2015 Iowa FFA Association Food Science General Knowledge Examination

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. The RDA is revised approximately every ____ years.
a. five
b. ten
c. two
d. three

____ 2. Carbohydrates and proteins provide about ____ calories per gram.
a. 5
b. 2
c. 4
d. 6

____ 3. Most vitamins are measured in ____.
a. milligrams
b. grams
c. liters
d. kilograms

____ 4. Naturally occurring ____ play a role in food coloring.
a. enzymes
b. sugars
c. pigments
d. carbohydrates

____ 5. ____ or spectrophotometers can be used for measuring transparent foods.
a. Thermometers
b. Meters
c. Liquid
d. Colorimeters

____ 6. ____ can be achieved on the basis of density or size and shape.
a. Separation
b. Quality
c. Clarification
d. Flavor

____ 7. Sediment and microorganisms can be removed centrifugally in a ____.
a. tube
b. clarifier
c. pan
d. box

____ 8. The most common drying method is ____ drying.
a. freeze-
b. sun or tray drying
c. spray
d. oven

____ 9. Microbes that prefer cold temperatures are ____.
a. mesophilic
b. thermophilic
c. psychrophilic
d. obligative

____ 10. Microbial growth slows at temperatures under ____ºF.
a. 80
b. 70
c. 60
d. 50

____ 11. ____ are the most heavily used additives.
a. Minerals
b. Vitamins
c. Gums
d. Sweeteners

____ 12. Sequestrants are ____ agents.
a. cheating
b. chelating
c. chilling
d. charcoal

____ 13. In terms of additives, ____ include both natural and synthetic colorants.
a. flavors
b. gums
c. colors
d. sweeteners

____ 14. ____ dissolve in water and are made as powders, granules (small hard pieces), liquids, or other special-purpose forms.
a. Dyes
b. Lakes
c. Sweeteners
d. Gums

____ 15. ____ make a food acid or sour.
a. Flavorings
b. Texturings
c. Colorings
d. Acidulants

____ 16. Paper used for ____ cartons must come from sanitary virgin pulp.
a. milk
b. juice
c. eggs
d. butter

____ 17. Newer plastic materials for packaging contain cornstarch, which makes them more ____.
a. sanitary
b. tough
c. expensive
d. biodegradable

____ 18. The ____ is the large central portion of the kernel and contains most of the starch.
a. aleurone
b. bran
c. endosperm
d. germ

____ 19. Potato starch begins to ____ at a lower temperature than cornstarch.
a. burn
b. gelatinize
c. smell
d. separate

____ 20. The presence of ____ encourages the formation of a gel in cooked and cooled starch mixtures.
a. milk
b. sugar
c. carbohydrate
d. amylose

____ 21. About ____ percent of the proteins of white flour are relatively insoluble.
a. 55
b. 65
c. 75
d. 85

____ 22. The basic foundation of baked products is usually flour and ____.
a. sugar
b. eggs
c. liquid
d. leavening

____ 23. ____ flour has a slightly higher percentage of gluten and a much stronger and more elastic gluten than other types of flour.
a. Bread
b. Cake
c. Pastry
d. Rice

____ 24. ____ is a soft cheeselike food made by curdling fresh hot soymilk with a coagulant.
a. Tempeh
b. Tofu
c. Yogurt
d. Cheddar

____ 25. The vacuole of a plant is composed of ____ with soluble substances dissolved within it.
a. water
b. juice
c. oil
d. minerals

____ 26. The quality of most fresh vegetables can be judged reasonably well by their ____ appearance.
a. internal
b. external
c. leafy
d. green

____ 27. The use of U.S. grade standards for fruits and vegetables is ____ in most cases.
a. required
b. helpful
c. confusing
d. voluntary

____ 28. ____ juice is probably the most commonly processed juice.
a. Apple
b. Lemon
c. Orange
d. Cranberry

____ 29. ____ fruits produce ethylene gas during ripening.
a. Nonclimacteric
b. Climacteric
c. Orange
d. Tree

____ 30. ____ make up the major components of fat, butter, shortening, and oil.
a. Compounds
b. Composites
c. Spingolipids
d. Triglycerides

