

## 2014 Food Science and Technology Career Development Event

### OBJECTIVE TEST: INSTRUCTIONS

*Welcome to the Food Science Career Development Event!*

1. DO NOT TURN THIS PAGE UNTIL YOU GET INSTRUCTION FROM THE MONITOR
2. Enter all the required information on the scantron where it says name, team name, team code
3. There are 50 questions and you have 60 minutes total to complete the test
4. Check your test booklet have 50 questions
5. Darken the correct answer with a #2-pencil. Make sure you darken the bubble completely with the #2-pencil



Correct



Wrong



Wrong

6. In case if you finish early, please remain seated until the other participants completely finish. You will be dismissed as a group

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1. The pink pigment in meat that is created during the cure process is:
  - A. Nitrosohemochrome
  - B. Myoglobin
  - C. Metmyoglobin
  - D. Oxymyoglobin
  - E. Carboxymyoglobin
  
2. Name the microorganism used in bread making
  - A. *Lactobacillus thermophilus*
  - B. *Clostridium perfringenes*
  - C. *Saccharomyces cervisiae*
  - D. *Escherichia coli*
  - E. *Listeria monocytogenus*
  
3. Reduction is the process in which
  - A. An electron is gained
  - B. An electron is lost
  - C. No change in electron
  - D. Neutron is lost
  - E. Neutron is gained
  
4. Disease causing microorganisms are called
  - A. Pathogens
  - B. Pests
  - C. Spoilage organism
  - D. All of the above
  - E. None of the above
  
5. The NELA allows \_\_\_\_ types of health claims on a food label
  - A. 3
  - B. 7
  - C. 12
  - D. 8
  - E. 15
  
6. The pancreas releases \_\_\_\_\_
  - A. Bile acids
  - B. Red blood cells
  - C. Insulin
  - D. Thyroid
  - E. Bolus

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7. Name the protein present in milk
- Myoglobin
  - Catalyst
  - Casein
  - Calcium
  - Calpines
8. The amount of carbohydrate required to produce 88 calories of energy
- $88 \text{ calories} \div 4 \text{ calories} = 11 \text{ g carbohydrate}$
  - $88 \text{ calories} \times 4 \text{ calories} = 352 \text{ g carbohydrate}$
  - $88 \text{ calories} \div 4 \text{ calories} = 12 \text{ g carbohydrate}$
  - $88 \text{ calories} \times 9 \text{ calories} = 396 \text{ g carbohydrate}$
  - None of the above
9. \_\_\_\_\_ is the enzyme that breaks down lipids
- Lactase
  - Lipase
  - Ligase
  - Lacteal
  - Lactose
10. \_\_\_\_\_ refers to the water pressure within cells that make vegetables crisp
- Turgor
  - Osmosis
  - Concentration
  - Vacuum
  - Lysis
11. Imagine you ate low calorie pizza which contained 1 g of fat, 1 g of carbohydrate, and 1 g of protein. What will be the total calories from this food?
- 36 kilocalories
  - 68 kilocalories
  - 108 kilocalories
  - 48 kilocalories
  - 17 kilocalories
12. The process in which a substance goes from a solid state to a gaseous state is called
- Evaporation
  - Radiation
  - Freezing
  - Sublimation
  - Condensation

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13. Agar and carrageenan are derived from \_\_\_\_\_
- A. Collagen
  - B. Jello
  - C. Seaweed
  - D. Fungi
  - E. Plant gums
14. A solution with a pH of \_\_\_\_\_ is considered acidic
- A. 12
  - B. 7
  - C. 10
  - D. 1
  - E. 7.2
15. \_\_\_\_\_ organized the “poison squad”
- A. Louis Pasteur
  - B. The Jungle
  - C. Rosa Parks
  - D. Theodore Roosevelt
  - E. Harvey Wiley
16. The amino acids that body cannot synthesis and need to be obtained through diet
- A. Saturated amino acid
  - B. Unsaturated amino acids
  - C. Non-essential amino acids
  - D. Essential amino acids
  - E. None of the above
17. The term 12D is associated with
- A. Pasteurization
  - B. Radiation
  - C. Canning
  - D. Aerobic packaging
  - E. Microwave
18. Skim milk has less than \_\_\_\_\_ percent fat
- A. 4.0
  - B. 2.0
  - C. 0.5
  - D. 5.0
  - E. 3.25

