

ABSTRACT

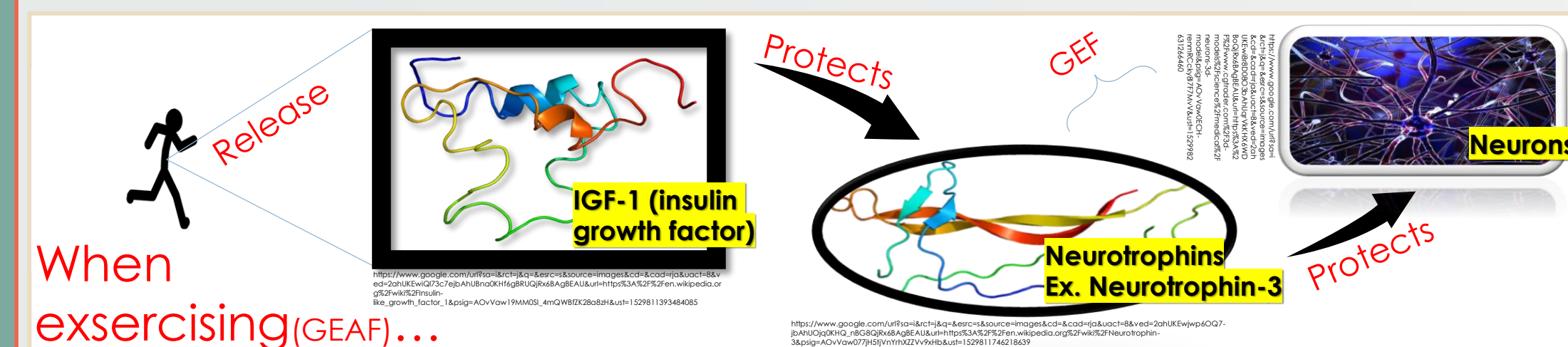


This research aims to measure how much locomotion is affected in *Drosophila melanogaster* considering the alimentation. The experiment was divided in a control group, a group fed with natural sugar and another fed with artificial sugar. The diets were prepared based on standard laboratory food (SLF) by varying the sugar. Several generations were grown. The locomotion was measured through monitors with infrared lasers which calculated the number of times the fly passed through it. They were accustomed to a day and night cycle and were kept under observation for a period of 13 days. As a result, the group that ingested natural sugar had a greater effect on locomotion. In conclusion, to get more energy and carry out tasks with better performance it is ideal to ingest natural sugar.

RESEARCH PROBLEM/ INTRODUCTION

According to the sweetener, artificial or natural, or custom laboratory food, how much is the locomotion of the fly *Drosophila Melanogaster* affected?

Our body needs energy to carry out different processes. The energy we consume is acquired through sleep and food. In our diet, some of the main energy nutrients we consume are sugars, also known as sweeteners. There are 4 types of energy consumption:



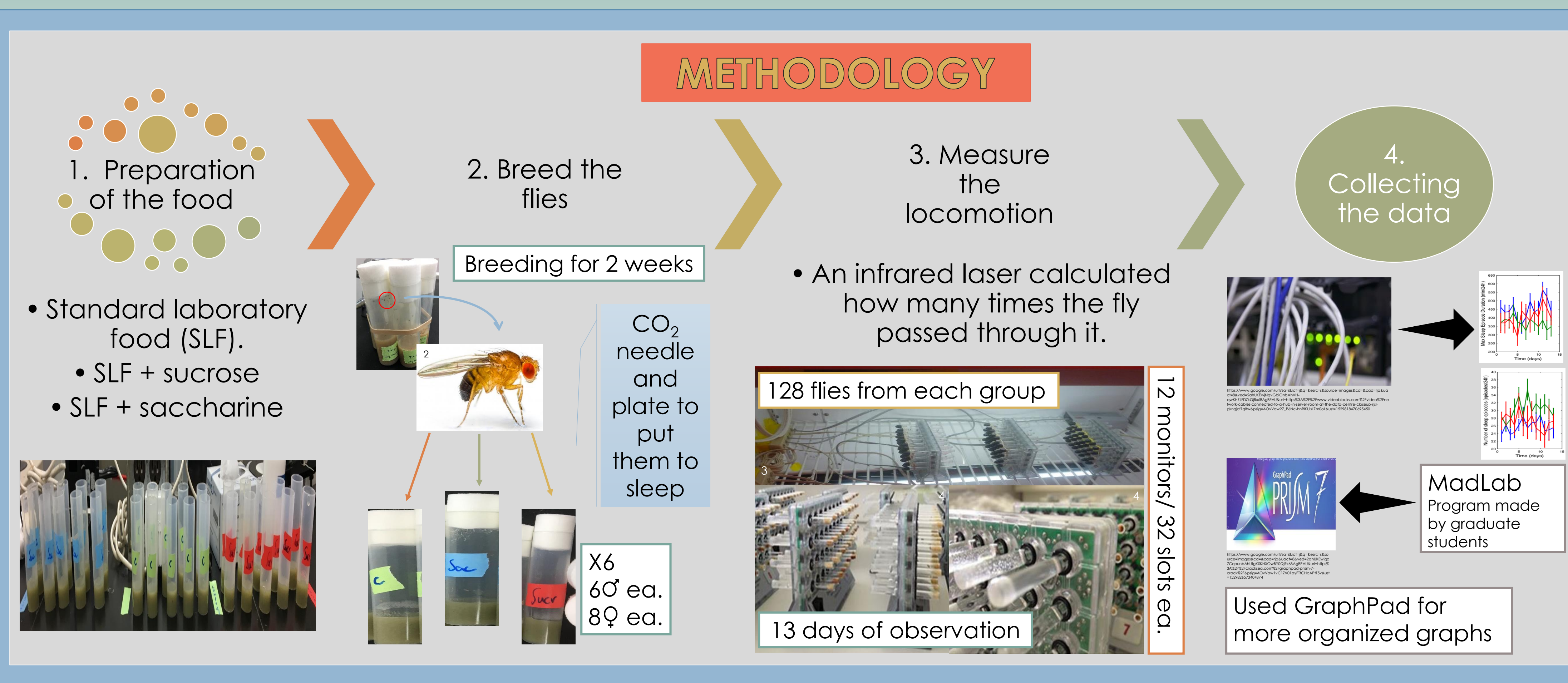
The diagram above proves not only the interrelation of GER and GEAF but also that good physical and active development creates an increase in cognitive processes, therefore a better performance in tasks. Also, these two categories depend on the TID, since they need the body to process the energy of the food to carry out its functions.

ACKNOWLEDGEMENTS

My sincere thanks to everyone who made this project possible, especially my advisors José Agosto and Nelson Cruz, and the University of Puerto Rico, Rio Piedras Campus. I would like to thank my mother, Prof. María Flores and Prof. Keyla Soto for the continuous motivation and inspiration. This project would have not been possible without you!

The Effect of Sweeteners in *Drosophila Melanogaster's* Locomotion.

