

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 Fall semester. A portion of that data appears in the data file nutri2a.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
totcalf	Total calories in the Fall semester
Cal3000f	0=no, 1=yes for over 3000 calories in Fall
caf	Calcium (mg) in Fall semester
ca1000f	0=no, 1=yes for over 1000 mg of calcium in Fall

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 **totcalf** gives the total number of calories. The variable **cal3000f** 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 **ca1000f** 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 **residence** vs. **cal3000f**. Let A be the event of being an on-campus resident and B be the event of ingesting more than 2000 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 on-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. **ca1000f**. 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	Ca13000f		
	0	1	Grand Total
Total	27	17	44

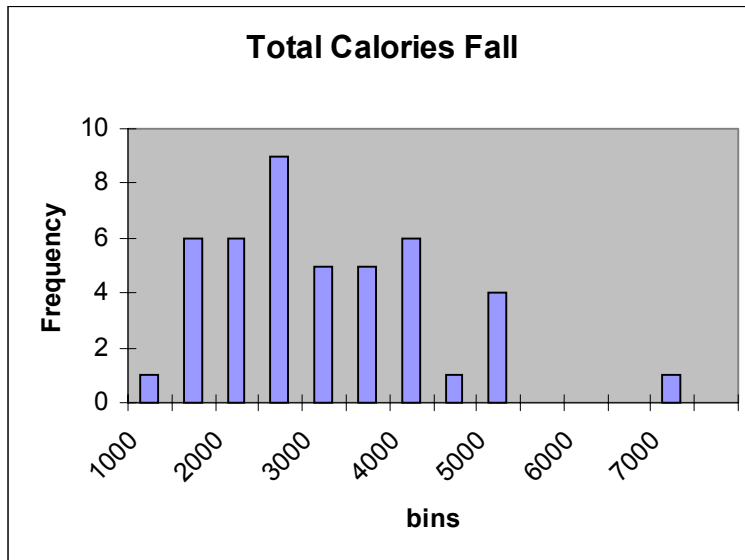
Sum of count	Ca1000f		
	0	1	Grand Total
Total	21	23	44

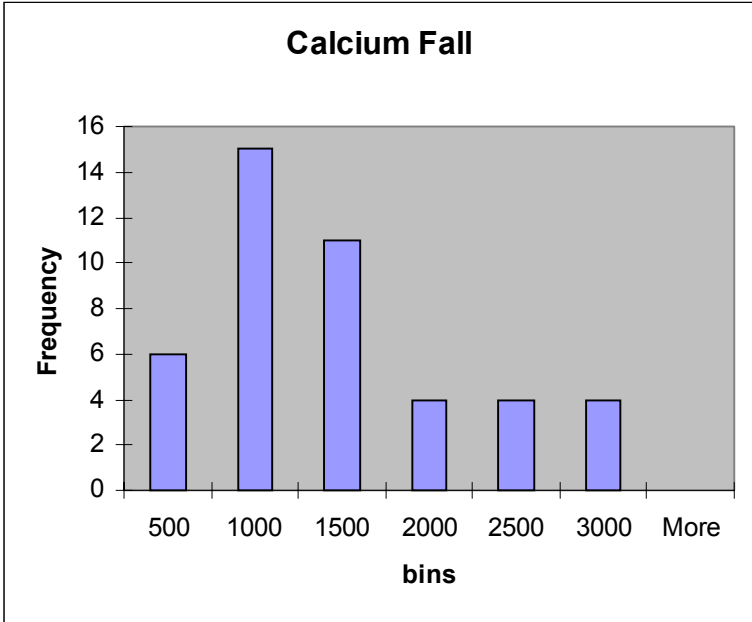
totcalf

Mean	2733.032
Standard Error	184.3276
Median	2519.8
Mode	#N/A
Standard Deviation	1222.691
Sample Variance	1494973
Kurtosis	1.043818
Skewness	0.8123
Range	5793.9
Minimum	901.7
Maximum	6695.6
Sum	120253.4
Count	44

caf

Mean	1261.777
Standard Error	111.1209
Median	1029.7
Mode	#N/A
Standard Deviation	737.0925
Sample Variance	543305.4
Kurtosis	-0.42951
Skewness	0.737565
Range	2649.7
Minimum	234.6
Maximum	2884.3
Sum	55518.2
Count	44





Sum of count		cal3000f	
residenc	0	1	Grand Total
0	18	14	32
1	9	3	12
Grand Total	27	17	44

Sum of count		cal3000f	
athlete	0	1	Grand Total
0	20	11	31
1	7	6	13
Grand Total	27	17	44

Sum of count		ca1000f	
athlete	0	1	Grand Total
0	15	16	31
1	6	7	13
Grand Total	21	23	44