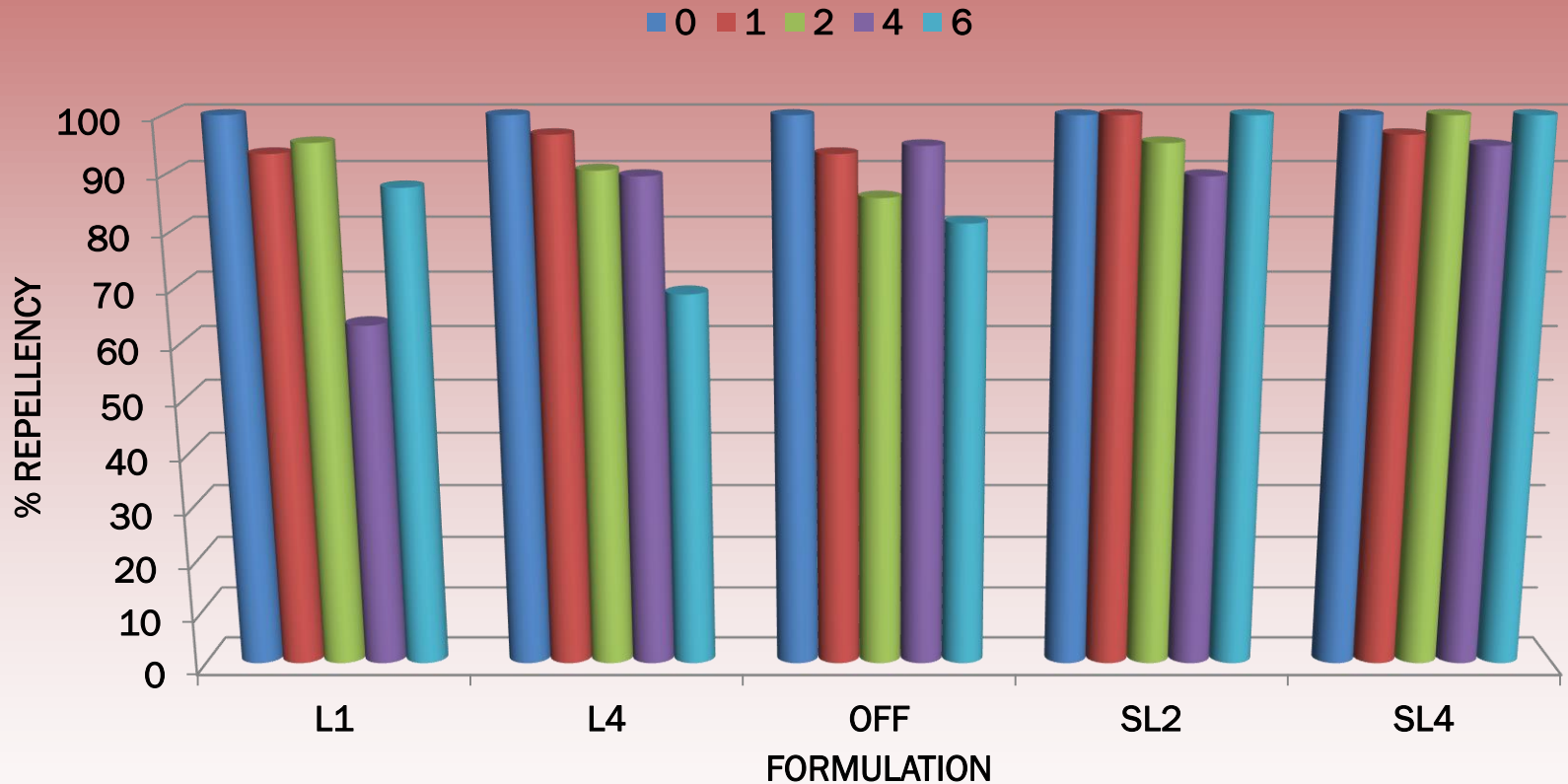


n=9



% Repellency – *Aedes aegypti*

Comparative Treatment