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19. A non-nutritive substance/GRAS substance added intentionally to improve quality and shelf-life of food is called:
- A. Food safety
  - B. Food additives
  - C. Food contaminant
  - D. Food technology
  - E. None of the above
20. \_\_\_\_\_ is the process of using heat to kill pathogenic organisms but does not destroy all spoilage microorganisms
- A. Homogenization
  - B. Sterilization
  - C. Pasteurization
  - D. Steaming
  - E. None of the above
21. FSMA is an acronym for:
- A. Food System and Maintenance Act
  - B. Food Safety Modernization Act
  - C. Food Safety and Microbiology Act
  - D. Food Safety and Meat Adulteration Act
  - E. None of the above
22. \_\_\_\_\_ (GMP) are procedures that have been developed to ensure safe and wholesome food production as well as safe working environment
- A. Gross manufacturing production
  - B. Good Mass Production
  - C. Great Manufacturing Policy
  - D. Good Manufacturing Practices
  - E. All of the above
23. The fats that are generally solid and has no double bonds
- A. Unsaturated fatty acids
  - B. Saturated fatty acids
  - C. Essential fatty acids
  - D. Omega fatty acids
  - E. Polyunsaturated fatty acids

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24. The red color of beef is due:
- A. Myosin
  - B. Myoglobin
  - C. Mitosis
  - D. Maltose
  - E. Lactose
25. A \_\_\_\_\_ is the amount of energy equal to the quantity of heat necessary to raise the temperature of 1 gram of water to 1 °C
- A. Joule
  - B. Watt
  - C. Amp
  - D. Calorie
  - E. None of the above
26. \_\_\_\_\_ are the building blocks of proteins
- A. Glucose
  - B. Fatty acids
  - C. Carbohydrates
  - D. Amino acids
  - E. Lipids
27. Homogenization of milk is
- A. The process that kills all pathogenic microorganisms in milk
  - B. The process that reduces fat globule size in milk
  - C. The process that separates cream from the skim milk
  - D. The process that add fat into milk
  - E. None of the above
28. The final stage of product planning and development process is:
- A. Concept stage
  - B. Commercialization stage
  - C. Product development stage
  - D. Grading
  - E. Pilot study stage
29. COOL is an acronym related to:
- A. Cold products
  - B. Country of origin labeling of food products
  - C. Food ingredient
  - D. Coloring compound
  - E. Cooked food products

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30. A green ham is \_\_\_\_\_
- A. Actually green in color
  - B. The turkey substitute for pork
  - C. Not yet cured
  - D. All of the above
  - E. None of the above
31. A humectant is:
- A. Limits lipid oxidation
  - B. Increase alkaline nature
  - C. Chelate metals
  - D. Retain moisture
  - E. Acidulant
32. FDA food laws are found in which Title of the Code of Federal Regulations?
- A. Title 7
  - B. Title 8
  - C. Title 20
  - D. Title 21
  - E. Title 22
33. Fruit sugar is \_\_\_\_\_
- A. Glucose
  - B. Fructose
  - C. Lactose
  - D. Sucrose
  - E. Maltose
34. Tofu is made from
- A. Red beans
  - B. Lentils
  - C. Hummus
  - D. Soybean
  - E. Navy bean
35. FSIS stands for:
- A. Food Safety and Inspection Administration
  - B. Food Safety and Inspection Service
  - C. Fiber Safety and Inspection Service
  - D. Food And Drug Administration
  - E. Food Safety and Inspection Safety

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36. The Delaney Clause passed in 1958 states that
- A. Preservatives cannot be used in meat products
  - B. No hormones can be added to food
  - C. Pesticides must be regulated
  - D. Synthetic compounds can be added to food
  - E. Chemical additive that induce cancer should not be added in food
37. A synthetic hormone to increase milk production is \_\_\_\_\_
- A. BSA
  - B. BSE
  - C. BST
  - D. BBA
  - E. None of the above
38. Which type of microorganism is used to make wine, beer, and bread
- A. Bacteria
  - B. Yeast
  - C. Virus
  - D. Parasite
  - E. Prions
39. The USDA recommend safe minimum internal temperature for ground beef is
- A. 140 °F
  - B. 150 °F
  - C. 160 °F
  - D. 170 °F
  - E. 180 °F
40. Psychrophilic microorganisms will
- A. Grow like thermophiles
  - B. Grow at very high temperatures
  - C. Grow at low temperatures
  - D. Die at low temperatures
  - E. None of the above
41. An aspartame is a:
- A. Simple sugar
  - B. Natural sugar
  - C. High fructose corn syrup
  - D. Fatty acid
  - E. Non-calorigenic artificial sweetener



