



SCAN ME



# ARE BEAN BEETLES PICKY ABOUT OVIPOSITIONING ?

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## INTRODUCTION

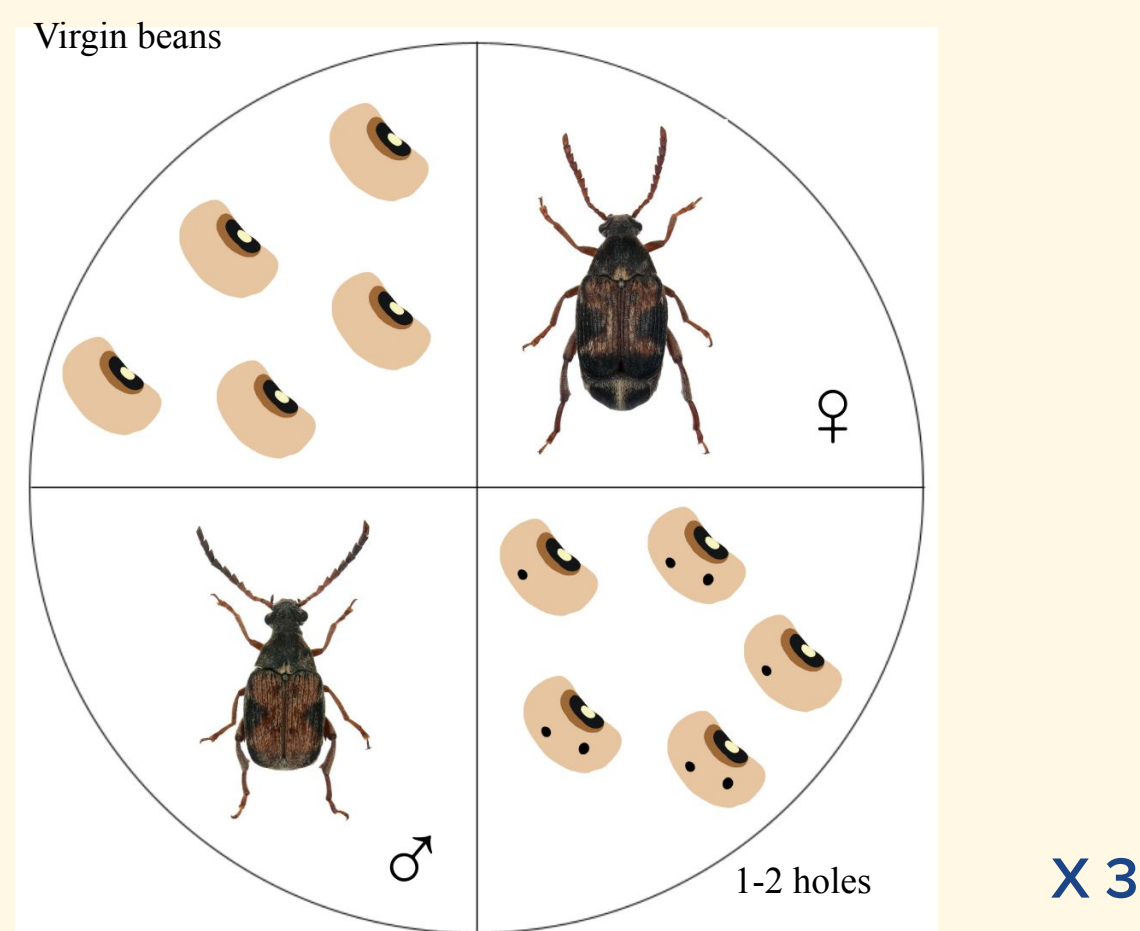
In this experiment, *Callosobruchus maculatus* and black eye beans are utilized. *C. maculatus* has a short generation time and it is easy to manipulate with limited resources. They lay eggs on the beans so the larva can develop and emerges from this seed which creates the holes. These holes are an indicator of how used a bean is, and for this experiment we defined beans with 1-2 holes as “used” and beans with 3-4 holes as “very used”.

