



IMAGE AWARENESS HEALTHLETTER PHYSICAL FITNESS

Nutrition for the Athlete (The Cutting Edge)



VOLUME 103 NO. 1

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Notice

This newsletter is designed for educational purposes only. Any individual suffering from health problems which are mentioned or discussed should consult a physician for proper diagnosis and treatment. Consult with a physician or trained professional before undertaking any rigorous athletic program.

The Octane Effect

During World War II China was allied to the United States. All routes to China were blocked by the Japanese with the exception of a plane flight over the Himalaya mountain range. American planes, however, could not fly high enough or long enough to leapfrog this immense mountain range.

Researchers tackled the problem and learned that if the octane rating of the gasoline were improved the planes could fly higher and further: they could easily sur-

mount the huge mountain range which had seemed an impossible obstacle.

Just as the functioning of those planes could be improved with better fuel, so the human body can accomplish more when nourished in an optimal manner. New planes could have been built to fly over the Himalaya mountain range, but the athlete does not have this option. The athlete can take simple measures to increase energy for muscles and nerves,

resulting in increased performance.

Benefits of Exercise

1. Youthfulness

In one study physically active men were found to have muscle strength and lean body tissue comparable to inactive men ten years younger. Exercise can make a person look and feel ten years younger.

2. Bone Loss

Exercise prevents bone loss and can protect against the development of osteoporosis.

3. Back Pain

Exercise early in life strengthens muscles in women which may help

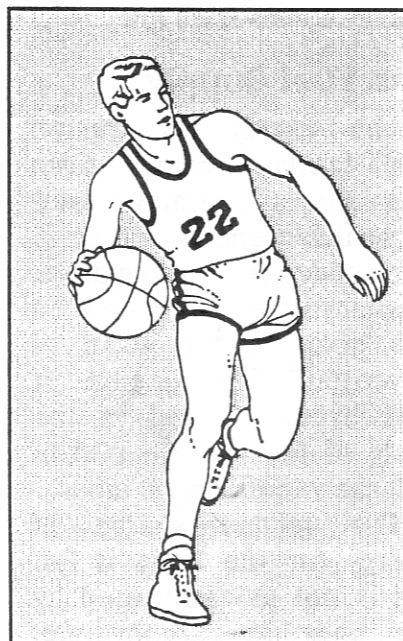


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them avoid chronic back pain after childbirth. Exercise may also decrease the length and severity of menses.

4. Mood

Exercise improves the way a person feels. It reduces what has been termed "free floating tension" and aids sleep.

5. Immune System Enhancement

Both exercise and vitamin supplements can enhance the immune system, aiding resistance to disease. For certain immune properties, vitamin supplements worked better in a group that had a high level of fitness, than in a group that was unfit.

References:

Kuta, I. Parizkova, J., and Dycka, J., "Muscle Strength and Lean Body Mass in Old Men," Journal of Applied Physiology 29:168, 1970.

Chalmers, J. and Ho, K. C., "Geographical Variations in Senile Osteoporosis: The Association with Physical Activity," J. Bone Joint Surg., 52:667, 1970.

Kreitler, H. and Kreitler, S., "Movement and Aging: A Psychological Approach," Med. and Sport, 4:302, 1970.

Ismail, A.H., Petro, T.M., Watson, R.R., "Diet Supplementation With Vitamin C and E in Fit and Non-Fit Adults: Biochemical and Immunological Changes," Federation Proceedings, Vol. 42, No. 3, (March 1, 1983), p. 335.

The Demands of Exercise

The change from a resting state to maximal exertion requires that skeletal muscle increase metabolic rate 50 times. The overall metabolic rate of body tissues must increase tenfold. It would be surprising if nutritional requirements were not to be altered somewhat by such a

dramatic change in the way the body operates.

Reference:

Blomqvist, C.G., Exercise physiology: clinical aspects. Exercise and the Heart. Wenger N.K., Ed. F.A. Davis Co., Philadelphia, 1978, p.1.

KINDS OF EXERCISE

Anaerobic Exercise

High intensity exercise is called "anaerobic" (without air or oxygen) because the body runs out of available oxygen when exercise is too intense. The body chooses to burn carbohydrate rather than fat during this kind of exercise. Carbohydrate is composed of much more oxygen than fat is, which is why it is the preferred energy source for a body desperately in need of oxygen.

Aerobic Exercise

Lower intensity exercise is called "aerobic" or "steady state" because it can be engaged in for long periods of time. In this kind of exercise as much as 50% of the energy comes from fat.