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42. Five taste stimuli are:
- A. Sweet, sour, bitter, salty, umami
  - B. Sweet, sour, bitter, salty, astringent
  - C. Sweet, sour, flavor, salty, astringent
  - D. Sweet, bubbly, flavor, salty, astringent
  - E. Sweet, bitter, fizz, salty, umami
43. An example of simple carbohydrate would be
- A. Fatty acids
  - B. Starch
  - C. Cellulose
  - D. Carboxylic acid
  - E. Glucose
44. Enzymatic browning is seen in:
- A. Freshly cut apple
  - B. Freshly cut beef
  - C. Cooked steak
  - D. All of the above
  - E. None of the above
45. An emulsion is a stable mixture of \_\_\_\_\_ and \_\_\_\_\_
- A. Oil and water
  - B. Water and water
  - C. Oil and gas
  - D. An emulsion is related to nutritional quality
  - E. None of the above
46. Total counts of microorganism used as an indication of sanitary quality
- A. SPC – Standard Plate Count
  - B. PPC – Potential Plate Count
  - C. SPC – Sanitary Plate Count
  - D. SCP – Standard Counts Plated
  - E. All of the above
47. Milk is fortified with
- A. Vitamin K
  - B. Vitamin E
  - C. Vitamin D
  - D. Vitamin M
  - E. None of the above

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48. Two factors that accelerate rancidity in food are
- A. Protein and carbohydrate content
  - B. Fat and exposure to oxygen
  - C. Fat and lack of exposure to oxygen
  - D. Fat and absence of exposure to light source
  - E. None of the above
49. Which of the following cannot be digested and absorbed, but looks, feels, and behaves like fat
- A. Aspartame
  - B. Sucralose
  - C. Olestra
  - D. Splenda
  - E. None of the above
50. Which term refers to the folding and manipulating of dough to achieve the proper consistency?
- A. Reduction rolling
  - B. Gluten
  - C. Kneading
  - D. Cooling
  - E. Docking

## 2014 Food Science and Technology Career Development Event

### CUSTOMER INQUIRY

Please read each of the five customer inquiries. For each inquiry, you must indicate:

1. If the complaint is related to a food safety or food quality problem.
2. If the hazard is primarily biological, chemical, or physical.
3. Please mark your answers in the *separate sheet provided*.
4. Each question carries 5 points. Total points for this section is 25

***This is an individual event!! No talking allowed!***

#### **Customer Inquiry #1**

To whom it may concern:

I am writing because I purchased a package of your whole grain bread at the grocery store in Somewhere, OK on April 25, 2014. I consumed approximately half of the loaf when I found numerous pieces with black grease materials. I smelled it and it had an oily odor. I didn't consume any of the remaining bread loaf for fear of my health. I find this to be a very serious problem and expect that you will correct it immediately. I saved the remainder of the product and would like a refund.

Thank you for your attention to this very important matter.

Sincerely  
Hank Smith

#### **Customer Inquiry #2**

Dear Cookie Lady,

My daughter is highly allergic to almonds. We purchased a vegetable soup after carefully reading the label. The label said that the product did not contain almonds. However, when we opened the package, I noticed that there were small pieces of almond. If my daughter had eaten them, I am afraid to think about the situation.

I hope you will not repeat this again.

Upset Mom.

### **Customer Inquiry #3**

Dear Customer Service,

We purchased your potato chips for our children. When the kids were enjoying them, we noticed that potato chips had a rancid smell. Interestingly those potato chips were still within the expiry date.

I am really disappointed with your product.

Sincerely,  
Disappointed customer.

### **Customer Inquiry #4**

Last month, I bought four 64 oz chubs of your Genoa Salami at the Oklahoma Groceries in Oklahoma. After 2 days of storage in my refrigerator, I opened the salami packages and on slicing the product, I noticed that three of the chubs had streaks/spots/slime of green discoloration on the inside of the chub. I was really disappointed and I discarded the discolored product in domestic trash.

