Sports Performance 15

Unit III: PERFORMANCE ENHANCEMENT

Section 3.1: Basic Nutrition

By Andrew Morgan BPE/BEd

Nutrition

- We cannot underestimate the importance of adequate nutrition in the area of sports performance
- It can often make the difference between success or failure in competition
- Vital to a successful training program

Nutrition

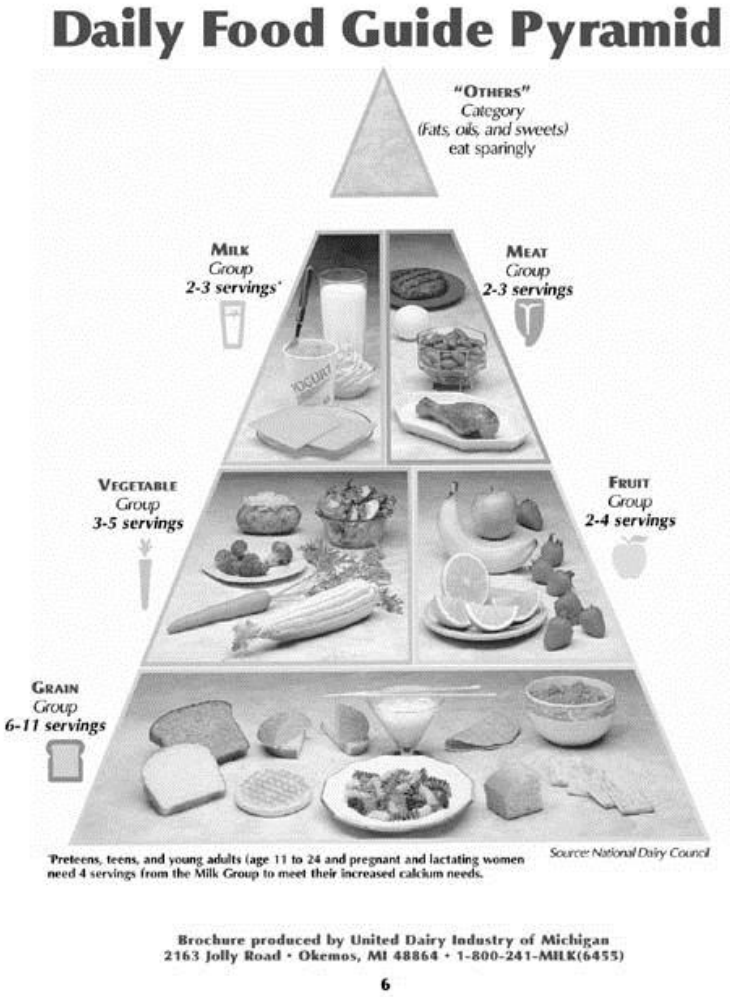
- Many athletes require a strict diet in order to obtain optimal sports performance
- However, for some athletes a regimented diet is necessary for survival, as well as performance.

Nutrition

- **6 classes of nutrients – what makes up our food:**
- Carbohydrates – provide the body with energy
- Protein – builds, repairs and maintains tissue
- Fat – insulates body, cushions and protects vital organs
- Vitamins & Minerals – regulates the release of energy and other aspects of metabolism
- Water – temperature control, circulation and urine production

Nutrition

- **Four food groups:**
- Grain Products (5-12 servings a day): breads, cereals, pasta, rice
- Vegetables and Fruit (5-10 per day): fresh or frozen, juices, salads
- Milk Products (2-4 servings a day): milk, cheese, yogurt
- Meat and Alternatives (2-3 servings a day): chicken, eggs, beans

