

# Experimental write-up

## Data Analysis

### Males vs Females (Experiment 1) - Feeding and Oviposition behaviour

#### Feeding behaviour

A linear model was used with quasipoisson to count for overdispersion, significance of day was tested in the model and this was kept as it was significant ( $F_{8,903} = 0.941$ ,  $P = 0.05$ ). ANOVA analysis showed that there was significance between the sexes and the interaction effect ( $F_{8,903} = 35.36$ ,  $P = <0.001$ ), so this was kept in the model.

The significance of diets between sexes and within sexes was looked at using a tukey test? Looking at the significance of diets within sexes, there was a significant difference found between a 1:2 diet and an 8:1 diet on the female assay (Tukey test:  $t_{903} = -5.088$ ,  $P < 0.001$ ). On day 1, there was a mean average of 1.43 +/- S.E. 0.154 flies per patch but on day 2 there was an average of 2.36 +/- S.E. 0.230 flies per patch on the 8:1 diet.

### Mated vs Virgin females (Experiment 2) - Feeding and Oviposition behaviour

#### Feeding behaviour

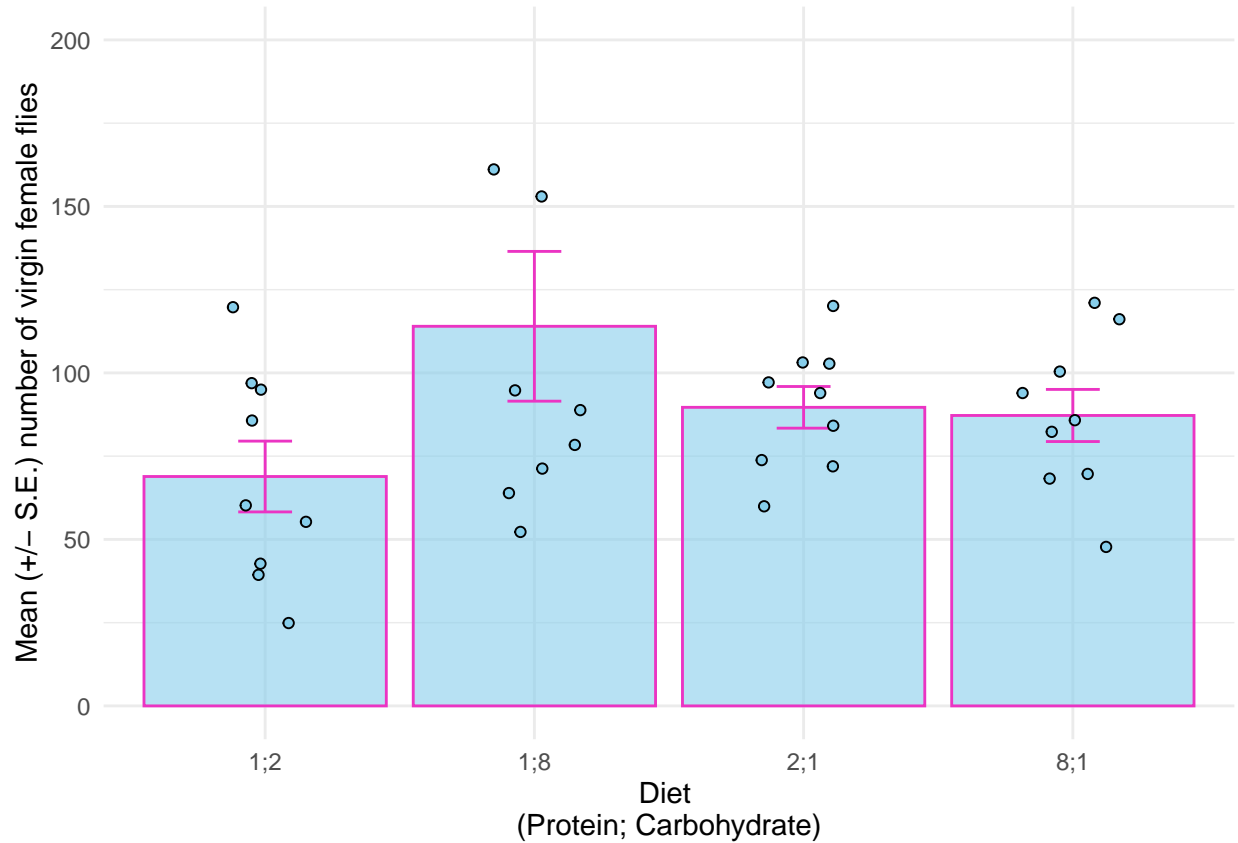
A generalised linear model was used with quasipoisson to count for overdispersion. Day was dropped from the model as there was found to be no significant effect of including day in the model ( $P = 0.32$ ). It was found that there was a strong significant effect in diet choice when comparing mated *drosophila melanogaster* with virgin. When comparing the P:C 8:1 diet to mated and virgin flies, there was a significant difference found ( $P = <0.0001$ ), there was a mean average of 2.74 flies on the 8:1 diet per observation while there was a mean average of only 1.64 flies on a patch at an observation for the virgin females (Figure 1). This shows that mated females will prefer a diet which is high in protein, indicating that mated females are sensible enough to choose a diet which is good for pregnancy, contributing to the growth of their offspring.