Angry Customer.

### **Customer Inquiry #5**

Dear Mr. Apple,

We purchased a 32 oz container of your cinnamon apple sauce that had a best by date of April 27, 2013. When we popped the seal, we noticed there were black mold growing inside the container. I am upset that I wasn't able to enjoy my purchase.

Sincerely  
Customer

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### **FOOD PRODUCT DEVELOPMENT SCENARIO**

*Instructions: This is a team event. Total time allotted for the product development is 60 minutes.*

*Total time for oral presentation is 10 minutes and 10 minutes for questions and answers.*

**Scenario:** Breakfast is the most important meal of the day and skipping breakfast can affect health. However, there is a trend that the most people are skipping breakfast especially among teenagers. Recent study shows that number of people snacking during day time is increasing. You and your team are in charge of creating a high protein trail mix with 4 ounce serving size for the teenagers (age group 13-18 years old). The product should be shelf stable so it can be sold in grocery stores and stored in the household. Additionally, it should be healthy to purchase and be attractive. Carefully consider the healthy lifestyle trend and how this product may be attractive to such a consumer.

The ideal considerations for this product are:

1. Healthy
2. Lower amount of sugar
3. Attractiveness to teenagers

The currently available breakfast cereals don't have the ideal consideration and these problems are mainly associated with the product formulation and the packaging. Consider this when developing your product.

Given this scenario, you should develop as a team:

1. High protein trail mix that is marketed towards families with teenagers between 13-18 years old. Take into account concerns about high sugar content and the teenager's eagerness to consume an attractive product.
2. You need to select five ingredients from a total of given seven ingredients and you need to make the breakfast cereal based on selected five ingredients.
3. Consider serving size to be 4 oz.
4. Create a front display (Label) and mock package (container) on the poster sheet available.
5. Create a nutritional panel and an ingredient statement on the poster board provided. The nutritional panel should contain all of the relevant information. A spread sheet of ingredient information is included in this packet.

The *approximate weight* different given ingredients are:

Whey protein: 56 g

Cocoa Puffs: 56 g

Almonds: 28 g

Chocolate chips: 28 g

Dried cranberries: 56 g

Pecans: 28 g

Marshmallows: 28 g

### **Pricing Strategy**

Pricing strategy is very important in the placement of our product. You need to demonstrate that this is a nutritional and quality product that is attractively priced to be competitive with other cereal products. This means a price around \$3-4. This target price does not include a standard store mark-up of 20%. After financial analysis of the product, it had determined the following base price for our product:

Product costs:                 \$0.30

Distribution:                    \$0.18

Promotion:                       \$0.11

“Shelf” maintenance:         \$0.01

These cost estimates do not include ingredient costs. Each ingredient used will add to the cost of the product since the ingredients have to be purchased elsewhere and assembled into the final product. The ingredient costs per pound are listed in the information included in this packet.

Good luck!!

## NUTRITIONAL INFORMATION OF INGREDIENTS

ITEM	Cost per lb (\$)	Serving size (Oz)	Calories	Fat (g)	Saturated fat (g)	Trans fat (g)	Cholesterol (mg)	Sodium (mg)	Carbohydrates (g)	Dietary fiber (g)	Sugar (g)	Proteins (g)	Vitamin A (IU)	Vitamin C (mg)	Calcium (mg)	Iron (mg)
Corn flakes	4	1	110	0	0	0	0	280	26	<1	3	2	500	6	100	9
Cocoa Puffs	2	1	120	1	1	0	0	170	25	<1	10	1	500	6	100	9
Almonds	10	1	160	14	1	0	0	0	6	3	1	6	0	0	80	1
Chocolate chips	3.5	1	160	9	5	0	0	20	18	0	16	2	0	0	40	0
Dried cranberries	5	1	90	0	0	0	0	7	23	1.5	19.6	0	0	4	0	0
Pecans	7	1	210	22	2	0	0	0	4	3	1	3	0	0	100	2
Marshmallows	2	1	100	0	0	0	0	25	24	0	17	<1	0	0	0	0