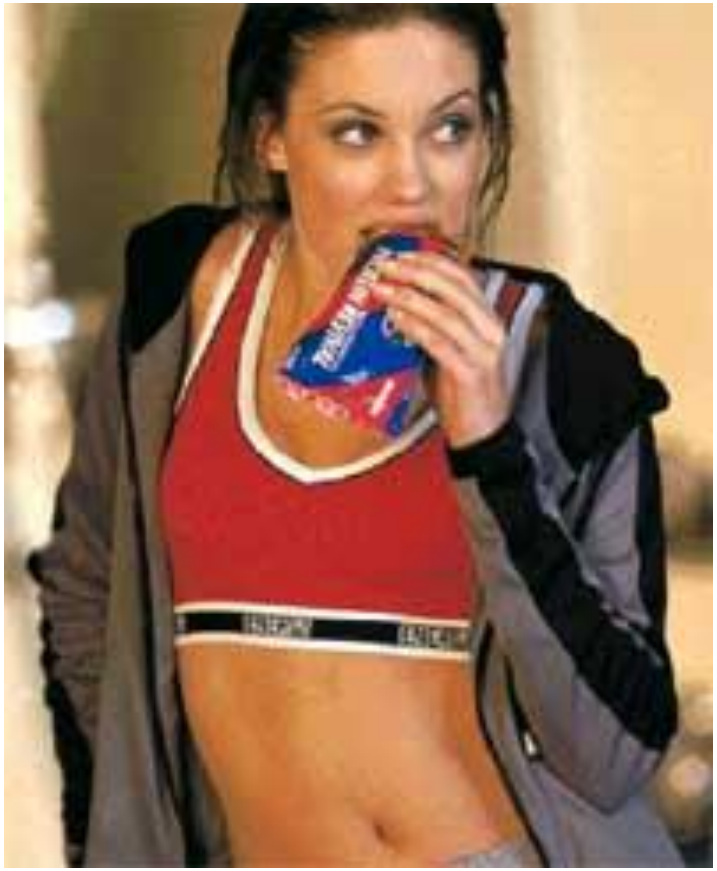


Nutrition

- **5 Components to healthy eating:**
- **Adequacy:** Does your diet provide all the essential nutrients?
- **Balance:** Does your diet over-emphasize any food type or nutrient at the expense of another?
- **Calorie Control:** control over consumption of calories
- **Moderation:** Does your diet contain excess amounts of less healthy nutrients?
- **Variety:** Different foods are used for the same purposes on different occasions

Nutrition

- Differences between **Essential** and **Non – essential** nutrients:
- Essential nutrients – body cannot produce them, therefore we must acquire them through food (example: Vitamin A)
- Non Essential nutrients – nutrients needed by body, but can be synthesized from other nutrients (glucose)

