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Metabolic Conditioning

Part I

Most wrestlers typically perform their strength training separate from their conditioning activities. On the mat, however, wrestlers are required to integrate their muscular strength with their aerobic conditioning.

Metabolic conditioning is essentially a combination of intense strength training (or other anaerobic efforts) and aerobic conditioning. It involves three major biological systems: the musculoskeletal, respiratory and circulatory systems. In order for you to improve your metabolic conditioning, these three systems must share the physiological demands.

Unfortunately, conditioning of the metabolic system is rarely emphasized or even addressed. However, a thorough understanding of metabolic conditioning and an application of specific training techniques can enhance your functional fitness.

PROJECT TOTAL CONDITIONING

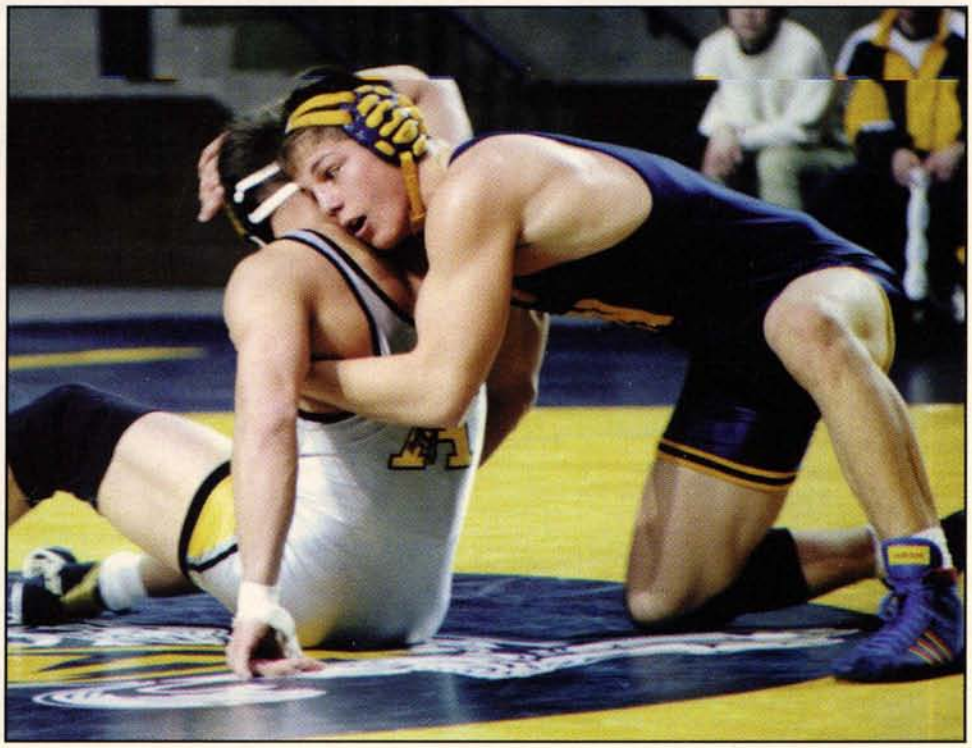
In the early 1970s, research designated as "Project Total Conditioning" was conducted at the United States Military Academy in New York. The research used members of several athletic teams at the academy as test subjects. Project Total Conditioning actually consisted of a number of different studies. However, the main portion of Project Total Conditioning was a 6-week study that examined metabolic conditioning. An experimental group consisted of 18 varsity football players from the academy (a nineteenth subject was injured during spring football practice). This group performed a strength-training workout three times per week on alternate days with two days rest after the third workout of the week. Each workout consisted of ten exercises and took an average of about 30 minutes to complete. (The subjects also performed six neck exercises twice per week.) Each subject was required to perform as many repetitions as possible using proper technique in every exercise of every workout. One set of each exercise was done to the point of muscular fatigue within a repetition range of 5 - 12. The group took a minimum amount of recovery time between exercises.

In order to minimize the influence of the "learning effect," the experimental group followed the training protocol for two weeks prior to the study. (The "learning effect" refers to the often dramatic increases initially attained by individuals which is attributable to improvement in their neurological functioning not muscular strength.) Prior to the 6-week study, the subjects were tested in several areas -- including body composition, strength, cardiovascular fitness, the 40-yard dash, the vertical jump and flexibility -- and were retested following the study.