## HYPOTHESIS:

We assume that between virgin and used beans, the beetles will always choose virgin beans to lay their eggs. Furthermore we assume that beetles will choose the least used beans when presented with both used and very used beans.

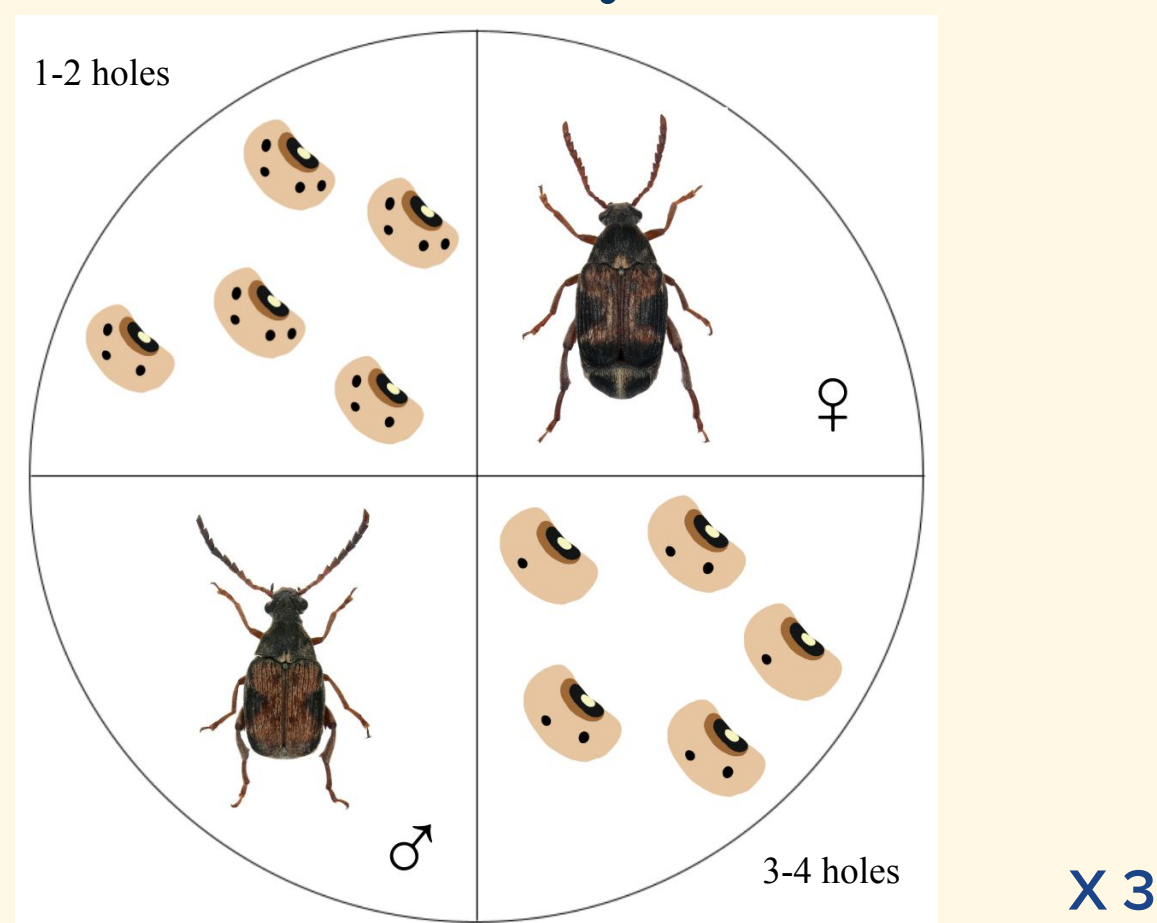