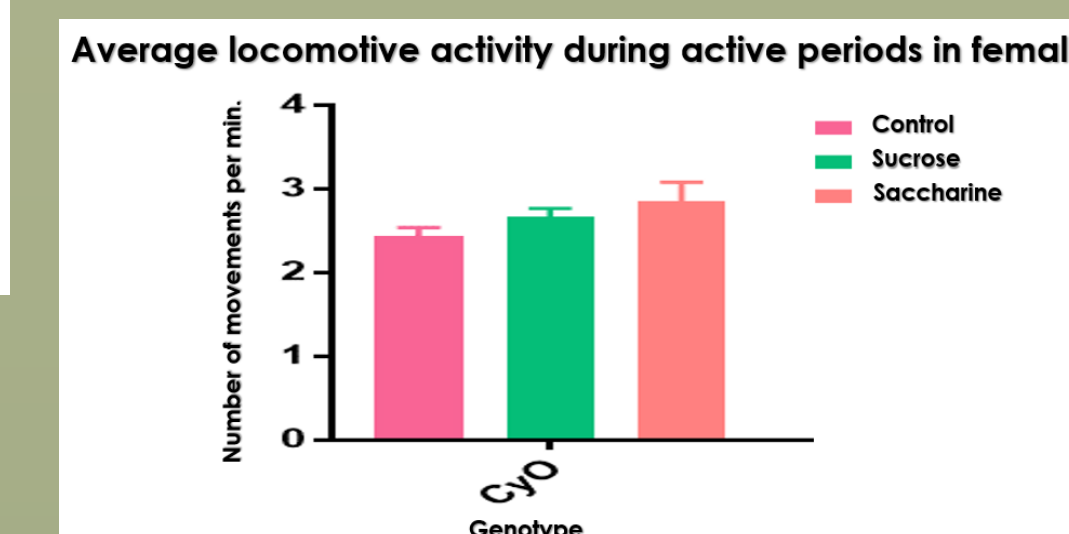
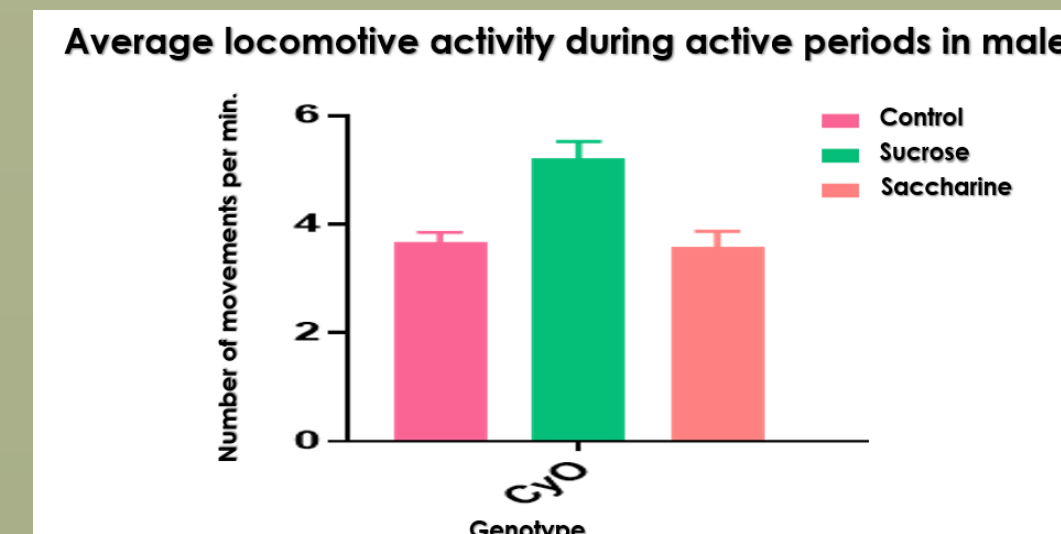
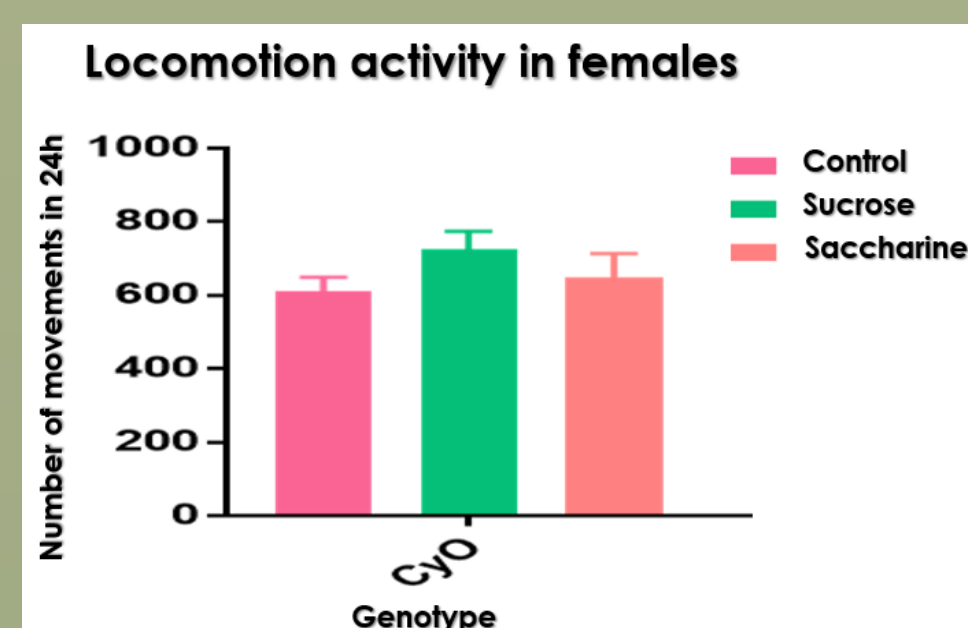
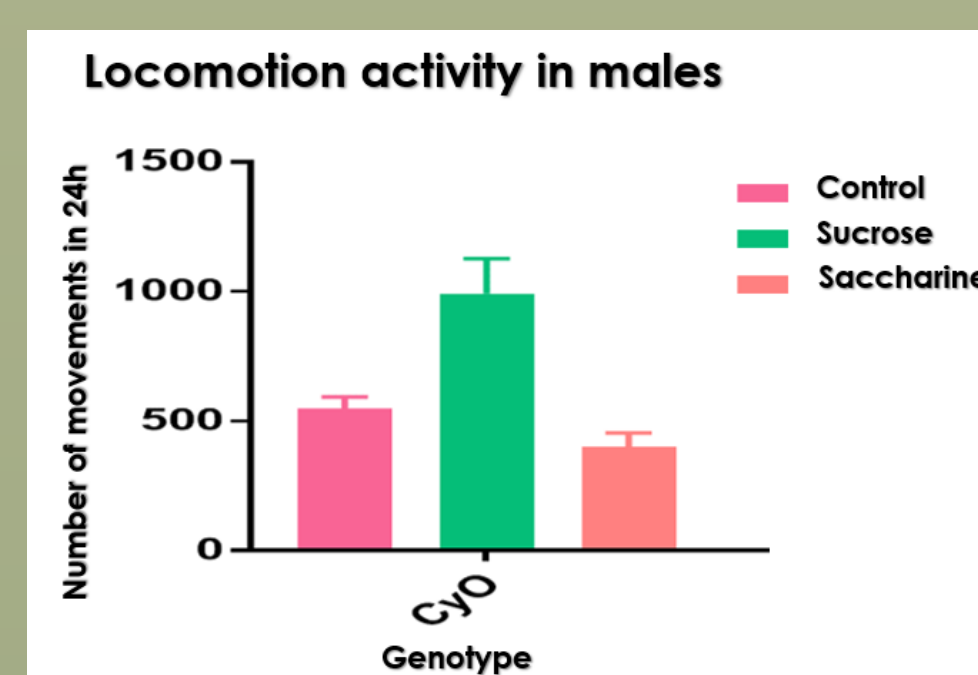
By: Araceli Francisco / University of Puerto Rico, University High School



