Advanced Resistance Training Techniques

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Abstract: **Muscle hypertrophy is primarily influenced by three key mechanisms: mechanical tension metabolic stress, and muscle damage. Training with heavy loads (above 85% of one-repetition maximum, or 1-RM) is particularly effective at producing mechanical tension and building strength. On the other hand, using moderate loads (typically 60–80% of 1-RM) in combination with shorter rest periods tends to increase metabolic stress, which supports muscle growth. Interestingly, lifting lighter loads (60% of 1-RM or less) to the point of failure can also lead to similar hypertrophic gains, although this approach generally requires greater training volume to be effective. Several advanced training methods—such as accentuated eccentric loading (AEL), blood flow restriction (BFR), cluster sets, supersets, pre-exhaustion, and drop sets—offer diverse stimuli for muscle growth and can be strategically implemented depending on an individual's goals, experience level, and training preferences. While techniques like AEL and BFR provide unique advantages under specific conditions, traditional resistance training remains highly effective when key variables such as intensity and volume are properly managed.**

Keywords: **Resistance Training, mechanical tension, metabolic stress, and muscle damage.**

1. INTRODUCTION

Resistance training (RT) serves as a foundational exercise approach to improve muscular strength and support muscle hypertrophy. Developing muscle mass is essential in athletic conditioning, as it is closely linked to strength through the relationship between muscle cross-sectional area and force output. Increasing muscle size is also a primary goal for bodybuilders and a common objective among recreational strength training participants. From a health standpoint, maintaining sufficient muscle mass is vital, as inadequate levels have been associated with a greater risk of several health conditions, including cardiovascular disease, elevated cardio-metabolic risk in adolescents, and type II diabetes among middle-aged and older adults. Muscle growth occurs when muscle protein synthesis (MPS) exceeds muscle protein breakdown (MPB) over extended periods, leading to a positive net protein balance. Both resistance training and dietary protein intake can promote this process. Protein consumption boosts MPS and suppresses MPB, making the combination of resistance exercise and adequate protein intake a highly effective strategy for stimulating muscle hypertrophy. Various training variables—including intensity, volume, exercise selection and order, repetition andset schemes, movement tempo, rest intervals, and training experience—have been widely examined to optimize muscular adaptations. Among these, training intensity and volume are particularly influential in driving hypertrophy.

According to guidelines from the American College of Sports Medicine (ACSM), beginners shouldaim for 1 to 3 sets of 8–12 repetitions at 70–85% of their one-repetition maximum (1RM), while more advanced individuals may benefit from 3 to 6 sets of 1–12 repetitions using loads ranging from 70% to 100% of their 1RM. However, current research highlights a broader array of effective training methods. For example, studies have shown that using lighter loads (30–60% 1RM) can lead to similar muscle growth as heavier training, provided the sets are taken to volitional fatigue. Interestingly, training to complete failure is not always required to trigger hypertrophic adaptations — especially when using higher loads. Research suggests that training with moderate to heavy weights while stopping just a few repetitions short of failure (around 3–4 reps in reserve) can still produce significant gains in muscle mass.

Training volume—the total amount of work calculated as repetitions multiplied by sets and the load used—is widely recognized as a major factor influencing hypertrophy. Higher volumes of training may be needed to optimize muscle growth in many populations. However, as training experience increases, continued hypertrophy becomes more difficult to achieve, often prompting athletes and lifters to explore advanced resistance training techniques to push beyond performance plateaus. This paper aims to provide a critical analysis of advanced resistance training strategies that target skeletal muscle development and may enhance hypertrophy outcomes for both competitive and recreational lifters.