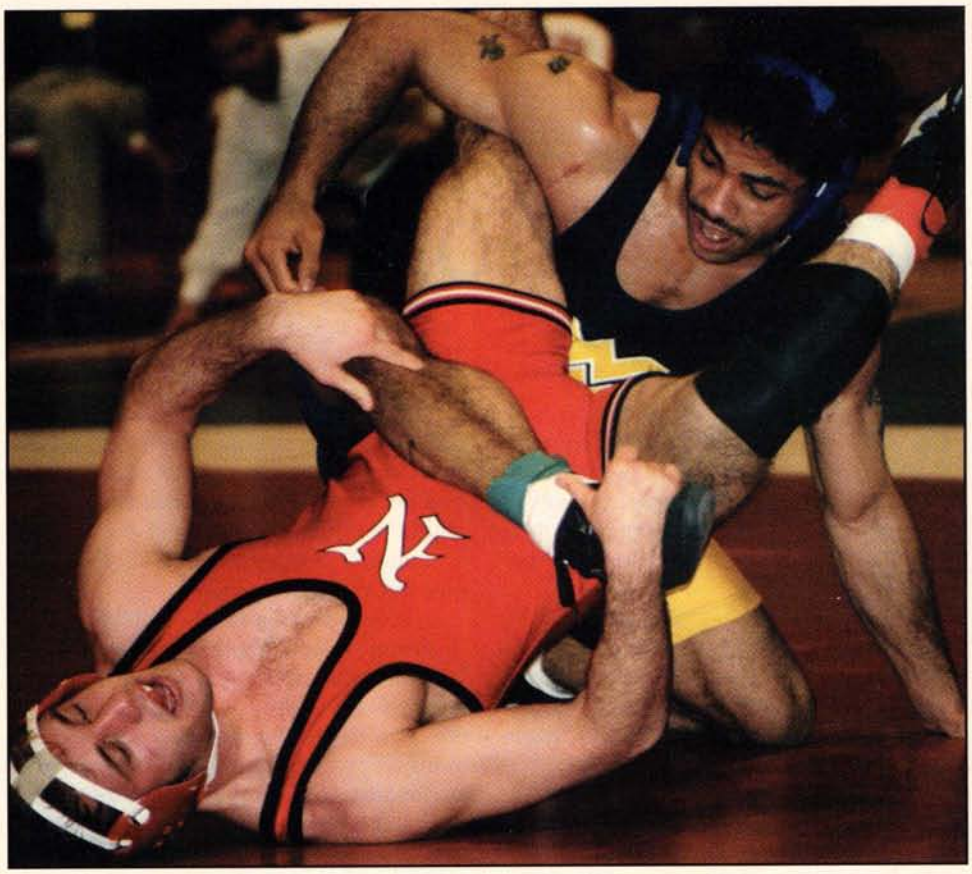
The study produced very compelling results. After 6 weeks of training, the subjects increased the resistance they used between their first and seventeenth workouts by an average of 58.54%. The minimum improvement in strength was 45.61% while the maximum increase in strength was 69.70%. (Incidentally, the average increase in the resistance that was used between the second and sixteenth workouts was 43.06%.) The subjects also increased the number of repetitions they performed between their first and seventeenth workouts by an average of 6.59%.

Interestingly, the time that the subjects needed to complete their workouts decreased substantially. Comparing the first workout to the seventeenth, the experimental group reduced the average duration of their workouts by 24.09% -- from an average of 37.73 minutes to an average of 28.64 minutes. Two individuals almost literally cut their workout times in half -- one from 49 to 25 minutes and the other from 43 to 22 minutes -- yet increased their strength levels by 68.32% and 65.59%, respectively. A third individual reduced his workout time from 42 to 27 minutes and increased his strength by 66.32%.

Besides the tremendous improvements in muscular strength, the subjects also



Annapolis Maryland, Navy midshipman, Karl Haywood, 167 lber battles West Point Cadet Joey Hess. Haywood won 9-7. Photo by Lawrence E. Fasick.