## METHOD

### “virgin vs. used”



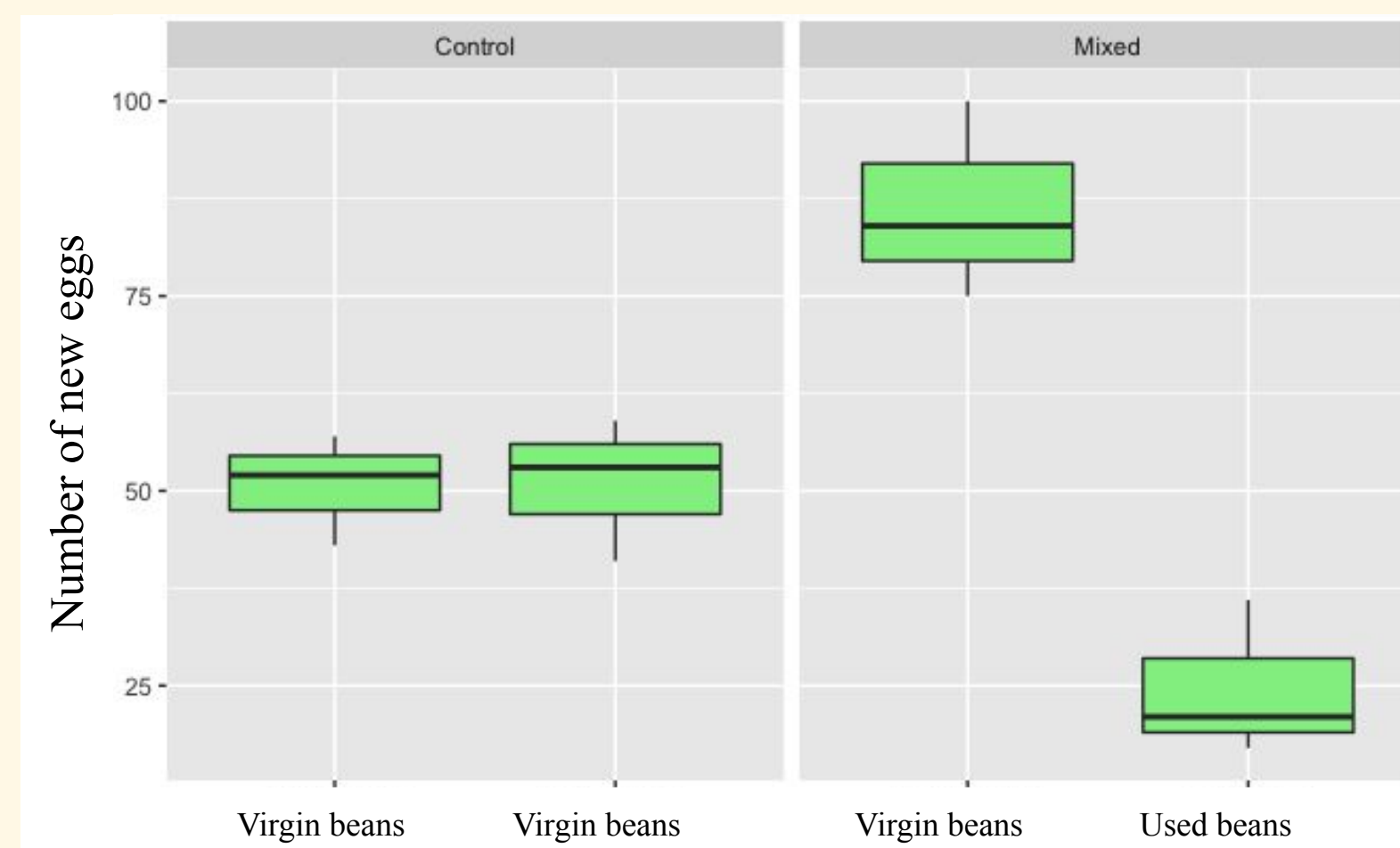
**Figure 1:** Experiment 1 tested beetles' preference between virgin beans and used beans. Virgin beans and used beans are separated in different compartments of the petri dish and a pair of beetles are placed separately.