____ 31. The first step in the refining process of many oils is ____.
a. degumming
b. refining
c. bleaching
d. winterization

____ 32. ____ is a selective process that can be controlled to produce various levels of hardening.
a. Winterization
b. Bleaching
c. Hydrogenization
d. Degumming

____ 33. Monoglycerides and diglycerides are used as ____ in a variety of foods.
a. emulsifiers
b. flavor
c. calories
d. color

____ 34. Grapes for wine are harvested when they contain the optimum balance of ____ and acidity.
a. color
b. size
c. sugar
d. alcohol

____ 35. ____ coffee is prepared by forcing an atomized spray of very strong coffee extract through a jet of hot air.
a. Decaffeinated
b. Instant
c. Black
d. Espresso

____ 36. Which organization issues the National Primary Drinking Water Regulations?
a. FDA
b. NRA
c. EPA
d. USA

____ 37. Turbidity of water is ____.
a. taste
b. smell
c. cloudiness
d. content

____ 38. A successful pollution prevention program requires frequent ____ to keep employees focused and careful.
a. cleaning
b. retraining
c. expense
d. reprimanding

____ 39. ____ serves as a universal solvent.
a. Water
b. Soap
c. Bleach
d. Odor

____ 40. Most pathogenic bacteria are classified as ____.
a. psychrotrophic
b. thermotrophic
c. psychrophilic
d. mesophilic

____ 41. Which agency registers chemical sanitizers and antimicrobial agents for use on food and food product contact surfaces?
a. EPA
b. FDA
c. USDA
d. HACCP

____ 42. Of the microorganisms, ____ are the greatest threat to food safety.
a. viruses
b. parasites
c. fungi
d. bacteria

____ 43. Ingredients on a food label are listed in ____ order, based on weight.
a. descending
b. ascending
c. alphabetical
d. chronological

____ 44. A daily intake of ____ calories has been established as the daily reference value (DRV).
a. 1,700
b. 1,800
c. 1,900
d. 2,000

____ 45. The word ____ on a label, means that a product contains no amount of, or only trivial or "physiologically inconsequential" amounts of, one or more of these components: fat, saturated fat, cholesterol, sodium, sugars, and calories.
a. Low
b. Free
c. Lean
d. Reduced

____ 46. The term ____ can be used on the labels of foods that can be eaten frequently without exceeding dietary guidelines for one or more of these components: fat, saturated fat, cholesterol, sodium, and calories.
a. free
b. reduced
c. lean
d. low

____ 47. The DRVs for the energy-producing nutrients are calculated as fat based on ____ percent of calories.
a. 30
b. 20
c. 25
d. 35

____ 48. ____ prepare pies, breads, rolls, muffins, cookies, cakes, icings and frostings, and many other foods, depending on where they work.
a. Inspectors
b. Bakers
c. Butchers
d. Chefs

____ 49. Chefs prepare delicious meals and participate in ____ to show off chefs' talents.
a. Culinary Olympics
b. Cooking Contests
c. Grand Demonstrations
d. Worldwide Classes

____ 50. ____ play an important role in the development of new foods and nonfood uses.
a. Bakers
b. Butchers
c. Chemists
d. Inspectors

2015 Iowa FFA Association Food Science General Knowledge Examination
Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1
2. ANS: C PTS: 1
3. ANS: A PTS: 1
4. ANS: C PTS: 1
5. ANS: D PTS: 1
6. ANS: A PTS: 1
7. ANS: B PTS: 1
8. ANS: C PTS: 1
9. ANS: C PTS: 1
10. ANS: D PTS: 1
11. ANS: D PTS: 1
12. ANS: B PTS: 1
13. ANS: C PTS: 1
14. ANS: A PTS: 1
15. ANS: D PTS: 1
16. ANS: A PTS: 1
17. ANS: D PTS: 1
18. ANS: C PTS: 1
19. ANS: B PTS: 1
20. ANS: D PTS: 1
21. ANS: D PTS: 1
22. ANS: C PTS: 1
23. ANS: A PTS: 1
24. ANS: B PTS: 1
25. ANS: A PTS: 1
26. ANS: B PTS: 1
27. ANS: D PTS: 1
28. ANS: C PTS: 1
29. ANS: B PTS: 1
30. ANS: D PTS: 1
31. ANS: A PTS: 1
32. ANS: C PTS: 1
33. ANS: A PTS: 1
34. ANS: C PTS: 1
35. ANS: B PTS: 1
36. ANS: C PTS: 1
37. ANS: C PTS: 1
38. ANS: B PTS: 1
39. ANS: A PTS: 1
40. ANS: D PTS: 1
41. ANS: A PTS: 1
42. ANS: D PTS: 1
43. ANS: A PTS: 1
44. ANS: D PTS: 1
45. ANS: B PTS: 1
46. ANS: D PTS: 1
47. ANS: A PTS: 1
48. ANS: B PTS: 1
49. ANS: A PTS: 1
50. ANS: C PTS: 1