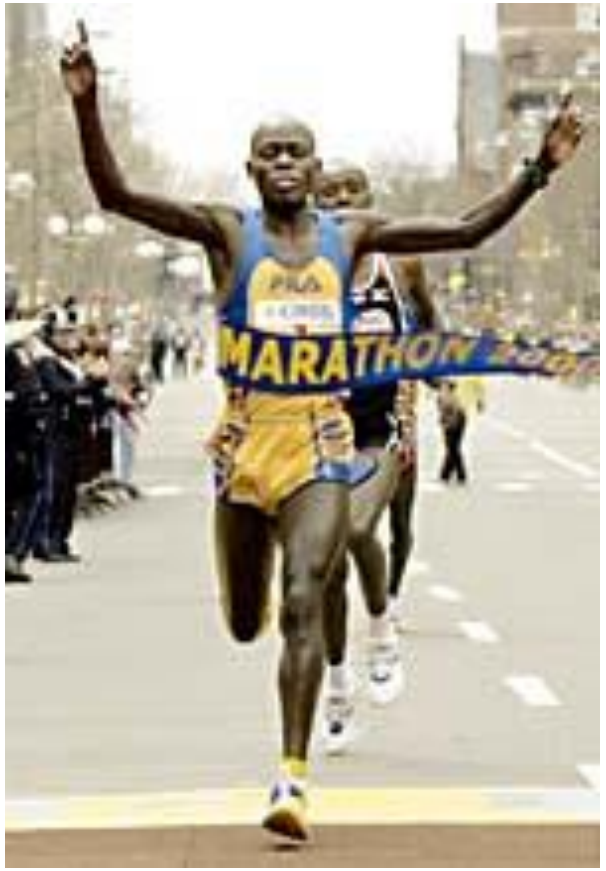


Nutrition - Carbohydrates

- The primary role of CHO's is to provide the body with energy. In addition, for certain body systems, for example the brain and the nervous system, CHO's are the preferred energy source.
- CHO's are the ideal fuel for the body

Nutrition - Carbohydrates

- Why are CHO's so important to athletes?
- CHO foods are needed to refill muscle glycogen stores.
- Muscle glycogen depletion occurs in endurance events and tournament situations
- How much is needed?
- Endurance Athletes: 15 or more servings.
- Minimum servings required for weight monitoring sports (diving, gymnastics)



Nutrition - Protein

- **Protein: facts and myths**
- Protein eaten in excess of need is stored intact in the body, as in fat, so that it can be used when a person's diet falls short of supplying the day's need for essential proteins. FALSE: Protein eaten in excess of need is not stored in the body, as is fat, so it has to be consumed EVERY day if it is not to become depleted.

Mr. Morgan: out of three main nutrients protein gets the most respect: essential for life.

Greek word proteios "of prime importance"

trition - Protein

- It is impossible to consume too much protein. FALSE.
- People who eat no meat have to eat a lot of special foods to get enough protein. FALSE: People who eat no meat can easily get enough protein without eating a lots of special foods (combo of vegetables with obtain 22 essential amino acids to ensure proper protein intake)

Mr. Morgan: high protein diets over a lifetime can cause kidney damage.

Nutrition - Protein

- **Functions of proteins within the body**:
- Growth and Maintenance – provides building materials (AA's) for growth and repair of body tissue.
- Hormones – some proteins act as chemical messengers – regulating body's processes; not all hormones are proteins.
- Fluid Balance – Protein helps regulate the quantity of body fluids in body compartments.
- Acid-Base balance – proteins act as buffers to maintain the normal pH concentrations in body fluids.
- Body structures – Proteins form vital parts of most body structures such as skin, nails, hair, muscles, teeth, bones, organs, ligaments and tendons.
- Energy – Protein can be used to provide calories (4 calories per gram) to help meet the body's energy needs.

Mr. Morgan: 1% of Canadians are vegetarians: approx 300,000

Nutrition - Protein

- What about people who do not eat meat…where do they get their protein from?
- **Vegan** – does not consume any animal foods; very few Canadians are vegans – nutrition problems
- **Semi-vegetarian** – some but not all groups of animal-derived products, such as poultry, seafood, eggs,milk, milk products, included in this diet.

Nutrition - Protein

- **Lacto-vegetarian** – Milk, milk products and eggs included in this diet, but meat, poultry, fish, seafood, and eggs are excluded. Possible limiting nutrient: Iron.
- **Lacto-ovovegetarian** - same as above, with the exception of eggs being included in diet. Possible limiting nutrient: Iron.

Nutrition - Protein

- **Ovovegetarian** – Eggs included in diet. Milk, milk products, meat poultry, fish and seafood excluded. Possible limiting nutrients: Iron, Vit D, calcium, riboflavin
- Strict vegan/vegetarian – all animal derived foods are excluded from diet. Possible limiting nutrients: Iron, Vit D, calcium, riboflavin, Vit B12, high quality protein.
- To get 7 grams of protein found in 1oz of meat you'd have to eat: 1C of broccoli or 1C of brussel sprouts, or 1C of egg noodles, large egg, ¼ C cottage cheese, 1oz of cheddar cheese

Mr. Morgan: Vit D is a unique vitamin related to amt of sunlight. Can be synthesized from compound found in dietary sources, milk,eggs, shellfish.

