**By Ken Mannie**

**Strength/Conditioning Coach**

**Michigan State University**

     One of the frequently asked questions we receive is, “Do you guys use free weights (i.e., barbells and dumbbells) or machines in your  program design?”  Our answer is simple – we use both.

     We believe in a comprehensive strength training system that, while structured, allows for flexibility in the use of equipment.  Emphasis is placed on safety, efficiency, productivity, and intensity, rather than the mode itself.  Proper training technique and an aggressive approach always supercede the equipment choice.

     In terms of morphological enhancements (increases in muscular size), the body responds favorably to progressive overload.  The source of this overload is not nearly as important as the proper application.  Our emphasis is placed on stimulating the target muscle complex with constant tension throughout the fullest range of motion safely possible.

     We do not believe that any one modality (barbell or machine) has a distinct advantage in stimulating lean tissue growth, enhancing strength and power development, improving explosiveness, or augmenting sport-specific skill acquisition.  No definitive scientific literature exists to suggest the superiority of any strength training modality in these areas.

     This is not to say that the two training modes are identical in function.  There are some very real differences between barbells and machines – pros and cons, per se – that must be understood.  Since no type of equipment is perfect, we will focus on the “pros” in order to present a case for using both.

Free Weights: Advantages

The use of free weights requires the component of balance in execution, as rods, cams, or a leverage mechanism do not guide the load.  As a result, it is possible that more “synergistic” muscles (i.e., stabilizing and fixating muscles) are used in addition to the target area muscles the exercise is designed to work.  The rate and level of this synergistic effect is unknown, as is the overall effect it has on development.  However, it is a point that deserves mention and certainly one to consider.

     Free weights are also diverse in that several different exercises can be performed for most areas of the body.  With dumbbells, for instance, you can perform the bench press, incline press, and chest flyes – all of which stimulate the chest and anterior shoulder regions.

     For those with a limited budget, free weights usually offer a more affordable option. It is interesting to note, however, that there are several “plateloading” machines (i.e., machines that use free weight plates for the resistance) on the market with competitive price tags.

Machines: Advantages

Machines offer the ability to target specific muscles in an intense manner with resistance that adjusts to the athlete’s needs along the strength curve for that particular area.  Simply put, your musculature is weaker at certain points during the execution of an exercise and stronger at others.  Variable resistance machines – those that accommodate for the biomechanical changes along the strength curve – address this problem.  While it is difficult to precisely match everyone’s body structure, these machines still do a much better job than free weights in meeting this need.  In any case, *some*accommodation is better than

 *none.*

     Another plus for machines is the fact that you can isolate an area that needs more emphasis.  The synergistic effect mentioned earlier with free weight training isn’t always desirable.  In our opinion, there is a need to heighten the stimulation to a target area in order to force those muscles to perform the brunt of the work.

     Machines can also offer trainees a safer mode for performing certain exercises.  Example:  A bent-over barbell row, albeit a good exercise for the upper back musculature, can be stressful to the lumber spine region.  A seated machine row is a safer and possibly more productive alternative.

     There are also many instances where machines are a necessity.  The neck, hamstrings, hip abductors (outer hip and thigh), hip adductors (inner thigh), and hip flexors (muscles that draw the thigh toward the abdominal area) require machine intervention or manual resistance for adequate stimulation.

     Rehabilitation and “special needs” situations (e.g., an injury to a single limb or an injury that limits range of motion) also propagate the need for machines in a strength training program.  You are usually put in a difficult position when these inevitable circumstances surface and free weights are the only option.

     Machines are extremely useful in rehabilitation because it is easier to restrict and document the user’s range of motion.  This documentation is important in assessing pain-free movement and determining the healing progress.

Keep an Open Mind

     In conclusion, we suggest the incorporation of both free weights and machines whenever possible.  Both have unique advantages that are difficult to ignore.

     We would advise you to be wary of any individuals or organizations that advocate the sole or primary use of any one type of equipment – machine, free weight, or whatever – as they probably have a financial motivation, philosophical bias, or some other “hidden agenda.”

     Remember that progressive overload is the vital ingredient to successful strength training.

     As far as equipment goes, ladies and gentlemen, choose your weapon!