

## Well-being transcribed in the formulas.

Well-being is an important matter for our horses, and it is good to recall some definitions in order to clarify the framework of the thought. Animal welfare is defined as "the positive mental and physical state related to the satisfaction of its physiological and behavioural needs".

To ensure well-being, it is necessary to guarantee:

The **absence of hunger, thirst and malnutrition**: the animal must have access to water and feed in appropriate quantities and corresponding to the needs of his species.

The **absence of fear and distress**: the conditions must not induce psychic suffering.

The **absence of physical and/or thermal stress**: the animal must have a certain physical comfort.

The **absence of pain, injury and disease**: the animal must not be subjected to abuse that may hurt or injure it and it must be treated in case of illness.

Freedom of **expression of normal behavior** of one's species: its environment must be adapted to its species (it must be in a group if it is a social species for example).

It is obvious that these general definitions must be compared and applied to horses discipline by discipline.

The notion of training is therefore fundamental as well as the sports follow-up practiced by a multidisciplinary team. This is necessary as soon as we want to work at the high level. As far as TWYDIL is concerned, this is what we want to bring to our customers. After working on the integration of nutrition, we continued in the development of formulas taking into account well-being. The integration of nutrition focuses on providing the nutrients needed to maintain horse health, discipline by discipline. This is the concept of "Feed for Health". But we also defend a broader concept in the service of well-being, it is the "Feed for Well-being".

The Feed for Health determines the amounts of: Energy / fiber / protein / macroelements (electrolytes, calcium, magnesium,...) / microelements (vitamins, trace elements) optimal to ensure the absence of pathological development in the different categories of horses.

While the Feed for Well-being is based on broader principles such as:

### **Optimization of physiological systems without forcing them**

The perfect example is TWYDIL HEMATINIC, a very effective product to improve the blood count of your horses and provide them a good energy. Thus an anemic horse will recover much better thanks to TWYDIL HEMATINIC (Feed for Health), because the formula provides all elements allowing a beneficial erythropoiesis. But by applying the principles of Feed for Well-being, TWYDIL HEMATINIC will promote the functionality of existing red blood cells (especially senescent) and not force the production of new red blood cells. Otherwise (forced erythropoiesis), this would eventually lead to engorgement, harmful congestion or turnover depleting the red blood cell synthesis system.

Having worked for several years on antioxidants in different animal species, but also for teams of high-level human athletes, we were able to demonstrate that the effort, training and stress of competition were better tolerated if organisms could rely on their own blood globular stock. Among the antioxidants, one stood out, it was SOD (enzyme super-oxide-dismutase).

The first study published in horses in 2010, clearly indicates antioxidant membrane effects and enhancing the functionality of these membranes. Membrane stabilization is observed at both muscle and erythrocyte levels. These effects help protect membranes, improve cellular and organ function. This observation is corroborated at the muscular level and at the level of the red blood cells of horses that have ingested SOD. They are more resistant to oxidation. Knowing the significant involvement of oxidative stress in cellular senescence (aging), the use of this element therefore participates in maintaining the functionality of erythrocyte membranes until their destruction. In summary, the antioxidants specifically used in TWYDIL HEMATINIC promote the effectiveness of existing red blood cells until their death at about 120 days (Feed for Well-being); Without these elements, red blood cells could lose much of their oxygen carrying capacity after only a few weeks of life.

### **Favoring one metabolic pathway to limit the potentially deleterious effects to another**

If the use of sugars is a good source for rapid energy production (ATP), it produces lactic acid promoting muscle fatigue. In addition, oxidative phosphorylation produces free radicals. When the production of radicals exceeds the capacity of antioxidants (oxidative stress), there is potential muscle breakdown (myopathy). Training improves the enzyme machinery to fight free radicals. Integrated nutrition (Feed for Health) can provide the nutrients needed to ensure balance. But referring to the principle stated above (Feed for Well-being), TWYDIL, thanks among other things to the incorporation of L-carnitine in TWYDIL PROTECT PLUS and TWYDIL OMEGADIL, will promote the use of fats as a source of energy; Fats use beta-oxidation pathways that cause much less damage to organs.

On the other hand we propose complex formulas that do not use the principle of the single-element. For example, in the context of antioxidants, it has been clearly established that the intake of a limited number of antioxidants aimed at counteracting one pathophysiological pathway promotes the appearance of disorders within other uncontrolled pathways. Combined use, in the right dose, can tackle all harmful pathways and thus promote well-being while supporting the accomplishment of the effort.

### **Focus on prevention**

Prevention is the cornerstone of Feed for Well-being. It must be studied and implemented at every stage of the horse's life and at all levels, from genetic approaches to basic environmental and nutritional in particular. In traditional Chinese medicine the patient seeks the prevention of diseases by following the advice of his traditional doctor. If a pathology occurs, it is an admission of failure and the practitioner is deprived of his fees.