trition - Fat

- **Why do we need fat?**
- Insulates body
- Cushions and protects vital organs
- Carries and helps absorb fat soluble vitamins
- Synthesizes hormones and cell membranes for healthy skin
- Makes food taste good (fat has a pleasant texture in the mouth)

Nutrition - Fat

- **The functions of fat in foods:**
- Provides calories
- Provide safety by slowing down the rate at which the stomach empties
- Some essential nutrients are soluble in fat and therefore are found mainly in foods that contain it
- These nutrients are the fat soluble vitamins (A,D, E and K). Fat also carries many dissolved compounds and gives foods their aroma and flavor

Nutrition - Fat

- Be ‘fat’ smart:
- **Saturated fats**
- Solid at room temp.
- All animal meats, butter, cheese, coconut oil, cream, whole milk, chocolate
- Raises cholesterol levels

Nutrition - Fat

- **Polyunsaturated fats**
- Liquid at room temp
- Found in vegetable oils, sunflower,corn, and soybean oils. Corn oil can help decrease cholesterol levels when part of a healthy diet

- **Monounsaturated fats**
- Liquid at room temp
- Found in vegetable oils such as olive and canola.
- Can help decrease blood cholesterol levels if part of a lower-fat diet

Nutrition - Fat

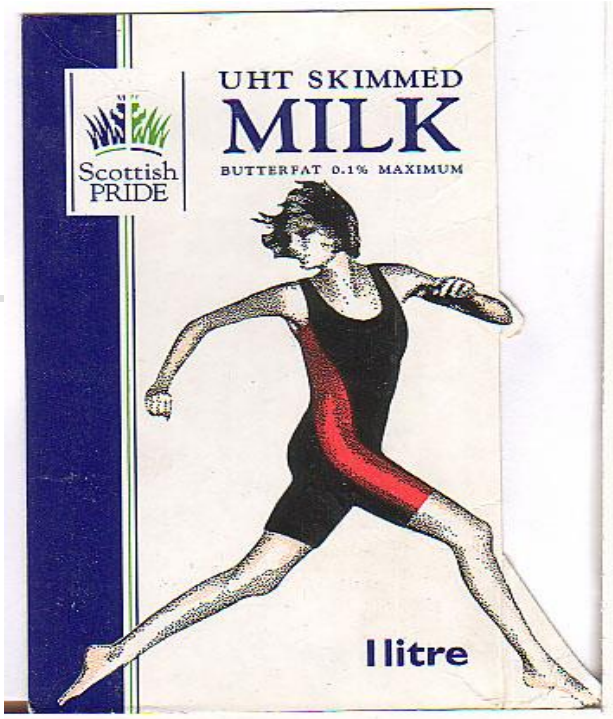
- **Dietary cholesterol**
- Comes only from animal sources such as fat in dairy products, egg yolks, meats, poultry and seafood. Vegetables, fruit and grains do not contain cholesterol

Nutrition - Fat

- Heart Disease – biggest killer in North America
- Risks: men>45, women>55
- High blood cholesterol, smoking, physical inactivity, diabetes, obesity, diet high in total fat and saturated fat
- Males at >risk
- Family history of heart disease before the age of 55
- Circulation disorders of blood vessels to the legs, arms and brain

Nutrition

- **Tips for a helpful eating plan:**
- Lean cut meats, such as loin and round cuts; trim all visible fat. White meat like chicken, turkey, fish is preferable.
- Buy lower-fat versions of dairy products: low fat cheeses, skimmed milk
- For added flavor use herbs and spices in place of high fat flavorings or sauces on vegetables
- Chill soups and stews and skim off the fat that collects on the surface.



Nutrition

- Choose low-fat or non-fat versions of your favorite salad dressings, mayonnaise, yogurt and sour cream.
- Use low-fat or fat free marinades to tenderize and add flavor to leaner cuts of meat.

