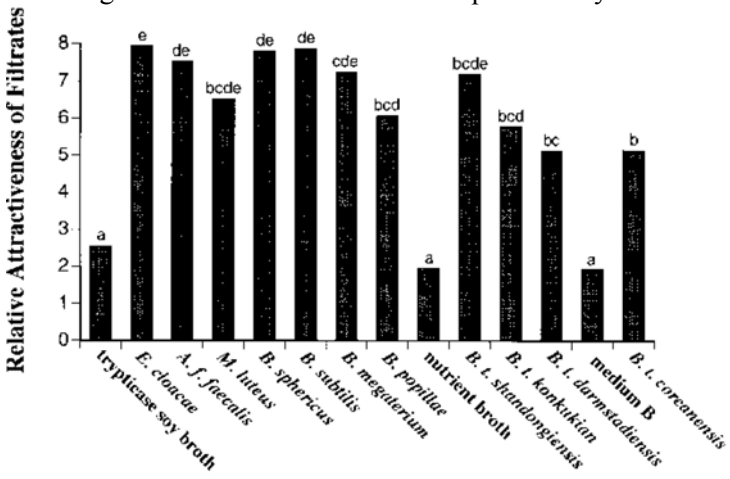
EXST7015 **Daily Design 7**

Carefully read the description of the experiment below. Be prepared to answer the questions that follow the design description as a class quiz.

Fruit flies are major fruit pests with the potential for causing considerable commercial damage. It is important to determine what factors cause the movement of flies among orchards and what attracts them to particular areas. The attractiveness of fermentation products produced by various types of bacteria was examined in this study. This was done in 3 steps, but we will concern ourselves only with the first step; the examination of the attractiveness of fermentation products from each bacterium. Filtrates were prepared from each of 11 bacterial species and 3 culture medium controls resulting in 14 combinations of bacteria and medium. Five fermentation batches were done in random order for each of the 14 filtrates.

In the first step, filtrates of 11 species of bacteria from 4 genera were studied. Based on preliminary evaluations of optimal growing conditions for each bacterial strain, all strains were fermented in either trypticase soy broth, Bacto-nutrient broth or culture medium B. These three growing mediums were also evaluated alone for attractiveness (as a control) in addition to the 11 bacterial fermentation filtrates giving a total of 14 filtrate examinations.



Evaluation was done by a bioassay conducted by putting a filter paper with the filtrate and a distilled water control paper on the top of a cage containing 180 to 200 fruit flies. The number of flies on each paper was counted once each minute for 10 minutes. The difference in the mean number of flies on the filtrate paper minus the mean number on a distilled water control was the value used as the measure of "attractiveness" for each bioassay. This process was done twice for each batch, producing two bioassay values of the attractiveness number for each filtrate. The objective of the study was to compare the attractiveness number of fermentation products from each bacterium and control. Two bioassays were conducted for each of the 5 fermentations of each of the 14 filtrates in random order (14 filtrates × 5 batches × 2 replicate bioassays = 140 values in all).

Answer choices:	**(A) filtrates**	**(B) bioassay**	**(C) fermentation batch**
	(D) cages	**(E) individual flies**	**(F) attractiveness number**

Name _____ **Quiz Number** ____ **Date** _____ / _____ / **2012**

Circle the appropriate letter for each question.

1) What is the experimental unit for this experiment? A B C D E F

2) What is the sampling unit for this experiment? A B C D E F

3) What is the dependent variable for this experiment? A B C D E F

4) What is the treatment variable for this experiment? A B C D E F

5) If the design is RBD, what are the blocks? A B C D E F NA

6) Does it seem more likely that the treatments are fixed or random? (A) fixed (B) random

7) What is the treatment arrangement for this experiment? (A) single factor (B) factorial (C) nested

8) What is the experimental design? (A) CRD (B) RBD (C) LSD (D) Split-plot (E) Repeated Measures

9) The treatment degrees of freedom are _____ .

10) The degrees of freedom for the error used for testing treatments are _____ .