



# Designing a cage for *Hermetia illucens*: Summarizing two years of work

D. DERUYTTER, C. L. COUDRON, J. CLAEYS, S. TEERLINCK  
Inagro, Ieperseweg 87, 8800 Rumbeke-Beitem, Belgium  
Mail to: [David.Deruytter@inagro.be](mailto:David.Deruytter@inagro.be)



## Introduction

Rearing insects on an industrial scale requires a constant and reliable source of eggs or new-born larvae. These can either be bought from a hatchery or, what is currently most common, bred on site. In any case, the space, labour and energy needed to breed them should be minimized. In the Bioboost and Entomospeed projects the goal was to increase the cage productivity and ensure a stable supply of new larvae to process organic sidestreams.

## Goals



### 1) One person handling

- 80\*120\*130 cm (l\*b\*h) with wheels
- Aluminium frame



### 2) Batch and continuous breeding

- Pupae drawer (blue)
- Easy removal of dead flies via removable floor



### 3) Easy cleaning and disinfection

- Only aluminium and plastic
- No contact between attractant and flies (yellow)



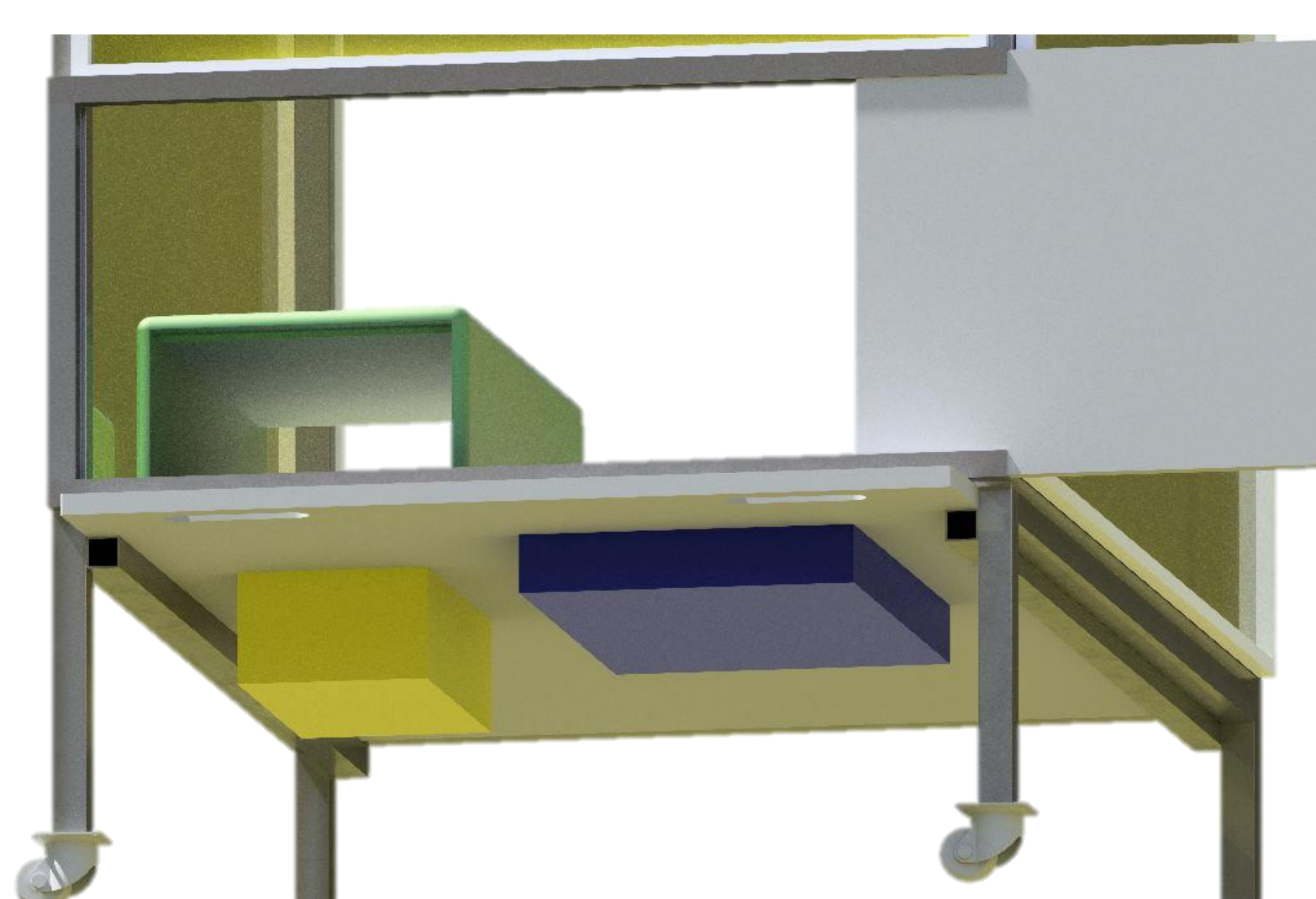
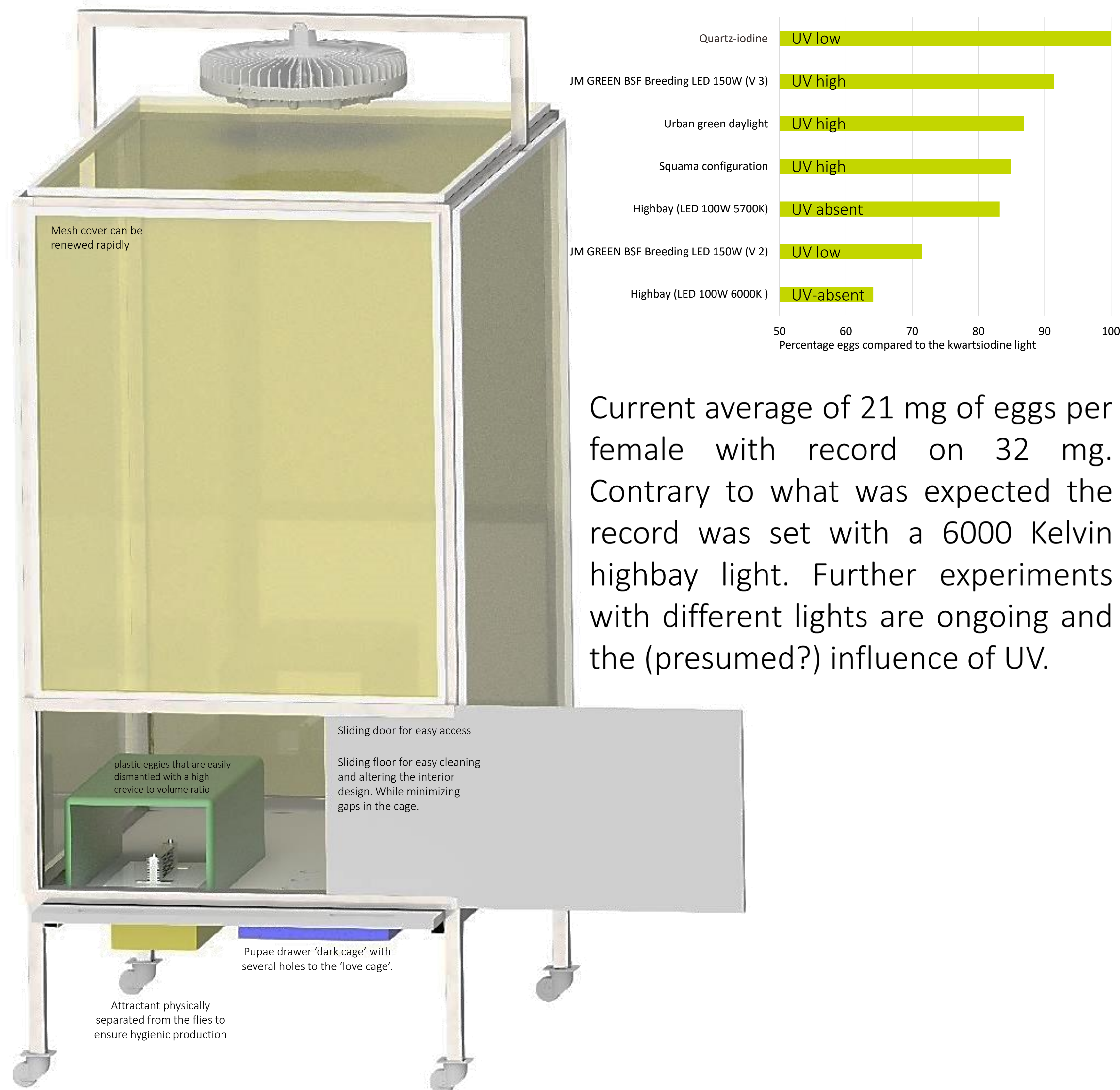
### 4) Durable design

