

# Arizona Peace Officer Standards and Training

## Basic Curriculum Lesson Plan

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**LESSON TITLE: PHYSICAL TRAINING - NUTRITION 8.3**

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SUBJECT: Section 8

AZ POST DESIGNATION: 8.3.8

HOURS: 2

INSTRUCTOR TO STUDENT RATIO:

COURSE CONTENT: The course covers the basics of nutrition with a major focus on the six (6) essential nutrients: Carbohydrates, fats, proteins, water, vitamins and minerals.

PERFORMANCE OBJECTIVES: Upon completion of this course of instruction, students using notes, handouts and other support materials as references, within the allotted time, will be able to:

- 8.3.8.1. Name the six (6) essential nutrients in a balanced diet.
- 8.3.8.2. Explain the proper percentages of carbohydrates, protein and fats that one needs in a balanced diet.
- 8.3.8.3. Explain how to reduce fat in one's daily diet.
- 8.3.8.4. Identify the vitamins that contain antioxidant properties.

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**LESSON TITLE: PHYSICAL TRAINING  
NUTRITION**

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DATE FIRST PREPARED:	December 1997	
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REVIEWED – <b>REVISED</b> :	Lt. Angela Kwan, Phoenix P.D.	DATE: February 2004
REVIEWED – <b>REVISED</b> :	Officer Liz Skeenes, Tucson PD	DATE: September 2008
REVIEWED – <b>REVISED</b> :	AZPOST (DocX)	DATE: April 2022
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REVIEWED – REVISED:		DATE:
AZ POST – APPROVAL:	Richard Watling	DATE: September 2008
AZ POST – APPROVAL:	Lori Wait	DATE: April 2020

LIST ANY PREREQUISITES:

LEAD INSTRUCTOR:

BACK-UP INSTRUCTOR(S):

INSTRUCTOR REFERENCES: Physical Fitness Specialist Course Manual compiled by the Cooper Institute of Aerobic Research, Dallas, Texas. Revised 2003.

Fit For Duty by Robert Hoffman and Thomas Collingwood, 2nd Edition, 2005

CLASS LEVEL: Instructor

TRAINING AIDS: Computer-aided slides on PowerPoint software and handouts.

INSTRUCTIONAL STRATEGY: Instructional objectives will be obtained through the use of lecture, reading assignments, instructor demonstration and group participation.

SUCCESS CRITERIA: Success in this functional area will be demonstrated through the attainment of a 100% passing grade on a written objective. The examination consisted of short-answer questions.

COMPUTER FILE NAME: 8.3.8 Sec 8 Nutrition

DATE RELEASED TO THE SHARE FILE: August 2023

**I. INTRODUCTION**

- A. Instructor(s) – (self) introduction.
- B. Preview of performance objectives.

**II. SIX (6) ESSENTIAL NUTRIENTS**

**P. O. 8.3.8.1**

**A. Carbohydrates.**

1. Simple carbohydrates include monosaccharides and disaccharides. (Digest quickly. Do not provide lasting energy.)
  - a. Monosaccharides are glucose, fructose and galactose. (Natural sugar, fruit sugar, milk sugar respectively.)
  - b. Disaccharides are sucrose, lactose and maltose. (Glucose + fructose, galactose, glucose.)
  - c. These are referred to as “empty calories.” (Low nutrient density.)
2. Complex carbohydrates are polysaccharides (starch/glycogen and fiber).
  - a. Complex carbohydrates are a major source of fiber.
  - b. Because fiber is non-digestible, it binds to excess cholesterol, adds bulk to stool and decreases transmit time.
  - c. Low fiber intake is linked to colon/rectal cancer, hemorrhoids and non-insulin dependent diabetes.
  - d. The recommended intake is 25-35 grams per day – the average intake in the United States is only 12 grams per day. (25 minimum in women, 38 minimum in men.)
  - e. Sources include: Bran cereal, plums/prunes, strawberries, legumes and whole wheat grains.
3. Complex carbohydrates include: Breads, cereal grains, legumes, rice, pasta and vegetables. Although fruit contains fructose (a simple sugar), it has a high nutrient density and should be considered a complex carbohydrate. Fiber leads to reduction in heart attacks, diabetes, diverticulitis and cancer of the breast and colon.
4. The primary function of carbohydrates is to provide the body with energy. The nervous system, for example, relies heavily on glucose as a supply of energy. Carbohydrates are

**P. O. 8.3.8.2**

found in two (2) forms within the body.

