Subject: Anthropology

Production of Courseware

-Content for Post Graduate Courses

Paper No. : 09 Physiology and Sports Anthropology

Module : 24 Nutrition, Doping and Performance

Development Team

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Description of Module	
Subject Name	Anthropology
Paper Name	09 Physiology and Sports Anthropology
Module Name/Title	Nutrition, Doping and Performance
Module Id	24

Contents

Learning outcomes:

The student will come to understand and know about the

- general nutrients of diet, nutrition and how it affects performance
- energy requirements of different types of sports
- Doping and its effects
- different types of doping, the different types of stimulants and their effects on sports performance.

1. Introduction

Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity (http://www.who.int/topics/nutrition/en/).

A basic understanding of nutrition and its effect upon health, weight control and physical performance is important for all for all people, including the coach, trainer and athlete. An athlete's performance may be improved with good and balanced nutrition, while at the same time it may deteriorate with poor nutritional practices.

Source: http://www.stonelea.com.au/wellbeing/energy-reload/balance-and-healthy-diet

2. General nutrients of the diet:

a) Carbohydrates: The main function of carbohydrates is to furnish energy to the millions of cells within the human body. Carbohydrates are classified as monosaccharides, disaccharides, or polysaccharides. The most common monasaccharide carbohydrate is glucose which can be oxidized and used directly by the body for energy, or it may be broken down by the digestive system and converted into glycogen (a polysaccharide) and stored in the muscle and liver for later use. However, if it exceeds the storage capacity for glycogen in the muscle and liver, the excess glucose is converted into fat and stored in the fatty adipose tissue of the body. Therefore, if a person is on a high carbohydrate and low fat diet, it is still possible for that person to increase his or her fat level.

b) Fats: Fats have several major functions in the body, such as:- (i) Energy storage which can be used as fuel as the body needs it, (ii) Carrier for soluble vitamins A,D,E and K throughout the body, (iii) as a soft cushion against inside and outside shocks or blows to vital organs such as the heart, lungs, kidneys, liver, spinal cord, etc., (iv) heat insulator to protect body against cold weather and (v) Retarding or depressing hunger pangs. Fat molecule consists of carbon, oxygen and hydrogen. Fats contain lesser oxygen and more carbon and hydrogen than carbohydrates, acts as greater fuel providers but has a greater oxidation cost. Chemically, a fat molecule is made up of fatty acids and glycerol. Fats are stored in the body in the form of triglycerides.

c) Proteins: It contains nitrogen in addition to carbon, oxygen and hydrogen. Proteins are 'building blocks' of tissue, so every cell in the body needs protein. They furnish the basic material for muscular contraction. Proteins are made up of nitrogenous compounds called amino acids which are of 20 different types, of which 8 are essential and are not synthesized within the body. The essential amino acids are obtained directly from the diet are isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine.

d) Vitamins: Vitamins are organic substances that are essential for human life. The living cell cannot manufacture vitamins, so they are to be provided in either the diet or by way of supplements. They are generally classified as either water soluble or fat soluble. The fat soluble vitamins are composed of carbon, hydrogen and oxygen, whereas the water soluble vitamins contain nitrogen, cobalt and sulphur in addition to carbon, hydrogen and oxygen. The fat soluble vitamins can be stored in the body whereas the water soluble vitamins are not capable to be stored in the body.

e) Minerals: Minerals like vitamins provide no energy, however, each mineral have a diverse function which is vital for proper functioning of the body. Minerals are found in bones, teeth, muscles, cells and connective tissue, body fluids and also in vitamins, hormones and enzymes. They make up approximately 4 percent of the body weight. Mineral deficiency can lower an athlete's efficacy. Depleted minerals during exercise can be replaced by diet or through supplementation (Shaver, 1981).

f) Water: Water makes up 40 to 60 percent of the total body weight but not classified as an energy nutrient. The function of water is that it not only provides the medium for all chemical processes to take place in, but it also assist in forming blood plasma, digestion of foods, glandular secretion and in waste elimination.

3. Nutrition and performance

During times of high physical activity, energy and macronutrient needs—especially carbohydrate and protein intake—must be met in order to maintain body weight, replenish glycogen stores, and provide adequate protein for building and repair of tissue. Fat intake should be adequate to provide the essential fatty acids and fat-soluble vitamins, as well as to help provide adequate energy for weight maintenance. Overall, diets should provide moderate amounts of energy from fat (20% to 25% of energy). Body weight and composition can affect exercise performance, but should not be used as the sole criterion for sports performance; daily weighing should be discouraged.

