

## **2011 North Dakota State Food Science CDE Team Product Development**

Memorandum

To: Product Development Team  
From: Board of Directors of Farm Fresh Alternatives  
Re: Ready to Prepare Side Dish

Farm Fresh Alternatives is a family owned food processing company that has been producing fresh and frozen vegetables for over 35 years. We are proud to use only produce grown in the United States, and have never imported produce from Europe. With our recent purchase of a pasta processing plant, we have expanded our line to include frozen meals and side dishes. This growth has been steady. We are really excited about the new line of Quick Cook pastas, noodles that only take 3 minutes to prepare! Add this to our already existing line of 5 minute parboiled rice and we truly have many products that the consumer can quickly prepare after a long days work.

We have recently contacted McCormick spices about a partnership with their brand to deliver a line of ready-to-prepare side dish for the up-coming grilling season. The McCormick Grill Mates product has been popular. As consumers prepare their chicken, pork, fish or beef on the grill, we believe that our seasoned vegetable side dish will be the perfect complement. We are hoping you will consider either noodles or rice as the base of this dish, and create a blend of vegetables and spices that will complete the meal.

Our board of directors hired the research team of Wahlberg, Theron and Norton to study consumer trends in eating habits within the current economic downturn. The research showed that as the consumer becomes more careful with their food budget, the frequency of dining away from the home has decreased. The data shows a 5% reduction in dining out from 2009 to 2010 and a 10% reduction from 2008 to 2010.

When you are finished with your product development, you will present it to the Board of Directors for approval. We are confident that your product development team will come up with some fantastic ideas of ready-to-prepare side dishes that our companies can be proud of, while bringing both a positive image and a successful return on investment.

**Specific product parameters have been suggested:**

- The product should be a one or two serving item.
- The side dish preparation should take few minutes then grilling the entrée.
- Calculate a wholesale price with a 40% markup by Farm Fresh Alternatives, and an additional 30% markup for the retail price. Present your cost analysis to the board.
- Give your recommendations for marketing this product in the west coast.
- Explain wholesale and retail prices, and the amount of profit for both our company and the final retailer.
- Design the product to have less than 500 calories, more than 7 grams of protein, and less than 6 mg of saturated fat.
- Market the product with a healthy image as much as possible.

## Facts about Pasta (taken from the National Pasta Association)

- Carbohydrates like pasta provide glucose, the crucial fuel for your brain and muscles. Pasta is an excellent source of complex carbohydrates, which provide a slow release of energy. Unlike simple sugars that offer a quick, yet fleeting boost of energy, pasta helps sustain energy.
- Pasta is very low in sodium and cholesterol-free. Per cup, enriched varieties provide a good source of several essential nutrients, including iron and several B-vitamins. Whole wheat pasta can provide up to 25% of daily fiber requirements in every one cup portion.
- Enriched pasta is fortified with folic acid – essential for women of child-bearing age. FDA regulations require enriched grain products to contain this essential vitamin. A serving of dry pasta supplies the equivalent of roughly 100 micrograms of folic acid, or 25% of the recommended daily intake. Read more about the importance of folic acid [here](#).
- Pasta is part of a well-balanced diet. Current dietary guidance calls for up to 65% of daily calories to come from carbohydrates.
- It's a fact: reducing calories, not carbohydrates, helps you lose weight. [Studies show](#) there are no significant differences in weight loss over the long term between low-carbohydrate diets and those considered “high” carbohydrate when dieters achieved similar calorie reductions.

Facts about Rice:

**Rice is an excellent food to help keep your body healthy. Rice has the following nutritional benefits:**

Excellent source of carbohydrates

Good energy source

Low fat

Low salt

No cholesterol

Low sugar

No gluten

No additives

No preservatives

**Rice is low in fat, salt and has no cholesterol:**

One cup of cooked rice has about 240 calories. Several types of rice are available including short grain, medium grain, long grain and brown rice. Nutrition experts suggest that we make half our grain choices whole grains. Brown rice is a whole grain product, and it contains just a small amount of fat.

**Rice is gluten free:**

Some people are unable to tolerate the proteins found in wheat, barley, rye, oats. These people choose foods that are gluten free. All rice is gluten free, making rice the essential choice for people with gluten free dietary requirements.