RESULTS

The purpose of this investigation was to determine which sweetener, artificial or natural, could affect locomotion more.

The analyzed data presents that 2 out of 2 groups that manifested a large volume of movement in 24h were consuming the natural sweetener, sucrose.



The analyzed data presents that 1 out of 2 groups that manifested a large volume of movement per minute were consuming the natural sweetener, **sucrose**. And 1 out of 2 groups was consuming the artificial sweetener, saccharine.

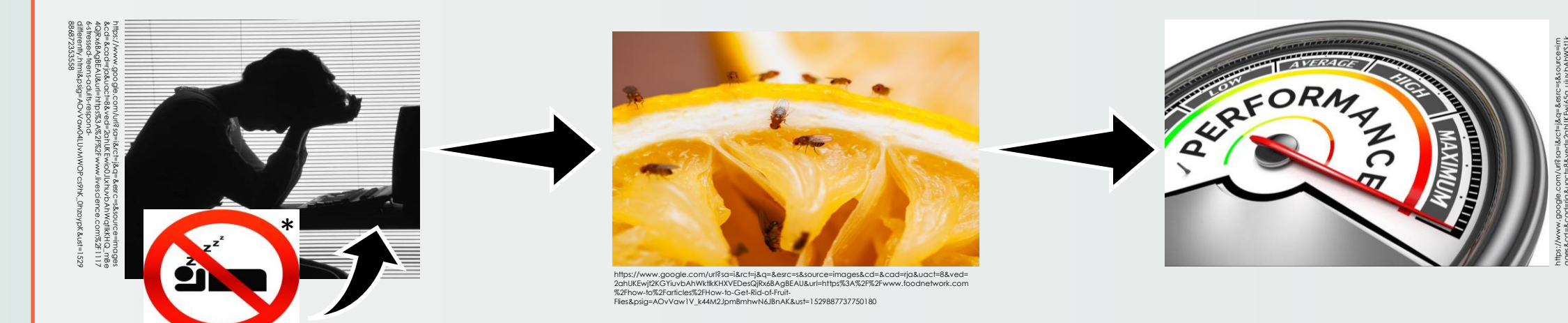
CONCLUSIONS

- The sweetener that most affected locomotion was the natural sweetener, sucrose. Overall, the graphics showed that the flies that consumed the natural sweetener moved more in comparison to the control group or the group consuming saccharine.
- The results of this research demonstrated that the sweeteners we should consume if we lack sleep but need energy to carry out our daily tasks efficiently are natural sweeteners.



WHAT I LEARNED / APLICABILITY

- The complex routines of teenagers and college students demands copious amounts of energy to carry them out efficiently.
- The consumption of sugars as an energy source plays a significant role. Through this research I learned that natural sweeteners are the essential in a balanced diet if we look for a higher performance.



FUTURE RESEARCH

My experience with this investigation has been enriching and more than amazing. I plan to continue investigating in the genetic field. Due to the changes the world is going through, my vision is to improve the human performance on daily tasks to make them more competent and use their full potential.