Nutrition – Vitamins & Minerals

- Vitamins and Minerals play regulatory roles
- They do not supply energy, instead they regulate the release of energy and other aspects of metabolism

Nutrition – Vitamins

Water Soluble Vitamins	Best Sources	Chief Roles
Vitamin C	Citrus fruits, tomatoes, potatoes, dark green veg.	Heals wounds, maintains bones and teeth, increased resistance to infection
Fat soluble vitamins	**Best sources**	**Chief Roles**
Vitamin A	Milk, cheese, spinach, deep orange fruits (apricots and cant.)	Growth and repair of body tissues, immunity
Vitamin D	Self-synthesis with sunlight, milk,fish,liver	Bone and tooth formation, aids absorption of calcium

Nutrition - Minerals

- Minerals play a vital role in maintaining fluid balance in the body
- Major role in healthy functioning of nervous system

Nutrition - Minerals

Minerals	Best Sources	Chief Roles
Calcium	Milk, and milk products, certain green veggies	Principal mineral of bones and teeth, involved in muscle contraction and relaxation
Potassium	Meats, fruit (bananas), grains, legumes, veggies	Facilitates many reactions including protein synthesis, fluid balance, nerve transmission and contraction of muscles

Nutrition - Water

- Provides the medium for life processes.
- Often neglected but equally vital, water is the medium in which all body processes take place.
- 60% of body is water.
- Water carries materials to and from cells and provides the warm, nutrient rich bath in which cells thrive.

- **Functions:**
- Temperature control
- Urine production
- Circulation
- Everyday water is lost to sweat and urine and we must replace it.
- Without water we could only live a few days.

Mr. Morgan: Electrolyte replacement required after 3 hours of exercise! –Sports drink.

trition - Dehydration

- How can you tell if you are dehydrated?
- Monitor how you feel (chronically fatigued, headache, lethargic)
- Monitor amount and color of urine
- Weigh yourself before and after
- Determine amount of sweat you lost and the extent to which you dehydrated yourself
- Balance fluid loss with fluid replacement
- For every pound (lb) you lose, you should drink at least 2 cups of water

Nutrition – Dehydration

% dehydration	Pounds lost for 150lb person	Effect
1%	1.5lbs	Increased body temperature
3%	4.5lbs	Impaired performance
5%	7.5lbs	Heat cramps, chills, nausea, rapid pulse, 20-30% decrease in endurance capacity
6-10%	9-15lbs	Gastrointestinal problems, heat exhaustion, dizziness, dry mouth, headache, fatigue
>10%	>15lbs	Heat stroke, hallucinations, no sweat or urine, swollen tongue, unsteady walk, high body temperature

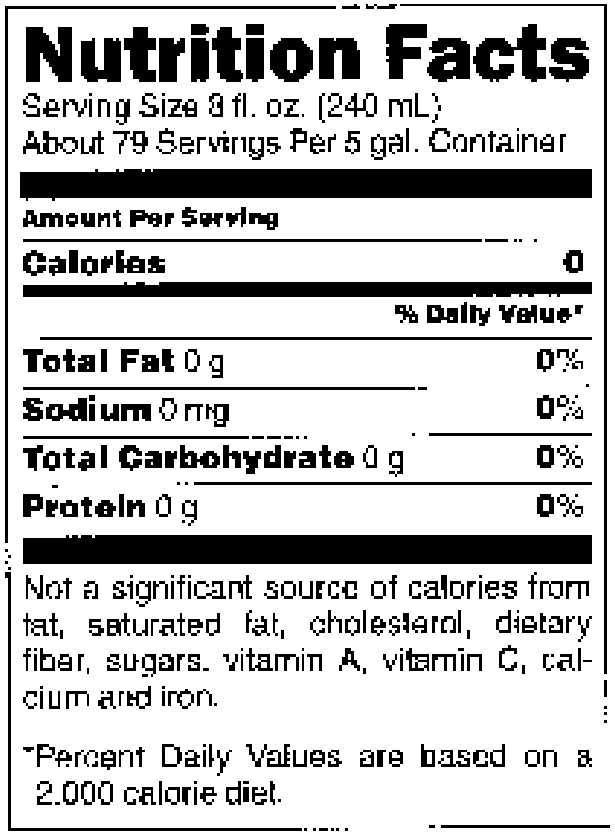
Nutrition – Recommended Fluid Intake before exercise

