Food choice in adult *Drosophila melanogaster* (Diptera: Drosophildae) in laboratory conditions

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Introduction

- In nature, fruit flies live, eat, mate, oviposit and complete life cycle on decaying fruits and vegetables.
- Thus, choosing a good quality of food is crucial for *Drosophila melanogaster*.
- Foraging is based on the interaction of various factors (nutritional requirements, satiety, reproductive state, food composition, presence of various chemicals).
- Food preference depends on the interaction between environmental and physiological cues that inform the animal about the degree of satiety.
- Such information are processed by sensory and physiological systems which depend on complex gene networks.

Material and Methods

- Virgin and starving males and females participated in food choice experiments.
- Individual flies and flies in the groups of five individuals could choose between standard (St), tomato (T), banana (B), carrot (C), and apple (A) substrates during 1h observing period.
- Substrates were offered in Petri dishes which were placed in transparent plastic boxes (Figure 1).
- Three-way ANOVA and Tukey's post hoc test were used to determine if differences between time spent on different substrates, as well as differences between sexes, individual flies (I), and social groups (G) in food choice exist.

Results and Discussion

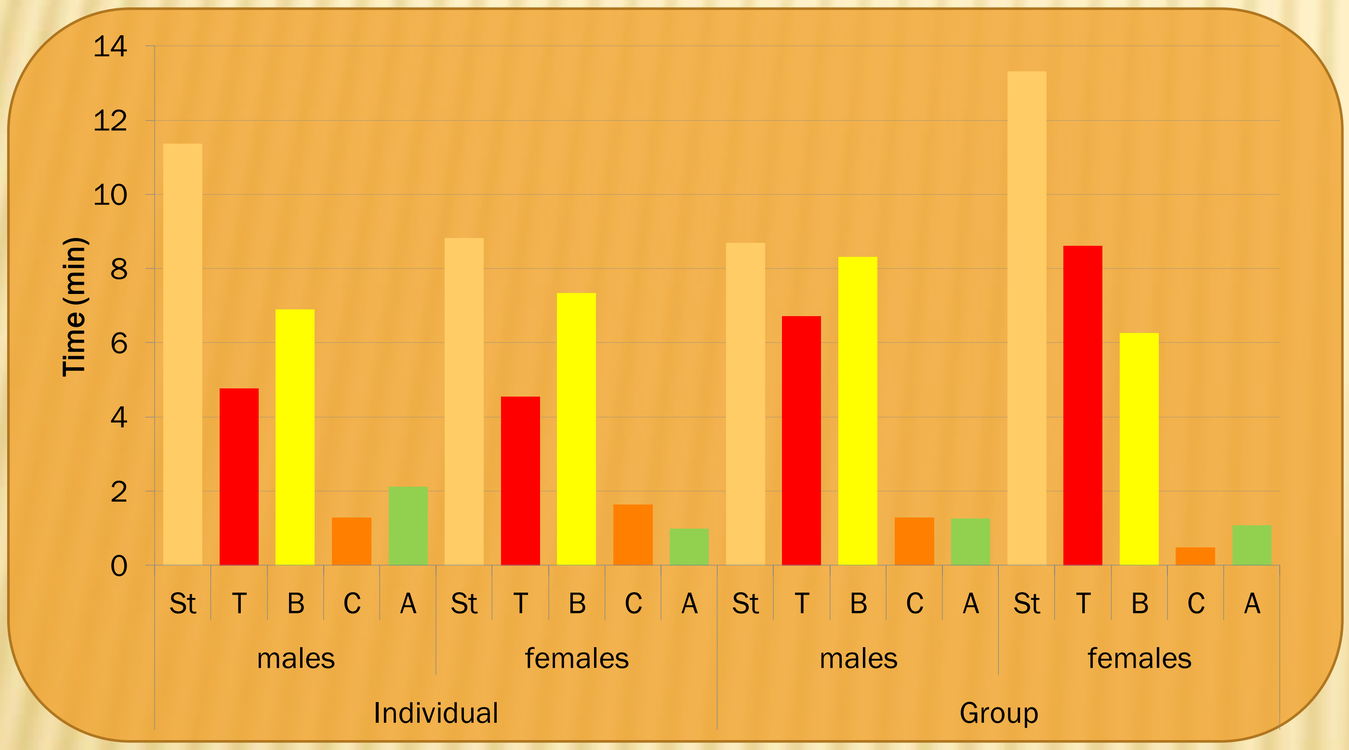

Figure 2. The average time which flies spent feeding on different substrates ili food within 1 hour observing period.

- Results of Three-way ANOVA showed significant differences in food preference.
- Flies spent significantly more time feeding on standard, tomato, and banana substrates compared to carrot and apple substrates.
- Such results could be expected, since substrates differ in the amount of nutrients, carbohydrates, and proteins.
- No difference in food preference between sexes was observed, as well as when flies were individually and group tested.
- Preference toward standard, tomato, and banana substrates may be related with behavioral phenotypes, i. e. higher sexual fitness of flies maintained on these substrates, as observed in our previous research.

The Aim of the Study

- investigating preference for a particular food in *D. melanogaster* reared on standard cornmeal substrate.

Table 1. Three-way ANOVA of *D. melanogaster* food choice.

	SS	df	MS	F	p
Food	8593,9	4	2148,49	23,30	***
I/G	64,3	1	64,27	0,70	
Sex	0,3	1	0,25	0,00	
Food × I/G	281,0	4	70,25	0,76	
Food × sex	96,2	4	24,06	0,26	
I/G × sex	71,9	1	71,94	0,78	
Food × I/G × sex	464,0	4	115,99	1,26	
Error	108815,6	1180	92,22		

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