Repellency at Five Time Intervals
Against *Aedes aegypti*



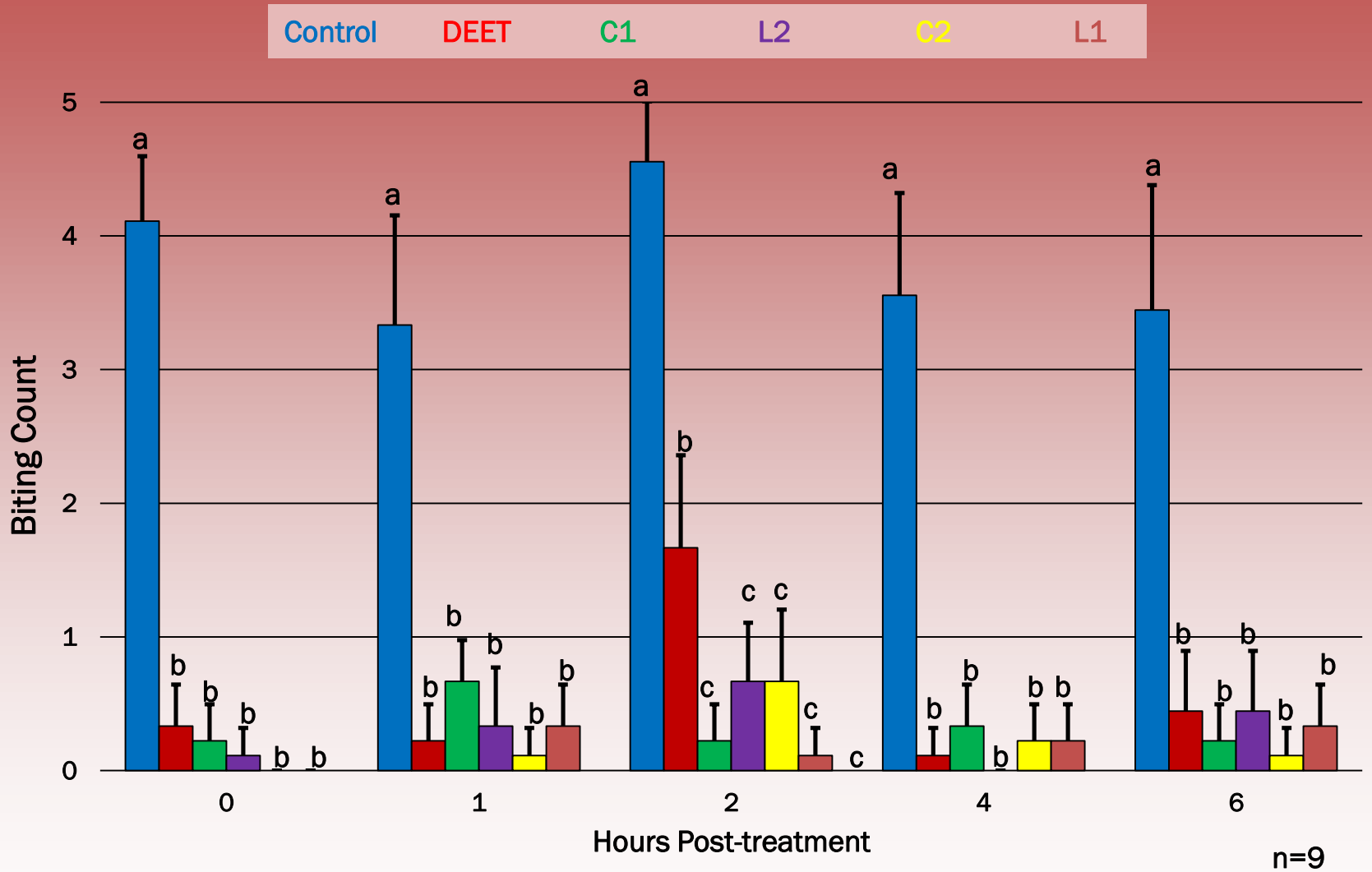