### “used vs. very used”

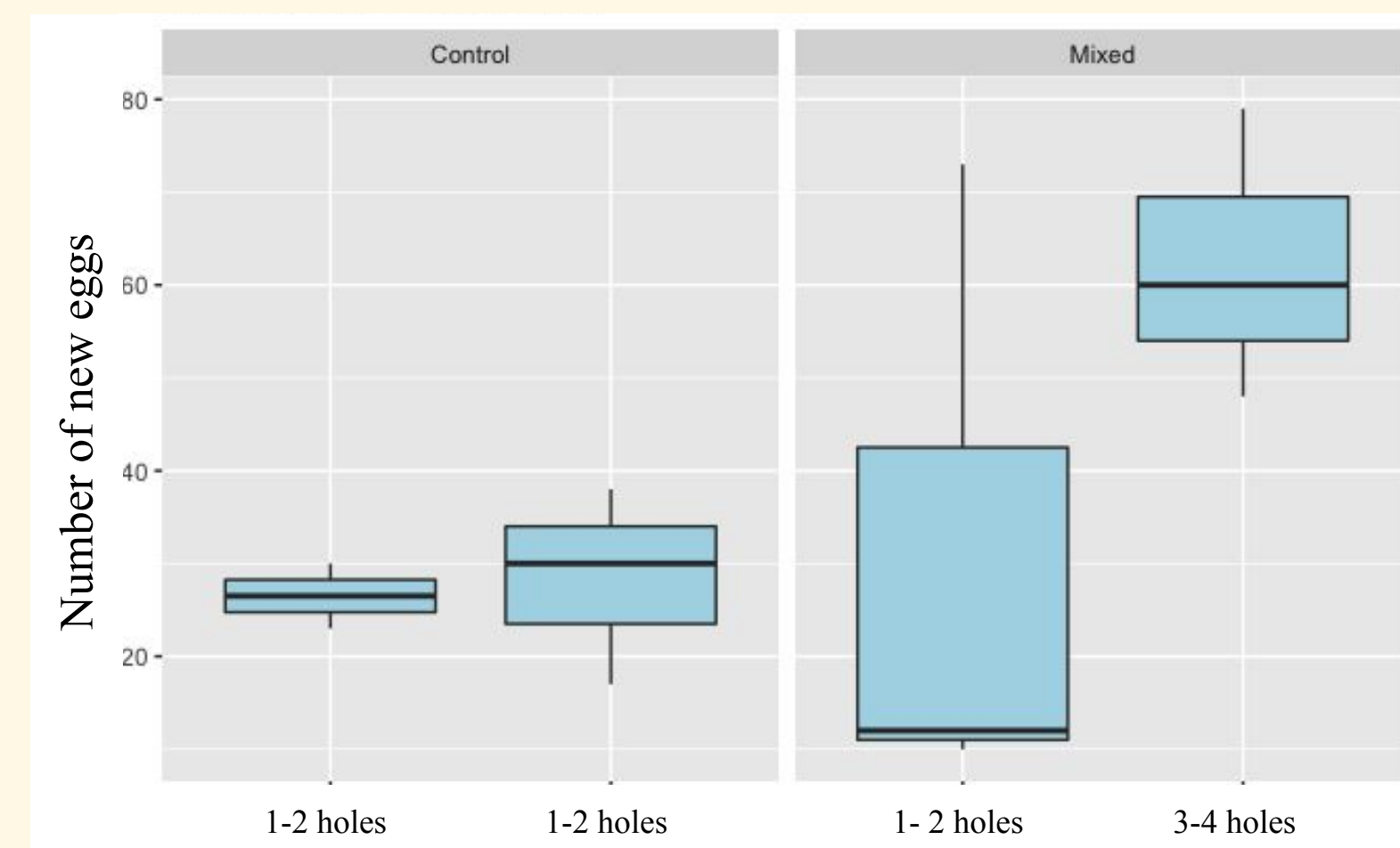


**Figure 2:** The second experiment tested beetles' preference between different degrees of used beans. Used beans and very used beans are separated in different compartments of the petri dish and a pair of beetles are placed separately.

## RESULTS



**Figure 3:** The number of new eggs in experiment 1. Control group on the left, labeled control, shows an even distribution on where the beetles chose to lay their eggs ( $P = 0.9543$ ), whereas experiment 1, labeled mixed, on the right side shows a significant preference ( $P < 0.0001$ ) towards virgin beans.