RESEARCH METHODS

A. Literature Search

A comprehensive literature search was conducted using the MEDLINE and SPORT Discus databases to identify studies published between 1996 and September 2019 that investigated the impact of advanced resistance training methods on muscle hypertrophy and associated training variables. The search strategy included keyword combinations such as: (‘resistance training’ OR ‘strength training’ OR ‘hypertrophy training’ OR ‘muscle’) AND (‘time under tension’ OR ‘movement velocity’ OR ‘eccentric overload’ OR ‘accentuated eccentric’ OR ‘blood flow restriction’ OR ‘blood flow restricted’ OR ‘occlusion’ OR ‘cluster set’ OR ‘superset’ OR ‘agonist-antagonist’ OR ‘pre-exhaustion’ OR ‘drop set’ OR ‘sarcoplasma’ OR ‘advanced training techniques’ OR ‘cross-sectional area’ OR ‘eccentric duration’).

To be included in this review, studies were required to meet the following criteria: (1) they must report original experimental findings involving healthy adult participants between the ages of 19 and 44; (2) they must be published in peer-reviewed scientific journals; and (3) the full text must be available in English. No exclusion criteria were applied regarding the sex of the participants during the selection process.

b. Inclusion and Exclusion Criteria

The primary objective of the literature review was to locate research studies that explored the impact of advanced resistance training (RT) methods on muscle hypertrophy and associated training variables. The initial screening phase involved reviewing article titles and abstracts, which led to the identification of 1,088 studies for further analysis.

In the next stage, studies were evaluated based on internal validity and specific selection criteria, which included: (1) comparisons between advanced RT techniques and conventional training methods; and (2) measurement of changes in muscle hypertrophy, muscular strength, and/or training volume before and after the intervention. Muscle hypertrophy was assessed through changes in muscle cross-sectional area, typically measured using magnetic resonance imaging (MRI) or dual-energy X-ray absorptiometry (DXA), as well as muscle thickness, commonly evaluated via ultrasound. Muscle strength assessments included repetition maximum tests (such as 1RM or 5RM), while training volume was determined by analyzing changes in total repetitions performed, total load lifted, and time under tension leading up to muscular failure.

The selection process was carried out independently by researchers following a set of predefined inclusion and exclusion criteria. After full evaluation, a total of 30 studies met the requirements and were included in the final analysis (see Figure 1).

DISCUSSION

a. Training Considerations

The traditional model for promoting muscle hypertrophy is centered around three primary mechanisms: mechanical tension, metabolic stress, and muscle damage. These elements can be stimulated through the deliberate adjustment of resistance training (RT) variables and the integration of specialized RT techniques. Among these factors, progressive overload through increased mechanical tension is considered a core principle for muscle development and structural adaptation. This is often achieved by raising training intensity. Utilizing heavy loads (greater than 85% of one-repetition maximum, or 1RM) with lower repetition ranges (typically 1–5 reps) and extended rest periods (3–5 minutes) targets maximal mechanical tension and improves strength.

However, this style of training may not be optimal for maximizing hypertrophy.Low-rep, high-load training heavily recruits fast-twitch muscle fibers due to the elevated neural demands but may provide limited metabolic stress, which is also important for muscle growth. Training volume is another critical variable with a well-established dose-response relationship. Evidence suggests that performing a greater number of sets per muscle group per week—typically between 28 to 30—yields significantly greater hypertrophic outcomes than lower volumes, such as 6 to 10 sets per week, in both novice and experienced lifters.

Using moderate loads (60–80% 1RM) for moderate repetition ranges (around 6–12 reps) across several sets (3–6), combined with short rest intervals (about 60 seconds), promotes substantial metabolic stress, which is thought to be a powerful stimulus for hypertrophy compared to heavy-load training alone. Importantly, research indicates that when RT is performed to volitional fatigue, the actual load used may be less critical for hypertrophy outcomes.

In a study by Schoenfeld et al., both low-load training (≤60% 1RM) to failure and moderate-load training (>60% 1RM) produced significant muscle growth in well-trained individuals. However, the low-load group had to complete nearly three times the training volume to achieve similar results. Supporting this, Ikezoe et al. found that even when total training volume was higher in the low-load group (30% 1RM, 12 sets of 8 reps), the high-load group (80% 1RM, 3 sets of 8 reps) saw nearly twice the increase in rectus femoris muscle thickness after eight weeks. This reinforces the idea that when sets are not taken to failure, a minimum intensity threshold of around 60% 1RM is likely necessary to optimize muscle growth.

