

Influence of Nutritional and Exercise Factors on the optimal Body Characteristics in Females

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In our body-conscious era, women struggle to attain the perfect body. Sometimes they can retreat to unconventional methods to achieve that. But it is proper nutrition, which is about 75% responsible for the way the body looks. The remainder is facilitated by weight training and cardiovascular exercise. Physical exercise, undoubtedly, plays a pivotal role in the maintenance and achievement of desirable optimal body characteristics. This review intends to focus on these two important issues.

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Women want to be thin. For some, the attack on fat has become a full-fledged war. Looking for fast ways to lose fat, women subscribe to many forms of physical torture. They will eat cabbage soup for days, eat only grapefruit or sometimes do the worst thing of all- they stop eating altogether¹. Health and fitness are completely disregarded in the quest for losing weight. Women need to make a lifestyle change in order to meet this goal. This means being aware of nutritional content, knowing the body's reaction to different energy sources and making exercise a part of our daily ritual². With all the latest weight-loss gimmicks being presented, it's easy to be led astray by false promises, profitable schemes, unhealthy practices and ultimately reaping no benefits¹. A clean, healthy diet along with consistent cardiovascular exercise and an effective training program is the philosophy behind permanent weight loss and fitness². This article is a review on proper nutrition along with weight and aerobic training which will lead to the perfect bodyshape.

Macronutrients

Food represents nutrients essential for maintaining optimal health and top performance. There are three types of macronutrients: carbohydrates, fat, and protein³. To develop a food plan, an understanding of these macronutrients is essential. The ideal lies in finding a ratio among the three that supplies the body's energy needs and produces an aesthetically pleasing body that is fit and healthy⁴.

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Carbohydrates

Carbohydrates are the macronutrients involved in sustaining energy and life. They are broken down to produce simple sugars, which can be utilized by the body as an efficient energy source⁵(Fig 1). The energy yield from one gram of carbohydrate is four calories³. Carbohydrates are stored in cells of the liver and muscles as glycogen (a mass of glucose units linked together⁵).

Figure 1. Basic plan for the utilization of carbohydrate and fat

Carbohydrates may be considered under simple sugars or complex carbohydrates and the importance of this division is related to the timed release of sugars into the bloodstream, which cause a surge in insulin³. Simple carbohydrates would include table sugar, honey, syrup, jelly, white flour, etc. Complex carbohydrates would include vegetables, pasta, brown rice, beans, whole-wheat bread, etc.

Originally intended and created for diabetics to help them manage and adjust insulin injections, the glycemic index (GI) is a scale that measures the speed at which 100grams of carbohydrates enter the blood as sugar⁶. The index assigns numbers to all varieties of carbohydrate foods, comparing the variable speeds at which they are ultimately absorbed⁶. The theory behind the index is that foods with a high glycemic index cause a rapid increase in blood sugar, while foods with a lower index increase blood sugar more slowly⁵. Substances with a high glycemic index also cause a marked increase in insulin. Insulin moves sugar from the blood-stream into the cells and increases the rate at which our body adds fat to adipose tissue⁵. Also, a high insulin reaction will cause an initial “sugar high”, but subsequently will result in earlier onset of hypoglycemia⁵. High GI numbers can however be radically skewed and significantly lowered when food is combined with protein, fat or fiber⁷.

Conclusively, it is essential to keep the blood sugar levels stable to avoid the fat-promoting effects of insulin. This can be achieved by eating complex carbohydrates and avoiding the refined, simple sugars. Nutritionists recommend getting at least 55% of the daily calories from carbohydrates⁸.