**Rice contains no additives or preservatives:**

Rice contains no additives or preservatives, making it an excellent inclusion in a healthy and balanced diet. Rice also contains resistant starch, which is the starch that reaches the bowel undigested. This encourages the growth of beneficial bacteria, keeping the bowel healthy.

- *Provided by: Dr. Shabbir*



**NORTH DAKOTA FFA  
2011 STATE FOOD SCIENCE OBJECTIVE TEST**

Please complete the scantron sheet provided for the following 50 questions. You must use a **pencil**. Turn in the test with the scantron sheet to the room coordinator. ABSOLUTELY NO WRITTEN TESTS MAY BE TAKEN FROM THE ROOM OR YOU WILL NOT RECEIVE A SCORE

1. A calorie is the amount of energy required to raise \_\_\_\_\_ of water to one degree \_\_\_\_\_.
  - a. 1 ounce, Fahrenheit
  - b. 1 kilogram, Centigrade
  - c. 1 kilogram, Fahrenheit
  - d. 1 gram, Centigrade
  
2. Serving size on nutritional labels must be given in \_\_\_\_\_.
  - a. English measurements
  - b. Common household measurements
  - c. Metric
  - d. All measurers
  
3. The \_\_\_\_\_ on a package of chocolate chip cookies tells the consumer what nutrients are present in the product.
  - a. Food Pyramid
  - b. Nutrition Statement
  - c. Nutrition Facts Panel
  - d. Ingredient Statement
  
4. A solution containing more OH<sup>-</sup> ions than H<sup>+</sup> ions is considered to be \_\_\_\_\_ solution.
  - a. An acidic
  - b. A neutral
  - c. A basic
  - d. A mixed
  
5. Fats and oils are part of a family of compounds called \_\_\_\_\_.
  - a. Lipids
  - b. Proteins
  - c. Fiber
  - d. Carbohydrates
  
6. Safety concerns about food products in metal cans include

- a. Lack of vacuum when can is opened
  - b. Off -odors of food
  - c. Discoloration of food
  - d. All of the above
7. A canning method where uncooked food is placed into a container then filled with boiling water or juiced and closed with a ring band is called \_\_\_\_\_.
- a. Cold pack
  - b. Sulfating
  - c. Carmelization
  - d. Dehydration
8. Bacteria cannot grow in an all \_\_\_\_\_ environment because of the lack of available moisture.
- a. Milk
  - b. Sugar
  - c. Vegetables
  - d. Meat
9. These are chelating agents that combine with iron and copper to remove them from solution.
- a. Preservatives
  - b. Surface Active Agents
  - c. Sequestrates
  - d. Stabalizers
- 10 The food industry is the \_\_\_\_\_ industry in the United States
- a. Number 1
  - b. Number 2
  - c. Number 6
  - d. Number 13
- 11 When glucose reacts chemically with oxygen, water and \_\_\_\_\_ are formed.
- a. Sucrose
  - b. Fructose
  - c. Ethyl alcohol
  - d. Carbon dioxide
12. The pH of a food ingredient, measured on a scale from \_\_\_\_\_, influences the functionality of the ingredient in a food product.
- a. 0-1
  - b. 0-7
  - c. 0-14
  - d. 0-20
13. When a thermometer is used to monitor product internal temperature, it should be \_\_\_\_\_ before it is used to ensure the readings are accurate.

- a. tared
- b. calibrated
- c. cleaned
- d. adjusted

14. \_\_\_\_\_ is the form of carbohydrates that is found in meat.

- a. Glucose
- b. Collagen
- c. Myosin
- d. Glycogen

15. The meat industry is regulated by the \_\_\_\_\_.

- a. United States Department of Agriculture
- b. United States Food and Drug Administration
- c. United States Environmental Protection Agency
- d. Centers for Disease Control and Prevention

16. How often does the federal government revise the Dietary Guidelines for Americans?

- a. Every year
- b. Every other year
- c. Every five years
- d. Every ten years

17. Which of the following are needed to calculate your Body Mass Index

- a. Age
- b. Height
- c. Weight
- d. All of the above

18. Which of these is a chronic disease of the heart and blood vessel system?

- a. Cancer
- b. Cardiovascular diseases
- c. Diabetes
- d. Hypertension

19. In which order must ingredients be listed on a food label?

- a. From most to least in order of weight
- b. From least to most in order of weight
- c. From most to least in order of volume
- d. From least to most in order of volume