To break through plateaus and keep training varied—particularly for advanced lifters—implementing advanced resistance training strategies can provide new stimuli. Techniques such as accentuated eccentric loading, slowed eccentric tempos, cluster sets, blood flow restriction (BFR) with light loads, supersets, drop sets, pre-exhaustion methods, and sarcoplasma-targeted training all offer distinct benefits. These methods not only help maximize hypertrophy but also reduce the risk of training stagnation by introducing novel challenges to the neuromuscular system.

b. Tempo Eccentric Technique

One notable advanced resistance training (RT) strategy involves prolonging the eccentric portion of an exercise. In resistance training, the tempo of movement—typically expressed as a four-digit sequence (e.g., 2/0/1/0)—indicates the time spent during different phases of a repetition: the eccentric (lowering) phase, the transition pause, the concentric (lifting) phase, and the following pause. Modifying this tempo can significantly affect critical training variables such as repetition count, total time under tension (TUT), and overall training volume.

Studies have demonstrated that faster tempos (e.g., 2/0/2/0) permit more repetitions within a set, whereas slower tempos, particularly with a prolonged eccentric component (e.g., 6/0/2/0), reduce repetitions but substantially increase TUT. This elevated time under tension may enhance the hypertrophic stimulus by prolonging mechanical stress on the muscle fibers. However, a meta-analysis by Schoenfeld and colleagues indicated that muscle growth can occur similarly across a wide range of repetition durations—anywhere from 0.5 to 8 seconds per rep. It's worth noting, though, that the analysis did not isolate the eccentric and concentric durations, which limits the ability to determine the specific impact of the eccentric phase alone.

In one study by Shibata et al., researchers compared the effects of slow (4-second) and fast (2-second) eccentric tempos during back squat exercises taken to muscular fatigue in male soccer players. Both groups exhibited comparable gains in thigh cross-sectional area, suggesting that when training is performed to failure, eccentric tempo may not drastically alter hypertrophy outcomes.

Interestingly, eccentric contractions can produce higher force outputs and are significantly more energy-efficient—requiring roughly four times less energy than concentric movements at the same load. This reduced metabolic demand may limit the buildup of metabolic stress during slow eccentric work, potentially influencing muscle growth.

In practical terms, varying the duration of the eccentric phase can still be a valuable tool forpromoting muscle hypertrophy. Although it's not definitively established whether slower eccentric tempos provide a superior stimulus, a moderately slow pace of around 2 seconds may strike aneffective balance—ensuring sufficient mechanical loading without unnecessarily extending workout durations. This approach could optimize training efficiency while supporting continued muscle development.

c. Accentuated Eccentric Loading Method

Accentuated Eccentric Loading (AEL) is an advanced resistance training (RT) method that specifically targets the eccentric phase of movement, leveraging the muscle's natural ability to generate more force during lengthening contractions—often 20–60% greater than during concentric actions. This technique typically utilizes equipment like weight releasers, which temporarily add load during the eccentric portion and automatically disengage at the transition point, allowing the lifter to complete the concentric phase with a lighter load. This setup enables intense mechanical stress and muscle microtrauma, both of which are considered key drivers of muscle hypertrophy.

Some studies have indicated that training focused exclusively on eccentric contractions can lead to more substantial increases in muscle mass than concentric-only training. However, when training volume is equalized, AEL and conventional high-intensity RT often result in similar hypertrophic outcomes, particularly among experienced lifters. Furthermore, it has become increasingly clear that muscle damage isn't essential for muscle growth, as training routines that reduce tissue damage have also been shown to stimulate similar hypertrophic adaptations compared to those that induce muscle soreness and breakdown.

