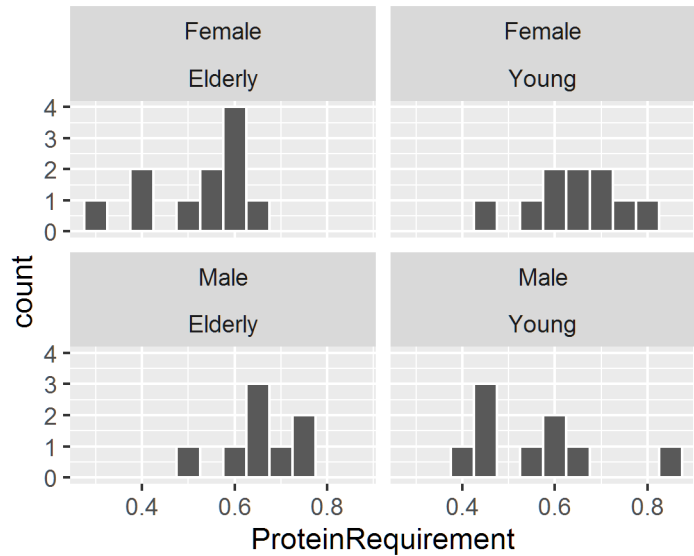


# Lesson 14: Inference for Several Means (ANOVA)

## Homework

### Solutions

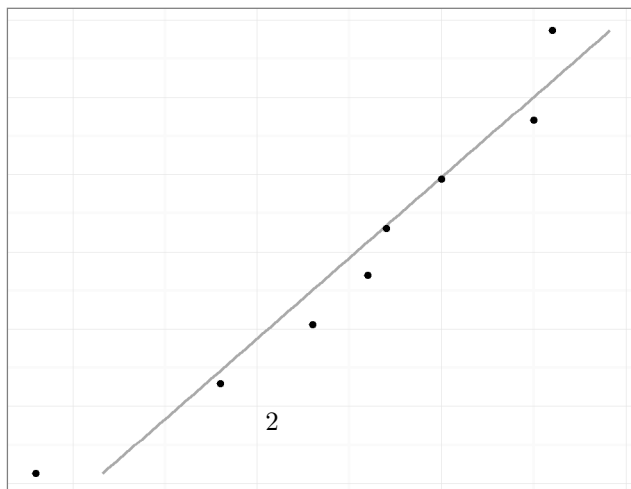
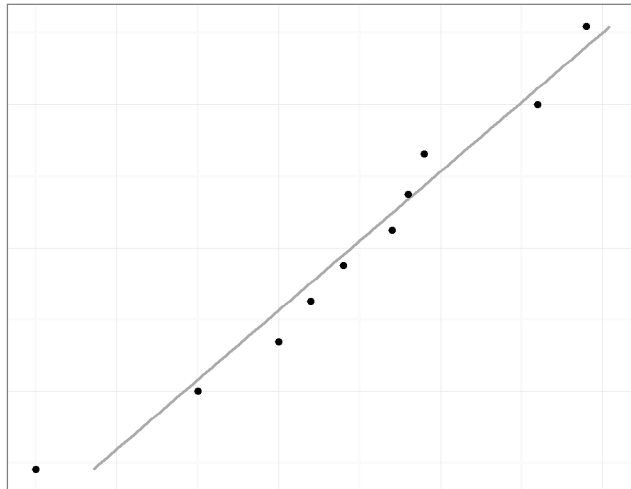
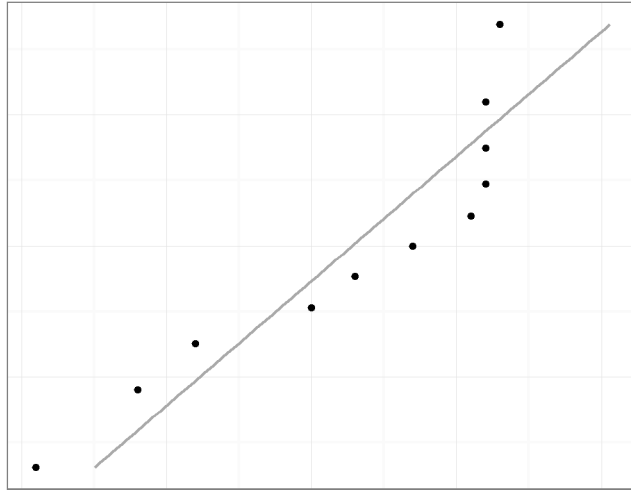
Problem	Part	Solution
1	-	ANOVA is a test for equality of several means. It allows us to compare the means for several groups in one hypothesis test.
2	-	<p>a. An <math>F</math>-distribution is right skewed. A <math>t</math>-distribution is bell-shaped.</p> <p>b. The values of <math>F</math> are never negative. The values of <math>t</math> can be positive or negative.</p> <p>c. The P-value for the ANOVA test is always the area in the right tail in an <math>F</math>-distribution. We will never divide the area in the tail. The P-value for a <math>t</math>-test can be either the area under the right tail, the left tail, or both.</p>