The Fuel Supply

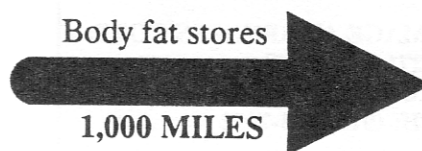
The energy for motion and exercise comes from two sources. The most readily available energy source in the body is carbohydrate. Carbohydrate is stored in the body in the form of "glycogen." The amount of carbohydrate stored in the body of the average person will carry them only 6 miles.

The second source of energy for the body is fat. Fat is not as easily used by the body as carbohydrate,

but it is a much more concentrated source of energy. The average person's fat could theoretically fuel a run of 1,000 miles.

BODY ENERGY RESOURCES

Body carbohydrate stores
6 MILES

Body fat stores 
1,000 MILES

References:

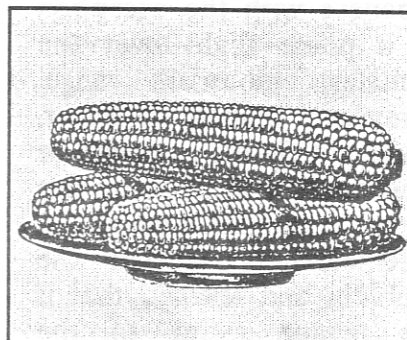
Simon, Harvey, "Sports Medicine," Scientific American, 1983, p. 5.

Medical Staff Conference: Fuel utilization in marathons: implications for performance. West. J. Med. 133:493, 1980.

Carbohydrate Loading

One of the earliest discussions of carbohydrate loading is found in the writings of Per-Olof Astrand, M.D., of Sweden. His description of carbohydrate loading follows:

"The proper preparation for a competition for any endurance event exceeding 30-60 minutes would be to exer-

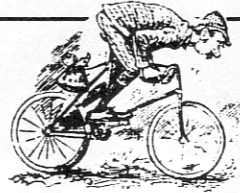


Carbohydrates are the best source of fuel for athletic endeavors due to their high oxygen content and the endurance they produce.



CARBOHYDRATE INTAKE AND ENDURANCE

Diet	Glycogen content of muscle (Per 100 g wet muscle)	Maximum Work Time in Min. At 75% of Max oxygen uptake
Fat and Protein	.63	57
Normal Mixed	1.75	114
Carbohydrate Rich	3.51	167



Work of Per-Olof Astrand, M.D. published in Astrand, Per-Olof, "Something Old and Something New...Very New," *Nutrition Today*, June 1968, pp. 9-11. The dietary measures used to increase the glycogen content of muscle were unbalanced and should not be attempted by the average person nor by the athlete without professional supervision. The study does reveal the value of increasing the quantity and quality of carbohydrate in the diet. This research does not negate the importance for high quality oils and protein for athletic performance.

cise to exhaustion the same muscles that will be used in the event. This should be done about one week in advance to exhaust glycogen stores. Then the diet should be almost exclusively fat and protein for about three days. This keeps the glycogen content of the exercising muscles low. As the big day nears, the athlete should add large quantities of carbohydrate to the diet. "Add" is the key word, because the intake of fats and protein should be continued. This regimen is recommended for anyone preparing for prolonged, severe exercise (in hiking, mountaineering, or military operations). We have found it works."

Astrand demonstrated the effectiveness of his technique with a study of bicycling ability on different diets.

While carbohydrate loading may be only for the professional athlete, it is important to realize that carbohydrate is the fuel that determines the length of time one can exercise

without becoming exhausted. These oxygen containing foods can enable a person who wants to lose weight (for example) to exercise longer and thus have more effective weight loss.

Reference:
Astrand, Per-Olof, "Something Old and Something New...Very New," *Nutrition Today*, June 1968, pp. 9-11.

Oxygen

The energy produced for movement requires a great deal of oxygen. It takes more oxygen to burn fat than it does to burn muscle. This is important for those who exercise to lose weight or for those who exercise to the limits of their endurance.