2015 Iowa FFA Food Science CDE

Food Safety and Quality Section
Response to Consumer Complaint

The Consumer Affairs Department at Breakfast Shack has received the following letter from a customer. Please respond to the consumer's complaint. Your response should contain the answers presented by the consumer. Please be concise and courteous in your response. Your response will be scored based on the identification of problem, identification of correct solution, completeness and correctness of your response, courteousness, conciseness (limit to 1 page), and appropriate grammar and correct spelling.

Dear Sirs:

I purchased your whole grain flour from Breakfast Shack at your farmers market stand last week for my family. We love all your products. We made pancakes with your flour on Sunday and they were delicious. However, on Monday morning when I went to make the kids more pancakes, I noticed that there were black specks in the bag of flour and some of them were moving like bugs. I stored the flour in the cabinet above the stove and it can get very hot. My husband thought this was disgusting and told me to throw it away. Is the flour safe to eat? We decided to throw out the flour, but wanted to ask a few questions in case we see this problem again.

1. *What caused the black specks?*
2. *What are the moving bugs in my flour?*
3. *Will I get sick from eating the flour?*
4. *Is there anything I can do to correct the problem or should I just throw it out?*
5. *What will your company do to make sure that there are no more black specks and bugs in my flour in the future?*

I look forward to hearing from you.

Thank you.
Amber Peek

	Points Possible	Points Received
Identification of Problem	15	
Presentation of Solution	15	
Courteousness of Response	10	
Conciseness (less than 1 page)	5	
Grammar and spelling	5	
	50	

FFA Food Science Consumer Complaint Response

June 4, 2015
50 points

School Name _____
Name _____
Contestant Number _____

Score _____/50____

Complete your response in the box below:

2015 Iowa FFA Food Science CDE

Food Safety and Sanitation Section – Student Exercise

In this segment of the contest, you will be given pictures/graphics to view in reference to common problems that exist within the food industry. Your task for each set of pictures and/or graphics are to: (a) identify the problem and (b) select the most appropriate solution to the problem. There will be five (5) sets of food safety and/or sanitation concerns with each question valued at 5 points for a total of 50 possible points.

When done, return this document with your answer sheet to the test proctor.

DO NOT MARK ON THIS DOCUMENT

Set #1:

Question 1: These pictures most represent which of the following food industry concerns:

a. Botulism
b. Salmonella
c. Listeria
d. Staphylococcus
e. Campylobacter

Question 2: In reference to the above pictures, what would be the solution to this food industry concern/problem?

a. Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.; Wash raw vegetables thoroughly before eating; and Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
b. Carefully wash fruits and vegetables, and steam oysters before eating them; Frequently wash your hands, especially after toilet visits and changing diapers and before eating or preparing food; and Thoroughly clean and disinfect contaminated surfaces immediately after an episode of illness.
c. Always wash hands with warm, soapy water; if your hands have any kind of skin abrasion or infection, always use clean disposable gloves; and keep cutting boards clean
d. Do not eat raw or undercooked eggs, poultry, or meat.; avoid Cross-contamination of foods; and wash hands after contact with animal feces and/or reptiles.
e. Handle poultry carefully to prevent cross-contamination; utilize proper wrapping; and most egg products should be pasteurized.