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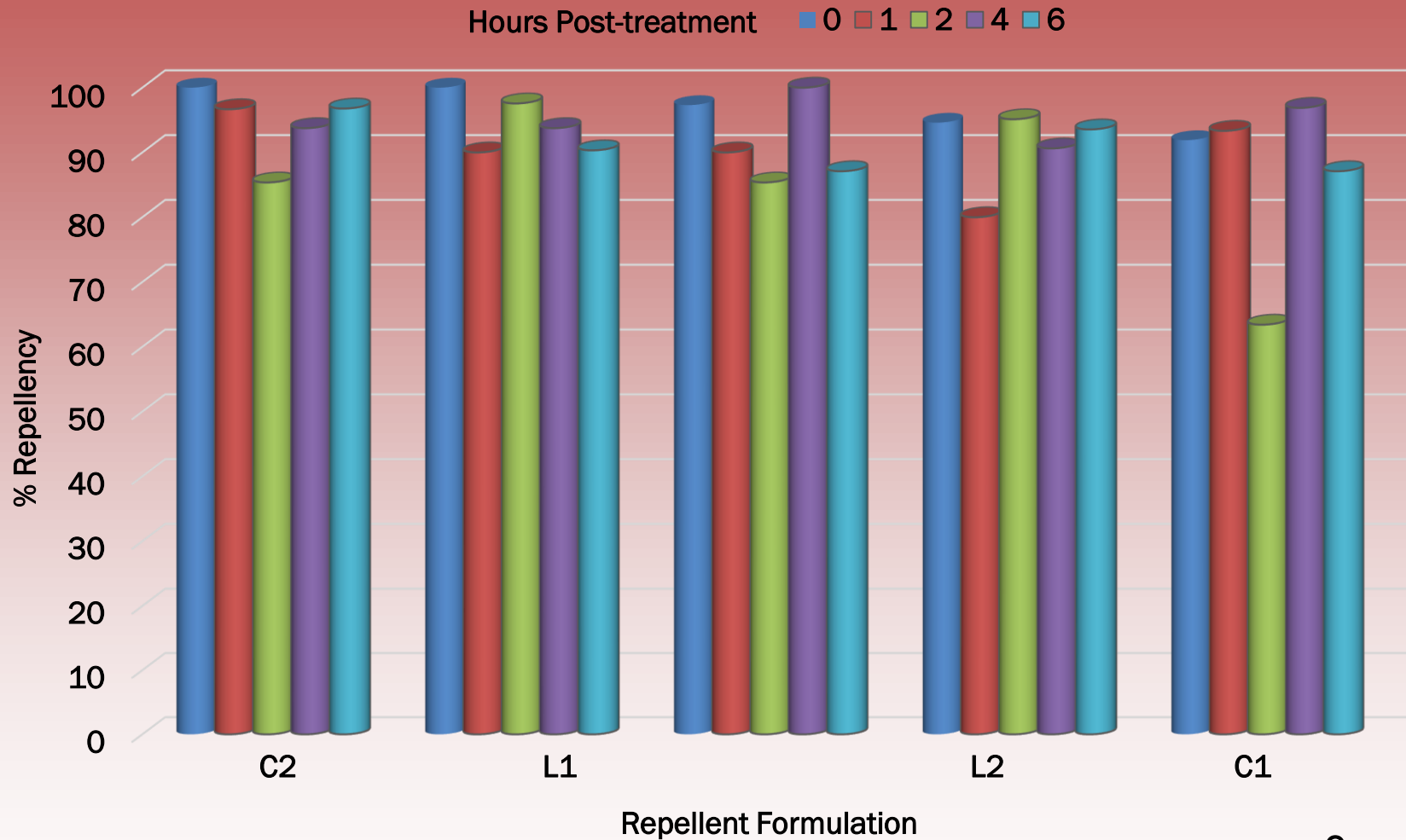
3X3 Bioassays