- a. Glucose – exists in the bloodstream.
- b. Glycogen – exists in the muscle and liver.

5. Carbohydrates should be 50%-60% of one's daily caloric intake.

**P. O. 8.3.8.2**

- a. Most should be in complex form.
- b. Low calorie diets are not recommended in most cases.
  - i. Leads to chronic fatigue.
  - ii. Ketosis – high levels of acidic fluids in the body; considered toxic.
  - iii. Loss of lean muscle mass.
  - iv. Decreased exercise performance.

6. Carbohydrates have four (4) calories per gram and are considered a major source of energy.

**B. Protein.**

**P. O. 8.3.8.1**

- 1. Protein is needed for building, maintaining and repairing tissue. It makes hemoglobin and forms antibodies in the blood. It can also be used for energy when there are no carbohydrates.
- 2. Dietary protein is broken down into amino acids during digestion.
- 3. Amino acids are the "building blocks" of protein. Amino acids are classified as essential and non-essential. Essential amino acids cannot be synthesized by the body, whereas non-essential amino acids can be synthesized by the body. There are nine (9) essential amino acids and eleven non-essential amino acids.
- 4. Complete proteins are foods that contain all of the essential and non-essential amino acids in proper balance. These are mainly foods from animal sources. Examples are meat, fish, poultry, eggs, and milk.
- 5. Incomplete proteins lack one (1) or more amino acids. These are foods from non-animal sources. Incomplete proteins can be combined to form a complete protein. Examples are: Rice and beans, grains and green vegetables, beans and nuts, etc.
- 6. Protein intake should be 12%-15% of one (1) daily caloric intake. (Misconception is that

the average person needs more.)

**P. O. 8.3.8.2**

- a. A high protein diet is not recommended because it has a diuretic effect.
  - b. There is evidence that excessive protein intake can lead to kidney damage.
  - c. Body weight and age determine protein needs.
    - i. Infants need 2.2 grams per kg of bodyweight.
    - ii. Most adults need only 0.8-1.0 grams per kg of body weight.
    - iii. Endurance athletes who train vigorously may require 1.0-1.5 grams per kg of body weight.
    - iv. Strength athletes who train vigorously may require 1.4-1.8 grams per kg of bodyweight.
  - d. Protein can be easily obtained in a balanced diet. Amino acid supplements are costly and are poorly absorbed in the body.
7. Protein has four (4) calories per gram and is not an efficient source of fuel.

**C. Fats.**

**P. O. 8.3.8.1**

1. Also known as lipids; fat has a vital function and is a necessary nutrient.
  - a. Fat is needed for absorption of vitamins A, D, E and K.
  - b. Fat insulates the body against heat loss.
  - c. Fat protects and cushions the internal organs.
2. Excessive dietary fat is associated with cardiovascular disease, breast cancer, colon cancer and diabetes.
3. The body synthesizes some fatty acids, like amino acids; essential fatty acids must be obtained in the diet.
4. Fat should be 20%-30% of the daily caloric intake. **P. O. 8.3.8.2**
  - a. Less than 1/3 from saturated fats, up to 1/3 polyunsaturated fats and the rest, monounsaturated fats.

