

Exam II – Take Home

First Year College Student Nutrition Study

The data for your project comes from a nutritional study conducted at Youngstown State University during 1997-1998. Forty four subjects completed the study in which body measurements and nutrition data was collected at the beginning of the Fall semester and then again in the Spring semester. This data set contains information from measurements taken during the Spring semester. A portion of that data appears in the data file nutri2b.xls which is available at <http://csuohio.edu/holcombj/mth147/exam2.htm> Note that some variables may not be used for this assignment, but may be used for the take-home Final Examination.

Variable guide:

studynum	An identifying number to keep track of subjects
gender	0=male, 1=female
residenc	0=on-campus, 1=off-campus
athlete	0=non-athlete, 1=athlete
totcals	Total calories in the Spring semester
cal3000s	0=no, 1=yes for over 3000 calories in Spring
cas	Calcium (mg) in Spring semester
ca1000s	0=no, 1=yes for over 1000 mg of calcium in Spring

The main purpose of the study was to examine weight and nutrition characteristics in the college first year population. One the variables examined was the total calories consumed by subjects. The variable **totcals** gives the total number of calories in the Spring Semester. The variable **cal3000s** indicates whether the subject ingested more than 3000 calories. The USDA generally recommends calorie consumption of 2000 per day.

Another important variable is calcium. The USDA recommends that an adult obtain 1000 mg or more of calcium per day. Diet records were kept and the amount of calcium ingested is recorded. The variable **ca1000s** indicates whether a student ingested sufficient calcium.

Begin your report by providing a summary of the discrete variables (raw numbers and percents), and a table summary of the continuous variables (5 number summary and histogram). Determine the shape of the histograms and comment on whether the mean or median is a better measure of center.

Create a 2x2 contingency table of **residenc** vs. **cal3000s**. Let A be the event of being an on-campus resident and B be the event of ingesting more than 3000 calories. Determine the following:

1. $P(A)$
2. $P(B)$
3. $P(A \cap B)$
4. $P(A \cup B)$
5. $P(B|A)$
6. $P(B|A')$

Now we will consider being an off-campus resident (A') as a risk factor of ingesting more than 3000 calories as the disease (B). Calculate the relative risk and interpret its meaning.

Create a 2x2 contingency table of **athlete** vs. **cal3000f**. Let the risk factor be being a non-athlete and the disease be ingesting more than 3000 calories. Determine the relative risk and interpret its meaning.

Create a 2x2 contingency table of **athlete** vs. **ca1000s**. Let A be the event of being an athlete and B be the event of ingesting more than 1000 mg of calcium. Determine the following:

1. $P(B)$
2. $P(A \cap B)$
3. $P(A \cup B)$
4. $P(B|A)$
5. $P(B|A')$

Write a summary paragraph of at least five sentences that reports any of the findings that you find interesting or surprising. Also propose two additional variables that could have been measured with this study and describe how the measurement would have taken place.

Answers for Test

Sum of count	gender		
	0	1	Grand Total
Total	18	26	44

Sum of count	athlete		
	0	1	Grand Total
Total	31	13	44

Sum of count	residenc		
	0	1	Grand Total
Total	32	12	44

Sum of count	Ca13000s		
	0	1	Grand Total
Total	29	15	44

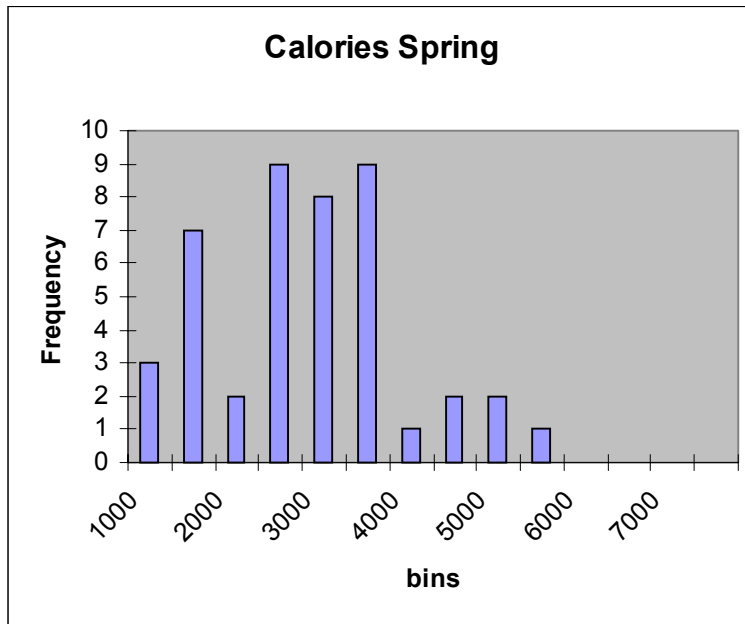
Sum of count	Ca1000s		
	0	1	Grand Total
Total	20	24	44

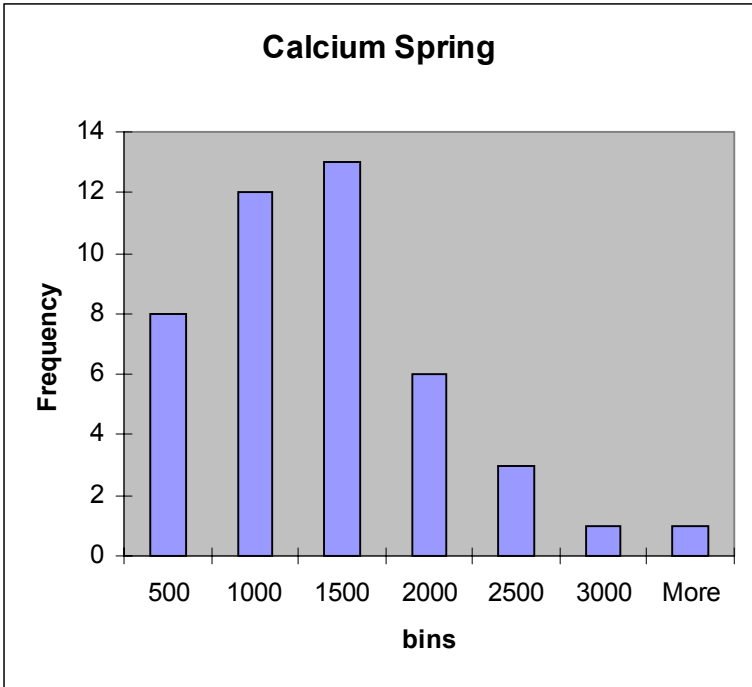
totcals

Mean	2567.664
Standard Error	166.0405
Median	2563.95
Mode	#N/A
Standard Deviation	1101.388
Sample Variance	1213056
Kurtosis	-0.21981
Skewness	0.355074
Range	4689.9
Minimum	584.5
Maximum	5274.4
Sum	112977.2
Count	44

cas

Mean	1153.366
Standard Error	100.9799
Median	1047.45
Mode	#N/A
Standard Deviation	669.8249
Sample Variance	448665.4
Kurtosis	1.087097
Skewness	1.068254
Range	2889.7
Minimum	142.5
Maximum	3032.2
Sum	50748.1
Count	44





Sum of count		cal3000f		
residenc	0	1	Grand Total	
0	22	10		32
1	7	5		12
Grand Total	29	15		44

Sum of count		cal3000f		
athlete	0	1	Grand Total	
0	19	12		31
1	10	3		13
Grand Total	29	15		44

Sum of count		ca1000s		
athlete	0	1	Grand Total	
0	15	16		31
1	5	8		13
Grand Total	20	24		44