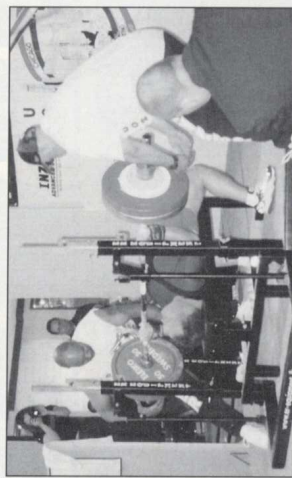


TRAINING

The POSITIVE of NEGATIVES
by Rick Armillei M.S., C.S.C.S., Joe McAluffe M.A., C.S.C.S., IPF World Record Holder



Joe McAluffe breaking the IPF record in the bench press with 577 lbs.

In an effort to improve maximal strength, it is important to realize the most important aspect of performance, the nervous system. Muscular contraction is governed by the efficiency of the nervous system. The interaction between the nervous system and muscular system refers to the neuromuscular system. A motor unit describes a nerve cell and all the muscle fibers it innervates. When the motor unit is activated, all the innervated muscle fibers are stimulated to contract. It is the activation of the motor unit and the contraction of the muscle which leads to force production. Therefore, it is the athlete with the most efficient neuromuscular system that can recruit the most motor units and maximize force production.

Research has shown individuals are capable of improving maximal strength without increases in muscular hypertrophy (1). These improvements in strength are typically seen in the beginner or athlete who incorporates a new exercise into the training program. The typical time course for strength development without increases in muscular hypertrophy is the early phases of training lasting up to eight weeks. After this point, the contribution of increased muscular hypertrophy to strength production can be observed.

The increased strength produced without increased muscle mass is due to the improved efficiency of the nervous system. Strength improves by the ability of the nervous system to increase the number of motor units involved in muscular contraction, the rate at which the motor units are stimulated, increased inhibition of the antagonist muscle, increased activation of synergistic muscles, inhibition of neural protective mechanisms, and increased motor neuron excitability. The improved efficiency of the nervous system leads to an increased recruitment of muscle fibers, which leads to an improved rate of force production and greater strength.

The ability to increase strength without increasing body weight is important to the strength/power athlete who desires to improve performance without the added bodyweight. Sports where power classes are important such as powerlifting, weightlifting, and wrestling can benefit from specific strength/power training of the nervous system along with any athlete who feels an increase in body weight will hinder performance.

Motor units are recruited in order of the "size principle" which states that the lower threshold motor units are activated first, followed sequentially by the higher threshold motor units (1). It is important to

been a method of increased loading. Athletes typically incorporate negative overload training into their programs in an attempt to improve their concentric strength. Research to support the theory that increased eccentric loading will display any carry-over effects on concentric strength is inconclusive.

One effect of maximal eccentric work often overlooked is the psychological benefits of handling increased resistances. Since maximal performance is dependent on the athlete's confidence and psychological arousal, the performance of eccentric training may provide the positive reinforcement necessary to perform at maximum levels. Simply stated, the lifter will be accustomed to the "feel" of weights well above maximum and new personal records in the actual lifting of the weight will not feel as intense.

An efficient means to transiently improve strength performance is to perform eccentric overload training prior to attempting maximal concentric contractions. The performance of a "negative" overload will excite the nervous system and aid in the enhancement of muscular contraction. Strength coaches have long used maximal contractions to improve neural drive (2). One example of such physiological rationale is wave loading programs. This training technique takes advantage of the increased neural drive to transiently improve strength. Incorporating an increased eccentric contraction into the training program will give the benefits of increased neural drive, improve neuromuscular efficiency, and improve the psyche of the lifter all in one set. The negative overload is basically a preparatory method.

The negative will prepare the lifter mentally and physiologically for the maximal concentric contraction. Care should be taken not to go to maximal eccentric failure and to allow proper rest to ensure complete recovery of the neuromuscular system. The ATP-CP immediate energy system may recover between 3-5 minutes between heavy sets, but the nervous system may need considerably longer rest. Rest periods of 5-10 minutes may be necessary for complete or near complete nervous system recovery. Experimentation may be necessary to gauge the optimal work to rest ratio.

The application of Exercise Science and principles of neuromuscular potentiation helped Joe McAluffe break a 25 year old IPF world bench press record. Joe recently incorporated negative training his last competition training cycle and benched 577 at 220. The following is Joe's personal comments on the benefits of increased eccentric training.