- Only aluminium and plastic
- Easily changeable mesh

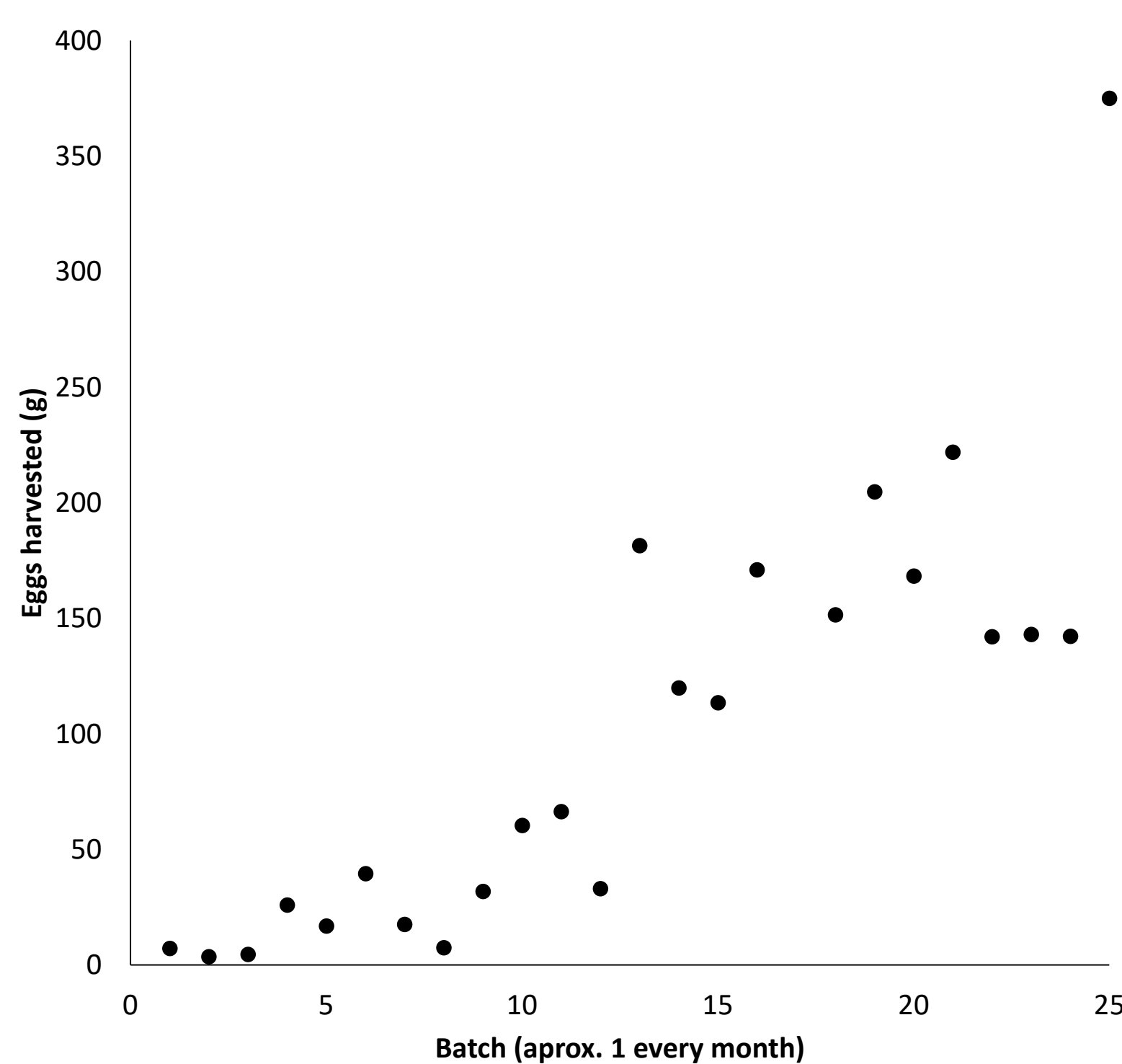
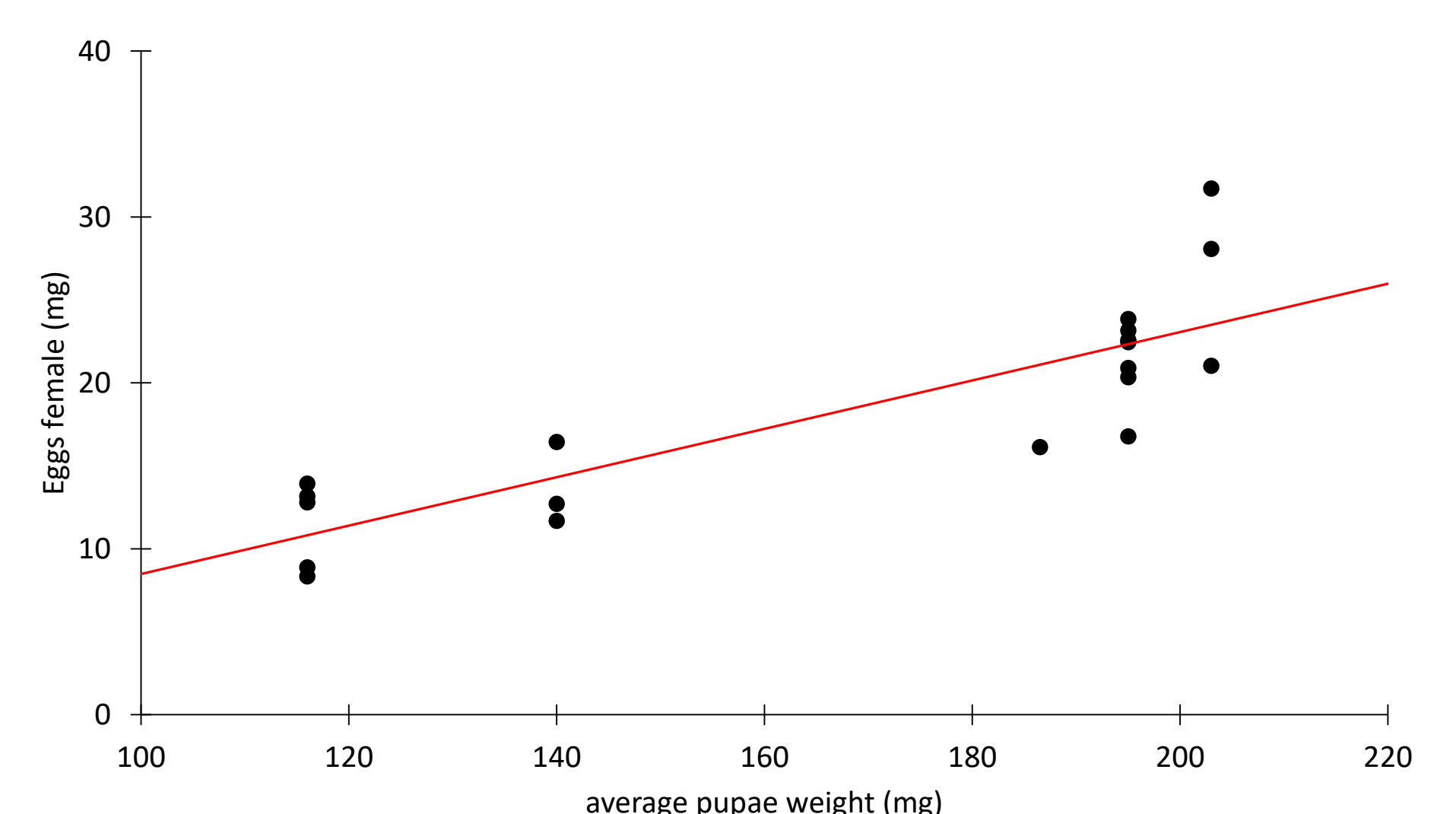