Biting Counts - *Aedes aegypti*



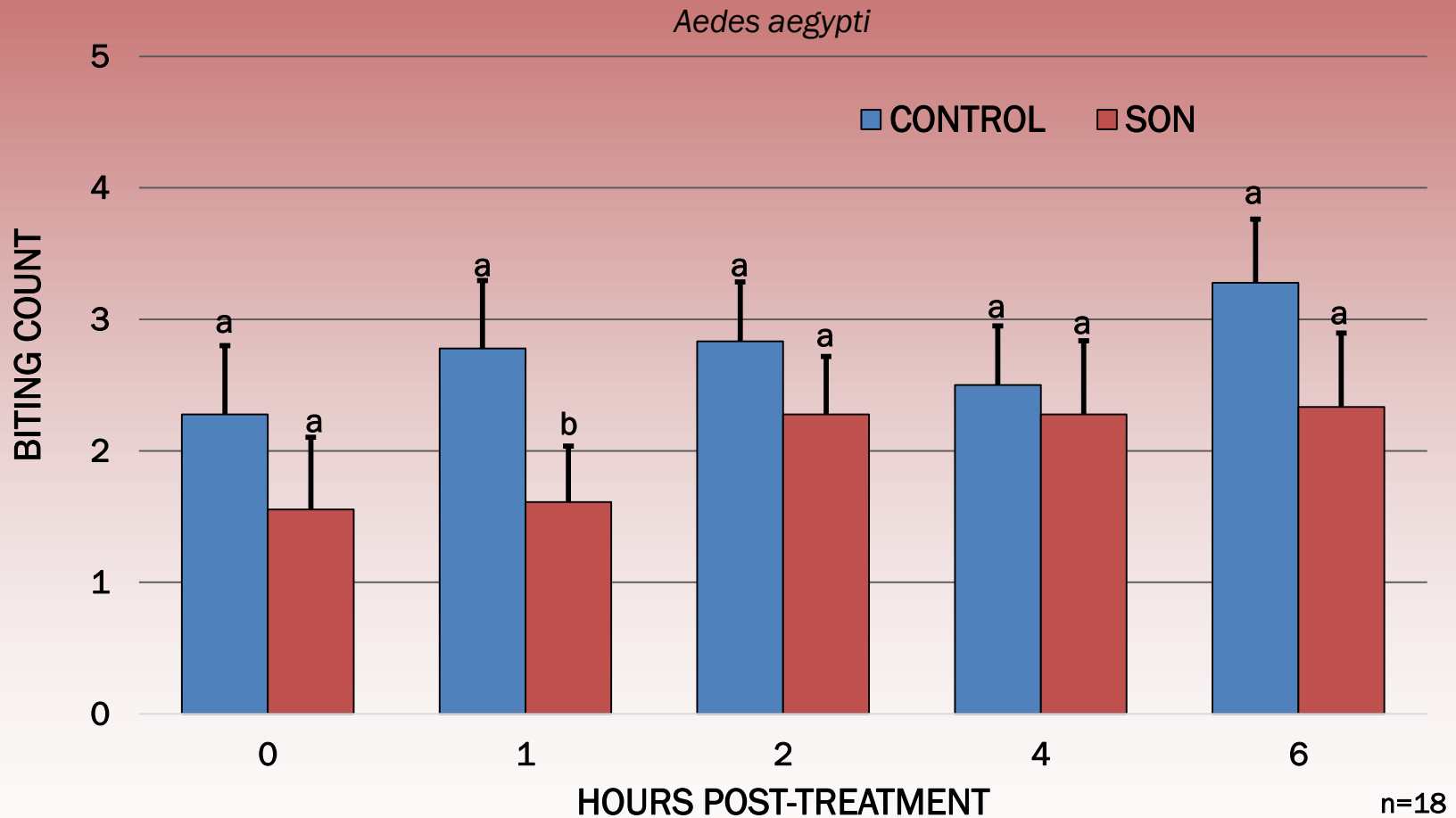
% Repellency - *Aedes aegypti*



