

Name: _____

Practice Exam 1

Statistics 0800

Fall 2013

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This is a closed book exam worth 150 points. You are allowed to bring a two-sided sheet of notes.

1. (10 pts.) Read the article **The return of the grapefruit diet?** and answer the following questions:
 - (a) Which one of the following would be the **best** way to improve the study?
 - i. Look at people of normal weight, too, not just obese people.
 - ii. Give the control group another fruit or fruit drink in similar amounts, in case the weight loss has occurred because consuming fruit or juice before meals makes people fuller.
 - iii. Make sure the researchers are blind, so that their subjective opinion does not enter in when making weight assessments.
 - (b) How many groups were being compared? _____

2. (35 pts.) Read the article **Chocolate medicinally useful?** and answer the following questions:

- (a) What type of study was involved?
 - (i) sample survey/observational study (ii) experiment (iii) census
- (b) What is the explanatory variable?
 - (i) eating dark chocolate (ii) flexibility of blood vessels (iii) weight gain
 - (iv) heart attacks
- (c) The explanatory variable was treated as
 - (i) quantitative (ii) categorical (iii) it is not clear from the article
- (d) What is the response variable?
 - (i) eating dark chocolate (ii) flexibility of blood vessels (iii) weight gain
 - (iv) heart attacks
- (e) The response variable is treated as
 - (i) quantitative (ii) categorical (iii) it is not clear from the article
- (f) Which two of the following components are **not** specified in the article?
 - (i) source of research (ii) individuals studied (iii) use of a control group
 - (iv) magnitude of effects
- (g) The study was apparently
 - i. not blind at all
 - ii. single blind: subjects did not know if they were given dark chocolate
 - iii. single blind: researchers did not know if subjects were given dark chocolate
 - iv. double-blind

3. (60 pts.) Read the article **Family Time** and answer the following questions:
- (a) Which one of the following best describes the intended population of interest?
 - (i) adolescents
 - (ii) adolescents who eat meals with their families
 - (iii) adolescents in Minnesota
 - (iv) adolescents in Minnesota who eat meals with their families
 - (b) Identify the role and type of each of the following variables:
 - i. eating meals with family **explanatory** or **response** (circle one)
 - ii. eating meals with family **quantitative** or **categorical** [see 4th paragraph] (circle one)
 - iii. adolescent's health **explanatory** or **response** (circle one)
 - iv. adolescent's health **quantitative** or **categorical** [see 4th paragraph] (circle one)
 - v. smoking cigarettes **explanatory** or **response** (circle one)
 - vi. smoking cigarettes **quantitative** or **categorical** (circle one)
 - vii. gender **explanatory** or **response** (circle one)
 - viii. gender **quantitative** or **categorical** (circle one)
 - (c) Which one of the following should be considered most carefully before drawing conclusions from the study?
 - i. Was the sample really large enough?
 - ii. Was the study double-blind?
 - iii. Are there confounding variables?
 - iv. Could the adolescents possibly be exhibiting the placebo effect?
 - (d) Source of funding was
 - i. University of Minnesota
 - ii. Archives of Pediatric and Adolescent Medicine
 - iii. not mentioned but probably not important
 - iv. not mentioned and a likely source of bias
 - (e) Magnitude of effects was
 - (i) more pronounced for girls
 - (ii) more pronounced for boys
 - (iii) not mentioned

4. (10 pts.) Read **Sorority Pounds** and answer the following:
- (a) The explanatory variable is categorical, whether or not a college woman joins a sorority. Which one of these best describes the response?
 - i. weight (quantitative)
 - ii. whether or not weight was gained (categorical)
 - iii. amount of weight gain (quantitative)
 - iv. whether or not the women were overweight before pledging (categorical)
 - (b) The magnitude of the difference between groups compared was
 - (i) 5 lbs. (ii) 1.5 lbs. (iii) 3.5 lbs. (iv) unknown
5. (30 pts.) The article **Prevent Migraines Naturally** states that “Patients who took 100 milligrams of the supplement Coenzyme Q10 (CoQ10) three times a day had up to 50 percent fewer migraines and less nausea after three months, finds a new Swiss study. Their headaches were also shorter and not as severe. Researchers believe that CoQ10 prevents migraines by boosting energy production in cells.” Identify each of the following as well as you can. When possible, quote the article directly.
- (a) source _____
 - (b) individuals _____
 - (c) explanatory variable _____
 - (d) response variable _____
 - (e) What comparison is being made?
 - i. patients who do or do not take CoQ10
 - ii. patients before and after taking CoQ10
 - (f) Which one of the following additional pieces of information would be **most** helpful in deciding whether CoQ10 is really beneficial for migraine sufferers?
 - i. Was there a control group taking a placebo?
 - ii. Were the patients randomly chosen to participate in the study?
 - iii. How did researchers define a migraine?
 - iv. Were different dosages of CoQ10 tested?
6. (5 pts.) For which study is it probably easiest for subjects to be blind?
- (a) a study to see if eating grapefruit helps lose weight
 - (b) a study to see if joining a sorority makes you gain weight
 - (c) a study to see if CoQ10 reduces migraines