- b. The average American diet consists of 35% fat.
- 5. Saturated fats are mostly from animal sources.
  - a. Usually solid at room temperature.
  - b. Tends to elevate LDL cholesterol.
  - c. Includes tropical oils such as palm and coconut.
- 6. Monounsaturated fats are mainly from vegetable sources (canola oil, avocados, olive oil and nuts).
  - a. Usually liquid at room temperature.
  - b. Tend to lower LDL cholesterol.
- 7. Polyunsaturated fats are also from vegetable sources.
  - a. Usually liquid at room temperature.
  - b. Tends to lower LDL, but may also lower HDL.
  - c. These include: Corn oil, soybean oil and safflower oil.
  - d. Omega-3 polyunsaturated fats (found in cold water fish) have shown to inhibit blood clot formation and promote dilation of the blood vessels. Also found in milk, canola oil, walnuts, soybeans and wheat germ.
- 8. Trans-fatty acid - Hydrogenated oils – hydrogen atoms are added to monounsaturated and polyunsaturated oils. This process increases shelf life and improves texture. Hydrogenated oils are found in margarine, fried foods and baked goods. They have been shown to increase LDL, therefore, increasing the risk of CHD. No known health benefit.
- 9. Fats are in the form of triglycerides (a combination of three (3) fatty acids and glycerol). Triglycerides are stored in adipose tissue and small amounts are found in the muscle tissue and the bloodstream. Free fatty acids can be found in small amounts in the bloodstream as well.
- 10. Fat has nine (9) calories per gram and can be a major source of energy. It is also the most abundant energy source in the body.
- 11. Reducing fat in the diet.
  - a. To lose weight, one should limit fat intake to 10%-20%.

**P. O. 8.3.8.3**

- b. Select lean cuts of beef and pork; limit serving size.
- c. Read food labels; fat should be 30% or less of the total calories.
- d. Avoid fried foods; opt for grilled, baked or broiled.
- e. Drink non-fat or low fat milk.
- f. Limit the use of: Oils, margarine, butter, creamy dressings, etc.
- g. Remove the skin from poultry before cooking.
- h. Experiment with low-fat products and recipes, but do not over eat these products.

**D. Vitamins.**

**P. O. 8.3.8.1**

- 1. Defined as a class of organic substances.
- 2. The primary function is to regulate numerous and diverse physiological processes in the body:
  - a. Vision.
  - b. DNA formation.
  - c. Bone ossification.
  - d. Metabolism of carbohydrates, fat and protein.
- 3. Vitamins do not contain calories and, therefore, cannot provide energy by themselves.
- 4. Fat-soluble vitamins include: A, D, E and K. They are absorbed in the small intestine in the presence of bile (a fatty substance produced by the liver).
- 5. Vitamin A- assists with vision and formation and maintenance of skin. Carrots, sweet potatoes, liver, butter, margarine.
- 6. Vitamin D- aids in growth and formation of bones and teeth. Fortified milk, liver, tuna, eggs.
- 7. Vitamin E- Protects red blood cells and is antioxidant. Grains, leafy green vegetables, polyunsaturated fats, vegetable oils.

8. Vitamin K- Assists in blood clotting. Liver, wheat bran, peas, soybean oil, potatoes.
9. Water-soluble vitamins include B complex and vitamin C. Excess is secreted in the urine; however, some vitamins can be toxic if taken in large amounts.
10. Vitamin B- 8 of these. They assist in the production, metabolism and utilization of energy. Whole grains, milk, nuts, yogurt, fish, poultry, cheese, lean pork.
11. Vitamin C- Helps hold cells together and strengthen cell walls. Wound healing helps with maintenance of healthy teeth and bones. Also an antioxidant. Citrus fruits, broccoli, strawberries, tomatoes, peppers, dark green vegetables.
12. Many foods today are fortified with vitamins; therefore, vitamin deficiencies are rare in the United States. Those who may need vitamin supplements are:
  - a. Alcoholics.
  - b. Pregnant or lactating women.
  - c. People taking medication(s) or who have diseases that inhibit vitamin absorption.
  - d. Strict vegetarians.
  - e. The elderly.
  - f. Females with severe menstrual loss.
  - g. Individuals on very low calorie diets.
13. Free radicals and antioxidants. **P. O. 8.3.8.4**
  - a. Free radicals are very unstable molecules because they contain an odd number of electrons in their outer shell.
  - b. They are produced from everyday chemical reactions in the body.
  - c. Oxygen is a source of free radicals. In a normal healthy state, the superoxide radicals are neutralized into water.
    - i. When exercising, more oxygen is consumed giving rise to forming more superoxide radicals.
    - ii. A fit person is able to neutralize these free radicals, although over-training can inhibit this ability.