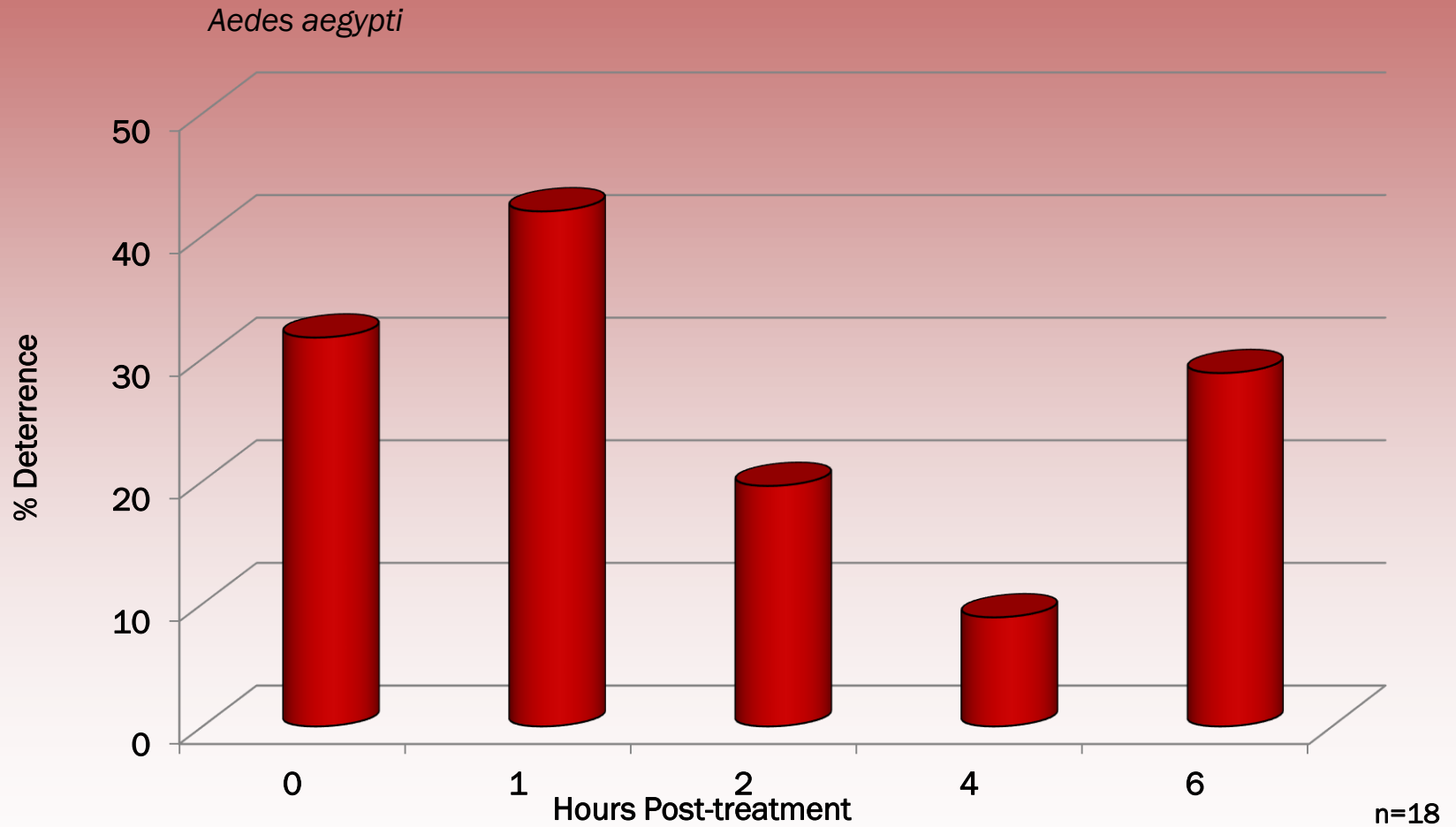
Treating Mosquitoes with Feeding Deterrents



