

DBQ #2: Nutritional Biochemistry

(Due _____)

Max Score: 32 pts (2 pts per question)

Category weighting: Test/Project/Paper (50%)

Independent research may be required. Read and annotate the articles before attempting to answer questions. All questions must be answered with complete sentences and indicate high-level critical thinking. All submissions must be turned in on TurnItIn.com as a DOC or PDF file, with numbered bullets (-10 pts for noncompliance) and doubled spaced (-10 pts for noncompliance).

Article A

- 1) What is BMI and how is it different from BMR?
- 2) The title of the Article A says “Sugar and carbs...”. Explain how this is redundant from a biochemical standpoint.
- 3) “You can’t outrun a bad diet” is in the article. You may have heard the phrase “Six-pack abs are made in the kitchen, not in the gym.” Discuss and explain what you think these related phrases mean.
- 4) Article A seems to suggest that sugar calories cause obesity and hunger in a way that fat calories do not. Find and provide the sentence that appears to justify that statement.

Article B

- 5) Using a *minimum* of one paragraph (5 sentences and a topic sentence), compare and contrast Article A with Article B. Be sure to note differences and similarities in content (message) and style.

You should note that the “calories” mentioned in this article are kilocalories (or Calories with a capital “C”). The article does not distinguish this because it is written for a non-scientific, general public audience. The public is familiar with traditional food calories (kilocalories), so it is written as “calories”. The following mathematical conversions are important:

1 lb of fat = 3500 Cal (kcal or food calories).

1 lb of fat = 452.6 g of fat

1 g of fat = 9 Cal

1 g of carbohydrate = 4 Cal

1 g of protein = 4 Cal

Knowing this, do the math as the bottom of the first page of the Article B states:

- 6) In 1 week, many *grams* of fat will a person lose by eliminating 1000 food calories from their daily intake?
- 7) In the fourth paragraph of Article B, it says that participants in the study were restricted to eating a maximum of 20 g of carbohydrates per day. How many food calories (kilocalories or Calories) is 20 g of carbs?
- 8) What biochemical macromolecule do the researchers think causes an increase in appetite?
- 9) What is the name of the specific diet (popular in the 90s and early 2000s) that promises weight loss by carb restriction?
- 10) List five (5) foods that someone on a low-carb diet should not consume. (These should be high-carb foods. They are not in the article. Think and do some research, and use your own experiences and knowledge of food and labels.)

Article C

- 11) In the fourth paragraph (Starts with “*The 10 low-carb...*”), what is the independent variable?
- 12) After reading the entire article, determine what the dependent variable was in their study, and explain how you know.
- 13) Applied mathematics: An athlete in the study burned 1.5 g of carbs per minute during a long race, which took them 4 hours to complete. Be sure to answer *both* questions in order to earn credit:
How many grams of carbs does the runner burn during their race? How many calories does this represent?
- 14) Typically, the body’s main energy source is carbohydrates. Explain how a ketogenic diet is different.
- 15) Be sure to answer *all* parts of the question: What is glycogen, where is it found in the body, and what does it do for us as humans? (Minimum of 3 sentences)
- 16) Between the two parts of metabolism (catabolism and anabolism), which one is the process that carbohydrate and fat combustion fall under? Explain/Justify your answer.