Consuming adequate food and fluid before, during, and after exercise can help maintain blood glucose during exercise, maximize exercise performance, and improve recovery time. Athletes should be well-hydrated before beginning to exercise; athletes should also drink enough fluid during and after exercise to balance fluid losses. Consumption of sport drinks containing carbohydrates and electrolytes during exercise will provide fuel for the muscles, help maintain blood glucose and the thirst mechanism, and decrease the risk of dehydration or hyponatremia. Athletes will not need vitamin and mineral supplements if adequate energy to maintain body weight is consumed from a variety of foods. However, supplements may be required by athletes who restrict energy intake, use severe weight-loss practices, eliminate one or more food groups from their diet, or consume high-carbohydrate diets with low micronutrient density. Nutritional ergogenic aids should be used with caution, and only after careful evaluation of the product for safety, efficacy, potency, and whether or not it is a banned or illegal substance. Nutrition advice, by a qualified nutrition expert, should only be provided after carefully reviewing the athlete's health, diet, supplement and drug use, and energy requirements.

Research has clearly documented the beneficial effects of nutrition on exercise performance. There is no doubt that what an athlete eats and drinks can affect health, body weight and composition, substrate availability during exercise, recovery time after exercise, and, ultimately, exercise performance.

As the research and interest in sport nutrition has increased, so has the sale of ergogenic aids, supplements, herbal preparations, and diet aids, all aimed at improving sports performance.

The manufacturers of these products frequently make unsubstantiated claims to entice the athlete to use their products. The athlete who wants to optimize exercise performance needs to follow good nutrition and hydration practices, use supplements and ergogenic aids carefully, minimize severe weight loss practices, and eat a variety of foods in adequate amounts. This position is focused on adult athletes, rather than children or adolescents, and does not focus on any particular type of athlete or athletic event. Moreover, the position is intended to provide guidance to dietetics and health professionals working with athletes, and is not directed to individual athletes themselves.

Source: http://dnaperformancenutrition.com/

Source: http://elitenutritionandperformance.com/fitness/small-group-training/

4. Energy requirements

Meeting energy needs is the first nutrition priority for athletes. Achieving energy balance is essential for the maintenance of lean tissue mass, immune and reproductive function, and optimum athletic performance. Energy balance is defined as a state when energy intake (the sum of energy from food, fluids, and supplement products) equals energy expenditure (the sum of energy expended as basal metabolism, the thermic effect of food, and any voluntary physical activity) (Swinburn & Ravussin, 1993). Inadequate energy intake relative to energy expenditure compromises performance and the benefits associated with training. With limited energy intake, fat and lean tissue mass will be used by the body for fuel. Loss of muscle results in the loss of strength and endurance. In addition, chronically low energy intake often results in poor nutrient intake, particularly of the micronutrients.

In the 1989 Recommended Dietary Allowances (RDAs) (National Research Council, 1989), mean energy requirements for women and men who are slightly to moderately active and between 19 to 50 yr of age were established as 2,200 and 2,900 kcal per day, respectively. Expressed alternatively, normally active people are counseled to consume an energy intake of 1.5 to 1.7 times resting energy expenditure or at a rate of 37 to 41 kcal/kg body weight per day (National Research Council, 1989). Energy expenditure is influenced by heredity, age, sex, body size, fat-free mass, and the intensity, frequency, and duration of exercise. For athletes, the recommendation is made to evaluate the kind of exercise performed for its intensity, frequency, and duration, and then to add this increment to the energy needed for normal daily activity (109,97,59). For example, a 70 kg male runner who runs 10 miles per day at a 6-min pace would require approximately 1,063 kcal per day to cover the energy expenditure of running (0.253 kcal·min-1/kg) (Katch & McArdle, 1993), plus the energy cost of normal daily activities (70 kg 337 to 41 kcal/kg body weight) for normal activity. Thus, this athlete would need approximately 3,653 to 3,933 kcal per day to cover the total cost of energy expenditure. Ultimately, however, numeric guidelines for energy intake, such as those cited above, can only provide a crude approximation of the average energy needs of an individual athlete. Any athlete needs to consume enough energy to maintain appropriate weight and body composition while training for a sport. Usual energy intakes for male endurance athletes range from 3,000 to 5,000 kcal per day (Grandjean, 1997). Although usual energy intakes for many intensely training female athletes may match those of male athletes per kg of body weight, some consume less energy than they expend. This low-energy intake can lead to weight loss and disruption of reproductive function, and is often seen with energy intakes of less than 1,800 to 2,000 kcal per day (Katch & McArdle, 1993; Grandjean, 1997; Jonnalagadda et al., 1998; Manore, 1999).

