FOREWORD

I know what you must be thinking: “Oh no, not ***another*** fitness book.” Well, yes . . . and no. While this certainly is a fitness book, it’s not a run-of-the-mill fitness manual. It offers a pathway to improved fitness for both the fitness enthusiast (new or experienced) and the aspiring or certified personal trainer. My knowledge is drawn from educational sources as well as years of hands-on experience working with everyone from the average person in the gym to the elite, Olympic-level athlete on the field.

I have been involved in the health and fitness industry in one way or another for many, many years. Whether I was studying Physical Education and Sports Management in college, working as an Assistant Strength and Conditioning Coach with the NFL’s Baltimore Ravens and The United States Olympic Bobsled Team, running my own personal training company, or conducting health and training seminars, I’ve noticed that no one is immune to the gamut of health and fitness crazes flooding our lives. No one is immune to the search for a health and fitness "quick fix".

Diets seem to cause people the most anguish. There is a constant war over what we should or should not eat. Fearing the frown of disapproval from others, we seek the endless diets. But, we neglect adopting a healthy lifestyle of eating, which will last a lifetime and bode us well. The grapefruit diets, the "48-hour liquid diet”, the cabbage-juice diet, and the Hollywood diet—all merely promote yo-yo dieting and weight loss (which is primarily water and muscle) and the inevitable rebound weight gain. With unsound yo-yo diets, no long-term benefits can ever be achieved.

You can’t imagine my frustration as a fitness educator, competing against the burgeoning fitness-industry exercise innovators, entrepreneurs, and quick-buck supplement companies who continually try to reinvent the wheel based on their “latest,

proven technique." They know that more money can be made if something "new and exciting" comes along. Why do you think there are numerous exercises for each body part, when perhaps 2 or 3 are more than sufficient? The age-old, proven methods of strength training, sensible eating habits, and cardiovascular training are the only prescription for a long and healthy life.

Don't be mistaken: some training concepts have been debunked over time, some have been updated, and other just laughed off the block. Day in and day out, people tend to seek the easiest way to train their bodies for health and longevity. Quite honestly, I'm not going to provide you any "revolutionary" training technique that came to me in the middle of the night.

What has become quite evident as I've looked back on the people I've trained is that they all battle similar areas of frustration. I wish I could wave a magic wand and commit people to living a well-rounded and consistent healthy lifestyle. But my wand is time, commitment, patience, and a sound foundation of education.

I offer a basic book of proven techniques that have worked for many. I will not offer 40 different ways to do an ab exercise when just one would do. I have no intention of reinventing the wheel; just a return to basics.

Similarly, I'm not going to discuss "diets" in detail. Once again, there are basic components to healthy, well-balanced eating that do not inflict more harm than good on the human body.

I ENDORSE MODERATION WHEN EATING, BUT DO NOT PREACH SAINTHOOD. QUITE FRANKLY, MY IDEA OF A CLASSIC MEAL IS A 1/4-POUND FLAME-COOKED BURGER AND A CHOCOLATE MALTED

MILKSHAKE, FINISHED OFF WITH A FEW KRISPY KREME DONUTS. I KNOW THIS SOUNDS EXCESSIVE, EVEN (DARE I SAY) GLUTTONOUS, AND GOES AGAINST WHAT "OTHER" FITNESS PEOPLE SPOUT, BUT I HAVE EXCEPTIONS: ONE, I LIVE IN THE REAL WORLD, AND TWO, I PRACTICE MODERATION WITH MY DIET. I DID NOT SAY MY PREFERRED MEAL IS CONSUMED DAILY, BECAUSE IT ISN'T. WHAT I DO IS EXERCISE DAILY, EAT SMALL BALANCED NUTRITIONAL MEALS 6 OR 7 TIMES A DAY, REST WHEN NEEDED, AND ALSO REMEMBER TO GIVE MYSELF A TREAT PERHAPS ONCE A MONTH. *BURGERS AND MILKSHAKES* PROVIDES THE NECESSARY BASIC INGREDIENTS TO ASSIST YOU WITH IMPROVING YOUR CURRENT FITNESS LEVEL, MAINTAINING IT, OR TAKING IT TO A NEW LEVEL WITH A COMPLETE STRENGTH AND CONDITIONING PROGRAM. Adherence to a strict diet, performing hours of cardio each week, performing strength training exercises, and having the added benefit of good genetics, will, without question, work. But rare are the few who have the time, money, dedication, and motivation to achieve results in this manner. The possible frustration of never getting "the look" quickly is further compounded by a monthly slew of fitness magazines with pages filled with God-like, chiseled, and bronzed models. In addition, at least once a year a new fitness gadget surfaces, claiming the delivery of rock-hard abs in just six minutes a day! For most people, the sales pitch will work; however, getting the longed-for six-pack abs using the latest miracle gadget will not.