20. What substance do potatoes contain which can cause severe reactions in people?

- a. Starch

- b. solanine
- c. alkaloid
- d. mutagen

21. The HA in HACCP stands for \_\_\_\_\_.
- a. handing and
  - b. heating agent
  - c. hazard analysis
  - d. harmful agents
22. Starch is a \_\_\_\_\_.
- a. fat
  - b. mineral
  - c. protein
  - d. carbohydrate
23. Trans fat is made when \_\_\_\_\_ is added to vegetable oil in a process called hydrogenation.
- a. oxygen
  - b. nitrogen
  - c. hydrogen
  - d. sodium
24. Tugor \_\_\_\_\_ when lettuce wilts
- a. increases
  - b. decreases
  - c. stays the same
  - d. is cyclic
25. The sugar \_\_\_\_\_ is sweeter than sucrose
- a. lactose
  - b. fructose
  - c. glucose
  - d. maltose
26. The food pyramid indicates that the \_\_\_\_\_ group is the one you should obtain the most servings each day.
- a. bread
  - b. milk
  - c. fruit
  - d. vegetables
27. Water functions in the body to:
- a. dissolve oxygen



- b. induce glycogen
- c. serve as a medium for chemical reactions
- d. moderate metabolism

28. Starch is a:

- a. carbohydrate
- b. protein
- c. fat
- d. mineral

29. A sticky substance which accumulates on the surface of meat; contains high levels of protein and water and acts as a glue to help bind meat pieces together upon cooking is:

- a. Dextrose
- b. Maltodextrin
- c. Adenosine Triphosphate
- d. Exudate

30. Surface like agents that prevent like particles conglomeration are:

- a. Adenosine triphosphates
- b. Emulsifiers
- c. Pathogens
- d. Cladocerans

31. An apple that has been peeled for processing will turn brown quickly as a result of \_\_\_\_\_.

- a. carmelization
- b. the maillard reaction
- c. enzymatic browning
- d. bruising

32. Based on the principles of HACCP, the presence of a walnut in vanilla ice cream is an example of a \_\_\_\_\_ hazard.

- a. physical
- b. chemical
- c. biological
- d. non existant

33. Which vitamin is commonly added to breads and cereals?

- a. Vitamin A
- b. B Vitamins
- c. Vitamin C
- d. Vitamin D

34. The nutrient that has the most calories is:

- a. fats

- b. vitamins
- c. carbohydrates
- d. proteins

35. Oil floats above water in salad dressings because oil has lower \_\_\_\_\_ than water.
- a. force
  - b. mass
  - c. density
  - d. weight
36. Food components such as fat that do not dissolve in water are considered \_\_\_\_\_.
- a. miscible
  - b. insoluble
  - c. volatile
  - d. miscible
37. Water functions in the body to \_\_\_\_\_.
- a. dissolve oxygen
  - b. serve as a medium for chemical reactions
  - c. induce glycogen
  - d. moderate metabolism
38. Which of the following is not a carbohydrate?
- a. Thrombin
  - b. Starch
  - c. Pectin
  - d. Cellulose
39. An additive that can keep a compound, mixture or solution from changing its form or chemical nature is called a \_\_\_\_\_.
- a. preservative
  - b. antioxidant
  - c. stabilizer
  - d. buffer
40. A market approach where a store loses money on one product to attract customers is a:
- a. sale
  - b. promotion
  - c. mark down
  - d. loss leader
41. The HACCP process uses \_\_\_\_\_ to show the entire food processing operation.
- a. pictures

- b. food processing software
- c. risk assessment
- d. flow charts and diagrams

42. Potato Chips are commonly sealed in packages flushed with pure nitrogen to minimize oxidation that would lead to unpleasant flavors, otherwise known as \_\_\_\_\_.

- a. carmelization
- b. stabilization
- c. rancidity
- d. saturation

43. The primary sugar in milk is \_\_\_\_\_.

- a. Lactose
- b. Leucine
- c. Sucrose
- d. Arginine

44. Flavor is sensed by taste buds which are sensory organs located on parts of the tongue. The taste buds on the sides of the tongue respond to \_\_\_\_\_ flavors

- a. sweet
- b. sour
- c. salty
- d. bitter

45. Microorganisms that cause human disease are known as \_\_\_\_\_.

- a. parasites
- b. pathogens
- c. vegetative cells
- d. spores

46. A food technologist is formulating a low carbohydrate pasta so they need to select a grain source that has the highest amount of protein and lowest amount of carbohydrates. They should use \_\_\_\_\_.