Although resistance exercise usually requires less energy than endurance exercise, the total energy needs of athletes participating in strength training and bodybuilding may be as high as those of endurance athletes because of their increased body size and high levels of fat-free mass. In circumstances in which an increase in lean body mass is the goal, energy intake must be sufficient to meet the needs for muscle growth. Thus, many strength athletes may need 44 to 50 kcal/kg body weight/d, and those in serious training may have even higher energy requirements (more than 50 kcal/kg body weight/d) (Kleiner et al., 1989; Manore et al., 1993).

The American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine stated that physical activity, athletic performance, and recovery from exercise are enhanced by optimal nutrition. These organizations recommend appropriate selection of food and fluids, timing of intake, and supplement choices for optimal health and exercise performance.

The following key points summarize the current energy, nutrient, and fluid recommendations for active adults and competitive athletes noted in this position paper. Sport nutrition experts can further adjust these general recommendations to accommodate the unique concerns of individual athletes regarding health, sports, nutrient needs, food preferences, and body weight and body composition goals.

During times of high-intensity training, adequate energy needs to be consumed to maintain body weight, maximize the training effects, and maintain health. Low-energy intakes can result in loss of muscle mass, menstrual dysfunction, loss or failure to gain bone density, and increased risk of fatigue, injury, and illness.

Body weight and composition can affect exercise performance but should not be used as the sole criterion for participation in sports; daily weigh-ins are discouraged. Optimal body-fat levels vary depending upon the sex, age, and heredity of the athlete, as well as the sport itself. Body-fat assessment techniques have inherent variability, thus limiting the precision with which they can be interpreted. If weight loss (fat loss) is desired, it should start early—before the competitive season—and involve a trained health and nutrition professional.

Carbohydrates are important to maintain blood-glucose levels during exercise and to replace muscle glycogen. Recommendations for athletes range from 6 to 10 g/kg body weight per day. The amount required depends upon the athlete’s total daily energy expenditure, type of sport performed, gender, and environmental conditions.

Protein requirements are slightly increased in highly active people. Protein recommendations for endurance athletes are 1.2 to 1.4 g/kg body weight per day, whereas those for resistance and strength-trained athletes may be as high as 1.6 to 1.7 g/kg body weight per day. These recommended protein intakes can generally be met through diet alone, without the use of protein or amino acid supplements, if energy intake is adequate to maintain body weight.

Fat intake should not be restricted, because there is no performance benefit in consuming a diet with less than 15% of energy from fat, compared with 20% to 25% of energy from fat. Fat is important in the diets of athletes as it provides energy, fat-soluble vitamins, and essential fatty acids. Additionally, there is no scientific basis on which to recommend high-fat diets to athletes.

The athletes at greatest risk of micronutrient deficiencies are those who restrict energy intake or use severe weight-loss practices, eliminate one or more food groups from their diet, or consume high-carbohydrate diets with low micronutrient density. Athletes should strive to consume diets that provide at least the RDAs/DRIs for all micronutrients from food.

Dehydration decreases exercise performance; thus, adequate fluid before, during, and after exercise is necessary for health and optimal performance. Athletes should drink enough fluid to balance their fluid losses. Two hours before exercise 400 to 600 ml (14 to 22 oz) of fluid should be consumed, and during exercise 150 to 350 ml (6 to 12 oz) of fluid should be consumed every 15 to 20 min depending on tolerance. After exercise the athlete should drink adequate fluids to replace sweat losses during exercise. The athlete needs to drink at least 450 to 675 ml (16 to 24 oz) of fluid for every pound (0.5 kg) of body weight lost during exercise.

Before exercise, a meal or snack should provide sufficient fluid to maintain hydration, be relatively low in fat and fiber to facilitate gastric emptying and minimize gastrointestinal distress, be relatively high in carbohydrate to maximize maintenance of blood glucose, be moderate in protein, and be composed of foods familiar and well tolerated by the athlete.

