

HIGH LEVEL TRAINING

Water fitness programming has progressed and diversified over the past several years. The water is a gym in three dimensions, since in a work of tone that use the characteristics and the properties of the water, we move towards where we move... we will have a resistance to the movement. Although a significant part of the workout intensity is up to the individual.

With the high level training we are looking for a complete muscular training, indicated for the advanced users and sportsmen, since we are working with the more important muscular groups of one more intense way. But we will see this kind of training soon; before, we begin reviewing the basic concepts of the muscular training.

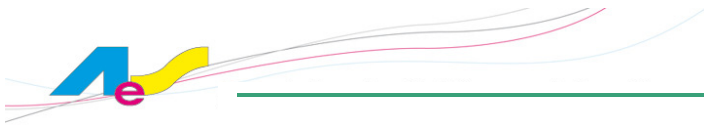
TERMS USED IN MUSCULAR WORK

We will start looking for a definition for the more used terms in the muscular work:

- **Hypertrophy:** It's the increase of the size of myofibrils per muscle fiber.
- **Hyperplasia:** It's the increase of the number of myofibrils per muscle fiber.
- **Muscular tone:** Refers to the basic and constant ongoing contraction or muscular activity in the muscles. Tone may be normal, too low (Hypotonic), or too high (Hypertonic).

Muscle growth depends on the **muscle fiber type** activated and the pattern of recruitment. Muscular fibers can be divided into three broad families:

- **The fast fibers:** used for short efforts and highly fatigable, they work exclusively under anaerobic conditions. They use the oxygen and glycogen they have stored. They are used in bodybuilding during short series.
- **The intermediate fibers:** determine a capacity for resistance, such as 400 m to 1000 m in athletics. They are not sufficiently powerful for 100 m, not sufficiently enduring for 10 000 m.
- **The slow fibers:** also known as red fibers, they capture oxygen coming directly from the lungs, they have no reserve, this is the typical fiber of the marathon runner.



Remember that the type of muscular fiber found in any particular individual depends purely on genetic considerations. Deficiencies in a particular type of fiber can be improved through training, but always at the expense of the primary qualities. The results are generally disappointing since you cannot turn a carthorse into a race horse.

Another think that we need to remember is that the voluntary muscular contractions can be classified in several ways. One of these categorizes them as either eccentric or concentric:

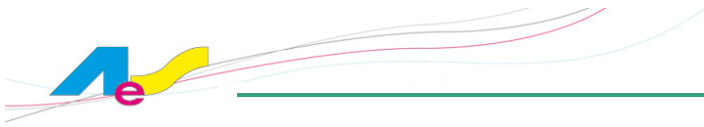
In the case of **concentric** contraction, the force generated is sufficient to overcome the resistance, and the muscle shortens as it contracts.

During a concentric contraction, a muscle is stimulated to contract according to the sliding filament mechanism. This occurs throughout the length of the muscle, generating force at the musculo-tendinous junction, causing the muscle to shorten and changing the angle of the joint. In relation to the elbow and bicep, the contraction of the bicep would cause the hand to move from close to the leg, to close to the shoulder (a bicep curl).

In the case of **eccentric** contraction, the force generated is insufficient to overcome the resistance placed on the muscle and the muscle fibers lengthen as they contract.

An **eccentric contraction** is a type of muscle contraction in which the resistance (such as a weight carried in the hand) is greater than the force applied by the muscle so that the muscle lengthens as it contracts. Because the contraction works in the opposite direction the muscles are generally supposed to move (i.e. muscles can only shorten, never lengthen), muscles undergoing heavy eccentric loading suffer greater damage when overloaded (such as during muscle building or strength training exercise) as compared to concentric loading.

We know that exercise that incorporates both eccentric and concentric muscular contractions (i.e. involving a strong contraction and a controlled lowering of the weight) can produce greater gains in strength and toughness than concentric contractions alone; exercise featuring a heavy eccentric load can actually support a greater weight (muscles are approximately 10% stronger during eccentric contractions than during concentric contractions) and also results in greater muscular damage and delayed onset muscle soreness one to two days after training.



But into the water, for their properties, do not exist the eccentric work; **always works in a muscular balance**. Interesting for:

- To avoid muscular imbalances
- To have a better corporal position (position)
- To reduce the time of training
- To protect the joints
- Etc...

IS THE HIPERTROPHY POSSIBLE?

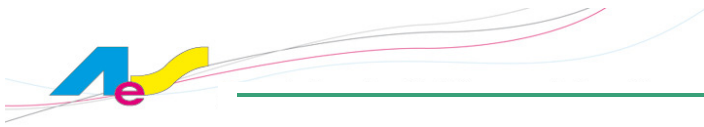
Once known the basic terms used when we spoke of muscular work, we will try to discover if we can obtain an increase of muscular volume and of muscular tone, or not, with Aquafitness; and, if it is possible, like obtaining it.

Understanding that the search of the hyperplasia will be complicated (remember that it's not scientifically demonstrated), we will be centred in hypertrophy. But, the first problem appears when remembering that hypertrophy is generated handling volumes of intensity around 70/90% of the maximum force of an individual.

But into the water... how we made the analysis to know the 1RM (maximum repetition) of the maximum intensity? And, how the not trained people can know the intensity whom must work?

Another problem appears when advancing in the term hypertrophy; we observed that in addition to the intensity of the muscular work, it indicates to us a maximum number of repetitions that oscillate between 10 or 12 repetitions to produce the wished metabolic effects. And, when we try to imitate the terrestrial work with that we will make in aquatic means, we discovered that to obtain the resistance necessary to elevate the intensity until obtaining a maximum of 10-12 repetitions... we would need or a very voluminous or very heavy material that it difficult us to make the exercises of the technically correct form.

In addition, considering that the processes of return to the starting point of each repetition would imply to antagonistic muscles, we did not obtain therefore the isolation necessary to reach the required intensity. You remember that into water the eccentric muscular contraction does not exist, all are concentric.



Therefore, the muscular hypertrophy is possible? We could think, by before commented, that is not possible; but it is not thus, if we approached hypertrophy from a point of view of an increase of the muscular volume caused by the growth of the fast and slow muscular fibers, we will observe that in the water and with its auxiliary materials, work with fast fibers will be complicated since they need the previous indications.

But if that we can try to work with slow fibers that, evidently, they will not cause an hypertrophy as evident as the development of both but the sufficient thing like aesthetically, healthful and physics improving to our clients, from the improvement of the force - resistance who we can obtain with Aquafitness. Without leaving of side variable like: high intensity, rest... related to hypertrophy.

HOW WILL BE THE CLASS?

During the 50 minutes that the class lasts, we will try to work the main muscular groups to the maximum intensity. We will try to isolate to the maximum the implied muscular group although sometimes we will have to work two or three groups simultaneously.

We will begin with a general warm up where we will imply all the muscular groups to continue with the isolated work of each one of them:

1. Pectoral (pectoralis major)
2. Latissimus dorsi muscle
3. Quadriceps muscles
4. Triceps
5. Gluteus & Hamstrings muscles
6. Biceps
7. Adductors, abductors & abdominal muscles

It's time to start!!!