



Ranvet

HORSING AROUND

HOW MUSCLES WORK

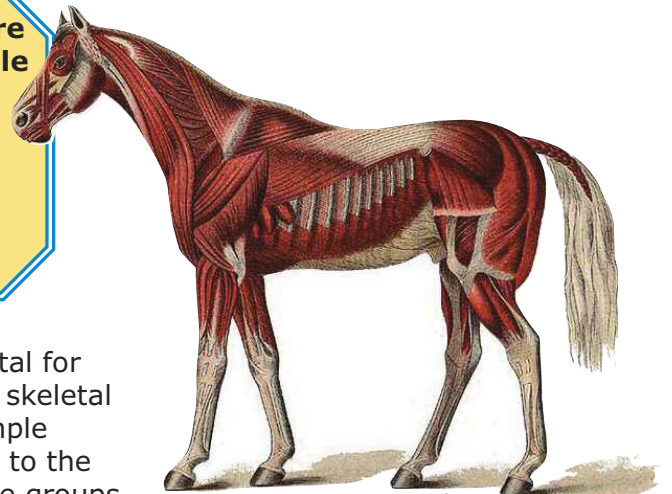
The principal functions of muscles are to produce movement and maintain posture, these two functions being achieved by adjusting the length and tension of muscle i.e.; contracting and relaxing. Additionally, microscopic muscle cells contained within muscles enable energy to be transformed into motion, allowing vertebrate animals such as the horse to complete various tasks, functions and interact with their environment.

Horses, as with all vertebrates are comprised of three primary muscle types which are vital to the functioning of all body systems;

Smooth muscle

Cardiac muscle

Skeletal muscle



www.horse-diseases.com

SKELETAL MUSCLE FUNCTION

While cardiac and smooth muscle are vital for cardiovascular and respiratory function, skeletal muscle enables movement, allowing simple movements such as the pricking of ears to the involvement of a large number of muscle groups in galloping. The contraction of skeletal muscle is controlled by the nervous system and involves a complex array of reactions which in turn produce movement.

In order to understand the principles of muscle contraction, the process has been simplified below;

Excitation

Brain sends electrical impulse via nervous system. Nerve impulse activates the muscle cell for contraction by releasing calcium ions into the muscle cell.



Contraction

The muscle cell contracts using energy in the form of adenosine triphosphate (ATP) during the process.



Relaxation

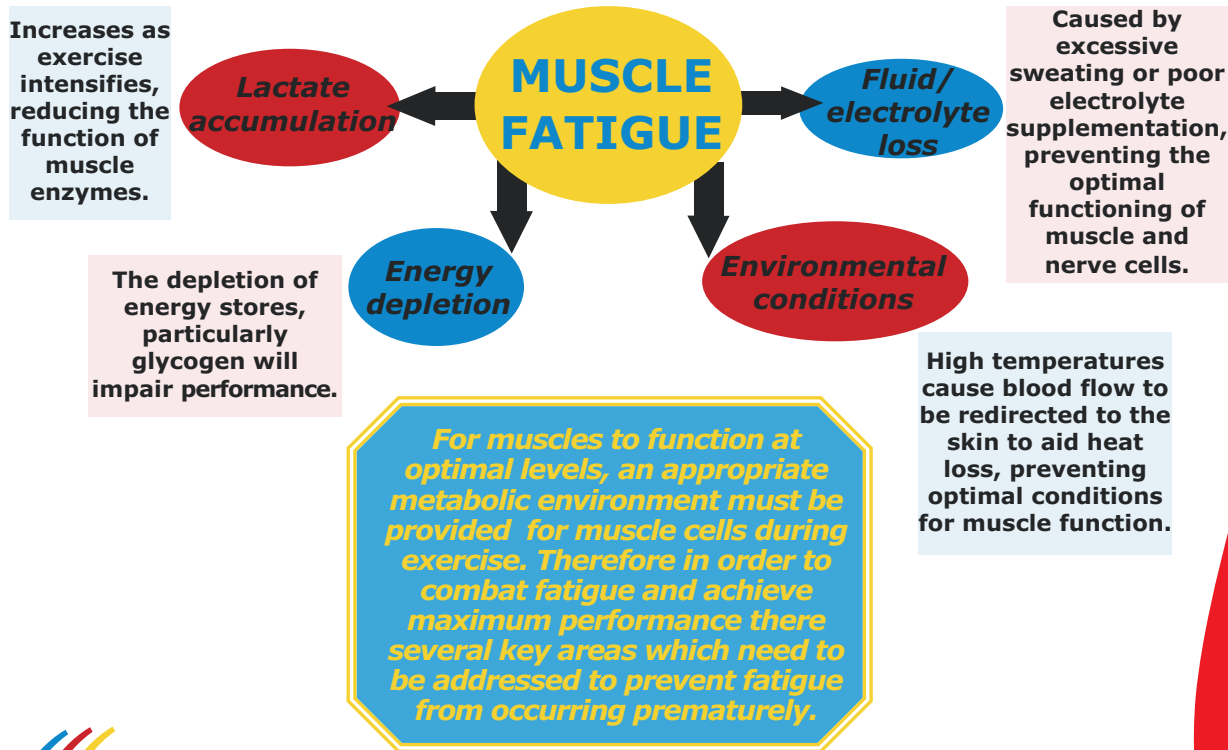
Once the electrical impulse has ceased, calcium is removed and the muscle cell relaxes. The ATP must then be replenished for further muscle contraction to occur.

**NEXT
MONTH;
Feeding the
Geriatric
Horse**

SCIENCE

■ INNOVATION ■

EXCELLENCE



KEY MUSCLE NUTRIENTS

- **Electrolytes** - The body uses electrolytes to regulate nerve and muscle function. Muscle contraction requires calcium, sodium and potassium ions to be present. When any of these electrolytes are excessive or deficient, muscle function may be adversely affected. Ranvet's **Salkavite®** is a premium grade electrolyte and B-Group vitamin replacer, providing all the essential electrolytes that a horse in work loses including *sodium, potassium, calcium, magnesium, chloride, phosphate and sulfate*.
- **Protein** - Is essential for maintaining muscle mass and repair/remodelling. Inadequate protein provision will impair these processes preventing optimal performance. The quality of a protein source is determined by its amino acid profile. Protein sources such as Power Formula® and soybean meal provide an amino acid profile which is complementary to the horse's needs. Ranvet's **Power Formula®** is a balanced protein, vitamin and mineral supplement suitable for the equine athlete.
- **Water** - Provides an essential environment for a vast array of chemical reactions vital for optimal muscle function. Always ensure fresh, clean water is available at all times.
- **Energy** - In the form of ATP is required for muscle contraction. Insufficient energy will impair this process leading to poor performance. ATP can be derived from glycogen, glucose and fatty acids. **Racing Oil®** provides a cool, concentrated energy source without the drawbacks associated with starch based grain sources and supplies a beneficial ratio of Omega-3 to Omega-6 fatty acids, promoting optimal functioning of anti-inflammatory and inflammatory processes.

Ranvet's Nutritional Consultation Service for your horse's every need;

- Customised diets
- Energetic demands
- Vitamin & electrolyte requirement
- Growth & development needs
- Correcting metabolic disturbance

SCIENCE

■ INNOVATION

■ EXCELLENCE