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Effect of diet variability on reproductive traits of Drosophila melanogaster

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All organisms take in food and use the resources they gain from it to allocate towards any number of different body functions. Processes such as somatic maintenance, reproduction, and longevity all vie for the same pool of nutrients. One of the most important functions to any organism is reproduction. In *Drosophila melanogaster,* studies have observed the effect of adult fly diet on life history traits such as fecundity. Little research, however, has been undertaken to understand how developmental diets influence adult reproductive phenotypes. The aim of this project was to determine the independent effects of the larval and adult diets on the fecundity of flies. To carry out this project, we used a population of outbred flies and gave them one of two larval diets: control (C) and dietary restriction (DR) to simulate a high and low nutritional diet. Once flies reached adulthood, they were released to cages and diets either carried over into adulthood or were alternated to observe any effects. Fecundity was measured every other day with a standard egg-laying period of three hours. Our results show that flies raised on restricted diet as larvae laid more eggs total and had more eggs per-female than those given richer diet. In addition, fecundity patterns also demonstrate "boom and bust" cycles of high fecundity per-female in cages followed by lower fecundity per-female. This cycle repeated itself several times in the months of data collection. This pattern could indicate that flies are possibly alternating allocation of resources between body functions or maintenance. Further analysis will seek to discern the origins of this phenomenon. Future plans for this project include examination of similar dietary effects on other life history traits such as fly size.