**Figure 1: A boxplot comparing feeding behaviour of mated and virgin females.** Figure shows a plot with the mean average  $\pm$  S.E. of where the mated females preferred to feed (left), compared with a mean average  $\pm$  S.E. of where the virgin females preferred to feed (right).

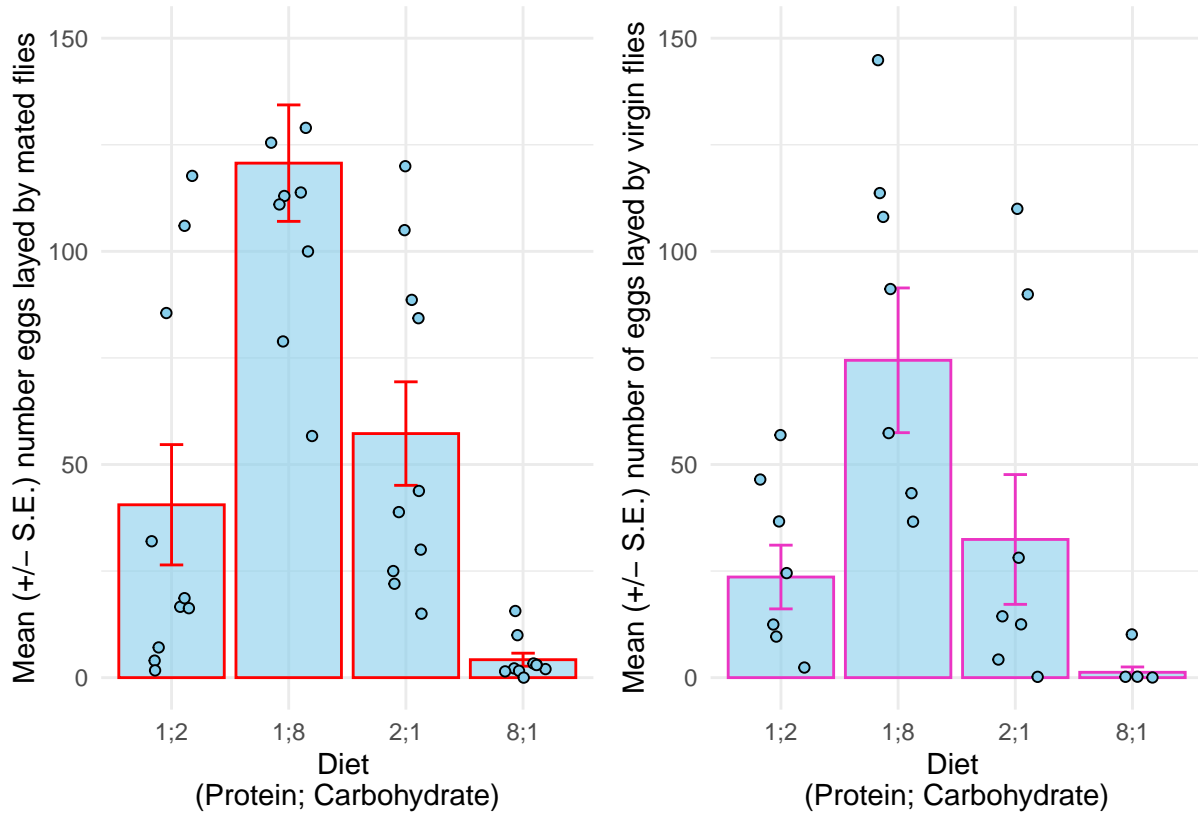
### Oviposition behaviour

To test for the significance in oviposition behaviour in the mated females, a generalised linear model was used with quasipoisson to count for overdispersion. It was found that although there was not a lot of differences, there were significantly more offspring emerging from diets 1:8 than diets 1:2 ( $P = 0.019$ ). Overall there was a mean average of  $114 \pm$  S.E. 22.5 offspring emerging from 1:8 diets and a mean average of  $68.9 \pm$  10.6 S.E. offspring emerging from the 1:2 diets (Figure 2). As these diets are both diets which are 'low in protein' it shows that although there is not a lot of preference for any particular diets when mated females are laying their eggs. Data for virgin female egg laying was not collected for this experiment.



**Figure 2: A boxplot of the offspring counted from mated females.** Boxplot shows mean offspring +/- S.E. that emerged from four varying protein: carbohydrate diet patches.