The Return of the Grapefruit Diet? Weight-loss diets that involve eating grapefruit or drinking grapefruit juice have been around for decades. But now there's clinical evidence that such a diet might work, at least for very overweight people. A 12-week study of 100 obese patients conducted at the Scripps Clinic in San Diego and sponsored by the Florida Department of Citrus found that people who ate half a grapefruit before each meal lost an average of 3.6 pounds and those who drank 8 ounces of grapefruit juice before meals lost an average of 3.3 pounds (though some lost more than 10 pounds). People who did neither lost an average of one half pound. None of the study subjects altered his or her diet in any other way. Researchers speculate that some chemical property of grapefruit lowers insulin levels, reducing fat storage, says Ken Fujioka, M.D., medical director of the clinic's Nutrition and Metabolic Center. It's important to note that grapefruit juice can interact with many drugs, including some antihistamines, anti-depressants and anti-anxiety medications.

Chocolate medicinally useful? Scientists have found that eating dark chocolate appears to improve the function of important cells lining the wall of blood vessels for at least three hours.

The study, involving 17 healthy young volunteers who agreed to eat a bar of dark chocolate and then get an ultrasound, found that eating dark chocolate seemed to make the blood vessels more flexible, which helps prevent the hardening of the arteries that leads to heart attacks.

But experts cautioned that the weight gain from eating a lot of chocolate probably would cancel out the apparent benefit.

Dark chocolate is rich in flavonoids, which act as natural antioxidants—chemicals that combat the damage oxygen does to the body. However, that does not mean that chocolate binges will ward off a heart attack, experts warn.

The latest study, conducted by cardiologists at Athens Medical School in Greece, set out to test whether chocolate affected the functioning of the so-called endothelial cells in the walls of the blood vessels, which are believed to be affected by oxygen damage.

The scientists presented their work yesterday at Europe's most important cardiology conference.

Prevent Migraines Naturally Patients who took 100 milligrams of the supplement Coenzyme Q10 (CoQ10) three times a day had up to 50 percent fewer migraines and less nausea after three months, finds a new Swiss study. Their headaches were also shorter and not as severe. Researchers believe that CoQ10 prevents migraines by boosting energy production in cells.

Family time: the unseen benefits of sharing a meal at home Remember when families actually sat down to dinner every night? Unfortunately, the family meal in many homes has been replaced with soccer practice, music rehearsal and other activities for youth.

Most parents believe the activities are good for their kids, and they are. But something of value is lost when the family dinner is a rare event. That's not just a value judgment, because there is now statistical evidence that children who dine with their families tend to enjoy better health than those who grab something on the fly or eat fast food regularly.

According to a study by the University of Minnesota, interviews with nearly 5,000 adolescents showed that the greatest benefit to sharing a meal is that children are healthier, even in families where the relationships are strained.

The findings were published in a recent edition of *Archives of Pediatric and Adolescent Medicine*, which reports that the more meals young people eat with their families, the better their overall well-being. Surveyors couldn't explain all of their findings: Girls seemed to derive more positive effects from the family meal than boys.

There's also a link between sharing a meal and youths who don't smoke. About half the girls who had not had a meal with their families in the previous week smoked cigarettes, while only about 17 percent of the girls who dined with their families every day in that period smoked. The results were similar, if a bit less dramatic, for boys, where the rates were 36 percent and 22 percent, respectively.

Not surprisingly, the study also found that higher-income and more-educated families are more likely to dine together than poorer, less educated families. Family is definitely still very important, even in a fast-moving world, where school kids also use planners to keep track of their lives.

To some, the idea of parent(s) and children gathered at the dinner table seems quaint, maybe even old-fashioned. But even the numbers are saying it should be an important part of every teenager's day.

Sorority Pounds College women who join sororities are no different in their body-weight or eating issues than women who don't join them—at first. That changes over time, say researchers from the universities of Pennsylvania and Connecticut. They tracked 102 women at a midwestern university during their first three years, surveying them annually about their weight, mood, body image, self-esteem, and eating habits. All the women averaged about the same body-mass index before the sorority pledge period, but by junior year the sorority members had put on nearly five pounds, while those who never joined had gained about a pound and a half. The sorority sisters also reported more preoccupation with weight and dieting than the nonjoiners did. These findings may relate to a “higher need for fitting in” among sorority members, says Kelly C. Allison, a psychologist at the University of Pennsylvania School of Medicine. The study also found increased alcohol consumption among the sorority set, which may explain their weight gain.