Burgers and Milkshakes offers you no quick miracles. YOU will be required to do all the work: first by reading, then by implementing and incorporating it into your life.

INTRODUCTION

Magazines too often claim that you can follow the latest celebrity workout program and have an amazing, lean body. Here's the catch: You need a spare 2-3 hours a day to train, about $200-$300 a day for a trainer, minimal negative stress, and great genetics. Elite, professional, and Olympic athletes are paid to train, maintain an optimal physical condition, and perform at peak condition. That's their job. However, for the average person who puts in a 9-hour work day (and contends with daily traffic jams and the demands of family life), spending several hours a day working out is just not feasible.

But don't be discouraged, for I offer a solution: If you are seeking realistic, time-efficient, and effective fitness programs, then congratulate yourself for selecting this

book.

By reading and following the prescriptions inside *Burgers and Milkshakes,* you will make real gains in your pursuit of a healthier life.

Eating healthy, balanced meals (fruits, vegetables, whole grains, and lean low-fat protein) and getting daily exercise for both the heart and muscles will greatly improve your overall health and lower your body fat. Yet occasional indulgences such as burgers and milkshakes never killed anyone, or added pounds. Occasional treats will preserve your sanity.

Burgers and Milkshakes delivers useful information that is easy to read, understand, and incorporate into your lifestyle. There are no celebrities endorsing the "newest" diet. I offer no magic pills. Nor am I selling you the latest fitness gadget. What I do offer are facts supported by scientific research. Unlike celebrities or athletes, most people cannot afford a daily personal trainer and a dietician to select and prepare healthy foods. *Burgers and Milkshakes* is for real people who want real results.

Each chapter provides information that will ensure your success with a fitness lifestyle change, along with scientific research to support the chapter's topic. I also strongly recommend further fitness education *via* taking college courses, obtaining fitness certifications, and attending fitness workshops and lectures. Despite what the fitness magazine industry would like you to believe, it is not the authority on scientific research.

Burgers and Milkshakes is unique with its information for the personal trainer and the general fitness enthusiast. If you are a baby boomer looking to tap into the fountain of youth, a tennis player trying to improve your game, or a young athlete trying to make the talent scouts take notice, this book will give you the tools to reach your fitness goals.

STRENGTH TRAINING TECHNIQUES AND APPLICATION

How are defined muscles developed? Most people think that muscle definition is the result of performing an exorbitant amount of repetitions. That couldn't be further from the truth: It is not the amount of reps that determines how a muscle develops, *it is how the muscle responds to the stimulus*. Genetics, proper nutrition, intensity, volume of exercise, and rest will stimulate muscular development, not just repetitions alone. A muscle will only adapt to the stress to which it is exposed. Dr. Ellington Darden, former Director of Research for Nautilus Sports Medical Industries and author of numerous exercise-related books, states, "The building of strength is proportionate to the intensity of exercise. The higher the intensity, the better muscles are stimulated. Performing an exercise to the point of momentary muscular failure assures that you've trained to maximum intensity."

Repetitions

How many repetitions per set should be completed? Developing size and strength is not a result of quantity of reps, but *how each rep is performed, and the quality of the rep*. The manner in which the repetitions are performed is the foundation of any strength program, and when they are performed properly, they will promote maximum muscular strength.

The number of repetitions performed to fatigue is an important consideration when designing a strength training regimen. The greatest strength gains result from resistance yielding 4-6 repetitions. Increasing the number of repetitions to 12-20 and decreasing the relative amount of resistance will favor increases in muscle endurance (Feingenbaum, 1997). Furthermore, a given percentage of one repetition maximum will

not always elicit the same number of repetitions when performing different lifts.

Muscle movements

Depending on the starting point of the repetition, the first phase of movement is termed concentric movement.

A concentric movement is when the muscle is shortened; it should last approximately 2-3 seconds. Once the weight is raised, there should be a momentary pause in the fully contracted position. Squeeze and "feel" the muscle without locking the joint.

The upward movement while performing a bicep curl is an example of the concentric phase of the repetition. When performing a bicep curl, stop when the muscle is fully flexed. A bounce due to forced momentum from lifting quickly indicates that the muscle is performing little or no work through that range. For maximum effectiveness in developing bigger and stronger muscles, lift the weight slowly.

To ensure that no momentum was used with the lift, all movement must be paused before the lowering phase is begun (an eccentric movement).

In contrast to concentric contractions, eccentric movements are contractions in which the muscle exerts force while it lengthens. The eccentric contraction should be controlled during each rep. **Due to gravity, it is easier to lower a weight; therefore, the eccentric movement should be purposely slower than the concentric.** Take approximately 3-4 seconds to lower the movement. During the eccentric phase, the muscle is approximately 20-40% stronger than during the concentric phase. In fact, some studies have shown that the greatest benefits can be gained during the eccentric portion of

the movement. More muscle fibers can be recruited when the rep speed is slower, thus increasing the intensity of the exercise.