### Packaging cost

Cardboard Carton	\$ 0.05
Plastic wrapper	\$ 0.02
Plastic Printed Pouch	\$ 0.03

### Conversions

1 oz = 28.35 grams (g)
1 lb = 16 oz = 453.6 grams (g)
1 gram = 1,000 milligrams (mg)





# INSTRUCTIONS

- You have one minute to identify each photo/slide
- Match the slide with the below food safety or sanitary problem
- For each slide, match the food safety or sanitary problem by darkening the bubble in the Food safety/sanitation pictures section in the scantron
- Total points for this section is 25

# Picture Number # 1



# Picture Number # 2





# Picture Number # 3



# Picture Number # 4



# Picture Number # 5





# Picture Number # 6





# Picture Number # 7

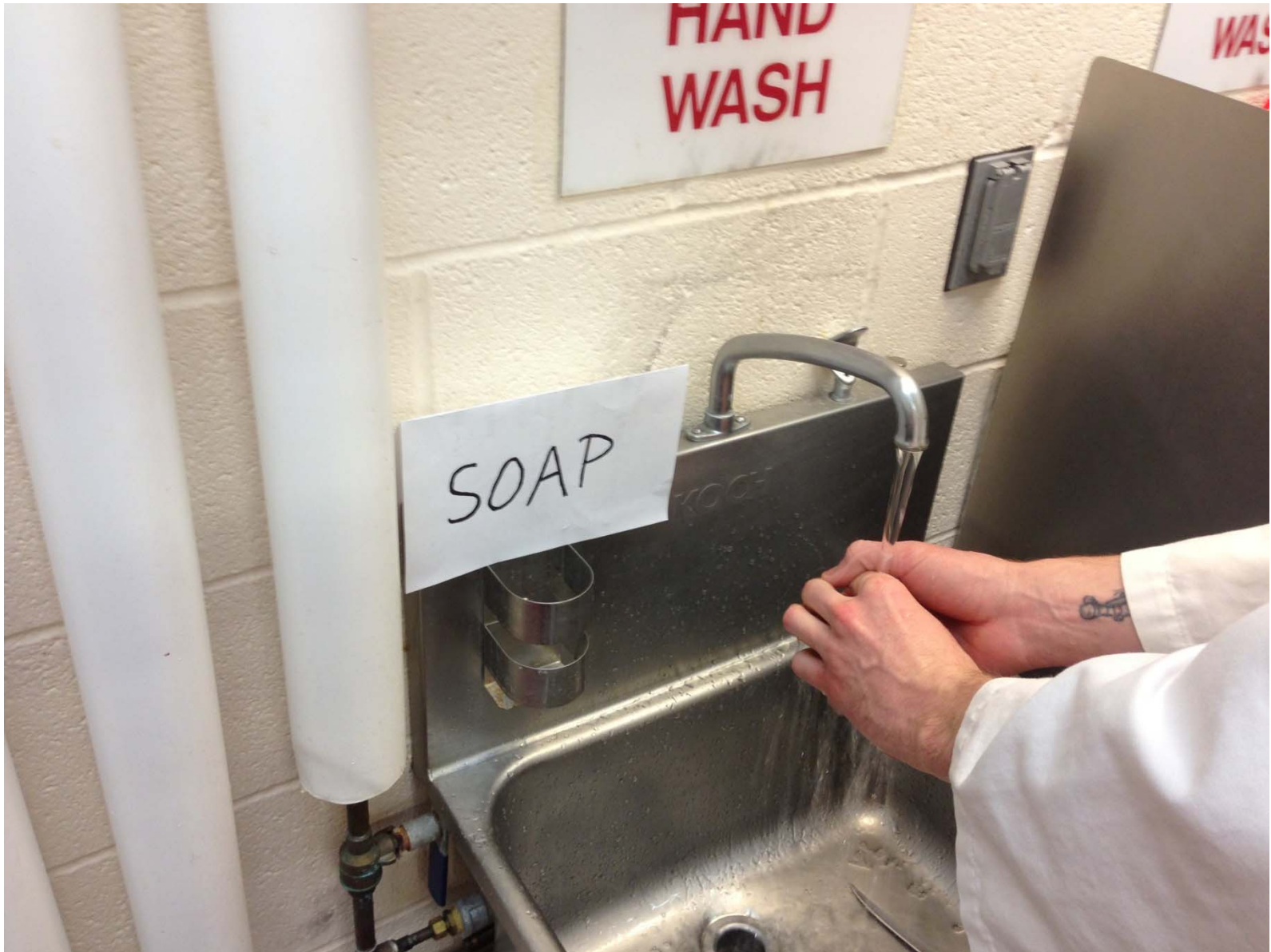




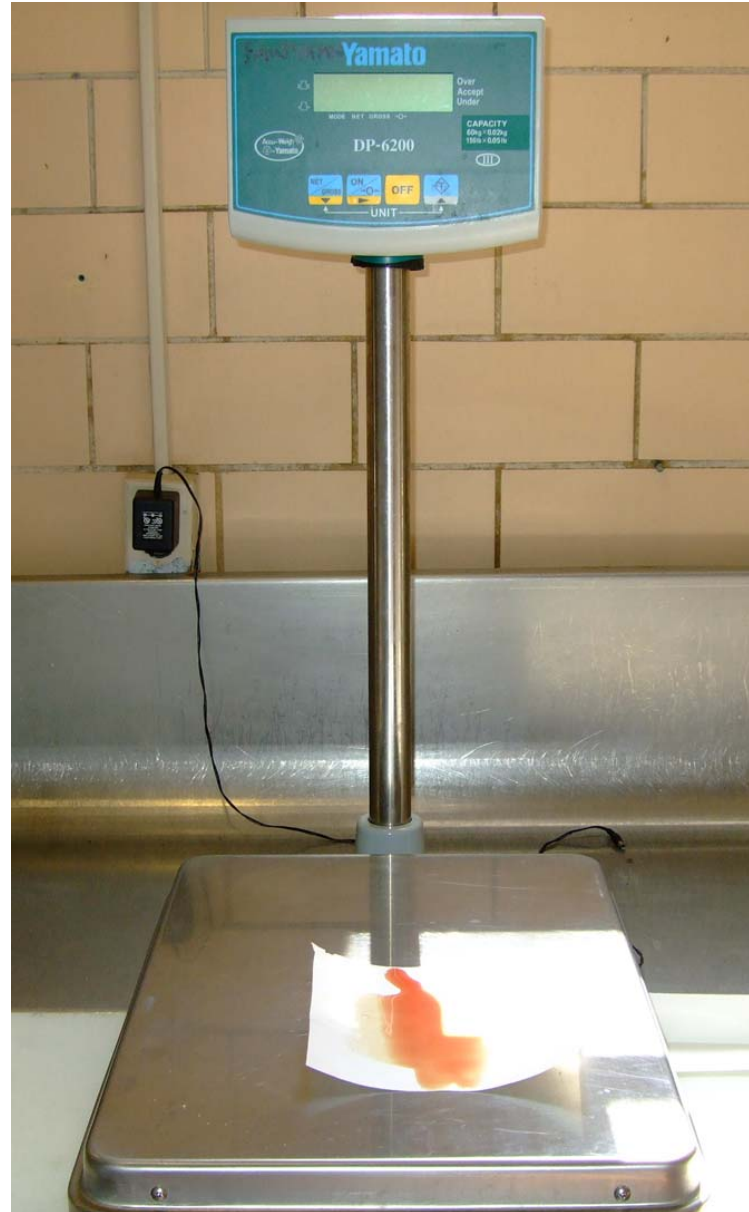
# Picture Number # 8



# Picture Number # 9



# Picture Number # 10



## 2013 Food Science and Technology Career Development Event

### POTENTIAL FOOD SAFETY AND/OR SANITATION PROBLEMS

#### INSTRUCTIONS

1. You have one minute to identify each photo/slide
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4. Total points for this section is 25

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1. No food in the locker rooms
2. Wear hairnets properly
3. Don't contaminate your uniform
4. Don't touch your face while at workplace.
5. Don't touch your hair during work.
6. Wash hands thoroughly with soap and hot water
7. Don't use broken gloves
8. No jewelry in work place
9. Wear proper footwear
10. Don't contaminate food contact surfaces
11. Chewing gum not allowed
12. Rust on the food processing equipment
13. Unsanitary measuring device
14. Food processing equipment in an unsanitary condition
15. Raw/cooked cross contamination