During exercise, the primary goals for nutrient consumption are to replace fluid losses and provide carbohydrate (approximately 30 to 60 g per h) for the maintenance of blood glucose levels. These nutrition guidelines are especially important for endurance events lasting longer than an h, when the athlete has not consumed adequate food or fluid before exercise, or if the athlete is exercising in an extreme environment (heat, cold, or altitude).

After exercise, the dietary goal is to provide adequate energy and carbohydrates to replace muscle glycogen and to ensure rapid recovery. If an athlete is glycogen-depleted after exercise, a carbohydrate intake of 1.5 g/kg body weight during the first 30 min and again every 2 h for 4 to 6 h will be adequate to replace glycogen stores. Protein consumed after exercise will provide amino acids for the building and repair of muscle tissue. Therefore, athletes should consume a mixed meal providing carbohydrates, protein, and fat soon after a strenuous competition or training session.

In general, no vitamin and mineral supplements should be required if an athlete is consuming adequate energy from a variety of foods to maintain body weight. Supplementation recommendations unrelated to exercise—such as folic acid in women of childbearing potential—should be followed. If an athlete is dieting, eliminating foods or food groups, is sick or recovering from injury, or has a specific micronutrient deficiency, a multivitamin/mineral supplement may be appropriate. No single nutrient supplements should be used without a specific medical or nutritional reason (e.g., iron supplements to reverse iron deficiency anemia).

Athletes should be counseled regarding the use of ergogenic aids, which should be used with caution and only after careful evaluation of the product for safety, efficacy, potency, and legality.

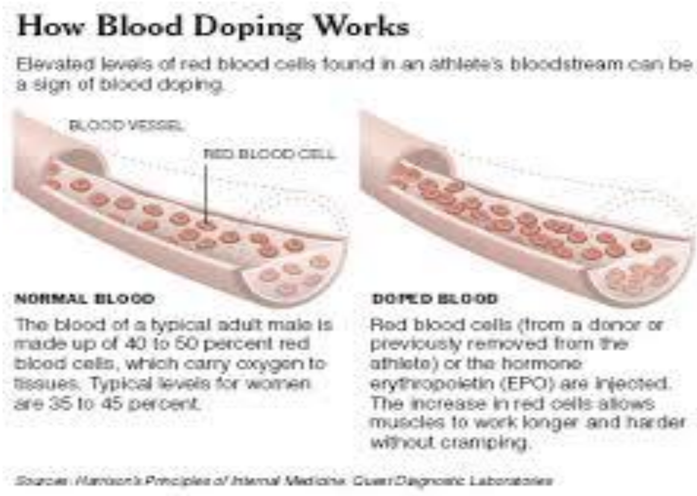
Vegetarian athletes may be at risk for low energy, protein, and micronutrient intakes because of high intakes of low- energy– dense foods and the elimination of meat and dairy from the diet. Consultation with a registered dietitian will help to avoid these nutrition problems.

5. Doping and performance

Doping is the use of performance enhancing drugs in sports. The use of these drugs is mostly done to improve athletic performance. The use of drugs to enhance physical performance has been observed for thousands of years. The goal of the user most often was to increase strength or overcome fatigue. Today we classify such drugs as anabolics and stimulants. A number of performance-enhancing drugs, including anabolic steroids, are not euphorigenic or mood altering immediately following administration. Instead, the appetite for these drugs was created predominantly by our societal fixation on winning and physical appearance. The word doping had become part of the English language in 1933 (Prokop, 1970). While Rieser and others continued to speak out against doping, it was not until 1967 that the International Olympic Committee (IOC) voted to adopt a drug-testing policy banning the use of specific drugs (Todd & Todd, 2001).

Children play games for fun, but society preaches the importance of winning- seemingly, at an increasingly younger age. Ours is a culture that thrives on competition both in business and in sport. However, we long ago realized that competition of all types must exist within some boundaries. In fact, sport itself is defined by boundaries, i.e. rules. A primary goal of competition is to win or be the very best in any endeavour. Philosophically, many in our society appear to have taken a `bottom-line' attitude and consider winning to be the only truly worthwhile goal of competition. If we accept this philosophy, then it becomes easy to justify, or be led to the belief, that one should win at any cost. At that point doping becomes a very rational behaviour, with the end (winning) justifying the means (use of AAS and other drugs).

This `win at any cost/winner take all' philosophy is not new. It dates back to the ancient Greek Olympics. In addition, a number of professional wrestlers such as Hulk Hogan and `Stone Cold' Steve Austin as well as some elite athletes, such as professional baseball player Mark McGwire, are admired in part for their larger-than-life muscularity. Anabolic steroid use among professional wrestlers, including Hulk Hogan, was given national attention during a steroid trafficking trial in 1991.