Quality repetitions

Each rep should look identical in movement and quality, irrespective of whether it is the first, second, or tenth rep. To emphasize this point, imagine that you have taken a photo of each of 10 reps. If all reps have been performed equally, you should not be able to arrange the photos in the order they were performed, then either you have not yet mastered the correct form for this exercise, or the weight is too heavy for you and the load needs to be lightened. Ideally, there should be no difference between the first and last rep.

Unfortunately, it is quite common for people to rush through their reps with no heed to quality. We have all seen this in the gym: the big guy on the bench, raising the 500-lb bar using his hips, back, and legs to assist in the lift. Yes, he got the weight up, but at great risk of injury and not using all the chest muscles (muscle specificity), because many other large muscle groups were helping with momentum.

Train yourself to concentrate on each rep equally, lifting in a controlled manner, as if each rep were the first one performed. When recording your regimen, only record the **correct** number of repetitions lifted. Do not record assisted lifts. For example, if someone assists you with the last two reps out of 15, you should only record 13 complete reps. Performing identical repetitions at a specific prescribed speed will ensure accountability by keeping the variables the same.

An important note: *do not lock the joint*. Locking the joint at the peak of contraction will place undue force on the joint, potentially causing injury, while reducing

the tension on the muscles.

Rep speed

When momentum is neutralized by means of isokinetic strength testing equipment, muscles always produce more force (Westcott, 1987). Additionally, after the initial explosive movement, the muscles throughout the remaining range of motion display little or no resistance. The weight almost moves by itself. Maximum muscle force invariably decreases as the speed of movement increases.

To maximize strength and reduce the risk of injury, the weight should be raised at a speed that forces the muscle to perform all the work, with no bouncing, jerking, or sudden movements. Most people perform repetitions too quickly, averaging 1-2 seconds—a speed which greatly reduces muscle fiber recruitment due to gravity and momentum assistance. However, performing one rep in 5-7 seconds will place more demand on the muscle and recruit more fibers (Westcott, 1987).

The advantages of slow repetitions are longer periods of muscle tension, higher levels of muscle force, lower rates of momentum, and less risk of injury. By creating and maintaining tension in the muscle groups, you can force the muscles in question to do more work per repetition. From a metabolic standpoint, this increased work will heighten the intensity of any given exercise and produce a stimulus for proper overload (Mannie, 1997). ***Most importantly, slow training produces better strength training results because of the thoroughness of the muscle's involvement*** (Darden, 1990). Muscles are recruited in order according to the intensity or force requirements, rather than speed of the movement. Lifting the weight slowly without momentum and recruiting as many muscle fibers as possible achieve greater strength gains.

The goal of the lift is to perform a prescribed number of repetitions and achieve momentary muscular failure (MMF) on the last repetition. Why is this important? It

allows the muscle to recruit all the fibers in the muscle group, allowing the muscle to become stronger more quickly. Muscular failure is the point at which the muscles can no longer function.

Always start with a weight that you can lift for 12 repetitions; typically approximately 75% of your maximum strength capacity. If the weight is too light, and 12 or more repetitions are easily completed, the resistance may be too light. Add about 20% more weight; rest a minute, then lift again. If you cannot perform at least eight repetitions, the resistance may be too heavy, and the weight should be lowered.

Injury prevention

Injury prevention is the top priority for any exerciser. Admittedly, people can get huge by using momentum and by throwing and jerking weights, but there is a higher potential for injury to occur.

Correct form execution while lifting weights is critical for increasing strength and reducing the risk of injury. It is important to minimize momentum and bouncing movements when raising and lowering the weight. Exercises involving dynamic (fast) movements are not only unsafe, but they reduce the maximal muscle fiber recruitment. **Again, the greater number of fibers recruited, the greater the strength and size potential of the muscle.**

Set number

How many sets should you perform? The number of sets to be completed is an important consideration for the strength program. Studies conducted by Westcott (1996) concluded that one set per exercise at maximal effort is sufficient to promote near-optimum strength development. In his study, 38 subjects were separated into three

groups. Each group was put on a 14-week training period and instructed to perform one, two, or three sets of lower body exercise. The group that performed one set showed a 14.5% improvement, whereas the group that performed three sets showed a 15.5% improvement. So, if your goal is to increase strength in a safe but timely way, one set is your best option.

One set versus multiple sets

While one advantage of performing one set per exercise is increased strength in a shorter period of time, another is that this training method allows a person to be more focused and work out with a greater intensity due to the decrease in additional demands. Another advantage is a reduced risk of injury through overuse. Finally, performing one set improves the quality of the repetition by allowing you to use a slow, determined, and controlled technique.