Protein and its effect on the Body

Protein is the lifeblood of tissue. It is responsible for cellular division and production, the regeneration of cells and functions, is linked with metabolic function and sustaining our daily lives⁴. One gram of protein provides four calories. Good sources of lean protein are chicken breast, turkey, egg whites, tuna, fish, beans, tofu, etc⁹. Humans do not store excess protein as protein, so we need to consume adequate protein daily. This is particularly important for active people who are restricting calories, because protein is burned for energy when carbohydrates are scarce³. Individuals have a range of protein needs, the following are some safe and adequate recommendations for protein intake (Lemon 1995; Lemon et al. 1992; Walberg et al. 1988):

Grams of protein per lb. of body weight

Current RDA for sedentary adult	0.4
Recreational exercisers, adult	0.5-0.75
Competitive athlete, adult	0.6-0.9
Growing teenager	0.8-0.9
Athlete restricting calories	0.8-0.9

Peter Lemon Ph.D., the noted protein researcher, from University of Western Ontario, suggests that protein intake should be increased during dieting, because some of the protein will be used as energy, which means less remains to either build or hold on to muscle^{6,8}. Protein is satisfying and slimming (Fig 2). It provides fewer net calories than carbohydrates, because energy must be expended to deal with its byproducts. Therefore, it has a thermogenic effect (calories lost as heat)⁸. Protein is used for growth and repair, because of that, it is less likely to be turned into body fat⁸.

Figure 2. Protein metabolism

Fat

Fat consists of a heterogeneous collection of fatty acids and the major distinction among them is the degree of saturation. Saturation refers to the amount of hydrogen atoms that are attached to the carbon chain. So if the maximum bonds are found, then it is saturated and if the least amount is found, then it is unsaturated¹⁰. Saturated fats include animal fat,

butter, lard, coconut oil, palm oil, etc. Monounsaturated fats include olive oil, canola, peanut, sunflower oil, safflower oil, etc³. All fats are not created equal. Saturated fats possess the ability to raise the cholesterol level and polyunsaturated fats will lower it. Fats are essential to our diet. Our bodies need fat in order to maintain healthy skin, hair and nails, and keep our internal organs in good condition, along with production of hormones⁴. Another function of fat is as a source of energy, being very calorically rich with nine calories per gram of fat¹⁰. It can be efficiently stored, much to the dismay of dieters.

Fat intake should be limited to 25% of total calories for reducing cardiovascular risks and trying to lose weight effectively³. The sources of the fat should be from polyunsaturated fats like nuts, olive oil, and salmon.

Water

Water is an essential substance that makes up about 60-75% of the body's weight. Water stabilizes body temperature, carries nutrients to and waste away from cells and is needed for cells to function³. Drinking too little water or losing too much through profuse sweating inhibits your ability to exercise³. Drinking water is also an effective way to fill your stomach to achieve a full feeling. It flushes your system, keeping everything cleansed and the more you drink, the less likely you are to retain water, helping you to avoid that bloated look¹¹. It is suggested to drink at least eight glasses (eight ounces each) a day, which does not include sodas, coffee or tea, which are dehydrating due to the caffeine³.

Meal Timing

Besides the importance of the components of the diet, the meal timings and number of meals are just as important. Eating five or six small meals a day raises your metabolism, rather than eating three large meals^{1,9,11}. Eating every three hours will ensure that you never get ravenous. By avoiding the stomach-stretching effects of gorging, your stomach stays small and tight and you feel fuller sooner. However, there is a need to adhere to portion control⁸. A serving of protein is about four ounces which correlates to the size of a deck of cards and a serving of carbohydrate is about one cup's worth of steamed rice and a piece of fruit is the size of a tennis ball¹. Skipping meals is detrimental to losing weight, because the body will react as if it was in starvation by slowing the metabolism to conserve as much fuel as possible along with storage of the food eaten as fat¹.

Research was conducted into whether there was a relation between gaining weight and big evening meals (Halberg 1983). It was found that subjects consumed 600 calories more when they were allowed only one meal in the evening, which was due to their enormous appetite and resulted in weight gain³. Dieters should eat appropriately during the day and then eat less at night. Eating breakfast is essential after the long night fast and it raises the metabolism for the rest of the day¹¹.

A good approach to dieting is to keep accurate records of all the food and liquids consumed each day along with the time. This helps to keep track of any fattening habits or the effective foods that facilitate losing weight³. When a record is to be maintained change is less likely.

To break the monotony of the diet, each week plan a day off from dieting. On that day, you are permitted to have a cheat meal such as a slice of pizza or a scoop of your favorite ice cream. It is an effective way to keep your sanity and keep the body from getting accustomed to the diet and reach a plateau in the fat-loss program¹.