BIBLIOGRAPHY

- Bago, B. (2013). El consumo energético del cerebro. Retrieved October 15, 2016, de Suite101 (Spain). website: <http://suite101.net/article/el-consumo-del-cerebro-c105564#MAC35u8942w>
- Borgh, A. (2012). Dietas, Calorías, Metabolismo y Sobrepeso. Retrieved October 18, 2016, de Sana Sana: Revista Latina de Salud, website: <http://www.sanasana.com/latinohealthmagazine/dieta-calorias-metabolismo-y-sobrepeso/>
- Consejo Europeo de Información de Comida (EUFIC). (2013). Respuestas a preguntas comunes sobre los azúcares. Retrieved October 18, 2016, de Consejo Europeo de Información de Comida, website: <http://www.eufic.org/articles/es/artid/Common-questions-about-sugars/>
- Cornejo, V. (2016). Evidencias Recientes: Los Educadores y La Energía. Retrieved October 18, 2016, de Nutrición y Vida, website: <http://nutricionyvida.cl/evidencias-recientes-los-educadores-y-la-energia/>
- Equipo Health Keeper. (2016). Nutrición: diferencias entre el azúcar refinado y el natural. Retrieved October 18, 2016, de AXA Health Keepers, website: <https://www.axahealthkeeper.com/blog/nutricion-diferencias-entre-el-azucar-refinado-y-el-natural/>
- Institute for Research in Biomedicine. (2006). Una mosca muy valiosa para la investigación de enfermedades. Retrieved September 4th, 2016, de Institute for Research in Biomedicine, website: <http://www.ifbarcelona.org/es/news/una-mosca-muy-valiosa-para-la-investigacion-de-enfermedades>
- Kelly, R. (2015). Sustitutos para el azúcar | Lo que usted necesita saber. Retrieved October 18, 2016, de FamilyDoctor.org, website: <http://es.familydoctor.org/familydoctor/es/prevention-wellness/food-nutrition/sugar-and-substitutes/sugar-substitutes-what-you-need-to-know.html>
- López et al. (2014). Cansancio (debilidad, agotamiento): Causas, Diagnóstico Tratamiento. Fuentes. Retrieved October 15, 2016, de Onmeda.es, website: <http://www.onmeda.es/sintomas/agotamiento.htm>
- Manning, G. (2008). Introduction to *Drosophila*. Retrieved October 15, 2016, de Ceolias.org, website: <http://ceolias.org/VL/ly/intro.html>
- Muñoz, E. (2016). Gasto Energético, Actividad Física | | Energía y gasto energético Alimentación y Nutrición. Retrieved October 15, 2016, de AlimentacionyNutricion.org, website: <http://www.alimentacionynutricion.org/es/index.php/modo-content-detail?id=51>
- Organización Mundial de la Salud (OMS). (2015). Alimentación Sana. Retrieved October 18, 2016, de Organización Mundial de la Salud, website: <http://www.who.int/mediacentre/factsheets/fs394/es/>
- Pérez, F. (2016). Evidencias Recientes: Los Educadores y La Energía. Retrieved October 18, 2016, de Nutrición y Vida, website: <http://nutricionyvida.cl/evidencias-recientes-los-educadores-y-la-energia/>
- Ramírez, W et al. (2004). El impacto de la actividad física y el deporte sobre la salud, la cognición, la socialización y el rendimiento académico: una revisión teórica. Revista De Estudios Sociales. (18), 67-75. Retrieved October 15, 2016, website: http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0123-885X200400200008
- Real Academia Española. (2014). Educador. Retrieved October 18, 2016, de Real Academia Española, website: <http://dle.rae.es/?id=EO0H0A>
- Salgado, R. (2016). CALORÍA UNIDAD DE ENERGÍA EN LA ALIMENTACIÓN. Retrieved October 18, 2016, de Saber Más: Revista de Divulgación de la Universidad San Nicolás de Hidalgo, website: <http://www.sabermas.umich.mx/archivo/secciones-antiores/la-ciencia-en-pocas-palabras/95-numero-12/188-caloria-unidad-de-energia-en-la-alimentacion.html>
- Torrendell, E. (2016). El azúcar, fuente de energía. Retrieved October 18, 2016, de Talentos Para La Vida, website: <http://www.talentosparalavida.org/nota138.asp>
- Wang, Qiao-Ping et al. "Sucralose promotes Food Intake through NPY and a Neuronal Fasting Response". Cell Metabolism 24.1 (2016): 75-90. Web.