Source: http://www.diabloclinical.com/tag/blood-doping/

6. Types of Doping

6.1 Blood doping: It is defined by World Anti-Doping Agency (WADA) as the misuse of techniques or substances to increase one's RBC count. This is done because RBCs help to carry oxygen to the muscles and therefore increase stamina and performance. Blood doping started in 1970 and was not outlawed till 1986. Blood doping was banned by International Olympic Committee (IOC) in 1985.

a. Autologous blood doping: Most commonly this involves the removal of two units of the athlete's blood several weeks prior to competition which is frozen and stored. A day or two before the big event, the stored blood is thawed and re-injected into the athlete's system.

b. Allogenic/homologous blood doping: It is the process of injection of fresh blood removed from a second person into the athlete's system.

c. Use of Haemoglobin based Oxygen carriers(HBOCs): Haemoglobin is the protein contained in RBCs that loads oxygen in the lungs and delivers it to the tissues. This has been developed for therapeutic use, however it is now being misused as performance enhancers.

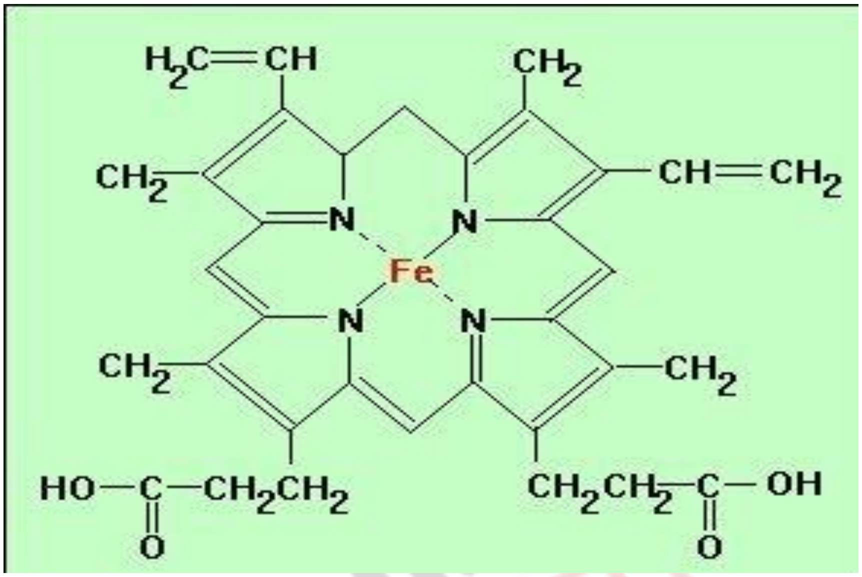


Figure 1: Haemoglobin Structure

Source: http://www.diatronic.co.uk/nds/webpub/haemoglobin_structure.htm

6.1.1 Effects on performance

Blood doping is most commonly used by endurance athletes such as distance runners, skiers and cyclists. By increasing the number of RBCs in the blood, higher volumes of the protein haemoglobin (Hb) are present. Hb can bind and carries oxygen from the lungs to the muscles where it can be used for aerobic respiration. Blood doping therefore allow extra oxygen to be transported to the working muscles, resulting in a higher level of performance, without the use of anaerobic energy systems.

6.1.2 Side effects of blood doping:

- Leads to increased blood viscosity.
- Increased chances of myocardial infarction.
- Increased risk of pulmonary embolism i.e. a blockage which can be fat or a blood clot in the pulmonary system.
- Increased risk of cerebral embolism, i.e. a blockage formed in the body which becomes lodged in an artery within or leading to the brain.
- Can lead to cerebrovascular accident.

- Have more chances of infections.

In addition to the above, athletes undergoing hologous blood transfusions are prone to further side effects:

- ✓ Allergic reactions
- ✓ Risk of contacting blood borne diseases like Hepatitis C, B, and HIV.

6.2 Stimulants

Continuing the practices of their nineteenth century counterparts, athletes during the first three decades of the twentieth century used a variety of substances (alcohol, cocaine, strychnine, caffeine and nitroglycerine) for their purported 'stimulant' effects (Boje, 1939; Prokop, 1970; Jokl, 1968). Noticeably absent from this doping menu is any mention of the use of amphetamines, even though they were first synthesized in 1887 (Hart & Wallace, 1975). In the 1920s and 1930s other derivatives of amphetamines were synthesized. However, it was not until the mid-1930s that amphetamines were identified as a central nervous system stimulant, and in 1937 they became available as a prescription tablet (Ray & Ksir, 1996).