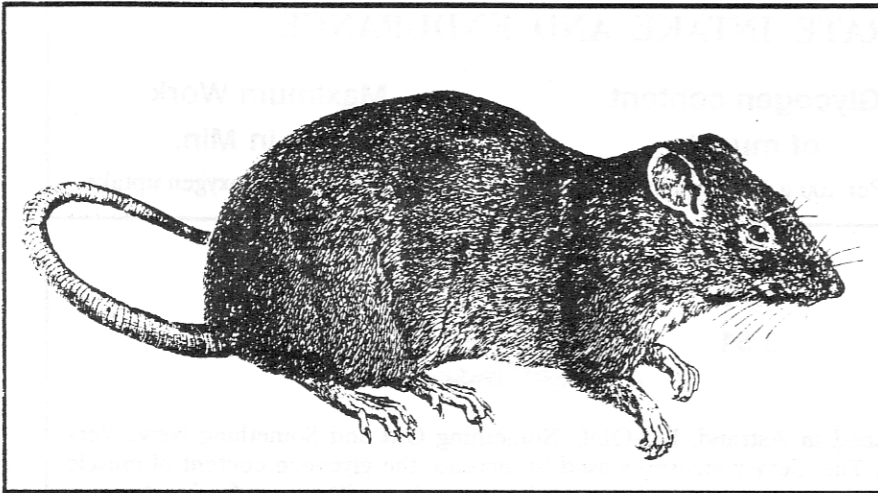
Exercise increases the ability of the heart to pump oxygen, the oxygen carrying power of the blood, and the circulation throughout the body. Thus the more one exercises the more they can exercise due to the fact that more oxygen is available to burn.

Nutrition can also play a key role in availability of oxygen. Anemia can rob the

body of oxygen. It can be caused by lack of a number of nutrients including iron, protein, copper, folic acid, vitamin B6, B12, and vitamin C. Lack of nutrients involved in oxygenation of the blood can result in



Lack of iron can be manifested by flattened or spoon shaped fingernails that are brittle or thin.. Iron is essential for the hemoglobin molecule that carries oxygen throughout the body. (Goodhard, Robert and Shils, Maurice, *Modern Nutrition in Health and Disease*, Philadelphia: Lea & Febiger, 1980, p. 343.)



lethargy and lack of motivation to exercise.

Nutrition and the Athlete

The performance of an athlete will be determined by genetic makeup, level of fitness, and nutritional intake. The poorer the nutritional intake the more likely performance is to be hindered.

Stamina Factor in Liver

One test of the stamina and endurance of a rat is to

submerge it in cold water and see how long it can swim. This test was conducted by Dr. Benjamin Ershoff on rats with three different kinds of diets.

One group of animals received a basic balanced diet. A second group received the basic balanced diet plus synthetic B vitamins. A third group was given the same diet as the second group with the addition of 10% desiccated (dried) liver. The animals were fed these diets for 12 weeks.

The endurance of the rats was then tested in the manner described above. Rats in the first two groups swam an average of a little over 13 minutes. Only 3 of the 12 rats in the group receiving liver swam for less than 2 hours. These rats swam for 63, 83 and 87 minutes.

Ershoff felt that it took more than 24 days for liver to exhibit its optimal effect.

Ershoff was unable to determine what factors were responsible for the improved stamina of his rats. It is known that liver is high in nutrients and many "accessory" factors which could produce results like those found in this experiment.

Reference:

Ershoff, Benjamin H., "Beneficial Effect of Liver Feeding on Swimming Capacity of Rats in Cold Water," Proceedings of the Society for Experimental Biology and Medicine, 77:488, 1957.

Advertisement

Neo-Life Sports 30

- Contains liver tablets which are defatted and saturated with vitamin C to prevent rancidity. Each tablet has a protective protein shell. (This product is also sold separately.)
- Contains threshold control B complex and vitamin C for energy production.
- Contains tre-en-en grain oils to nourish endocrine glands which control use of nutrients in the diet.
- Contains anti-oxidants to decrease oxygen requirements.

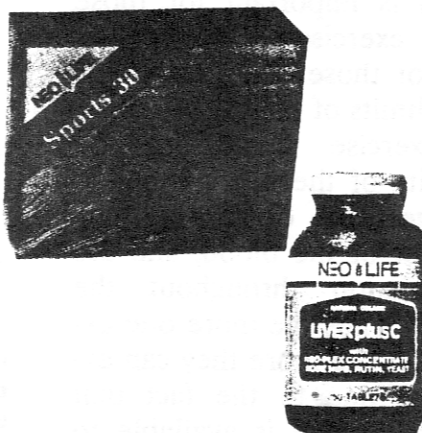


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NEXT ISSUE:

- Beating heat with vitamin C.
- Bioflavonoids and injury among athletes.
- Vitamin E and oxygen requirements.
- Grain oils, stamina and endurance.

Healthletter is written by James W. McAfee, Director of Nutritional Research for Image Awareness Corporation. To subscribe, enclose \$39.95 and include:

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