- d. Other sources of free radicals are: Pollution, cigarette smoke and ultraviolet radiation.
- e. Non-neutralized free radicals will seek out tissue to attach to so that it can become stable. This is thought to progress into cancer and cardiovascular disease (CVD).
- f. An antioxidant is a substance which can neutralize free radicals.
- g. Vitamins with antioxidant properties are: Beta carotene, C and E.
- h. Research of antioxidants is still ongoing. Studies show that Beta carotene, C and E are significant in preventing CVD and cancer. The present RDA of these vitamins may be too low; a balanced diet of foods rich in these vitamins is recommended. Do not sacrifice fiber and nutrients by just taking pills.
- i. Other cancer-preventing chemicals in food are: Phytochemicals and bioflavonoids.

**E. Minerals.**

**P. O. 8.3.8.1**

- 1. Defined as inorganic substances that are essential to life processes.
- 2. Major minerals are those that are needed in levels of 100 mg/day. These include: Calcium, phosphorus, magnesium, sodium, potassium and chloride.
- 3. Trace minerals are those needed in lower amounts. These include: Fluorine, chromium, manganese, cobalt, copper, iron, zinc, selenium and iodine.

**F. Water.**

**P. O. 8.3.8.1**

- 1. Water is the major component of plasma.
- 2. Regulates body temperature.
- 3. Controls distribution of solute.
- 4. Body weight is 60%-65% water.
- 5. Sources are from foods and fluids.
- 6. At least sixty-four (64) to 80 ounces of water are needed in a balanced diet More water may be needed during vigorous exercise and hotter climates. Up to two (2) quarts of water an hour can be lost through perspiration during exercise. About one (1) quart per day is lost through the urine.

7. Thirst is not an indicator of water replacement.
8. What you drink today hydrates you for tomorrow.

**III. HOW TO AIM FOR A HEALTHY WEIGHT**

- A. More IN than OUT over time = weight gain/ More OUT than IN over time = weight loss/ Same amount of energy IN and energy OUT = the same weight.
1. Eat less of the simple carbohydrates and more of the complex carbohydrates.
  2. Try to limit protein rich foods to those lower in saturated fats, such as fish, poultry, lean meat and pork.
  3. Choose quality over quantity.
  4. Delay, substitute or avoid.
- B. Portion Control.
1. Meat= 3 ounces or the size of a deck of cards.
  2. Cheese= one ounce or 4 dice.
  3. Medium fruit = .5 cup or size of tennis ball.
  4. Vegetable or legume = .5 cup or size of a racquetball.
  5. Butter – 1 teaspoon or size of the tip of thumb.
  6. Nuts or candy = 1 ounce or small handful.
- C. Advice and information from reputable sources and books.
1. American Dietetic Association.
  2. American Heart Association.
  3. American Medical Association.
  4. American Diabetic Association.
  5. Nancy Clark's Sports Nutrition Guidebook.

6. Textbooks from universities.
- D. Beware of nutritional quackery.
1. Too good to be true.
  2. Exaggerated claims.
  3. Promise of quick results and / or performance.
  4. Cost.
  5. Published research or studies from a reputable medical journal.
  6. Controlled studies or research to support claims.
  7. Testimonials from celebrities or popular athletes.
  8. Secret formulas or ingredients.

**IV. CONCLUSION**

- A. Review of performance objectives.
- B. Final questions and answers.
- C. Instructor closing comment(s).