**Sample Write Up of a Two-Way ANOVA**

The purpose of the study is to determine if sex and hormone dosage affect food consumption A 2 (gender) x 3 (hormone dosage) ANOVA was performed on food consumption within a 48-hour period. Prior to conducting the formal analysis of the data, preliminary steps were taken to strengthen the validity of the conclusions. The data were examined for first examined for potential outliers. Using the studentized residuals, no outliers were detected. The statistical inference assumptions associated with factorial ANOVA were also assessed. Inspection of plots and descriptive statistics in each cell suggest that there are no serious departures from the normality assumption. In addition, the independence assumption appears to be met because repeated measures were not used in the study and the treatments were administered on an individual basis. Further, Levene’s test for the equality of variance indicated that population cell variances are equal at the .05 level, *F* (5, 24) = 0.32, *p* > .05.

The results of the ANOVA are shown in Table 1, and the means and standard deviations are shown in Table 2. There is no significant main effect of sex on food consumption, *F* (1, 24) = .40, *p* > .05. There is a significant main effect of hormone dosage, *F* (2, 24) = 4.51, *p* < .05. The partial eta squared of .27 for this main effect indicated this to be a strong effect. Post hoc comparisons using Tukey’s HSD indicated that participants in the large hormone dose condition ate significantly less than participants in both the control condition and the small hormone dose condition (see Table 2). Nonetheless, the effect of hormone dosage depends on sex, as indicated by the significant interaction effect, *F* (2, 24) = 15.29, *p* < .001. The partial eta squared of .56 for the interaction indicated this to be a substantial effect. Follow-up comparisons of means using the Bonferroni approach indicate that food consumption by males is comparable in both the control and high hormone dose conditions, but is significantly higher in the small hormone dosage condition. Food consumption by females, on the other hand, is comparable in both the small and large hormone dose conditions, but is significantly higher in the control condition.

Table 1

*Analysis of Variance for Hormone Dosage by Sex*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Source | Sum of Squares | *df* | Mean Square | *F* | Partial eta Squared | *p* |
| Sex | 1.63 | 1 | 1.63 | 0.40 | .02 | > .05 |
| Hormone Dosage | 36.87 | 2 | 18.43 | 4.51\* | .27 | < .05 |
| Interaction | 124.87 | 2 | 62.43 | 15.29\* | .56 | < .05 |
| Error | 98.00 | 24 | 4.08 | ---- |  |  |

*Note:* *R* Squared = .62 (Adjusted *R* Squared = .55); *\* p* < .05.

Table 2

*Food Consumption for the Hormone Dosage Groups for Males and Females (n = 5 per cell)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sex | Control | Small Dosage | Large Dosage | Combined |
| Females |  |  |  |  |
| M | 7.00ab | 2.20a | 1.40b | 3.53 |
| SD | 2.12 | 1.64 | 1.14 | 3.00 |
| Males |  |  |  |  |
| M | 2.00a | 7.00ab | 3.00b | 4.00 |
| SD | 2.24 | 2.55 | 2.12 | 3.09 |
| Combined |  |  |  |  |
| M | 4.50a | 4.60b | 2.20ab | 3.77 |
| SD | 3.34 | 3.24 | 1.81 | 3.00 |

*Note.* Means in the same row sharing the same letter superscript differ at *p* < .05.