



Food and Fitness Virtual Workshop

Activity Seven:  
**Nutritional  
Challenges**

By Nancy Moreno PhD and  
Paula Cutler, BS  
Baylor College of Medicine



**BioEd Online**

**Virtual Workshop: Food and Fitness (Activity Seven) – Nutritional Challenges**

Activity Seven: Nutritional Challenges, of the instructional unit, Food and Fitness, is an assessment activity during which students learn about eating habits to meet special dietary needs and then design specialized menus, such as those for athletes, diabetics and vegetarians.

Science and health concepts covered in this activity include the following.

- Nutritional requirements vary with body weight, age, gender, activity level and body functioning.
- Diet consists of all the foods that someone eats. Sometimes people must adjust their diets for special health reasons or to meet unusual levels of physical activity.

The complete Food and Fitness Activities Guide for Teachers may be downloaded as a PDF file from the Teacher Resources menu on BioEd Online.  
<http://www.bioedonline.org/resources/nsbri.cfm>

Viewing this presentation fulfills part of the requirements for completing the Virtual Workshop on Energy, Food and Nutrition (“Food and Fitness”), offered for professional development contact hours on BioEd Online.

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organizations.

Center for Educational Outreach, Baylor College of Medicine: <http://www.ccit.bcm.tmc.edu/ceo/>

National Space Biomedical Research Institute: [www.nsbri.org](http://www.nsbri.org)

National Aeronautics and Space Administration: <http://www.nasa.gov>

## Same food choices for everyone?

- Many people follow different eating plans.
  - Health-related reasons (diabetes, lactose intolerance, high blood pressure, overweight)
  - Personal choices (vegetarian diets, ethnic preferences)
  - Special dietary needs (athletic activities, pregnancy, unusual occupations – such as astronaut)



People who exercise have higher caloric needs.



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### Same food choices for everyone?

The Food Pyramid provides approximate guidelines for a healthy diet. However, it is not a rigid prescription. Instead, the Food Pyramid calls for eating a variety of foods to obtain all of the nutrients needed by the body. Recommendations of the Food Pyramid have been adapted in a variety of ways to reflect ethnic preferences, personal beliefs and health needs. This activity allows students to consider the nutritional needs of people with specific dietary requirements and to create a full-day menu for these individuals.

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# Specialty Menus

- Create a one-day eating plan for one of the following.
  - Man with hypertension
  - Strict vegetarian
  - Pregnant woman
  - Lactose intolerant man
  - Girl with type 2 diabetes
  - Athlete in training
  - Astronaut in space
  
- Consider the total number of calories, general recommendations of the Food Pyramid and special needs when creating the diet.

DAY   DATE			WATER: Eight cups (or 8-oz glasses) per day		SERVINGS											
			□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		Breads	Vegetables	Fruits	Dairy	Meat & Beans	Discretionary						
TIME	FOOD ITEM & AMOUNT (List major ingredients for prepared foods.)				CALORIES	G	V	F	O	M	H	M	S	D		
PHYSICAL ACTIVITY					DAILY TOTALS											
					Calories					G V F O M H M S D						



## Specialty Menus

Each group of students will plan menus for all meals in one day for a person with special dietary needs. Activity Seven in the Food and Fitness guide provides information about the nutritional needs of hypothetical people with the following special needs.

•Hypertension (high blood pressure) affects about one in every four Americans. It makes the heart work too hard and increases the risk of heart disease and stroke. It also can cause other problems, such as kidney disease and blindness. People who are overweight or have diabetes are at an increased risk for high blood pressure. In general, people with hypertension should reduce their salt intake and limit consumption of processed foods that contain a lot of salt.

•Vegetarian diets vary from “strict vegetarian,” which excludes all animal-based foods, to ones that include dairy products, eggs or even fish and poultry. The greatest challenges in following a strict vegetarian diet are obtaining sufficient amounts of vitamin B12—which is not naturally present in plants—and all of the amino acids needed by the body to build proteins. Good sources of proteins for vegetarians include beans and nuts.

•Pregnancy places special demands on the body. A healthy diet is important, because everything a pregnant woman eats or drinks contributes to the development of the baby. A pregnant woman needs increased daily servings of proteins and dairy products (calcium sources).

- Lactose intolerance, which is the inability to digest the natural sugar in milk (lactose), is common in adults and is not dangerous. However, people who are lactose intolerant may have digestive system symptoms, such as nausea, cramps, gas and diarrhea, when they eat foods containing milk products. Avoiding milk products or taking an enzyme tablet (such as the commercially available Lactaid) eliminates the discomfort. However, lactose intolerant individuals must make sure they have enough calcium-rich foods in their diets to meet the body's needs. Good non-dairy sources of calcium include enriched soy milk, lactose-reduced milk, fish with soft edible bones (such as sardines) and broccoli.

- Type 2 diabetes is a growing problem among America's youth. According to the National Institutes of Health, type 2 diabetes, once seen only in adults, has been appearing at steadily increasing rates in children. Studies in Cincinnati, Charleston, Los Angeles, San Antonio and other cities indicate that the percentage of children diagnosed with type 2 diabetes has risen from less than 5 percent before 1994 to 30-50 percent in subsequent years. Type 2 diabetes makes it harder for cells in the body to take in glucose, a sugar that circulates in the blood and provides energy to cells. Over time, diabetes can result in damage to the eyes, kidneys, nerves, ear, teeth and gums. In general, persons with diabetes should eat about the same amount of food at the same times each day and avoid sugar, refined carbohydrates (white bread, white rice and potatoes, for example) and fats.

- Athletes, to perform at their best, must have proper nutrition, as well as exercise and practice. In general, an athlete in training has higher caloric needs than non-athletes. In addition, important nutrients must be replenished. Athletes should drink water before, during and after physical activity.

- Astronauts, who must live and work in microgravity conditions, have special nutritional needs. Without the pull of gravity, fluids distribute themselves equally throughout the body, leading to changes in the circulatory system. At the same time, muscles and bones become smaller and weaker because they do not have to work against the pull of gravity. The body uses about the same amount of energy in space as it does on Earth. However, astronauts frequently lose weight for a number of reasons, including the following: boredom with the food provided, busy schedules, poor appetite (fluid shifts in the upper body and head lead to a stuffy nose), difficulty eating in a microgravity environment (food and utensils float), and nausea and motion sickness, which usually is most pronounced during the first days of space flight.

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### **References:**

National Institutes of Health. (2002). Many Obese Youth Have Condition That Precedes Type 2 Diabetes. *NIH News Release, March 13, 2002*. Retrieved July 14, 2004 from <http://www.nih.gov/news/pr/mar2002/nichd-13.htm>