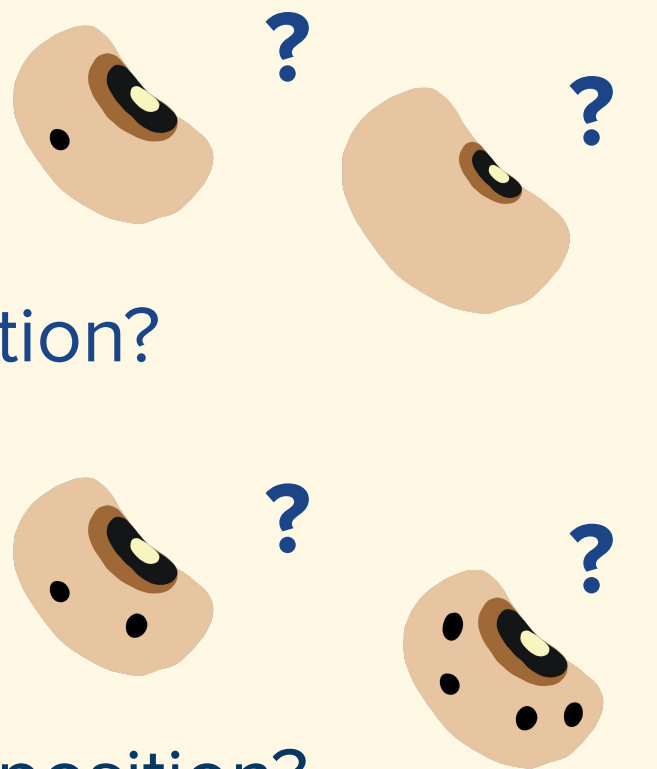


**Figure 4:** The number of new eggs in experiment 2. Control group on the left, labeled control, shows an even distribution on where the beetles chose to lay their eggs ( $P = 0.7023$ ), whereas experiment 2, labeled mixed, on the right side shows a preference towards used beans ( $P < 0.0001$ ).

## EXPERIMENTAL QUESTION

### Experiment 1 : “virgin vs. used”

Do they prefer **virgin** beans rather than **used** beans for oviposition?



### Experiment 2 : “used vs. very used”

Do they prefer **used** beans rather than **very used** beans for oviposition?



**Figure 5:** The number of new eggs in virgin beans are significantly **larger** than those in used beans in experiment 1: “virgin vs. used”

## DISCUSSION

**Virgin vs. used:** Female bean beetles prefer to oviposition on **virgin beans** when given the choice between virgin beans and used beans. This confirms our hypothesis.

**Used vs. very used :** Surprisingly the bean beetles oviposition more on more **used beans** when given the choice between more used beans (3-4 holes) and less used beans (1-2 holes). This is the opposite of our hypothesis, reasons for this might be:

- The **size** of more used beans are larger than less used beans
- The more used beans was in general **better quality** and this explains why they were more used in the first place, before our experiment.
- The used beans overall might have been **rotten** inside, and this made the beetles prefer some beans over others.

However, it is a big variation in the number of eggs laid on less used beans.

## TAKE HOME MESSAGE

Bean beetles prefer to lay their eggs on virgin beans when given the choice between virgin beans and used beans. When they are given the choice between less used beans and more used beans the result is much more indefinite.

In further research it would be interesting to look deeper into if the bean beetles prefer less used or more used beans for oviposition.

[1] Beck, C. W. Blumer, L. C. (2014) *A Handbook on Bean Beetles, Callosobruchus maculatus*. Available at: <https://www.beanbeetles.org/handbook/>.

[2] P.G. (n.d.-a). *Callosobruchus maculatus, female* | Insects, Reptiles pet, Insect prevention. Pinterest. Retrieved April 20, 2022, from <https://www.pinterest.co.uk/pin/476255729345620887/>.

[3] P.G. (n.d.-b). *Callosobruchus maculatus, male* | Insecti. Pinterest. Retrieved April 20, 2022, from <https://www.pinterest.de/pin/407223991307480735/>.