Set #2:

Question 3: These pictures most represent which of the following food industry concerns:

a. Listeria
b. Botulism
c. E coli
d. Salmonella
e. Cross contamination

Question 4: In reference to the above pictures, what would be the solution to this food industry concern/problem?

a. Home canned products need to use higher level acids, follow strict hygienic procedures, and prepare foods using high temperatures.
b. Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.; Wash raw vegetables thoroughly before eating; and Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
c. Drink only pasteurized milk, juice, or cider; wash fruits and vegetables under running water, especially those that will not be cooked; and cook all ground beef and hamburger thoroughly.
d. Sterilize raw foods at the plants, pasteurization of milk, and improving safe food handling practices in kitchens
e. Do not eat raw or undercooked eggs, poultry, or meat.; avoid Cross-contamination of foods; and wash hands after contact with animal feces and/or reptiles.

Set 3:

Question 5: These pictures most represent which of the following food industry concerns:

a. Botulism
b. Staphylococcus
c. Listeria
d. E coli.
e. Metal contamination in ground beef

Question 6: In reference to the above pictures, what would be the solution to this food industry concern/problem?

a. Sterilize raw foods at the plants, pasteurization of milk, and improving safe food handling practices in kitchens
b. Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.; Wash raw vegetables thoroughly before eating; and Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
c. Drink only pasteurized milk, juice, or cider; wash fruits and vegetables under running water, especially those that will not be cooked; and cook all ground beef and hamburger thoroughly.
d. Home canned products need to use higher level acids, follow strict hygienic procedures, and prepare foods using high temperatures.
e. Do not eat raw or undercooked eggs, poultry, or meat; avoid Cross-contamination of foods; and wash hands after contact with animal feces and/or reptiles.

Set #4:

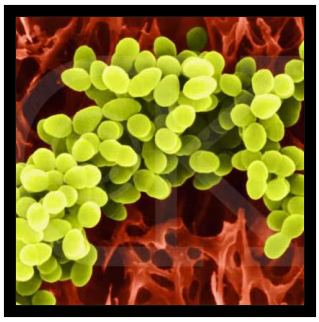
Question 7: These pictures most represent which of the following food industry concerns:

a. Cross Contamination
b. E. coli
c. Salmonella
d. Listeria
e. Campylobacter

Question 8: In reference to the above pictures, what would be the solution to this food industry concern/problem?

a. Home canned products need to use higher level acids, follow strict hygienic procedures, and prepare foods using high temperatures.
b. Sterilize raw foods at the plants, pasteurization, and improving safe food handling practices in kitchens
c. Increased regulations; over-use promotes emergence of resistant bacteria; and regulated usages to minimize residues in the human food chain.
d. Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.; Wash raw vegetables thoroughly before eating; and Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
e. Carefully wash fruits and vegetables, and steam oysters before eating them; Frequently wash your hands, especially after toilet visits and changing diapers and before eating or preparing food; and Thoroughly clean and disinfect contaminated surfaces immediately after an episode of illness.

Set 5:


Question 9: These pictures most represent which of the following food industry concerns:

a. Staphylococcus
b. E coli
c. parasites
d. Botulism
e. Norovirus

Question 10: In reference to the above pictures, what would be the solution to this food industry concern/problem?

a. Carefully wash fruits and vegetables, and steam oysters before eating them; Frequently wash your hands, especially after toilet visits and changing diapers and before eating or preparing food; and Thoroughly clean and disinfect contaminated surfaces immediately after an episode of illness.
b. Home made or processed foods need to be properly stored; when preparing foods, remember to prepare foods under sanitary conditions; if food is to be stored longer than two hours, keep hot foods hot (over 140°F) and cold foods cold (40°F or under).
c. Drink only pasteurized milk, juice, or cider; wash fruits and vegetables under running water, especially those that will not be cooked; and cook all ground beef and hamburger thoroughly.
d. Handle poultry carefully to prevent cross-contamination; utilize proper wrapping; and most egg products should be pasteurized.
e. Do not eat raw or undercooked eggs, poultry, or meat; avoid Cross-contamination of foods; and wash hands after contact with animal feces and/or reptiles.