- 600ml (20oz) 2 hrs before
- 250-500ml (8-16 oz) – 15-30 minutes prior to
- 90 – 150ml (3-5oz) every 15 minutes during
- For exercise lasting less than 3hrs, water is the best replacement
- >3hrs – dilute glucose and electrolyte solutions

Mr. Morgan: 'lite' product info often describes texture or taste not fat content.

trition – The Nutrition label

- **Helps consumers to choose foods for healthy living**
- Label is standardized for nutrient content
- Consists of value for energy, protein, fat and carbs, sometimes contains other dietary info.
- Popular claims and what they mean: '**low**' – very small amount
- '**Less**' used to compare one product to another. (50% less salt will be less than the food it is being compared to. Not necessarily low in salt.
- '**Light or lite**' – what part is light. Not always light in fat.



Nutrition Facts

Serving Size 8 fl. oz. (240 mL)
About 79 Servings Per 5 gal. Container

Amount Per Serving

Calories 0

% Daily Value*

Total Fat 0 g — **0%**
Sodium 0 mg — **0%**
Total Carbohydrate 0 g — **0%**
Protein 0 g — **0%**

Not a significant source of calories from fat, saturated fat, cholesterol, dietary fiber, sugars, vitamin A, vitamin C, calcium and iron.

*Percent Daily Values are based on a 2,000 calorie diet.

Nutrition

- **The importance of teen nutrition**
- **Adolescence is a time of change (12-20 boys, 10-18 in girls)**
- **Time of life where body needs most calories**
- **The individual teenager's energy need is influenced by body size, activity levels and biological factors affecting growth.**

Nutrition – Related Problems of Adolescents

- **Under-nutrition** – irregular meal patterns, substance abuse
- **Obesity** – increased in U.S by 39% among 12 to 17 year olds in last 15 years
- **Iron-deficiency anemia** – below average iron intake
- **Low calcium intake** – compromise peak bone mass development and increase risk of **osteoporosis** later in life
- **High Blood cholesterol levels**
- **Dental problems**
- **Eating Disorders**

Nutrition – RNI (Recommended Nutritional Intake)

- **Calories**: dependant on age, gender, activity level – amount of protein, carbs and fat also dependant on this.
- **Fiber**: 25-35g
- **Calcium**: 1200-1500 mg
- **Iron**: men – 10mg, women – 15mg
- **Cholesterol**: 300mg/day
- **% calories from**: fat 30% (<10% from Sat. fat), protein 15%, carbs 55%

Nutrition – RNI

- **Energy yielding nutrients:**
- CHO: 4 kcal/gram
- Protein: 4 kcal/gram
- Fat: 9 kcal
- Alcohol: 7 kcal

- **Amount guidelines**:
- **1 oz** = 30 grams
- **1 tsp. Of any powder or liquid** = 5g or 5ml
- **1 tbsp. Of any powder or liquid** = 15g or 15ml
- **1 serving of cheese** = 4 dice = 50g
- **1 serving of meat** = deck of cards = 50-100g
- **1 serving of ice cream** = 1 softball = 50g
- **2 servings of pasta or rice** = a regular soup can

Nutrition

- Fad diets, weight loss and eating disorders we will talk about as a class.

Nutrition

- During the next few classes we will be looking at sport drinks and supplements available designed to improve sports performance. Of course the marketing potential for this is huge, and has been exploited in recent years, here are a couple of videos underlining companies' attempts to sell these products to the general public.