

Agronomy 526 Homework

Due: 3/8/22

1. An experiment was conducted to determine the effects of treatment rate, forage moisture concentration, and treatment duration on changes in the digestibility of orchardgrass hay treated with anhydrous ammonia. Treatments were NH₃ applied at 12, 24, or 36 g kg⁻¹ dry weight, moisture at 10, 30, or 50 %, and duration of 7, 21, or 63 d. All treatments were in factorial combination and replicated twice. Experimental units were 2-liter containers of hay packed at a specific dry weight density. Because the NH₃ treatments required an hour to apply, it was not possible to treat all the experimental units in one day. Therefore, treatments were applied over a period of 6 days such that one rep of all rate x moisture (3 x 3 = 9) combinations were treated on each day. Reps, therefore, were confounded with days.

Percent dry matter digestibility measured *in vitro* for all treatment combinations were:

		Duration					
		1		2		3	
Moisture	Day:	5	6	2	3	1	4
	1	1	56.85	53.43	55.14	53.98	55.52
1	2	58.18	56.50	62.24	58.31	60.60	58.58
1	3	60.77	61.06	64.33	58.99	64.13	64.68
2	1	53.12	58.49	59.43	59.73	59.61	59.65
2	2	62.24	59.88	63.16	75.97	63.47	64.37
2	3	62.73	64.15	69.20	68.01	68.93	70.58
3	1	54.64	52.97	56.00	56.41	56.80	57.07
3	2	58.87	60.04	63.80	61.64	63.10	62.75
3	3	62.53	64.99	65.69	69.04	68.72	68.38

- a. Show the layout for the experiment.
 - b. Write the linear additive model.
 - c. Determine expected mean squares for the experiment assuming all factors fixed except reps.
 - d. Perform the analysis of variance.
 - e. Interpret the results.
- * turn in your SAS program as well as output