Through its formulas TWYDIL seeks to ensure long-term effects for a sustainable sporting career.

The first system related to well-being in horses is the microbiota, which is the symbiotic interface between the body and the outside. The microbiota manages the vast majority of the immune system, inflammatory responses and even modulates the psychic responses of the horse. Taking care of the microbiota is certainly the priority when it comes to nutrition for well-being. TWYDIL BEBACK, TWYDIL HEMOPAR, TWYDIL CALMIN, TWYDIL ELEVAGE, TWYDIL GROWING, TWYDIL COURSE, TWYDIL VIGORADE, TWYDIL MUCOPROTECT, TWYDIL STOMACARE, TWYDIL OMEGADIL, are all products that include microbiota support elements in their formulation.

Let's look at the definition, with regard to the digestive microbiota, of pre-, pro- and postbiotics.

Pre-, pro- and postbiotics are feed substances generally composed of complex carbohydrates (short-chain oligosaccharides), microorganisms or metabolites derived from flora. All these biotics are defined as nutrients used selectively and favoring the host flora to confer health and well-being benefits by exceeding their own nutritional capacities.

More specifically, sugar metabolism is a major concern in horses. When a herbivore eats cereals and the dust of the diet is stuck by about 4% molasses it generates repeated insulin peaks which are responsible in the long term for metabolic syndrome (insulin resistance comparable to type 2 diabetes in humans). In our sport horses it generates an inflammatory syndrome (with multiple locations: pulmonary, articular, tendon,...). The saying "sugar is the enemy" makes perfect sense. With this in mind, we removed all the sugar from our formulas (Feed for Health) and changed it to an isomer. This isomer is Palatinose<sup>®</sup> which diverts the metabolic ways of sugar in order to limit and delay its entry into the body, which will only generate limited insulin peaks with a low inflammatory power (prevention at the service of well-being).

### **Formulate to improve the human-horse connection in a psycho-cognitive approach**

Taking into account the principles previously stated, several TWYDIL products improve the daily lives of horses and their riders and reduce the risk of accidents. A calm, attentive, respectful horse is a horse that has a good state of well-being allowing a special connection with the person who cares for it. This reinforces learning.

The maintenance of the microbiota, in particular with TWYDIL CALMIN and TWYDIL GROWING, ensures the digestive and psychological well-being of horses. Riders feel a clear difference in the listening and attention given to them by their horses. Remember that the intestinal flora is called the second brain of the organism because it determines the mood of a horse and forges its character. A horse with healthy flora will be able to interact properly with its congeners and caregivers.

A horse that feels good (state of well-being) will be serene and less excitable. TWYDIL CALMIN, in addition to prebiotics, has a formula rich in magnesium, vitamin E and L-tryptophan. This conjunction generates a muscular, digestive and cerebral appeasement compatible with a reinforced listening of the horse for learning in calm.

The adaptation of the horse to its environment, training, transport, competition is the key factor in order to avoid excessive stress. The notions of adaptation, stress, resistance to effort and immunity are intimately linked because their regulation is genetically encoded on adjoining loci (Pre-opio-melano-cortin) and which are expressed at the same time. The regulation of the expression of these genes can be operated by nutrients called adaptogens. We are talking here about nutrigenomics for well-being: the modulation of gene expression by nutrients in order to increase adaptive capacities, support resistance to effort, immunity and reduce stress. TWYDIL HIPACAN+C and TWYDIL MUCOPROTECT belong to this product category thanks to their richness in different types of ginseng. These adaptogenic products provide true well-being and help horses of more fragile or unstable temperament.

### **Doping management for horse welfare**

If the debate shifts to ethics, then the notion of doping must be emphasized. The authorities want not only to protect fairness in competitions (Clean sport) but also to guarantee the well-being of horses. It is with this in mind that TWYDIL has put in place a unique strategy to ensure that its batches are free from contamination.

- 1) Control of phytotherapeutic raw materials before their purchase to verify the absence of natural contaminants.
- 2) Control of the finished product for each production to verify the absence of natural contaminants.
- 3) Control of blood and urine from a horse that has received 3 times the dose of the finished product for 3 days. Complete screening for an exhaustive search for prohibited substances.
- 4) For products with withdrawal period (TWYDIL ARTRIDIL, TWYDIL MUCOPROTECT and TWYDIL HIPACAN+C), check at 48 h (official withdrawal period) to verify the absence of the substance that justified the delay.

For many years TWYDIL's philosophy has been based on an approach that goes far beyond basic nutrition and that respects the horse first.