- a. soft wheat
- b. durum
- c. rice
- d. hard wheat

47. When you consume a cracker, the texture that you perceive is the result of several sensations including consistency, mouth feel, and

- \_\_\_\_\_.
- a. sound
  - b. aroma

- c. flavor
  - d. color
48. A bacteria that can contaminate poultry products and cause food borne illness in humans is:
- a. Salmonella
  - b. Gram Positive
  - c. Clostridium
  - d. Lactobacillus
49. \_\_\_\_\_ is a taste component that is best described as savory, pungent, deliciousness, or musty
- a. bitter
  - b. umami
  - c. sour
  - d. sweet
50. As popcorn heats, the \_\_\_\_\_ inside each kernel expands. Pressure builds, causing the corn to pop.
- a. water
  - b. lipid
  - c. protein
  - d. carbohydrate

TURN IN BOTH TEST AND ANSWER SHEET TO ROOM MONITOR

2011 NORTH DAKOTA FFA  
FOOD SCIENCE TEST KEY

1	D	26	A
2	B	27	C
3	C	28	A

4	C
5	A
6	D
7	A
8	B
9	C
10	A
11	D
12	C
13	B
14	D
15	A
16	C
17	D
18	B
19	A
20	B
21	C
22	D
23	C
24	B
25	B

29	D
30	B
31	C
32	B
33	D
34	A
35	C
36	B
37	B
38	A
39	C
40	D
41	D
42	C
43	A
44	B
45	B
46	D
47	A
48	A
49	B
50	A

**2011 North Dakota State Food Science CDE  
Customer Complaint Letter**

June 7, 2011

Valley Vista Bread Company  
200 Grand Junction  
Breadsville, ID

TO WHOM IT CONCERN

Last evening I opened a loaf of your whole wheat bread that I had in the freezer. It is fat free and had an expiration date on the tag of June 9, 2011. I noticed a very strong odor as I took out a slice. The odor smelled like bleach, but I couldn't see anything wrong with the bread or plastic bag. I didn't eat any, but wanted to report the problem. I have been buying this kind of bread, but now I'm afraid that maybe someone has tampered with it and put something in it. Have you had any problems at your bakery?

I have put the bread in the freezer again and will be waiting to hear from you. In this day of terrorism, I become very concerned about our food.

Very Concerned,

Mr. I. Thoreau Knuckleball

## **2011 North Dakota State Food Science CDE Customer Complaint Letter**

Problem 1 – Food Safety

Problem 2 – Chemical

Problem 3 – (to be written in letter form)

- Apologize for the problem
- Recall all of the same product
- Contact Legal Department
- Thanks for bringing to our attention
- Refund money/free vouchers
- Check in-stock inventory to stop further shipments
- Send for/collect product

**INGREDIENT LIST**

<b>Elbow Macaroni Noodle</b>	Semolina Durum Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid.
<b>Penne Noodle</b>	Semolina Durum Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid.
<b>Spaghetti noodle</b>	Semolina Durum Wheat Flour, Niacin, Iron, Thiamine Mononitrate, Riboflavin, Folic Acid.
<b>Long Grain White Rice</b>	Rice, Niacin, Iron, Thiamin, folic acid
<b>Butter</b>	Butterfat, salt
<b>Margerine</b>	Liquid and Partially Hydrogenated Soybean Oil, Water, Buttermilk, Salt, Soy Lecithin, Sodium Benzoate, Vegetable Mono and Diglycerides, Artificial Flavor, Vitamin Palmitate
<b>Green Bell Pepper</b>	Green Bell Pepper
<b>Carrots</b>	Carrot
<b>Baby Corn</b>	Sweet corn, salt
<b>Sweet Onion</b>	Onion
<b>Montreal Chicken Seasoning</b>	Garlic, Salt, Onion, Spices, Orange Peel, Paprika, Green Bell Peppers, And Sulfiting Agents
<b>Garlic and Herb Seasoning</b>	Salt, Onion, Spices, Roasted Garlic, Sunflower Oil, Paprika, Disodium Inosinate And Disodium Guanylate, Annatto, Erythorbic Acid
<b>Montreal Steak Seasoning</b>	Coarse Salt, Spices, Garlic, Sunflower Oil, Natural Flavor, And Extractives Of Paprika