



Drosophila melanogaster as a model system in studying nutrition – the knowledge obtained in work with fly strains maintained for more than two decades on different diets

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Fruit fly *Drosophila melanogaster* has been representing one of the most suitable model systems for studying underlying mechanisms in various biological research for more than a hundred years. This model system has already been used in the studies of mechanisms underlying complex human diseases, such as obesity, Alzheimer's, and Parkinson's.

Five "nutritional" strains



Protein/carbohydrate ratios
(Eur. J. Entomol. 114: 2017)

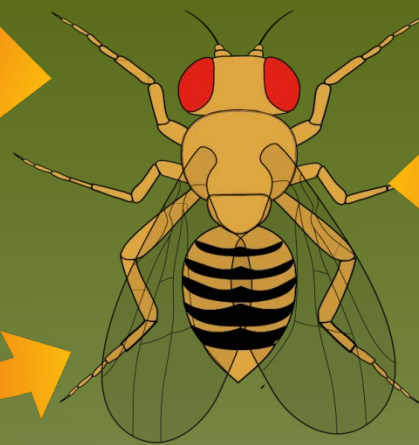
| DIET | C/N ratio |
|----------|-----------|
| Apple | 168.73 |
| Banana | 59.59 |
| Carrot | 34.35 |
| Cornmeal | 32.87 |
| Tomato | 20.95 |

We have performed different experiments with *D. melanogaster* flies collected from natural population, and maintained for 20 years on five diets (Dros. Inf. Serv. 86: 2003).

An experiment performed by adding the bioactive plant components in *Drosophila* diet, such as *Aronia melanocarpa*, indicated the ability of the black chokeberry to protect the cells from mutagens (Türk. entomol. derg. 43: 2019).



Diet can affect individuals on different levels



to the fitness

Eur. J. Entomol. 114: 2017
Türk. entomol. derg. 43: 2019

to behavior, and the life history traits

Arch. Biol. Sci. 61: 2009
Behaviour 150: 2013
J. Anim. Plant Sci. 23: 2013
Behav. Processes 140: 2017
Eur. J. Entomol. 114: 2017
Anim. Behav. 171: 2021

for social and sexual recognition

Folia Biol. 58: 2009
Arch. Biol. Sci. 61: 2009
Behaviour 150: 2013
Chem. Biodiv. 2016
Behav. Processes 140: 2017
Anim. Behav. 171: 2021

on body morphology

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Türk. entomol. derg. 43: 2019
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Conclusions:

During the years of running *in vivo* studies, we have shown that diet can affect *D. melanogaster* individuals on different levels, from morphological up to behavioral.

Studying the effects of nutrition and/or malnutrition in *Drosophila*, paved the way for this model system to be used in the study of the mechanisms underlying complex human diseases.