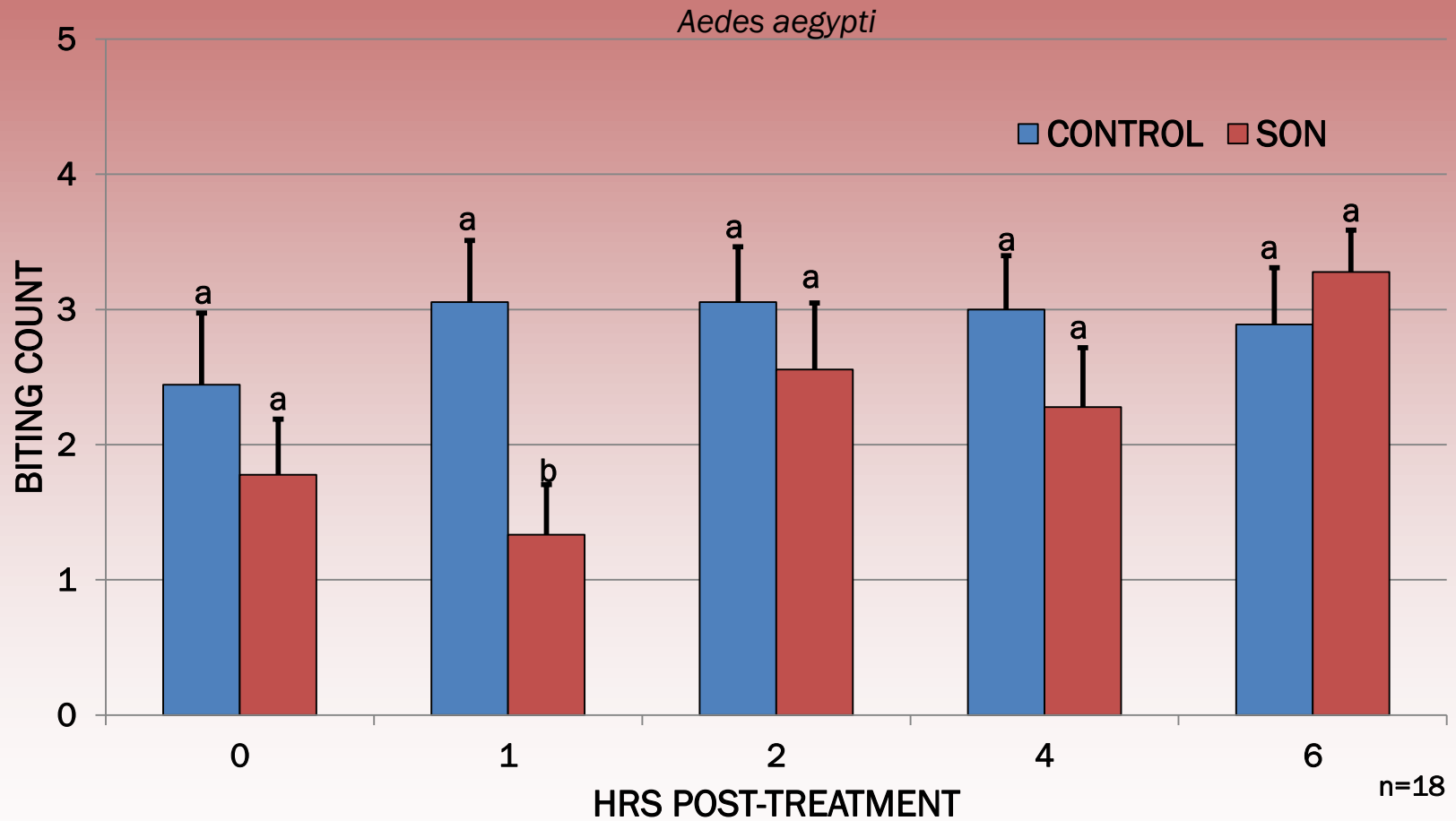
Mean 90-Second Biting Count When Exposed for 2 Hours to 48-hr Activated SON