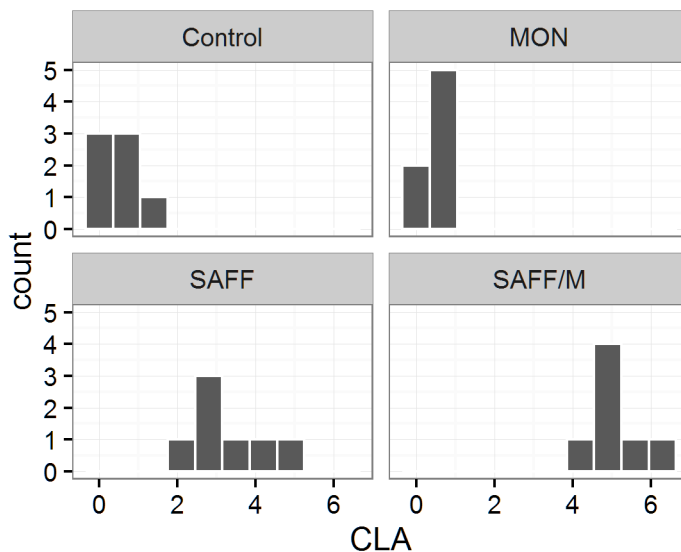
3	-	
4	-	<p><b>Elderly Females:</b> <math>n = 11</math>, mean = 0.528, Std. Dev. = 0.112</p> <p><b>Young Females:</b> <math>n = 10</math>, mean = 0.645, Std. Dev. = 0.099</p> <p><b>Elderly Males:</b> <math>n = 8</math>, mean = 0.654, Std. Dev. = 0.092</p> <p><b>Young Males:</b> <math>n = 9</math>, mean = 0.558, Std. Dev. = 0.145</p>
5	-	ANOVA

Problem	Part	Solution
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6 - Yes, the requirements are satisfied. The requirements that were checked were the following:  
 -The observations are normally distributed within each group. This was checked by creating Q-Q plots for each group. The sample sizes are small and this conclusion is subjective.



Problem	Part	Solution
7	-	$H_0$ : All the means are equal $H_a$ : At least one of the means differs
8	-	F = 2.932 df = 3 and 34
9	-	P-value = 0.047
10	-	P-value = 0.047 < 0.05 = $\alpha$ reject the null hypothesis
11	-	There is sufficient evidence to suggest that there is a difference in the mean protein requirements of the individuals in the four groups.