Data was also collected in a preliminary experiment, where the egg counts of where both virgin females and mated females laid their eggs was collected. It was found that there was no significant differences found in where virgin females laid their eggs and where mated females laid their eggs in this experiment. This experiment also showed however, that there was significantly more eggs laid on the 1:8 diets compared to the 1:2 diets ( $P = < 0.001$ ), with a mean average of  $121 \pm 13.7$  S.E. eggs laid on 1:8, and a mean average of  $40.6 \pm 14.1$  S.E. laid on the 1:2 diets. There was also a slight significant difference in eggs laid on the 1:2 diet, and eggs laid on the 8:1 diet ( $P=0.025$ ), with a mean average of only  $4.21 \pm 1.52$  S.E. eggs laid on the 8:1 diets.

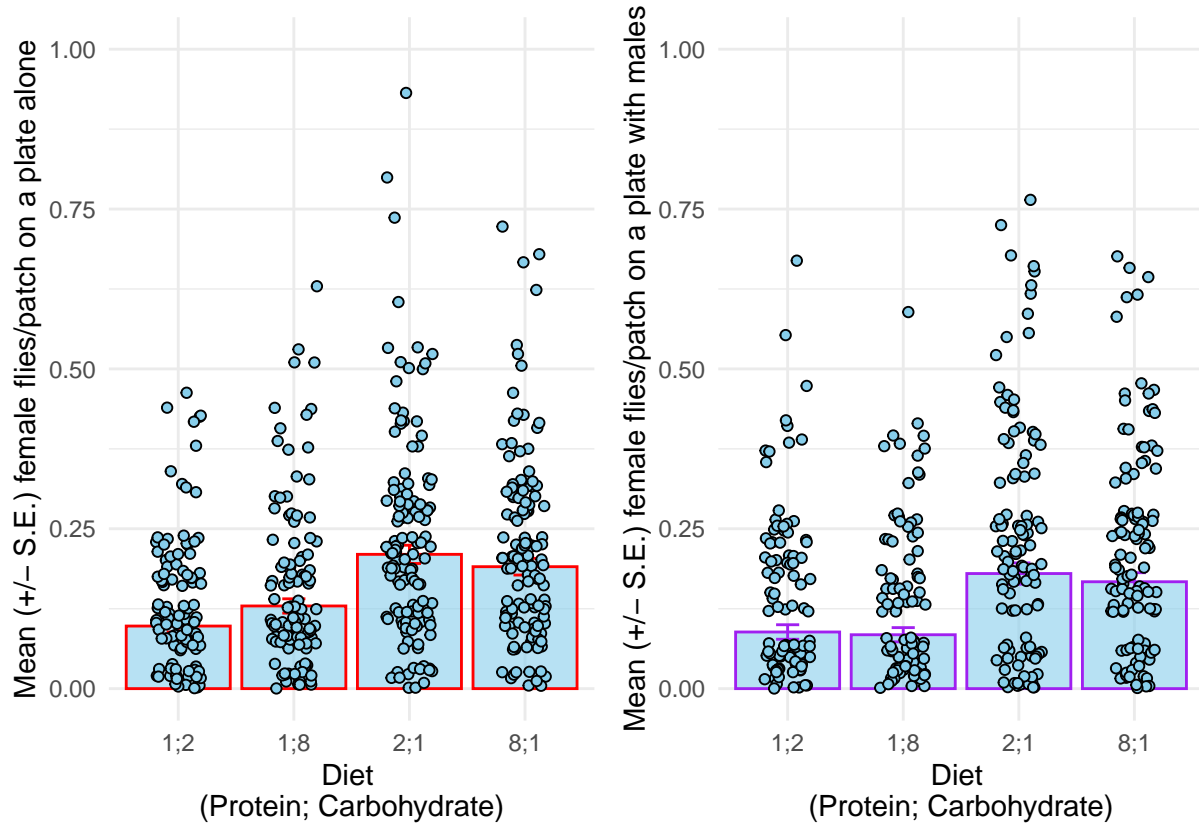


**Figure 3: A boxplot showing the eggs counted from mated females and virgin females.** Boxplot shows the mean average +/- S.E. that emerged from the varying protein: carbohydrate food patches.

### Mated Female behaviour alone vs Mated Female behaviour with Males (Experiment 3)

When looking at female feeding behaviour, and if this changed with females alone in a feeding assay, to females who were in a feeding assay with males. There was a small interaction effect of day with diet and feeding choice, however this was not significant from not having day as an interaction effect, ( $F_{1,0.91} = 0.941$ ,  $P = 0.27$ ), and was therefore dropped from the full model.

A generalized linear model with quasipoisson was used (as there was over-dispersion), which showed there was no significant difference in dietary choice between mated females who were alone on a plate and mated females who were on a plate with males.



### Offspring counts

A general linear model was used to test the significance of whether oviposition preference changed depending on if the mated females were in a plate alone or in a plate with males. There was no significant difference found between the diets chosen depending on the conditions ( $P = 0.44$ ).

