

Is The Boundary

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Only English Version

Every so often, scientific language introduces new terms in everyday language that sound initially obscure, then rare and finally become common. Such is the case, for example, of words like “microwaves”, “digital”, “catalytic”, “hypoallergenic”, “transgenic” and so on. Many of these words enter in our lives through a powerful and extremely effective medium, advertising, which speeds up the acceptance of new expressions and diffuses them at every level.

This happens also in the field of nutrition, particularly human but also animal, where the progress of knowledge spreads new concepts and new terms, first among a small group of initiates and then among the large public. Who would have imagined, just a few years ago, that it would be possible to highlight the “omega-3 fatty acid” content in food? And yet, this term has now become common knowledge. Similarly, everyone knows what “organic” or “diet” food is. Sometimes, in fact, no one really knows the exact meaning of the new words, but this problem can be resolved: those who are curious can find a way to fill the knowledge gap through specialist press.







A term with which horse lovers should start becoming familiar with is “nutraceuticals” because behind this word there is already a world market worth several billions of Euro. This ensures a considerable volume of advertising, so we will undoubtedly become used to the sound of this word. Therefore it is worth introducing the nutraceuticals straight away, throwing some light on the concepts connected with it.

Food and nutrients

It seems banal to give a definition of food, but it is useful to remember that most of what we eat is not born like that, perhaps only milk – and eggs if we extend the concept – are born as food. For all the others, it is a question of defining the limit of acceptability between what we can ingest and what we cannot. An example, for the sake of clarity: many products, also similar ones, can be eaten as food but can also entail a risk if ingested: such is the case of mushrooms, which can be eatable or poisonous, or herbs for horses, which can be excellent nutrients but can also conceal dangerous toxic elements.

According to a widely-accepted definition, food for animal is an eatable product consumed by animals that contributes to their well-being by providing energy and/or nutrients, and is generally recognized as safe. Other definitions include in this category also foodstuff that provides taste or aroma, in addition to energy and nutrients. The aforementioned definition requires us to explain the meaning of “nutrients”, which can be correctly defined as a substance that contributes to keeping the animal alive by its relative quality and quantity. Among the most widely known nutrients are proteins, fats, carbohydrates,



minerals and vitamins.

However, foods do not contain just nutrients; we might find neutral substances that have the role of "space fillers" but do not provide nourishment. Many toxic substances can also be found in food, but their presence does not exclude the food from nutritional use (for example raw soy seeds and linseeds are toxic). Other substances, finally, have an effect on metabolism. Cabbages contain substances that influence the working of the thyroid, citrus fruits are rich in vitamin C and other antioxidants.

In other words, there are types of food that, apart from providing nourishment, have also other effects. Each of us will have certainly tried (alas, with mixed results) to boost our immune system and avoid getting flu or a cold by drinking freshly-squeezed orange juice. This is a classic example of the use of food for non-nutritional purposes. And the evolution of this concept leads us to nutraceuticals.

Food and medicine

Some types of food contain substances with a positive effect, in a broader sense than just fulfilling our nutritional needs. This special role of food has become particularly relevant today, as the large public is more and more interested in some generic "natural" remedies.

There is no doubt that traditional medicine has kept its central role in many circumstances, but the interest in alternative medicines, or the use of natural substances (as opposed to chemical ones), particularly vegetable ones, is on the increase. In some cases the use of natural products has its advantages. Going back to the previous example, freshly-squeezed orange juice has more natural antioxidants and therefore has a different effect (even

though not necessarily a better one) than using vitamin C.

And so an entirely new horizon opens up before us: if until yesterday we used to think of medicines as substances completely isolated from food, now we need to familiarize ourselves with a more diverse reality, one that has more shades of gray. Nutraceuticals represent these "shades" of gray that are emerging between the two extremes of black and white. Here are some definitions that can help us make sense of all this.

Medicine or drug is a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in humans or other animals, or any article, other than food, intended to affect the structure or any function of the body of humans or other animals.

Nutraceuticals, on the other hand, are non-toxic food-stuffs that provide scientifically proven health or medical benefits, including the treatment or prevention of diseases. Another definition of a nutraceutical states that it is a substance that affects the health and the use of nutrients in men or animals.

Consequently, veterinary nutraceuticals are non-drug substances that are produced in a purified or extracted form and administered orally to provide agents required for normal body structure and function with the intent of improving the health and well-being of animals.

All these definitions have been coined by US official organizations that are also widely accepted internationally. Besides, the word "nutraceutical" is a portmanteau of the words "nutrient" and "pharmaceutical".