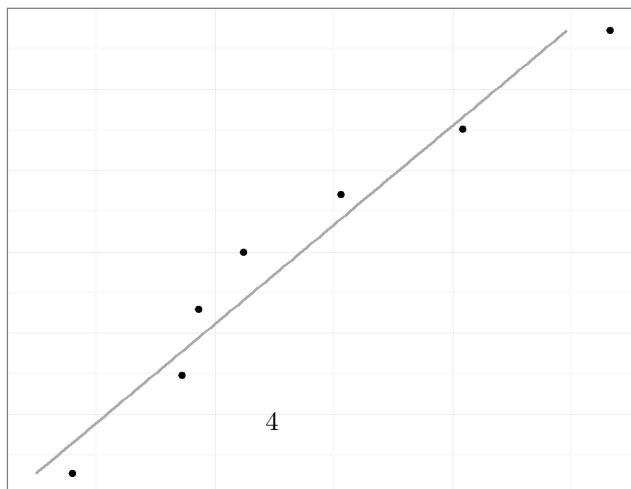
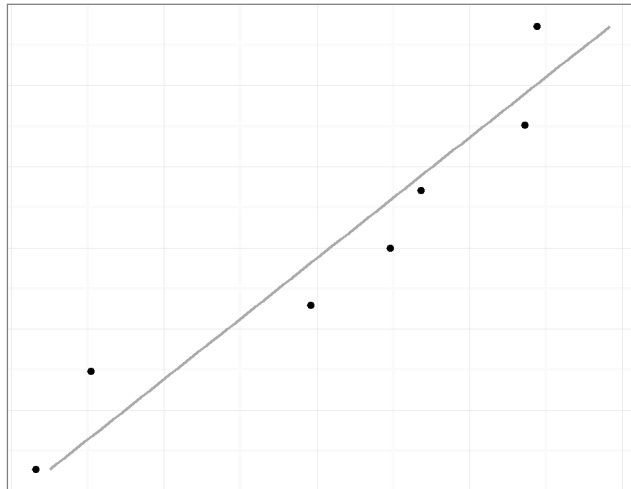
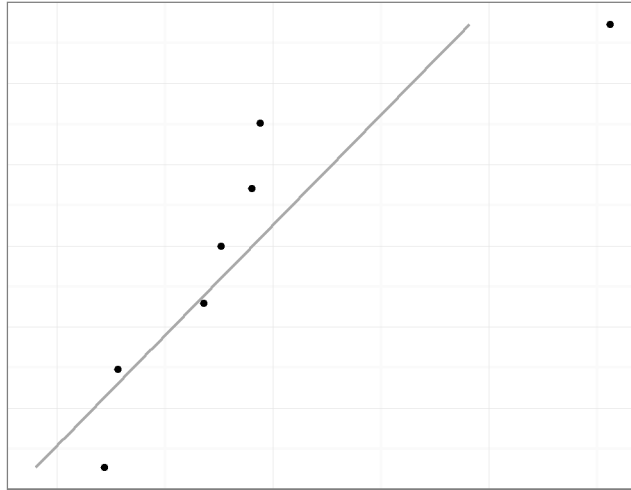


12 -  
13 -

**Control:** n = 7, mean = 0.453, Std. Dev. = 0.391  
**MON:** n = 7, mean = 0.521, Std. Dev. = 0.325  
**SAFF:** n = 7, mean = 3.363, Std. Dev. = 0.774  
**SAFF/MON:** n = 7, mean = 5.151, Std. Dev. = 0.729

Problem	Part	Solution
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14 - No, not all of the requirements are satisfied. The requirements that were checked were the following:  
 -The observations are normally distributed within each group. This was checked by creating Q-Q plots for each group. The sample sizes are small and this conclusion is subjective.



Problem	Part	Solution
15	-	$H_0$ : All the means are equal $H_a$ : At least one of the means differs
16	-	F = 106.217 df = 3 and 24
17	-	P-value = 0
18	-	P-value = 0 < 0.05 = $\alpha$ reject the null hypothesis
19	-	There is sufficient evidence to suggest that there is a difference in the mean CLA content in milk fat for at least one of the four diets.
20	-	It would be worth figuring out which of the diets produced the highest CLA content and then possibly encouraging the use of that diet more than the others.