Multiple sets

Many people prefer multiple sets. While multiple sets do produce big and strong muscles, they have little to no advantage over using the one-set method. It is purely a matter of preference. One reason for preferring to perform multiple sets may be that some people like the associated “pump"—the rush of blood to the muscle. If you want to feel the muscle swell to maximal potential, perform each set to absolute failure, then move immediately to the next exercise for the duration of the session. Performing multiple sets for each exercise can monopolize time. The extra time gained from the one-set method can be devoted to fat-burning activities, stretching exercises, or rest. Generally, 60 seconds is sufficient recovery time between sets or exercises.

Not surprisingly, there are numerous studies producing empirical evidence that performing one, three, or more sets produce the same results (Mannie, 1997). For more scientific research on the number of sets refer to Appendix D.

High-intensity training

There is a way for you to get stronger and larger muscles in less than 30 minutes: For intermediate and advanced persons, each set should be taken to Momentary Muscular Failure (MMF). As discussed earlier, MMF occurs when another repetition using proper form cannot be performed. To develop strength and muscle gains, continue exercising to the point where the completion of another rep is impossible. Admittedly, this is incredibly hard work. But if you are going to strength train, go all out. Push yourself beyond the comfort zone. Your mind may want to give up before your muscles do. If you stop before MMF, additional fibers will not be recruited. Any muscle fiber not recruited and not overloaded will not get stronger. This type of training is referred to as High Intensity Training (H.I.T.). Additional information on H.I.T. training can be found at www.cyberpump.com. Strength training goals will vary for each person; therefore, you must develop a program tailored to your goals:

Energy systems

Energy requirements are important considerations for an effective training and conditioning program. Once you determine these requirements you can factor in the amount of recovery time best suited to you.

The body uses three basic types of energy systems, and each functions differently. Your pre-set goals will determine which energy system you incorporate when designing the program. The energy needed for muscle contraction is derived from the breakdown of food into glucose and fatty acids to produce the chemical compound adenosine triphosphate (ATP).

- Phosphagen system is the metabolism of stored ATP and creatine phosphate. This system is used for high explosive activities with energy stores lasting less than 20 seconds.
- Anaerobic glycolysis is the metabolism of glucose and used for high intensity, moderate duration from 1-3 minutes.
- Aerobic glycolysis is the metabolism of glucose and fatty acids for activities lasting more than 5 minutes.

Rest periods

Rest periods influence the ability to generate greater muscle. The influence of intra-session rest intervals may have a profound effect on strength gains subsequent to short-term high-intensity training. To determine your necessary rest periods, the factors to be considered are volume of weight, intensity, and fitness level.

[standardize this table (and box it) so that it's not just floating randomly]

Recovery time between sets	%of ATP/PC restored[what is PC? Should it be explained?]
30 seconds	50.0
60 seconds	75.0

90 seconds	87.5
120 seconds	93.7
2.5minutes	96.8
3 minutes	98.4
5 minutes	99.9

Source: NSPA, 1994

Overload

In order for a muscle to increase in strength, the workload it is subjected to during exercise must be increased beyond what it normally experiences (Darden, 1990). A person's rate of adaptation to training is limited and cannot be forced beyond the body's capacity for development. Individuals respond differently to the same training stress, so what might be excessive training for one person might be below the capacity for another (Darden, 1990). Muscles adapt to increased workloads by becoming larger, stronger, and by developing greater endurance. However, it is important to increase the overload gradually.

When do you increase your overload (or amount of resistance)? Only increase the overload upon the successful completion of 12 repetitions. At this point, the resistance can be increased by 2.5-5 percent, adding small but frequent increments that progressively stress the muscular system. By increasing the load in small increments, the chance for injury and over-training is lessened.

[standardize this table (and box it) so that it's not just floating randomly]

Fitness level	Sets	Reps
Beginner	1	12-15
Intermediate	1	MMF
Advanced	1-3	MMF/advanced

Variety

Each of your training sessions should be challenging, but at the same time true to your intended goals and needs. When the body adapts to a stimulus, it works more efficiently and requires less energy. Each session should demand more from your body than the last session.

There are many ways to make sessions challenging and fun. For example, **changing the order of exercises**, mixing in different types of exercises, using a variety of equipment (machines, free weights, *etc*.), and varying the recovery intervals between sets are all effective methods for keeping it challenging.

Another example is to **increase the length of time to complete a repetition**. Raising the weight for 4 seconds and lowering for 8 seconds can be extremely challenging. As you become more adept at various training techniques, introduce advanced techniques. Examples of advanced training techniques are super-slows, breakdowns, and negatives. Such advanced techniques require more recovery between sessions; therefore, it is imperative to keep accurate records of your training.