Food Safety and Sanitation Section – Student Exercise Key

1. B
2. D
3. B
4. A
5. D
6. C
7. E
8. B
9. A
10. B

2015 FFA Food Science Product Development Career Development Event
Development of a Trail Mix/Granola Snack

Background:

The most recent Dietary Guidelines for Americans places stronger emphasis on reducing calorie consumption and increasing physical activity for individuals of all ages. Trail mix and granola snacks (including bars) are often advertised as a healthy snack for active individuals; however market research shows that these products are not being purchased or consumed by many consumers in the target age range of 13 – 25 years old. As a result, we are requesting the creation of a trail mix /granola snack that will appeal to active teens and young adults, both male and female, ranging in age from approximately 13 – 25.

Objective:

Your team needs to develop a trail mix/bar/snack to encourage healthy eating and increased activity among teens and young adults. Remember, your team needs to address important points such as: nutrition, quality control, food safety, and formulations. In other words, explain why you chose to create the product you created and how such a product meets the needs described above. You also need to identify a catchy name for this product and design the front label (PDP) with the required information, so as to attract the target audience. This is a team event and it is very important for your group to equally present material and provide answers to the judges' questions.

Teams should also prepare the nutritional analysis label (based on a serving size) for the product.

Your target nutrient guidelines are:

- Serving size: No more than 40 g
- Fat: Less than 8 g
- Protein: At least 5 g
- Carbohydrates (total): No more than 20 g
- Calories: Less than 180 calories

Method:

With your team, create a food product from the ingredients supplied in the following table. Your team should develop a product name, consider the potential use by individuals, determine the nutritional value, and evaluate the appearance, texture, and flavor of the final product.

Your team will present an oral report (15 minutes – 10 minutes to present and 5 minutes for questions) to a group of trained judges. The evaluation form attached is how your group presentation will be evaluated. It is important that you have graphics to clearly show your product.

Rules:

Your team will need to develop but not prepare your product. The following table includes suggestions for ingredients you may use. It is expected the product to include at least two ingredients from the fruits, nuts, and starches categories and at least one ingredient from the candy or confection category. Select items from the following categories:

Fruits	Candies	Nuts	Starches
Raisins	M & M's	Peanuts	Goldfish
Craisins	Red Hots	Almonds	Melba Toast
Dried Pineapple	Skittles	Pistachios	Corn Chex
Dried Mango	Jelly Beans	Walnuts	Multi-bran Chex
Yogurt covered raisins (chocolate)	Twizzler bites	Sunflower Seeds	Rice Chex
Dried Apricots	Sesame seeds	Cashews	Pretzels
Dried Apples		Macadamias	Cheerios
Prunes			
Dates			
Banana Chips			

Evaluation:

Product Name: _____

Ingredients Used: _____

Preparation Time: _____

Marketing Presentation:

Each team member should present at least one of the following aspects of food product development: selection of ingredients, nutritional value, ease of preparation, sensory characteristics.

Commercialization:

The product that you develop will need to meet all aspects of labeling requirements including principal display panel, nutritional label, and ingredient listing. Your team will be evaluated on this being done correctly. **Information about labeling can be found at:**
http://www.fda.gov/food/ingredientspackaginglabeling/default.htm

RESOURCES FOR DETERMINING NUTRIENT INFORMATION

1. Nutrient Data Laboratory
   Downloadable data sets prepared by the **USDA** Nutrient Data Laboratory with nutrient values of foods.
   http://www.ars.usda.gov/main/site_main.htm?modecode=12-35-45-00

SPECIFIC REQUIREMENTS

- Suitability of product as a high fiber sports energy bar
- Ingredients should be listed in order of amounts used in product.
- All required parts of the principle display panel should be there.
- All required elements on the Information Panel
- Correct relative placement of PDP and Information Panel
- Appealing PDP and Creative Character
- Reasonably close nutritional panel
- Ability to answer questions about the product.
- All members participate in presentation.

Chapter Name _____

CRITERION for 2015 CDE	**POSSIBLE POINTS**	**POINTS EARNED**
Objective met – to develop a **trail mix/granola snack**	50	
All required parts of the principal display panel (PDP).	50	
All required elements on the Information Panel	50	
Correct relative placement of PDP and Information Panel	50	
Reasonably close nutritional panel	50	
Communication skills/oral presentation (clear, logical, easy to understand, confidence in presentation and the information presented.	50	
Ability to answer questions about the product.	50	
Did all team members contribute?	50	
OVERALL	400	