Calorie Deficit

Weight control is based on a calorie budget, not only on a fat gram budget. Fat loss occurs when more calories are burnt than eaten, thus creating a calorie deficit³. Theoretically, if one eats 500 fewer calories per day or expend 500 calories through exercise, one should lose one pound per week, because one pound of fat is the equivalent of about 3,500 calories⁸. It is essential first to estimate daily calorie requirement. To determine that, one must determine our resting metabolic rate (RMR) which is the number of calories needed to sustain life, by taking the body weight multiplied by ten. Then determine how active one is and add those extra calories to the RMR.

If you are:	Add:
Sedentary	20-40% RMR
Moderately active	40-60% RMR
Very active	60-80% RMR

The total will be the daily total calorie requirement needed¹².

Exercise

Other than eating fewer calories to create a calorie deficit, one can expend more energy with exercise. It is an obvious component toward hyping the metabolism¹¹. There is aerobic exercise and resistance training ie. weightlifting. Many exercise experts insist that the aerobic equation is what results in fat loss, but recently it has been found that weight training has more of an effect on fat loss¹¹. Muscle is a metabolic furnace and burns more fuel even while sleeping, because for every kilogram of lean muscle gained, 60 calories more are expended¹³. Along with burning more calories, weight training gives the body a sleek and curvy shape and better muscle tone. Women fear weight training due to the impression that they will become bulky and laden with huge muscles, but that is not possible with the female physique and the low levels of testosterone which limit the amount of muscle built³.

This is not to say that aerobic exercise does not have its fat burning benefits. Aerobic exercise is needed to maintain cardiovascular fitness, which reduces the risks of heart disease, and conditions associated with obesity and accelerate the fat loss¹⁴. The most

appropriate time to do it is first thing in the morning on an empty stomach as suggested ten years ago by John Parillo¹⁵. His reasoning is that the body will always burn its preferred fuel source, glycogen, first. Only when its glycogen reserves have been depleted will it tap into fat stores for fatty acids. There are only two times when our bodies are free of glycogen: first thing in the morning before eating and immediately after hard weight training^{1,15}.

The American College of Sports Medicine (ACSM) recommends training at 60 to 90 percent of maximum heart rate (maximum heart rate(MHR)= 220-age)¹⁴. They also recommend 20-60 minutes of aerobic exercise like jogging, biking, fast walking about 3-5 times per week, plus progressive body building workouts made up of 8-12 repetitions of each exercise covering the whole body, each week¹⁶.

Combined with eating 300-500 calories fewer per day, this kind of bodybuilding regimen will cause the loss of about two pounds per week of almost pure fat. Not so with dieting alone, where approximately 35% of what is lost is muscle. Although adding aerobics to dieting helps, but 20% of weight lost is muscle, on the other hand weight training is more effective, with no more than 10% of weight lost being muscle⁸.

The combination of aerobics and weights may be better still. In one study, 97% of weight lost was fat and only 3% was muscle when subjects both lifted weights and did aerobics¹⁶.

CONCLUSION

Every individual has a secret wish to attain the perfect body, but you need more than wishful thinking to achieve that. It's an unwavering desire, proper nutrition and a sound exercise regimen that will enable a person to fulfill that wish¹¹. It is a commitment to overall improvement and being fit and healthy. Nutrition is a very important component to that goal. Each person needs to educate themselves on the macronutrients: carbohydrates, protein and fats. It is the correct combination of these that will allow you to reap the rewards of a perfect body along with the energy and health associated with it. Complex food-combining, fad diets, starvation and too strict an adherence to the timing of food intake can not be maintained consistently which results in the weight being piled back on¹¹. Proper nutrition should be a lifestyle change that can be followed throughout your life. As mentioned, carbohydrates should be around 55% of total calories, proteins should be calculated according to activity level and fat should be about 25% of total calories.

Alongside the nutrition plan, exercise plays a definitive role. It is the combination of weight training and aerobic exercise that will ultimately allow a person to reach that perfect body shape. The weight training will build the muscle that will define the body and raise the metabolism, and then the aerobic exercise will burn the excess calories and maintain cardiovascular fitness.

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