

HW08 - Chemistry of Nutrition & Booze

Question 1

6 pts

Anemia is a common health condition that can result from insufficient dietary iron intake. Iron is one of the rare micronutrients where different daily intakes are recommended for men and women. It has been determined that women should consume 18mg per day, while men only need to consume 8mg per day. Using the provided table of iron info for several foods, evaluate two hypothetical diets. Would these diets provide sufficient iron? 3.5 oz = 100 g

Food	mg iron per 100 g food
Ground beef	2.5
Cooked lentils	3.3
Raw spinach	2.7
Pumpkin seeds	9
Dark chocolate	4.2
Tofu	1.7
Eggs	1.9

Diet A Food Sources	Diet A Daily Quantities
Ground beef	5 oz
Raw spinach	2 oz
Pumpkin seeds	1 oz
Eggs	3 oz

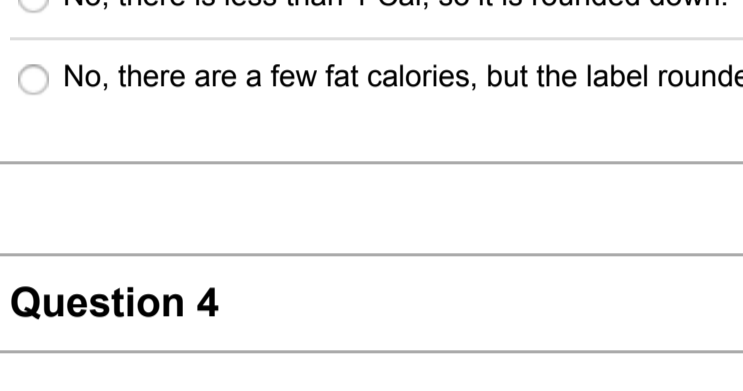
Diet B Food Sources	Diet B Daily Quantities
Cooked lentils	6 oz
Raw spinach	4 oz
Dark chocolate	2 oz
Tofu	6 oz

- Both diets meets the RDA for men, but neither meets the RDA for women
- Diet A provides enough iron for men and women
- Diet B provides enough iron for men and women
- Both diets provide sufficient iron for anyone.

Question 2

6 pts

Lycopene is a compound responsible for red color in many vegetables, most notably tomatoes. Its molecular structure is below. Does lycopene behave more like Vitamin A or Vitamin C, in terms of how our bodies absorb and store it?



- Vitamin A
- Vitamin C

Question 3

6 pts

Below is the label from a can of spray oil, like one would use to coat a pan before baking or cooking. Is this truly a zero calorie product?

Amount Per Serving	
Calories 0	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Polyunsaturated Fat 0g	
Monounsaturated Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 0mg	0%
Protein 0g	

Not a significant source of dietary fiber, sugars, vitamin A, vitamin C, calcium, and iron.

*Percent daily values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:
Calories 2,000 2,500

Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400g	2,400g
Total Carb	Less than 300g	375g
Dietary Fiber	25g	30g

- Yes, this is made from Olestra
- Yes, the only calories are from fiber, which doesn't count
- No, there is less than 1 Cal, so it is rounded down.
- No, there are a few fat calories, but the label rounded down.

Question 4

6 pts

Match the mineral class to the mass units that best represent the necessary daily intake of that class.

Macrominerals

Microminerals

Trace minerals

Question 5

6 pts

Which of these pairs represent the same unit of mass?

- microgram, mg
- mg, mcg
- µg, mcg

Question 6

6 pts

Vitamins and minerals are generally divided into which two groups?

- Water soluble and fat soluble
- Microminerals and Macrominerals
- Letter and Numeric
- Lipids and triglycerides

Question 7

8 pts

Below is the nutrition label from a packet of InstantLunch ramen.