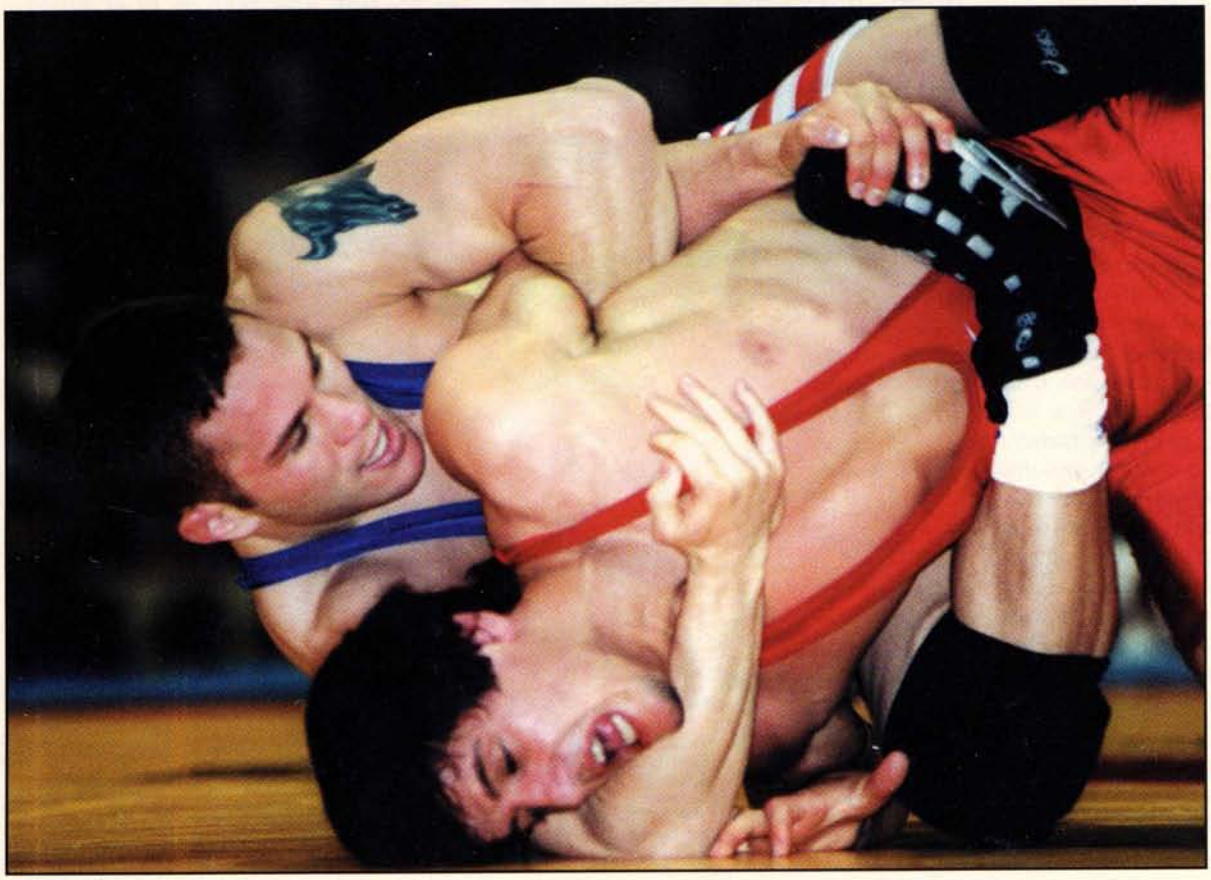


1998 NCAA Congressional Cup Tournament Finals - 142 lb. Dorian Hager, West Virginia, tangles up with Allen Hankins, Nebraska. Hankins won the match. Photo by Lawrence E. Fasick.

reduced their average time in the 2-mile run by 88 seconds -- from an average of 13:18 to an average of 11:50. This represented an average improvement of 11% -- without having performed any running except during the course of spring football practice (which occurred during the first 4 weeks of training). The subjects also had lower resting heart rates following the six weeks of training. In addition, the experimental group had lower exercising heart rates at various workloads on a stationary cycle and they were able to perform more work before reaching heart rates of 170 beats per minute.

At the end of the 6-week study, the experimental group had reduced their average time in the 40-yard dash from 5.1467 seconds to 5.0933 seconds -- a 1.04% improvement. Their vertical jump had increased from an average of 22.6 inches to an average of 24.067 inches -- an average improvement of 6.49%. Finally, their average improvement in three flexibility measures was 10.92%.

These striking results are even more impressive when you consider that they were accomplished in such a time-efficient manner. In fact, the total amount of actual training time performed by each individual during the 6-week program averaged less than 8.5 hours -- which is less than 30 minutes per workout. It should be noted that the test subjects were highly conditioned football players who were already quite strong and fit at the start of the program. Nevertheless, the study demonstrated the effects of short-duration, high-intensity strength training on metabolic conditioning.



Freestyle Wrestling - Russia 21, United States 14. 167.5 lb. Adam Saitiev, Russia, decisioned Sean Bormet, 7-6 in overtime.

THE METABOLIC CHALLENGE

In the next issue of *Wrestling USA*, you'll learn specific training techniques to challenge your metabolic system thereby improving your metabolic conditioning.