In terms of structural changes, different contraction types tend to promote distinct muscle architecture adaptations. Concentric-only routines generally lead to muscle growth via an increase in sarcomeres arranged in parallel, often reflected in larger pennation angles without major changes in muscle fiber length. Eccentric-focused training, on the other hand, typically enhances sarcomere addition in series, promoting longer muscle fascicles with relatively smaller adjustments to pennation angles.

The elevated mechanical load applied during AEL may serve as an effective growth stimulus, particularly beneficial for seasoned athletes seeking to push past training plateaus. Nonetheless, there are some practical challenges associated with this method. It usually requires access to specialized gear or trained partners for safety and proper execution. Additionally, the need to reconfigure the eccentric load after each repetition can interrupt training flow, extending rest periods and session duration. Despite these hurdles, AEL remains a valuable technique for advanced individuals aiming to maximize muscle growth through novel loading strategies.

d. Low-Load Resistance Training Under Blood Flow Restriction

Blood flow restriction (BFR) training is an alternative resistance training (RT) method designed to reduce the mechanical demands associated with heavy lifting and the volume requirements typical of low-load RT taken to failure. This technique involves the application of restrictive devices—such as cuffs, elastic bands, or tourniquets—to the upper portion of a limb. These devices partially limit arterial blood flow while fully restricting venous return, creating a localized environment that encourages the buildup of metabolic byproducts.

The resulting metabolic stress, when combined with low-load RT (typically 20–30% of one-repetition maximum), has been shown to promote noticeable increases in muscle cross-sectional area, even in the absence of complete muscular fatigue. However, current research indicates that while BFR training can enhance hypertrophy, its effects do not consistently exceed those achieved through traditional high-load RT (around 80% 1RM) without restriction.

BFR training has demonstrated effectiveness across a range of populations, including untrained individuals, recreational lifters with over a year of training experience, and even elite athletes. Moreover, combining BFR techniques with conventional high-load RT may produce enhanced muscular adaptations, making it a versatile strategy in athletic and rehabilitation settings.

The most widely adopted and evidence-supported BFR protocol involves performing an initial set of 30 repetitions, followed by three sets of 15 repetitions, using short rest periods of about 30 seconds between sets. These sets are typically performed at 20–40% of 1RM, with cuff pressures adjusted to 40–80% of the individual's arterial occlusion pressure.

It is important to recognize, however, that the hypertrophic effects of BFR tend to be localized to the muscles situated below the site of occlusion. This limitation makes it a more targeted strategy rather than a full-body training replacement.

e. Cluster Sets Technique

Cluster sets represent a resistance training (RT) strategy that aims to strike a balance between mechanical tension and metabolic stress. Unlike traditional set structures, where a fixed number of repetitions are performed in sequence followed by a longer rest period, cluster sets involve short rest intervals (typically 20–60 seconds) embedded within the set. These rest periods divide the set into smaller "clusters" of repetitions.

While most existing research on cluster training focuses on performance metrics—such as power output, force generation, and movement speed—less is known about its direct impact on muscle hypertrophy. However, early findings suggest that the inclusion of intra-set rest allows individuals to complete more total volume with the same external load compared to traditional methods, offering a potentially enhanced stimulus for muscle growth. This benefit applies to both novice and experienced lifters.

Cluster sets also enable the use of heavier loads due to the brief recovery between mini-sets, thereby emphasizing mechanical stress over metabolic fatigue. This shift in training stimulus may be particularly beneficial for hypertrophy when integrated into high-intensity programs. From a practical standpoint, cluster sets support efficient high-volume, high-load training, making them suitable for athletes or lifters looking to increase work output without significantly extending training duration. They can also be incorporated into periodized programs as an alternative to traditional methods, helping to maintain variety and reduce training boredom. Despite their growing popularity and promising applications, more targeted studies are needed to fully understand the effects of cluster sets on muscle hypertrophy.

f. Supersets and Pre-exhaustion Technique

Supersets and pre-exhaustion are resistance training (RT) strategies designed to intensify workouts by performing two exercises in succession without rest. Supersets can involve exercises targeting the same muscle group, opposing (agonist-antagonist) muscles, or different muscle regions, such as alternating between upper and lower body movements, followed by a rest period. Pre-exhaustion. on the other hand, consists of executing an isolation (single-joint) exercise prior to a compound (multi-joint) movement that targets the same muscle group—an example being dumbbell flys followed by the bench press.