Often, the substance can have different effects, depending on the dosage. Once again it is useful to make the exam-



ple of an antioxidant, vitamin E. A low dose has a nutritional effect, whereas a high dose prevents hemoglobinuria in horses and is therefore considered (and publicized) as a nutraceutical.

Safety and effectiveness

Nutraceuticals must have a safe beneficial effect on metabolism. In the current situation (and given the legislation in force), many nutraceuticals have a declared effect that is not always correctly supported by rigorous scientific research. Despite this, its use is tolerated also in case of doubtful effects, provided that the safety in its use is ensured. In this sense it is paramount that the dose is adhered to, because many of these substances, as in the case of drugs, have a toxic dose that must not be approached, let alone exceeded. In any case, it is worth bearing in mind that the current legislation concerning nutraceuticals does not require evidence of their effectiveness and safety similar to that required to obtain the authorization to market a drug.

With regards to horses, nutraceuticals are hardly ever used to prevent the onset of a disease; more often their role is that of performance promoter, assisting each horse in performing at their best.

In many cases, however, the studies on the effectiveness of these compounds are tested on man, those related to horses, even though they exist, are few and far between. Their use therefore needs often to be discussed case by case. There are, for example products that can reduce the level of lactic acid in the blood, also in horses. So it is advisable to use it only if the horse works hard and performs above the aerobic threshold, whereas if it is only used for walking or for long and slow work, the effect should be less apparent and the benefits doubtful.

Some examples

Many compounds can be found as base of nutraceuticals available on the market. Many categories of compounds

even end up being completely identified with this category, e.g. the antioxidants mentioned above, appetite stimulants, some colorings, natural antimicrobials, some carbohydrates and enzymes. Many nutraceuticals are sold as specific supplements for sport horses. Below are some examples of these supplements that can be found on the market.

Carnitine is an important compound consisting of nitrogen, which abounds in muscles and in the heart, whereas vegetable horse diets are generally poor of it. Its effect is connected with muscular contraction and, more generally, with the use of energy. Using carnitine enhancing muscular functionality. The body itself synthesizes carnitine in the liver, and the quantity synthesized is enough for normal conditions. It is necessary to use a supplement when a high level of performance is required, or in the case of high levels of stress.

Coenzyme Q10, also known as ubiquinone, has a role in the production of energy at cell level, is an important antioxidant and neutralizes free radicals. It can work also in horses, used for the treatment of heart disease.

Creatine, in its phosphorylated form (creatine phosphate) is the compound that enables the reconstitution of ATP, the molecule providing cells with energy in a usable form. Creatine was and is widely used by sportsmen, with generally encouraging results. So far, its use in horses has been limited, discouraged also by the administration procedure – 4 to 6 administrations a day – which appears to be impractical.

DMG (dimethylglycine) is one of the compounds used to reduce the level of lactic acid produced in the blood during an intense effort. Also this compound has been studied more extensively on men than on horses, and the results on the latter are not very conclusive, even though it seems to have a good effect.





Among horse experts, these natural products are also interesting as a way to treat inflammations. Traditional anti-inflammatory drugs are often treated as performance-enhancing drugs and are not without unpleasant side effects.

The interest for natural products used to cure the most common problems affecting our horse is becoming more and more widespread. Riders, groom experts but also veterinarians seem to have discovered the use of these products alongside traditional therapies, even though their use was known also in ancient times.

It is enough to consider that the Ancient Egyptians already knew the medicinal virtues of essential oils extracted from some plants and so did the Ancient Greeks: Hippocrates, father of modern medicine, had discovered the pain-relieving properties of the bark of willow trees, without obviously knowing that it contains salicylic acid, which today is the active ingredient of the aspirin. The bark of the willow tree can be an example of a natural "anti-inflammatory", as its effect is to fight the inflammation.

What is inflammation?

The term "inflammation" is widely used. With this word we define the body's response to an external aggression or to a tissue alteration. An inflammation occurs, for example, when a tissue becomes infected as a result of the bacteria that colonize a wound, or when a muscle gets sprain due to overworking. The body of an animal reacts to this stimuli by activating a series of standard measures: an increased flow of blood to the affected area, the arrival of cells specialized in repairing the tissue, release of chemicals

that can limit the damage caused. Externally, the area affected becomes swollen, warm and aching; if the skin is pink, it will redden. Inflammation is characterized by the classic four symptoms of what the Latins used to call the "fire" inside the body: redness (*rubor*), heat (*calor*), swelling (*tumor*) and pain (*dolor*).

The term *phlogosis* is synonymous of inflammation, so the word "antiphlogistic" is sometimes used instead of anti-inflammatory.

Why use anti-inflammatories?

