

2017 National Food Science CDE  
Problem Solving/Math Practicum

1. As part of your responsibility with Kraft Foods, you have been asked to develop a jalapeno jelly as a line extension for the jelly product line. Your initial formulation is:

Red Peppers	9 oz
Green Peppers	9 oz
Jalapeno Peppers	6 oz
Cider Vinegar	8 oz
Fruit Pectin	49.7 g
Butter	2.3 g
Sugar	35 oz

What percent of the formulation are jalapenos? (1g = 0.035oz)

- a. 5.0 %
- b. 25.0 %
- c. 10.2 %
- d. 8.7 %

4. A shipping container is 48 inches wide x 40 inches deep x48 inches tall. You have a case of parmesan cheese for export to Japan that it is an 20 cm x 20 cm x 20 cm box. In order to maximize your shipment over the ocean, how many of the parmesan boxes can you fit inside the shipping container?

- a.230
- b.180
- c.37
- d.11.5

5. You are preparing hams for the upcoming holiday season. You started with 2000 lbs of pork fresh hams and you are injecting the hams with a 10% solution that includes water, salt cure and phosphate. The injected hams are cooked in the smokehouse to internal 148 degrees Fahrenheit for 1.78 minutes. After the thermal process, hams were weighed 2046 pounds. What yield did you have on this batch of hams?

- a. 102.3 %
- b. 97.8 %
- c. 101.3 %
- d. 93.0%

2021 Food Science CDE  
Problem Solving/Math Practicum

1. Your product development team created a new family pack of a trail mix that has 7 ingredients. The final weight of the product is 38 ounces. If six of the ingredients account for 90% of the ingredients, how many grams of the last ingredient do you need to reach the 38 ounce product.

- a. 0.2375 grams
- b. 3.8 grams
- c. 107.73 grams
- d. 453.59 grams

2. As the manager of the smoked sausage processing room, you must report your weekly shrink of your production. Listed below are the precook weight and final weights of your sausage product. What shrink are you reporting for your weekly report?

Day	Pre-cook Weight	Final Weight
Monday	1285 lbs	1120 lbs
Tuesday	987 lbs	965 lbs
Wednesday	1190 lbs	1089 lbs
Thursday	1019 lbs	986 lbs

- a. 0.0716 %
- b. 7.16 %
- c. 0.928 %
- d. 92.84%

3. You need to produce 600 – 15 ounces bottles of steak sauce per line per shift. There are 6 lines running per shift. Assuming that your mixing and holding tank is Cylindrical. What is the minimum height (depth) of your mixing/holding tank if it is 4 foot in diameter to reach your production goal? ( $V = \pi * r^2 * h$ )

- a. 3 feet
- b. 4 feet
- c. 5 feet
- d. 6 feet

4. Your recipe says to cook to an internal temperature of 176°F but you only have a thermometer that reads in Celsius. What degree C does your thermometer need to read? ( $X \text{ } ^\circ\text{F} - 32) \times 5/9 = \text{ } ^\circ\text{C}$ )

a.80

b.115.56

c.259.2

d.374.4

## 2022 FOOD SCIENCE CDE

### PROBLEM SOLVING/MATH PRACTICUM

1. You have created a protein bar for your new product line. It contains the following nutrients. If you want your product to meet a 400 - calorie minimum, how many grams of protein do you need to add to the product? (1g = 1000mg)

Total Carbohydrates.....42 grams

Dietary Fiber.....4 grams

Protein.....16 grams

Total Sugars.....18 grams

Cholesterol.....28 mg

Sodium.....180 mg

Total Fat.....12 grams

a.10 grams

b.12 grams

c.14 grams

d.15 grams

3.You need to calculate how much seasoned ground beef you will need for a batch of seasoned beef sticks that will have a yield of 68%. You need 1904 pounds of the snack stick to sell next week. How much seasoned beef do you need for this batch of product?

a.1,294.72 pounds

b.1,300 pounds

c.2,800 pounds

d.3,000 pounds

4. You are tasked with relabeling a product with a change in weight for the product. The product currently has 675 grams. Your job is to convert it to ounces for the product label. How many ounces will you recommend for the label? (1g=0.035oz)

a.24.21

b.24.11

c.23.81

d.20.23

5. You are creating a new potato chip with dried potatoes, oils, rice flour, and potato starch. Using the amounts listed below for a bag of chips that contains approximately 19 chips, determine what percent potato starch is in the bag. (1g=0.035oz)

Dried potato	0.54 ounces
Oils	2 grams
Rice Flour	4 grams
Potato starch	1.69 grams

a. 0.0735 %

b. 73.47 %

c. 7.35%

d. 20.5%