Research conducted by Wallace et al. showed that supersets targeting the same muscle (e.g., flat bench press immediately followed by incline bench press) resulted in reduced overall training volume when compared to traditional workout sequences in trained individuals. However, agonist- antagonist supersets—such as pairing the bench pull with the bench press—demonstrated increased training volume compared to conventional methods. Both agonist-antagonist and upper- lower body supersets also proved to be more time-efficient, making them practical for lifters with limited training time.

The pre-exhaustion technique is particularly favored by bodybuilders aiming to enhance the hypertrophy of specific muscles. The logic is that by first fatiguing a muscle with an isolation movement, it may receive greater stimulation during the subsequent compound exercise. A variant of this method, reverse pre-exhaustion (e.g., performing a triceps pushdown before a bench press), aims to reduce the involvement of fatigued assisting muscles, potentially increasing the load on the primary movers.

However, studies challenge the effectiveness of this strategy in altering muscle activation patterns. Golas et al. found that pre-fatiguing the chest (e.g., incline flys) did not significantly increase pectoralis major activation during the bench press at near-maximal loads (95% 1RM). In contrast, pre-fatiguing synergistic muscles like the triceps or anterior deltoid led to increased activity in those muscles during subsequent pressing exercises. Additionally, Soares et al. reported a reduction in repetitions to failure when pre-exhaustion techniques were used (e.g., triceps pushdown followed by bench press).

g. Drop Sets and Sarcoplasma Stimulating Training Technique

Drop sets are a resistance training (RT) method where an exercise is performed until muscular failure with a specific load, after which the weight is immediately reduced—usually by around 20%—and the exercise is continued until failure again. This sequence may be repeated several times, with minimal to no rest between load reductions. The primary aim of this technique is to generate high metabolic stress, a key factor linked to muscle hypertrophy. In a study conducted by Fink et al., participants experienced significantly greater gains in muscle thickness using drop sets compared to a conventional set structure. Notably, their research also found increased cross-sectional area in the triceps after six weeks of drop set training.

However, it's important to consider that these participants had limited resistance training experience (under one year).

In contrast, Angleri et al. observed no hypertrophic advantage of drop sets over traditional training for the lower body in well-trained individuals, particularly when total training volume was kept constant. This highlights how training status and load management can influence the effectiveness of such techniques. Another metabolic stress–focused RT strategy is Sarcoplasm Stimulating Training (SST), which

follows a similar high-intensity format. SST typically begins with sets at 70–80% of 1RM performed to fatigue, followed by two more sets with brief 20-second rest periods. After this, the weight is decreased by 20%, and another set is completed using a controlled tempo (e.g., 4 seconds eccentric / 0 seconds pause / 1 second concentric / 0 seconds pause). This process is repeated with two additional 20% load reductions, culminating in a final set that ends with a static hold, such as maintaining a 90° elbow flexion position until failure.

An alternative SST approach includes performing eight fatigue-inducing sets at the same 70–80% 1RM load, with progressively decreasing rest intervals (e.g., 45, 30, 15, 5, 5, 15, 30, and 45 seconds), without reducing the load. Both SST variants are structured to elevate metabolic stress, similar to drop sets. Research by de Almeida et al. reported greater acute increases in muscle thickness in the biceps brachii and triceps brachii after SST compared to traditional RT, even though the traditional protocol involved a higher overall training volume.

