

Bioestatística

Exercício – 18/5/2015

Foram copiados 4 exercícios do livro **Design of Experiment: Statistical Principles of Research Design and Analysis**. 2ª. Edição, 2000

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Este livro é usado como livro texto em diversos cursos de Bioestatística nos EUA.

Durante a aula de hoje até as 17h, cada aluno deverá fazer os programas SAS para verificar se os dados desses experimentos devem ser transformados. Não há necessidade de fazer a análise de variância. Todos os experimentos são inteiramente casualizados. Coloque o programa SAS na folha de prova, assim como a interpretação dos resultados obtidos e se as possíveis transformações foram eficientes.

Favor não fazer perguntas exceto durante os primeiros 5 minutos e para o Profe.

Consulte apenas as suas anotações.

Não esqueça de colocar o seu nome e número USP na folha de prova.

Todos os dados devem ser colocados no Excel e importados no SAS.

1. A temperature-accelerated life test was performed on a type of sheathed tubular heater. Six heaters were tested at each of four temperatures: 1520°F, 1620°F, 1660°F, and 1708°F. The number of hours to failure was recorded for each of the 24 heaters in the study.

<i>Test Temperature</i>	<i>Hours to Failure</i>
1520°	1953, 2135, 2471, 4727, 6134, 6314
1620°	1190, 1286, 1550, 2125, 2557, 2845
1660°	651, 837, 848, 1038, 1361, 1543
1708°	511, 651, 651, 652, 688, 729

Source: W. Nelson (1972), A short life test for comparing a sample with previous accelerated test results. *Technometrics* 14, 175–185.

2. An entomologist counted the number of eggs laid by female moths on successive days in three strains of tobacco budworm (USDA, Field, and Resistant) from each of 15 matings. The data that follow are the number of eggs laid on the third day after the mating for each female in each of the strains.

<i>Strain</i>	<i>Number of Eggs per Moth</i>
USDA	448, 906, 28, 277, 634, 48, 369, 137, 29, 522, 319, 242, 261, 566, 734
Field	211, 276, 415, 787, 18, 118, 1, 151, 0, 253, 61, 0, 275, 0, 153
Resistant	0, 9, 143, 1, 26, 127, 161, 294, 0, 348, 0, 14, 21, 0, 218

Source: Dr. T. Watson and S. Kelly, Department of Entomology, University of Arizona.

3. A plant breeder evaluated the rooting capability of nine bermuda grass clones in a laboratory experiment. Two replications of each clone were grown in an aerated growth solution in a completely randomized design. The number of nodes that rooted on the stolons of each clone follow.

Clone	Replication 1		Replication 2	
	Rooted	Not Rooted	Rooted	Not Rooted
1	15	49	11	53
2	13	51	11	53
3	13	51	6	58
4	6	42	4	60
5	16	48	12	52
6	14	50	9	55
7	8	56	18	46
8	9	55	10	54
9	8	40	16	48

Source: Dr. W. Kneebone, Department of Plant Sciences, University of Arizona.

The plant breeder wants to analyze the proportion of rooted stolons or proportion of rooted nodes.

4. The Ames *Salmonella*/microsome assay is used to investigate the potential of environmental toxic substances for their ability to effect heritable change in genetic material. The compound 4-nitro-ortho-phenylenediamine (4NoP) was tested with strain TA98 *Salmonella*. The number of visible colonies was counted on plates dosed with 4NoP. Five dose levels of 4NoP were used in this study. The colony counts for seven of the plates at each dose level are shown.

<i>Dose ($\mu\text{g}/\text{plate}$)</i>	<i>Colony Counts</i>
0.0	11, 14, 15, 17, 18, 21, 25
0.3	39, 43, 46, 50, 52, 61, 67
1.0	88, 92, 104, 113, 119, 120, 130
3.0	222, 251, 259, 283, 299, 312, 337
10.0	562, 604, 689, 702, 710, 739, 786

Source: B. H. Margolin, B. S. Kim, and K. J. Risko (1989), The Ames *Salmonella*/microsome mutagenicity assay: Issues of inference and validation. *Journal of the American Statistical Association* 84, 651–661.