### 5) Maximize egg harvest / m<sup>2</sup>

- Pupae drawer underneath the cage
- Optimizing interior design (in progress)
- Optimize light (in progress)

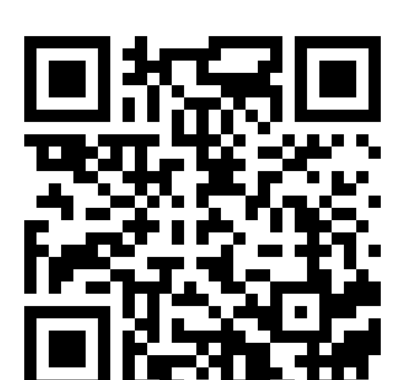


The pupae drawer (blue) can be used to continuously breed BSF. Initial results indicate that the optimal density is 8000 flies. Furthermore the mean pupae weight is a significant predictor for the amount of eggs per female, with an increase of 0.11 mg eggs for every extra mg mean pupae weight.



## Conclusion

- After two years, the result is a durable aluminium cage of 120 by 80 by 130 cm with a removable plastic bottom plate and mesh on the sides. Two drawers are installed in the bottom plate for pupae and attractant. The drawer design ensures that the flies cannot reach the attractant and that the pupae can be added without entering the cage (minimizing possibility of escape). Wheels ensure that they can be easily transported to and from the climate room (e.g. to the wash station). Further experiments are being performed to assess optimal light source (intensity and wavelength), fly density, cage colour, interior design (e.g. surface area), etc.



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