The first systematic use of amphetamines as an ergogenic aid is seen during World War II, when both Axis and Allied powers used these drugs to combat fatigue and improve endurance. The British army used amphetamines when men 'were markedly fatigued physically or mentally and circumstances demanded a particular effort' (Robson, 1999: 99). According to a report in the Air Surgeon's Bulletin (1944: 20), 'one pill (Benzedrine) may be worth a Flying Fortress when the man who is flying it can no longer stay awake'. Going beyond staving off fatigue, the Japanese were said to have used heavy doses of amphetamines to arouse or 'psych up' their kamikaze pilots in preparation for their suicide missions (Scott, 1971). Similarly Mandell (1981) suggested that amphetamines could be used by soldiers to create a sense of fearlessness.

6.2.1 Effects on performance: Amphetamines are stimulants which act on the Central Nervous System (CNS) to delay fatigue and increase alertness. They are also capable of increasing a person’s speed, power, endurance and concentration.

Source: http://muhc.ca/newsroom/news/adolescent-amphetamine-use-linked-permanent-changes-brain-function-and-behaviour

6.2.2 Side effects: Use of amphetamines is associated with addiction. Athletes can become dependent on the drug resulting in long term use and higher risk of more severe side effects. Short term use can produce the following side effects:

- Cerebral haemmorhage.
- Confusion, psychological disorder, delirium.
- Hypertension
- Angina
- Vomiting
- Abdominal pain
- Irritability and restlessness
- Insomnia
- Dizziness
- Tremors of the body

6.3 Anabolic steroids: It is sometimes known as anabolic androgenic steroids (AAS), which are derived from the hormone testosterone. Steroids are most commonly used by athletes involved in power sports like weight lifting, throwing and sprinting events. Field sports such as football and rugby also demonstrate a high incidence of use as in body building. In the mid-1920s, serious concern arose in the medical community regarding these overt claims of rejuvenation (Fishbein, 1925). As a result an international committee was appointed to evaluate these claims and concluded that they were unfounded (Parkes, 1985; 1988). The practice disappeared by 1935 when scientists isolated, chemically characterized, and synthesized the hormone testosterone and elucidated the basic nature of its anabolic effects (Kochakian & Murlin, 1935). Shortly thereafter, both oral and injectable preparations of testosterone were available to the medical community. While there is no record of systematic use of testicular transplants or the injection of testicular extracts by athletes, these procedures likely helped lay the foundation for the subsequent use of testosterone as an ergogenic aid.

It has been rumored that some German athletes were given testosterone in preparation for the 1936 Berlin Olympics (Francis, 1990). Wade (1972) has alleged that during World War II, German soldiers took steroids before battle to enhance aggressiveness. This assertion, although often cited, has yet to be documented, in spite of efforts in this regard. Furthermore, the Nazis were opposed to organism-altering drugs in general (Hoberman, 1992a; 1992b). There was a concerted campaign against the 'poisons' alcohol and tobacco, and the Nazis were not particularly interested in the popular gland transplant techniques of that period, since their idea of race improvement was genetic (Hoberman, 1992; 1992b).