Amount per serving	
Calories 290	
% Daily Value*	
Total Fat 15g	19%
Saturated Fat 3.5g	18%
Trans Fat 0g	
Cholesterol 65mg	12%
Sodium 220mg	10%
Total Carbohydrate 14g	5%
Dietary Fiber 3g	11%
Total Sugars 4g	
Includes 0g Added Sugars	0%
Protein 24g	
Vitamin D 0mcg	0%
Calcium 50mg	4%
Iron 1mg	6%
Potassium 309mg	6%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Suppose a student decides to live on a budget and eats 8 of these per day, and nothing else. Select all the definitively true statements about this student's state of nutrition if they persist with this diet. (Assume the 2000kcal diet on the label is an appropriate set of nutritive goals for this student)

- Undernourished, due to lack of calories
- Malnourished, due to lack of calories
- An excessive intake of some macro- and micronutrients.
- Malnourished, due to lack of at least one micronutrient
- Malnourished, due to lack of at least one micromineral

Question 8

8 pts

Suppose our Ramen-eating student wants to improve their diet and at least avoid coming down with scurvy. Do a bit of research and select the food that is most likely to provide sufficient Vitamin C if eaten once per day. The RDA for Vitamin C is 60mg/day.

- 1 lime
- 1 small orange
- 1 green bell pepper

Question 9

8 pts

Using the macronutrient info, how many calories do you expect to see (per serving) for this product?

Amount Per Serving	
Calories	
% Daily Value*	
Total Fat 8g	16%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 680mg	30%
Total Carbohydrate 23g	8%
Dietary Fiber 5g	18%
Total Sugars 4g	
Includes 5g Added Sugars	10%
Protein 5g	10%

Not a significant source of vitamin D, calcium, iron, and potassium

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Question 10

6 pts

How many grams of fat would you calculate to be in a serving of this product?

Amount Per Serving	
Calories	
% Daily Value*	
Total Fat	
Saturated Fat	
Trans Fat	
Cholesterol 5mg	2%
Sodium 180mg	8%
Total Carbohydrate 18g	7%
Dietary Fiber 1g	4%
Total Sugars 12g	
Includes 12g Added Sugars	24%
Protein 1g	2%

Not a significant source of vitamin D, calcium, iron, and potassium

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Question 11

6 pts

The fundamental idea of distillation is that liquids can be separated based on...

- charge balance
- texture
- polarity
- boiling point

Question 12

6 pts

In a distillation of fermented mash, liquor distillers typically separate the first portion of distillate. The first portion...

- is too high in methanol content because methanol has a higher boiling point than ethanol
- is too high in methanol content because methanol has a lower boiling point than ethanol
- is too high in ethanol content and must be discarded
- is the most delicious, and distillers keep it for themselves.

Question 13

6 pts

Cocktails, just like any other "drink" can have very different calorie and alcohol contents, even when they have the same name. Use the table below to answer the next two questions about margaritas.

Ingredient	ABV	Carbs (sugar g/oz)
Tequila	40%	0
Orange Liqueur	40%	8
Lime Juice	0%	1
Margarita Mix	0%	6

A traditional preparation of a margarita is made of 2 oz of tequila, 1 oz of orange liqueur, and 1 oz of lime juice. How many "standard drinks" of alcohol and how many Calories does this contain?

- 3 drinks, ~200 Cal
- 2 drinks, ~35 Cal
- 3 drinks, ~200 Cal
- 2 drinks, ~230 Cal

Question 14

6 pts

You are more likely to encounter a margarita made from a mix in a restaurant. A typical offering would be a 12 oz cocktail, made from 3 oz of tequila and 9 oz of mix. How many "standard drinks" of alcohol and how many Calories does this contain?

- 3 drinks, 350 Cal
- 2 drinks, 410 Cal
- 3 drinks, 255 Cal
- 2 drinks, 350 Cal

Question 15

4 pts

What is/are the risks associated with using sucrose instead of glycerol to support the fatty acids and make a non-digestible monster fat (Olestra)?

- inhibition of vitamin absorption
- abdominal cramping
- loose stools
- anal leakage

Question 16

6 pts

Which functional group in sucrose allowed it to be used in place of glycerol to make Olestra?

- phenyl
- carboxylic acid
- amine
- alcohol