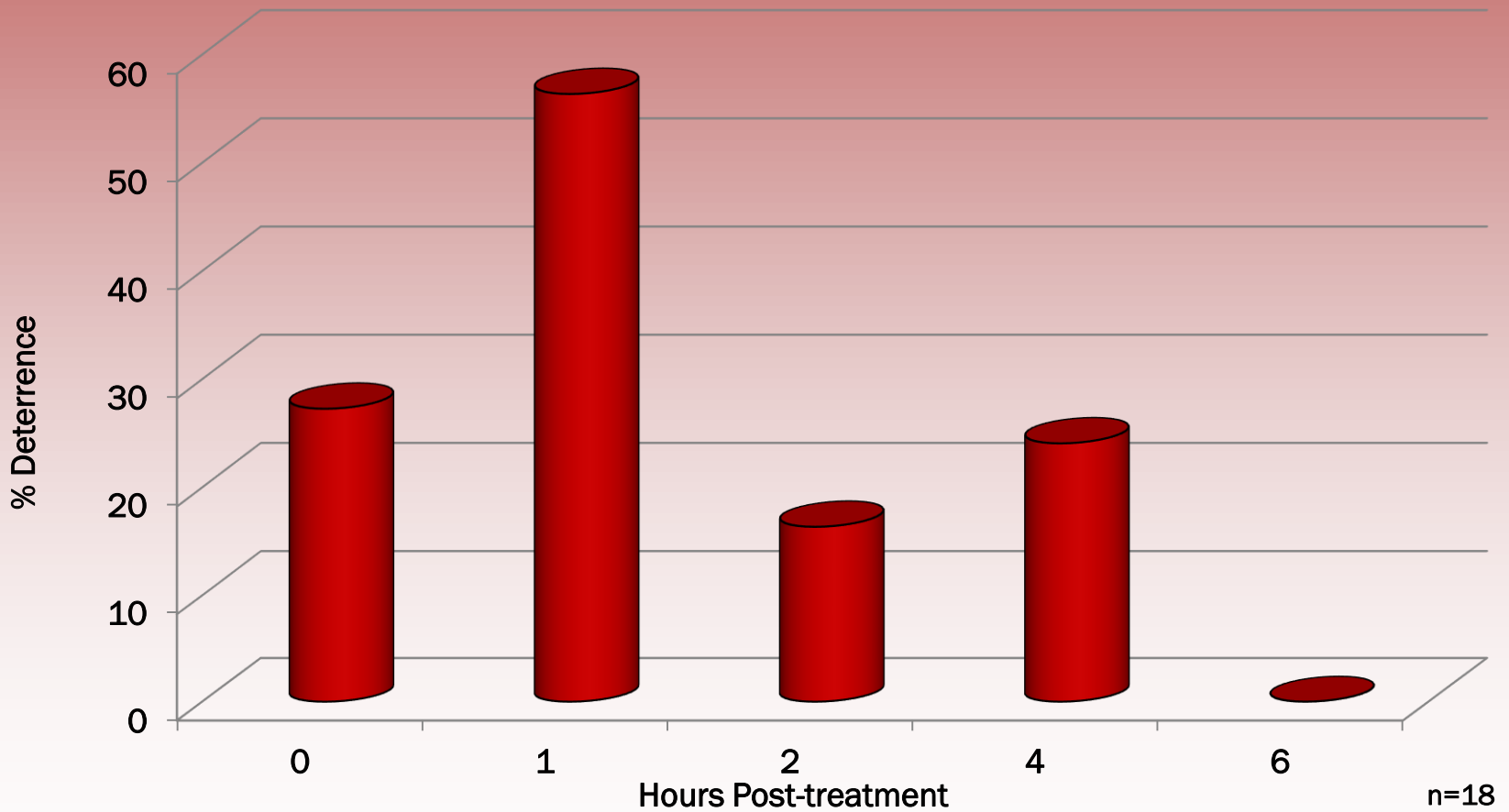
% Biting Deterrence by Time Interval



Mean 90-Second Biting Count When Exposed for 1 Hour to 6-hr Activated SON



% Biting Deterrence by Time Interval



Conclusions

- The K&D *in vitro* system provides a rapid means for screening formulations
- The system can be deployed in many configurations
- Several proprietary blends of essential oil provide comparable repellency to DEET
- Feeding deterrents may have promise
- Field tests will be required to confirm these findings



Thank you for your attention!



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