"The application of negatives into my training definitely helped me break a 25 year old record of the bench press. Controlling supramaximal loads prepares you for big contest personal records. If you lift raw or with a shirt it is a great way to feel weights that you have never gotten all the way to lock out. Supramaximal eccentric loads will also help you know whether your shirt will withstand the heavy weights. If done carefully, I think negative training will gradually allow your muscles, tendons, ligaments, and bones to adapt and thus become stronger and more resistant to injury.

Also, the negative is the first half of the bench press. Proper control of the negative is extremely important to consistently preserve the right position and maintain the correct groove for a successful attempt. Since most, not all, federations make you pause on your chest you must control the bar at a moderate speed. This will help maximize conservation of energy by not lowering the bar too fast and having to control a bounce off the chest. This is sport specific training. If you do it in a meet you will do it in training. I have personally found an increased eccentric overload of 5-10% over your previous best with or without a shirt to improve neural preparation for

give you!"

maximal attempts. The gradual adaptation of your nervous system will allow your muscles to use more weight for more reps. I used these techniques during my strength and power cycles to get ready for my last meet. The training cycle outlined below is for a 515 raw bench press and a 577 shirt assisted bench press.

This is the heavy day for a bench presser peaking for a contest who only benches one day per week. I would recommend you have a couple weeks under your belt before you try this cycle.

Additionally, this training cycle requires experienced, trustworthy spotters who can grab the bar off your chest after the negative set is complete. If you are a powerlifter in the midst of a hypertrophy cycle in an attempt to move up and compete in a heavier weight class, I recommend no more than 1 or 2 singles at an intensity of 15-20% over your prescribed work sets. Since I have only incorporated these techniques into my program this year I am cautious to recommend them on a year round basis. I would experiment in your off season to see how it works. You must give it 6-8 weeks in your program to see a difference. Keep an open mind and explore the positive results that negatives can give you!"

WORKOUT of the Month

by Joe McAluffe, IPF World Bench Press Record Holder

Week 1: 3x3 60% + blue band x 2 + green band (Speed/Power), 1x1x500 (95%) + contest shirt (Negative**), 3x1-5x5x365 (70%) (Strength**),

Week 2: 3x3 63% + blue + green band (Speed/Power*), 2x1x425 (83%) (Negative**), 5x4x385 (75%) (Strength**),

Week 3: 3x2 65% + blue band x 2 (Speed/Power*), 2x1x455 (88%) + loose shirt (Negative**), 5x3x405 (79%) (Strength**),

Week 4: 3x1 60% + blue band (Speed/Power*), 2x1x505 (88%) + loose shirt (Negative**), 3x3x420 (82%) (Strength**),

Week 5: 5x3 60% + blue band x 2 (Speed/Power*), 2x1x525 (91%) + loose shirt (Negative**), 3x2x440 (86%) (Strength**),

Week 6: 5x2 65% + blue band x 2 + green band (Speed/Power*), 1x1x550 (95%) + contest shirt (Negative**), 3x1-2x455 (88%) (Strength**),

Week 7: 5x2 60% + blue + green band (Speed/Power*), 2x1x600 (104%) + contest shirt (Negative**), 2x1x475 (92%) (Strength**),

Week 8: 5x1 60% + blue band (Speed/Power*), 1x1x625 (108%) + contest shirt (Negative**), 3x3x315 (light) (Strength**),

Week 9: Opener or second attempt to get shirt groove. **Week 10:** Light week for rehab and recovery. 3x3x275-315

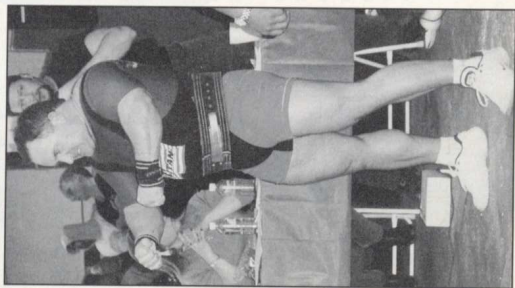
Week 11: Break PR/Contest

* Percentages are based on raw max. ** Sets x Repetitions

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Sets	2-6
Repetitions	1-6
Intensity	> or = 85%
Frequency	3-5 days/week
Rest Periods	2-5 min

ate intensity (2). Resistance training programs designed to improve strength typically utilize a multiple set, low-rep, complete or near complete recovery approach.

Simple physics states that force is a product of mass and acceleration ($F = m \times a$). Maximal resistance is not the only method to increase force production. Both components of force production can be manipulated to influence force production. Force production can be maximized by large resistance and low acceleration - $F = M \times a$, moderate resistance and large acceleration - $F = m \times A$, or by moderate resistances and mod-