While both drop sets and SST appear to be effective at inducing short-term muscle swelling, particularly in the arms, their long-term benefits for muscle growth remain less conclusive. Drop sets, in particular, have not consistently shown superior hypertrophy outcomes over time compared to standard training. Additionally, although SST has shown promising acute effects, further studies are needed to determine its chronic impact on muscle development.

CONCLUSION

Muscle hypertrophy is primarily driven by three physiological mechanisms: mechanical tension, metabolic stress, and muscle damage. Training with high loads (greater than 85% of one-repetition maximum or 1RM) and low repetitions (typically 1–5) maximizes mechanical tension and strength development but may not be optimal for muscle growth. In contrast, using moderate loads (around 60–80% 1RM) with moderate repetitions (6–12 reps) and short rest periods (~60 seconds) is more effective for promoting hypertrophy by increasing metabolic stress.

Training volume is another critical factor. Research suggests that performing 28–30 sets per muscle group per week can yield superior hypertrophic outcomes. Additionally, low-load RT (≤60% 1RM) taken to muscular failure can stimulate muscle growth comparable to that achieved with moderate-load training—though this often requires a higher overall volume to compensate for the lighter loads.

Manipulating the Eccentric Phase

Altering the eccentric phase tempo can influence time under tension (TUT) and the number of repetitions per set. Slowing down the eccentric phase (e.g., taking 6 seconds) increases TUT and may support hypertrophy. However, using a moderate tempo (~2 seconds) during the eccentric portion offers a practical balance between training efficiency and effectiveness. Evidence indicates that hypertrophy can occur across a wide range of eccentric tempos (0.5–8 seconds), though excessively slow tempos may reduce training volume and extend sessions unnecessarily.

Accentuated Eccentric Loading (AEL)

AEL takes advantage of the muscle's greater force capacity during eccentric contractions. Tools like weight releasers enable overloading the eccentric phase, increasing mechanical tension and muscle damage, both associated with muscle growth. While AEL offers unique stimuli and adaptations — such as longer fascicle lengths from eccentric-only training—it generally produces similar hypertrophy outcomes to traditional high-load training when overall training volume is matched. Due to its complexity and equipment requirements, AEL is better suited for advanced lifters.

Blood Flow Restriction (BFR) Training

BFR training involves using cuffs or wraps to partially restrict blood flow to working muscles during low-load resistance training (20–30% 1RM), promoting hypertrophy through increased metabolic stress. Remarkably, significant muscle growth can occur even without training to failure. Although BFR is effective across various populations—from novices to elite athletes—it generally does not outperform traditional high-load RT (80% 1RM). A typical BFR protocol includes an initial set of 30 reps, followed by three sets of 15 with 30-second rests.

Cluster Sets

Cluster sets incorporate brief rest periods (20–60 seconds) between smaller groups of repetitions within a set. This method enables lifters to use heavier loads or perform more total repetitions than traditional RT schemes. While metabolic stress is reduced, cluster sets support higher mechanical tension and improved training efficiency, especially useful during high-volume sessions. Though promising for hypertrophy, direct evidence of their long-term impact on muscle growth remains limited.

Supersets and Pre-Exhaustion

Supersets pair two exercises back-to-back without rest, targeting either the same muscle group, opposing muscle groups (agonist-antagonist), or alternating upper and lower body. They are known for enhancing training volume and time efficiency, especially when using agonist-antagonist or upper-lower splits. Pre-exhaustion, commonly used in bodybuilding, involves fatiguing a target muscle with a single-joint movement before performing a compound exercise. Although intended to increase activation in specific muscles, pre-exhaustion may reduce overall training volume and repetition capacity, and evidence on its effectiveness is mixed.

Drop Sets and Sarcoplasm Stimulating Training (SST)

Drop sets involve taking a set to failure, then immediately reducing the weight (typically by ~20%) and continuing until fatigue. This technique creates high metabolic stress and has shown short-term muscle thickness increases, particularly in muscles like the triceps. However, long-term benefits do not consistently surpass traditional methods, especially when training volume is equalized.