If the inflammation is the body's response to a damage, why fight it? The main reason is that the inflammation comes at the cost of suspending the body's normal immune and catabolic processes, causing difficulty in movement, and limiting the horse in its general ability to work. Anti-inflammatories are used by any athlete in order to avoid the problem of inflammations just before a competition. In the specific case of the sport horse, inflammations to the joints (arthritis and arthrosis) but also to the tendons, ligaments and muscles are often very painful and cause difficulty in movement and lameness. That is why anti-inflammatories such as cortisone-based drugs, phenylbutazone and others are used.

In some cases the inflammation can become a problem in itself, when the entity of the reaction is disproportionate to the initial damage. In this case, it is necessary to use anti-inflammatory drugs to prevent the occurrence of serious problems. Cortisone, for example, is used to treat the problem caused by excessive inflammation such as rheumatoid arthritis or the lupus ery-



thematosis of the skin, notorious in man in this age of self-immune diseases.

Natural anti-inflammatories

In addition to the willow tree mentioned earlier, there are many substances in nature that have an anti-inflammatory effect. Today, many of these substances are at the basis of the preparations that are used to keep inflammations in sport horses at bay (especially those that are not too serious).

The formulations that can be purchased on the markets are of different types. It is important to analyze its composition because even though they are made with natural plants, they need to be used carefully, in order to choose the most suitable for the problem that affects your horse. The choice of these products must be very accurate, preferably following the advice of your trusted veterinarian, even though the products do not require a prescription.

First of all it is important to correctly identify the problem affecting our horse, in order to be able to complement the traditional treatments, if necessary, with the most appropriate natural products. If the problem derives from an inflammation, there are several species of plants that have a proven anti-inflammatory effect.

It is important to point out that almost any natural substance with an anti-inflammatory effect, when administered as the products described above, are not considered performance-enhancing drugs for the sport horse.

Plants with an anti-inflammatory action

Many companies offer anti-inflammatory products based on the well-known effect of the active ingredients of some plants, which must be used according to the recommended dose and timings. Below are some examples of plants that are often used.

Uncaria tomentosa: this plant, popularly known as "Cat's Claw" comes from South America. The parts used medicinally include the inner bark and the roots, thanks to their anti-inflammatory and pain-relieving properties, especially for cartilages. Its effect in stimulating the immune system is also known. With a correct dose and used for the adequate length of time, this plant seems to stimulate the immune system, whose task is to defend the body.

Harpagophytum procumbens (Devil's Claw) is native to South Africa. Its roots are used medicinally. It has a strong anti-inflammatory effect, especially in the case of arthrosis that can often affect the joints of our horse.



Devil's Claw



Uncaria tomentosa

Boswellia Serrata is a plant that grows in India and Africa. It has an anti-inflammatory effect especially in connection with arthritis but seems to have an anti-inflammatory effect also for the intestine (as in the case of ulcerative colitis) or for the lungs, in case of a bronchoconstriction of inflammatory nature (COPD).

Ananas comosus: bromelain, known for its anti-inflammatory effects, is extracted from the fruit and stem of the pineapple. This substance is very useful in reducing swelling, also called inflammatory edema, caused by the accumulation of excess fluid as a result of an inflammation.

Curcuma longa: the rootstock of turmeric, an Asian plant, is used thanks to its antiphlogistic properties. Turmeric seems to be able to act on the series of factors that trigger the activation of inflammatory cells by stopping the process. It also has a high anti-oxidant effect as it acts on free radicals, toxic products that can damage the membrane of tissue cells. Turmeric has also a protective effect of the liver and of the digestive system.

Echinacea angustifolia: (Narrow-leaf Coneflower) is originally from the central part of the United States but is also very common in Europe. Its roots and above-ground parts have the ability to ward off infections, especially of trachea and bronchus. The anti-inflammatory effect is exercised through its ability to stimulate the body to produce the steroid hormones.

Glycyrrhiza glabra: this is the common licorice, used thanks to its anti-inflammatory effect on the stomach walls. It is excellent in protecting the stomach and can be used also in case of gastric ulcers.

Special oils

It is worth mentioning also that the inflammation occurs through molecules, the "middle-man of the inflammation", which exalt or minimize the process. All these molecules derive from the fat assumed through food. There are oils with a generally anti-inflammatory effect and others that do not have these properties. In particular, among fat components, the famous omega-3 fatty acids as well as the gamma linolenic acid can prevent inflammations. Fish oils are particularly rich in omega-3 fatty acids, whereas gamma linolenic acid can be found in special oils such as blackcurrant and borage oils. The oils made from the seeds of these plants have very strong anti-inflammatory properties.