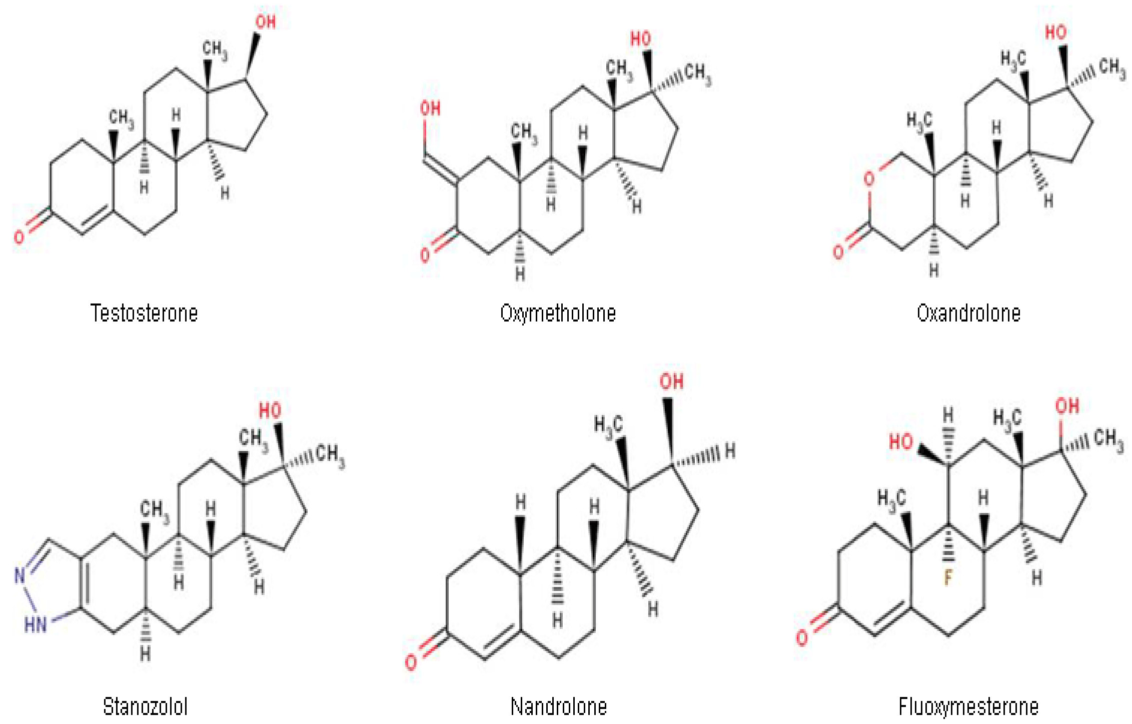


Figure 2: Structure of Testosterone & some Anabolic Androgenic Steroids

Source: https://online.epocrates.com/u/2921987/Anabolic+steroid+abuse/Basics/Definition

6.3.1 Effects on performance

The perceived benefits include:

- Increased muscle bulk
- Increased muscle strength
- Faster muscle recovery
- Reduced muscle catabolism

6.3.2 Side Effects:

- Increased aggressiveness, irritability and mood swing
- Liver disorder

- Hypertension
- Baldness
- Raised cholesterol level
- Development of over sized mammary glands in males (gyneocomastia)
- Menstrual irregularities among female users
- Reduced immunity
- Possible development of tumors
- Decreased sperm production in males
- Excessive facial hair growth occurring in females which follow the pattern of male hair growth (hirsuitism)

Summary

Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. A basic understanding of nutrition and its effect upon health, weight control and physical performance is important for all for all people, including the coach, trainer and athlete. An athlete's performance may be improved with good and balanced nutrition. Meeting energy needs is the first nutrition priority for athletes. Achieving energy balance is essential for the maintenance of lean tissue mass, immune and reproductive function, and optimum athletic performance.

Before exercise, a meal or snack should provide sufficient fluid to maintain hydration, be relatively low in fat and fiber to facilitate gastric emptying and minimize gastrointestinal distress, be relatively high in carbohydrate to maximize maintenance of blood glucose, be moderate in protein, and be composed of foods familiar and well tolerated by the athlete. During exercise, the primary goals for nutrient consumption are to replace fluid losses and provide carbohydrate (approximately 30 to 60 g per h) for the maintenance of blood glucose levels. After exercise, the dietary goal is to provide adequate energy and carbohydrates to replace muscle glycogen and to ensure rapid recovery. Athletes should be counseled regarding the use of ergogenic aids, which should be used with caution and only after careful evaluation of the product for safety, efficacy, potency, and legality.

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Blood doping is defined by World Anti-Doping Agency (WADA) as the misuse of techniques or substances to increase one's RBC count. This is done because RBCs help to carry oxygen to the muscles and therefore increase stamina and performance. Blood doping started in 1970 and was not outlawed till 1986. Blood doping was banned by International Olympic Committee (IOC) in 1985. Another type of performance enhancing drugs are amphetamines or stimulants which were actually used due to their ability to combat fatigue and improve endurance. Anabolic steroids, which are sometimes known as anabolic androgenic steroids (AAS), derived from the hormone testosterone. Steroids are most commonly used by athletes involved in power sports like weight lifting, throwing and sprinting events. Field sports such as football and rugby also demonstrate a high incidence of use as in body building. However, the short term benefits of such drugs can not hide their harmful effects which in the long run may even be fatal to the user.