SST is a more elaborate variation designed to amplify metabolic stress through multiple weight reductions, controlled repetition tempos, and static holds. SST protocols often produce greater acute hypertrophic responses, even with lower total volume. Despite these benefits, SST's chronic effects on muscle growth remain largely unexplored.

These advanced resistance training strategies offer diverse and targeted approaches to stimulate hypertrophy. Their application should be tailored based on an individual's training goals, experience level, available equipment, and time constraints. Whether aiming to break through plateaus or optimize training efficiency, integrating methods such as AEL, BFR, cluster sets, supersets, and drop sets can diversify stimuli and enhance muscular development over time.

REFERENCES

[1] Schoenfeld B. The Use of Specialized Training Techniques to Maximize Muscle Hypertrophy. Strength Cond. J.

[2] Ribeiro A.S., Nunes J.P., Cunha P.M., Aguiar A.F., Schoenfeld B.J. Potential Role of Pre-Exhaustion Training in Maximizing Muscle Hypertrophy: A Review of the Literature. Strength Cond. J.

[3] Kelleher A.R., Hackney K.J., Fairchild T.J., Keslacy S., Ploutz-Snyder L.L. The Metabolic Costs of Reciprocal Supersets vs. Traditional Resistance Exercise in Young Recreationally Active Adults. J. Strength Cond. Res.

[4] 3.Tufano J.J., Conlon J.A., Nimphius S., Brown L.E., Petkovic A., Frick J., Gregory Haff G. Effects of Cluster Sets and Rest-Redistribution on Mechanical Responses to Back Squats in Trained Men. J. Hum. Kinet.

[5] Scott B.R., Loenneke J.P., Slattery K.M., Dascombe B.J. Exercise with blood flow restriction: An updated evidence-based approach for enhanced muscular development. Sports Med.

[6] Gehlert S., Suhr F., Gutsche K., Willkomm L., Kern J., Jacko D., Knicker A., Schiffer T., Wackerhage H., Bloch W. High force development augments skeletal muscle signalling in resistance exercise modes

equalized for time under tension. Pflug. Arch. Eur. J. Physiol.

[7] Franchi M.V., Reeves N.D., Narici M.V. Skeletal Muscle Remodeling in Response to Eccentric vs. Concentric Loading: Morphological, Molecular, and Metabolic Adaptations. Front. Physiol.

[8] 7. Ikezoe T., Kobayashi T., Nakamura M., Ichihashi N. Effects of low-load, higher-repetition versus high-load, lower-repetition resistance training not performed to failure on muscle strength, mass, and echo intensity in healthy young men: A time-course study. J. Strength Cond. Res. 2017

[9] Ozaki H., Kubota A., Natsume T., Loenneke J.P., Abe T., Machida S., Naito H. Effects of drop sets with resistance training on increases in muscle CSA, strength, and endurance: A pilot study. J. Sports Sci.

[10] Fink J., Schoenfeld B.J., Kikuchi N., Nakazato K. Effects of drop set resistance training on acute stress indicators and long-term muscle hypertrophy and strength. J. Sports Med. Phys. Fit.

[11] Weakley J.J.S., Till K., Read D.B., Roe G.A.B., Darrall-Jones J., Phibbs P.J., Jones B. The effects of traditional, superset, and tri-set resistance training structures on perceived intensity and physiological responses. Eur. J. Appl. Physiol.

[12] Friedmann-Bette B., Bauer T., Kinscherf R., Vorwald S., Klute K., Bischoff D., Müller H., Weber M.A., Metz J., Kauczor H.-U., et al. Effects of strength training with eccentric overload on muscle adaptation in male athletes. Eur. J. Appl. Physiol.

[13] Walker S., Blazevich A.J., Haff G.G., Tufano J.J., Newton R.U., Häkkinen K. Greater Strength Gains after Training with Accentuated Eccentric than Traditional Isoinertial Loads in Already Strength-Trained Men.