

Statistics 5301 — Exam 1  
February 6, 1998  
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NAME \_\_\_\_\_

ID# \_\_\_\_\_

This exam is open book, open notes; you may use a calculator. **Do your own work!** Use the back if more space is needed. Each question is worth 10 points.

Please attach your data analysis notes for these data sets to your exam with the paper clips provided in the front of the room.

Questions 1 through 3 relate to the gel strength data. **Provide some justification for your answers!**

1. Describe how you checked assumptions and what you decided. Tell me about nonnormality, nonconstant variance, outliers, and so on. Were there any problems that required fixing?

2. Were all the starch sources equivalent? If not, which ones differed from the others?

3. Describe the effect of starch concentration on gel strength. Is it consistent across the levels of starch source?

Questions 4 through 6 relate to the leucine data. **Provide some justification for your answers!**

4. Describe how you checked assumptions and what you decided. Tell me about nonnormality, nonconstant variance, outliers, and so on. Were there any problems that required fixing?

5. Protein concentration is a quantitative effect. Was its effect linear, or were there nonlinear (quadratic or cubic) effects?

6. Is there evidence of a protein by source interaction? If so, describe this interaction.

7. Suppose that in a certain experimental situation I expect treatment effects of (-2, -1, 3), an error variance of 7, and I will test at the .05 level. For replication of n=6, my power is .81. What does it mean to have power .81?

8. Suppose that we compute the total effects for an unreplicated  $2^4$  factorial design. These effects are given below (in standard order), along with a rankit plot. What would you conclude from this information?

(1)	0.069865	3.8029	-0.068615	4.9692	0.071325
(6)	1.238	0.050728	0.13737	-0.13233	-0.18065
(11)	0.1255	-0.18538	-0.086918	0.12853	-0.24784

